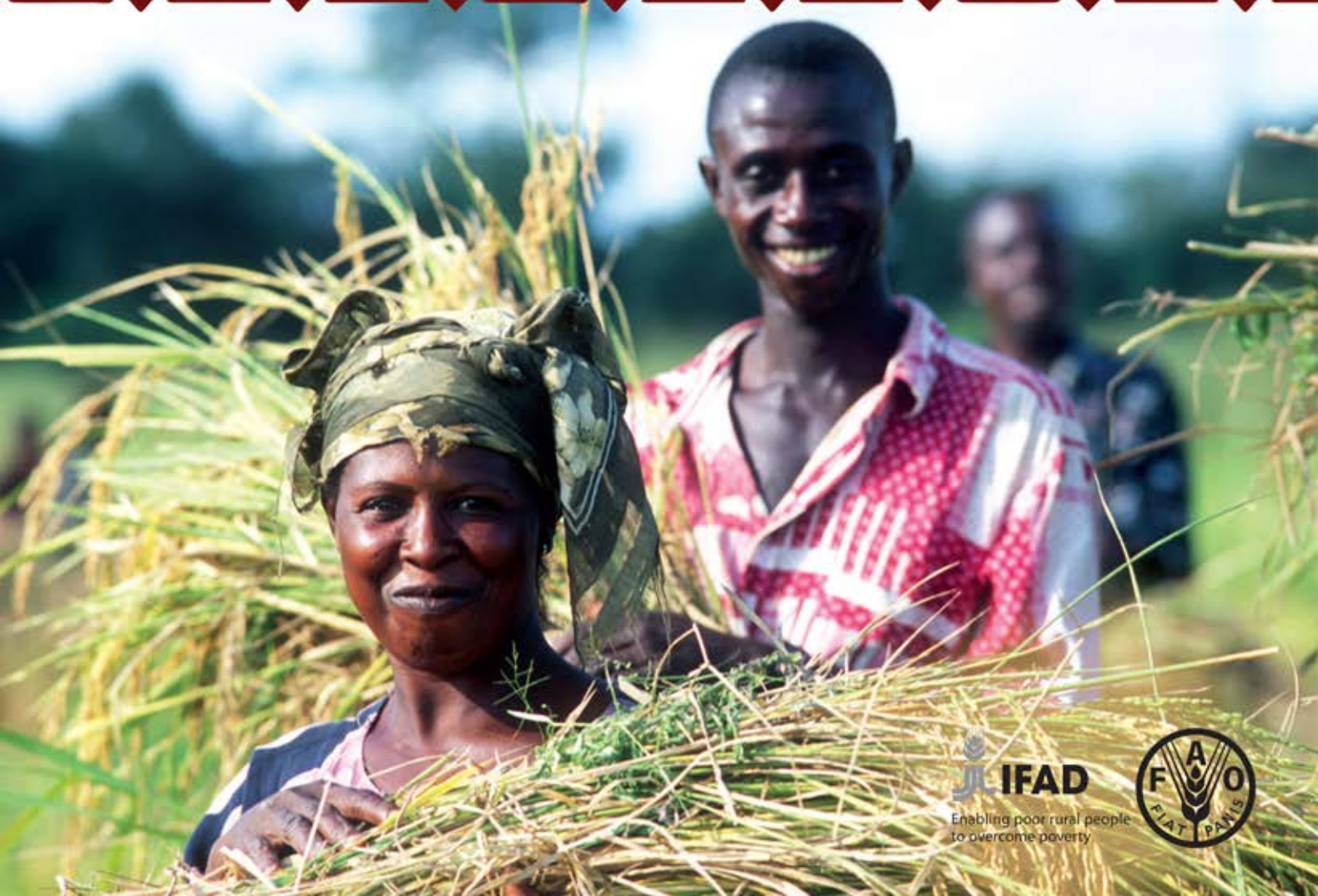




Rebuilding West Africa's food potential:

Policies and market incentives for
smallholder-inclusive food value chains



Rebuilding West Africa's food potential: Policies and market incentives for smallholder-inclusive food value chains

Edited by

Aziz Elbehri

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Foreword

The price hike on international food markets in 2007-2008 was a turning point in world agriculture. Despite the surge in food prices, the expected supply response for most smallholder farmers, particularly in Africa, did not occur. The crisis triggered a broad consensus calling for substantial investments in agricultural and rural development to reduce both food insecurity and poverty affecting chiefly rural areas. The price hike also confirmed the urgent necessity of making markets work for and inclusive of smallholder farmers.

In West Africa, this episode triggered a stronger commitment to a food security policy geared toward improving the performance of the agricultural sector. There were renewed commitments to create the enabling environment for greater investment in staple food commodities, long neglected in favor of a few export commodities. The episode also gave a new impetus to the CAADP (Comprehensive Africa Agriculture Development Programme) process which shaped the national agricultural development strategies and the related investment programmes.

The present book focusing on West Africa embodies a thorough analysis of past and present policies pertaining to food value chains without overlooking export commodities. It examines detailed value chain case studies conducted in several countries, covering both staple food commodities (rice, maize, sorghum, millet and cassava) and export crops (cocoa, cotton, oil palm, mangoes and horticultural products). It reviews public and private initiatives and includes thematic analyses on not only the private sector but also farmers' organizations seen as market agents.

This book aims to contribute to filling an existing gap in the literature on food value chains in West Africa. It identifies good practices in value chain development and provides policy guidance to agricultural and rural development stakeholders. It is intended to be a sourcebook for decision makers, especially at a time when many countries in the region have embarked on implementing their national agricultural strategies derived from the CAADP process.

The book recommends several priority areas for action. Key among these are: (a) Policy support to agriculture to achieve food security and poverty reduction must place *greater emphasis* on staple food crops and build stronger market incentives for smallholders' inclusiveness, with particular focus on *women's* access to inputs, credit, better organization and market/business capabilities; (b) Investment strategies aligned with CAADP must ensure *greater policy coordination* between public and private actors and enhance market opportunities, especially through domestic marketing and intra-regional trade; (c) Policy support should focus on developing *market-based* input delivery services, enhancing capacity for producers' organizations to self-reliably access information, inputs, credit and forge credible business linkages with other value chain actors.



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Editor's note and acknowledgements

This book addresses the central question of how to rebuild West Africa's food potential in light of the heightened concern over food security in the region, especially in the aftermath of the food crisis of 2007-2008. The book has a regional focus, namely the ECOWAS region (15 West African countries) plus Cameroun and Chad (part of the Central Africa region). Also the book places a particular focus on staple food value chains even though export commodities are also covered. The primary concern of the book was to identify and delineate the key features of a new development model suitable for competitive and smallholder-inclusive staple food value chains.

Several studies reported in this book were carried out by FAO Trade and Markets (EST) Division as part of the *All-ACP Program on Basic Commodities* (2008-2011) funded by the European Commission. Other studies were commissioned by EST as part of the program of work on small holder market integration. Finally, additional studies were also made possible with funding from IFAD under a small grant agreement with FAO to co-sponsor workshops on the topic and to produce a consolidated publication (this book). Under the IFAD grant, two workshops were organized; the first workshop was held in Rome in November 2011 and focused on the conceptualisation of an appropriate model for staple food value chains. The second workshop, with a more policy focus was held in Accra, Ghana in July 2012 to which a large number of stakeholders from West Africa participated.

Evidently, a large number of people have contributed to this book. Aside from the authors, whose names are listed under each chapter, several consultants from West Africa contributed indirectly as part of their participation in the All-ACP program through their assistance in organising and facilitating stakeholder workshops and roundtables. Special acknowledgements go to: Salif Foulani Sissoko, Ibrahima Coulibaly, and Fatoumatou Diallo Sireballa (Mali); Idrissa Wade, Abdoulaye Fall, and Papa Dieye (Senegal), Jean-Baptiste Zoma and Ouédraogo Salifou (Burkina Faso), Martin Tseunkeu, Norbert Monkam and Christine Andela (Cameroun).

Participants to the first FAO-IFAD workshop held in Rome (November 2011) also helped shape the argument for an appropriate model for staple food value chains, in particular: David Hallam, David Neven, Siobhan Kelly (FAO), Ides Willebois, Steven Schonberger (IFAD); Michael Morris, John Baffes (World Bank); Michael Weber (Michigan State University); Ethel del Pozo-Vergnes (IIED), Michel Benoit-Cattin (CIRAD), Tanguy Bernard (IFPRI), and Jonathan Coulter, UK.

The second FAO-IFAD workshop, held in Accra, Ghana in July 2012, brought together a large number of Government officials, country CAADP focal points, private industry, producer organisations and academic. The rich deliberations at that workshop were incorporated into the book in various ways. This successful workshop benefitted from a close coordination between FAO-HQ, FAO-Ghana office and the IFAD regional office in Accra under the leadership of Han Ulaş Demirag.

Bringing the various studies to fruition and shepherding through the book preparation process required dedication from a large team of professional and administrative staff at the Trade and Markets Division. Emily Carroll and Sugi Yoo ably provided the required administrative support during the All-ACP program phase (2008- 2011). Daniela Piergentili provided support for the organisation of the Rome workshop (November 2011); Patricia Arquerro, Antonia Caggiani (FAO-HQ), and Henrietta Appiah (FAO-Ghana) provided the superb logistic support to the regional workshop in Accra, Ghana (July 2012); Patricia Taylor, Nadia Laouini and Rita Ashton (FAO-EST), Francesca DEmidio (FAO-TCSR), and Michelle Calcatelli (IFAD), ensured a smooth administrative support for the present book. Marwan Benali assisted with

the organisation of the Rome and Accra workshops, and provided editorial assistance to several draft chapters.

Since the book was prepared simultaneously in English and French, all chapters had to be translated to one or the other language. Special thanks go to Brett Shapiro for his high quality English style editing and to Eric Juillard for translating documents into French and for proof reading the French version of the book. Additional translations were carried out by Chantal Zanettin, Illia Rosenthal, while Fergus Mulligan performed a final proof read for the English manuscript. The formatting and design of the book was ably carried out by Ana Filipa Amaro Costa who demonstrated skill and patience shepherding through the simultaneous formatting of two large volumes.

The final manuscript was reviewed by David Hallam, Director of FAO Trade and Markets Division, and individual chapters were cross checked by Suffyan Koroma, Felix Baquedano, Concepcion "Concha" Calpe, Peter Thoenes, ElMamoun Amrouk, and Jamie Morrison. IFAD staff from the West and Central Division, under the coordination of Barry Abdoul, also provided feedback on the manuscript and their input was incorporated into the synthesis chapter.

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List of acronyms and abbreviations

Chapter 1

CET	Common External Tariff
CFA	Communauté Financière Africaine
CILSS	Comité Inter-Etats de Lutte contre la Sécheresse au Sahel
EU	European Union
ECOWAS	Economic Community of West African States
FDI	Foreign direct investment
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
GDP	Gross domestic product
NERICA	New rice for Africa
OECD	Organisation for Economic Co-operation and Development
PPP	Public Private Partnership
R&D	Research and Development
SSA	Sub-Saharan Africa
TFP	Total factor productivity
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Aid Agency for International Development
USD	United States dollar
WAEMU	West African Economic and Monetary Union
WB	World Bank
WDI	World Development Indicators

Chapter 2

ACP	African, Caribbean and Pacific Group of States
BNDA	National Bank for Agricultural Development
CAADP	Comprehensive Africa Agriculture Development Programme
CAISTAB	Agricultural Products Price Support and Stabilization Board, Côte d'Ivoire
CFDT	French Company for the Development of Textile Fibres, Mali
CIC-B	Interprofessional Committee on Cereals and Niebe, Burkina Faso
CMDT	Malian Company for Textile Development
COCOBOD	Ghana Cocoa Board
COFRUCI	Côte d'Ivoire's Banana and Fruit Production Agricultural Cooperative
COPACO	French Cotton Company
CSIR	Council for Scientific and Industrial Research, Ghana
DAC	Development Assistance Committee
ECOWAP	ECOWAS Regional Agricultural Policy for West Africa
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
FCFA	CFA franc (currency of Côte d'Ivoire)
FDI	Foreign Direct Investment
GDP	gross domestic product
IGG	FAO Inter-Governmental Groups on Commodities
IMF	International Monetary Fund
INERA	Institute of Environment and Agricultural Research, Burkina Faso
IRCT	Research Institute of Cotton and Exotic Textiles
MDG	Millennium Development Goals
NCB	Nigeria Cocoa Board
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental Organization
OCAB	Central Organization of Pineapple and Banana Producers
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
ONCAD	National Office of Marketing and Development Assistance, Senegal
ONCC	National Cocoa and Coffee Board
PPP	Public/Private Partnership
PSI	Presidential Special Initiative
ROPFA	Network of Farmers' and Agricultural Producers' Organizations of West Africa
SAP	Structural Adjustment Programme
SODEPALM	Society for the Development of Oil Palm
SODEVA	Society for Development and Agricultural Extension
SOMIEX	Malian Import and Export Company
SONACO	National Packaging Society, Côte d'Ivoire
SONACOS	National Seed Marketing Company, Senegal
SONAGESS	National Security Stocks Management Company, Burkina Faso
SOSUCO	Sugar Company of Comoe
SYCOV	Union of Cotton and Food Producers, Mali
UEMOA	West African Economic and Monetary Union

WB	World Bank
WTO	World Trade Organization
XOF	African Financial Community francs

Chapter 3

CIG	Common Initiative Groups
ACP	African, Caribbean, and Pacific Group of States
ECOWAS	Economic Community of West African States
CEMAC	Monetary and Economic Community of Central Africa
CILSS	Permanent Interstate Committee for Drought Control in the Sahel
ECOWAP	Economic Community of West African Agricultural Policy
FAO	Food and Agriculture Organization of the United Nations
FARM	Foundation for World Agriculture and Rurality
NEPAD	New Partnership for Africa's Development
OECD	Organization for Economic Co-operation and Development
WTO	World Trade Organization
FO	Farmer Organization
WFP	World Food Program
CAADP	Comprehensive African Agricultural Development Programme
NAIP	National Agriculture Investment Program – In French we have plan, but the official name contains program
RAIP	Regional Agriculture Investment Program – In French we have plan, but the official name contains program
RESOGEST	Regional network of food security stocks
SONAGES	National Management Company
EU	European Union
WAEMU	West African Economic and Monetary Union
POU	Producers Organization Union

Chapter 4

ACP	Africa, Caribbean, Pacific countries
AfDB	African Development Bank
C2D	Contracts for Debt Relief and Development Agreement
CAADP	Comprehensive Africa Agriculture Development Programme
CAPEF	Chamber of Agriculture, Fisheries, Livestock and Forestry of Cameroon
CAR	Central African Republic
CEMAC	Central African Economic and Monetary Community
CICC	National Cocoa and Coffee Board
CIG	Common Initiative Group
EU	European Union

ECCAS	Economic Community of Central African States
EPA	Economic Partnership Agreement
FAO	Food and Agricultural Organization
FODECC	Cocoa and Coffee Development Fund
FONADER	National Fund for Rural Development
GDP	Gross Domestic Product
GESP	Growth and Employment Strategy Paper
HIPC	Heavily indebted poor countries
IFAD	International Fund for Agricultural Development
MDG	Millennium Development Goal
NAP	New Agricultural Policy
NEPAD	New Partnership for Africa's Development
NFSP	National Food Security Programme
NGO	Non Governmental Organization
ONCPB	National Commodity Marketing Agency
PACA	Agricultural Competitiveness Support Project
PNDRT	National Roots and Tubers Development Programme
PNVRA	National Agricultural Extension and Research Programme
SAP	Structural Adjustment Programme
SODECAO	National Cocoa Development Company
WTO	World Trade Organization
XAF	Central African CFA franc

Chapter 13

AFD	French Development Agency
AMO	Market observatory
CET	Common External Tariff (CET)
CFS	Food Security Commission
ECOWAS	Economic Community of West African States
EIS	Government Intervention Stock
EWS	Early Warning System
ha	hectare
km	kilometre
MDG	Millennium Development Goal
NSH	National Food Security Stock
OPAM	Office of Agricultural Products in Mali
PAO	Professional agricultural organizations (PAO)
WAEMU	West African Economic and Monetary Union
WFP	World Food Programme
WTO	World Trade Organization
XOF	Franc CFA

Chapter 14

ATP	Agribusiness and Trade Promotion (USAID)
BNDA	Banque Nationale de Développement Agricole
CAADP	Comprehensive African Agricultural Development Policy
CICB	Comité Interprofessionnel des Céréales du Burkina Faso
CIMMYT	Wheat and Maize Improvement International Center
CFA	Colonies Françaises d'Afrique
CFAF	French Colonies of Africa Franc
ECOWAP	Economic Community of West Africa Agricultural Policies
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
FASONORM	Direction de la Normalisation et de la Promotion de la Qualité
FEPPASI	Fédération des Professionnels Agricoles de la Sissili
IITA	International Institute of Tropical Agriculture
INERA	Institut National de l'Environnement et de Recherches Agricoles (Burkina)
OECD	Organization of Economic Co-operation and Development
OPV	Open pollinated varieties
PAFASP	Programme d'Appui aux Filières Agro-sylvo-pastorales
PO	Producers' organization
PPP	Public-Private Partnership
ROPPA	Réseau des Organisations Paysannes et des Producteurs de l'Afrique de l'Ouest
RPCB	Réseau des Producteurs de Coton du Burkina Faso
SITRAC	Société Industrielle pour la Transformation et la Commercialisation des Céréales
SME	Small and medium enterprises
SMS	Short Message Service
SODEPAL	Société d'Exploitation des Produits Alimentaires
SONAGESS	Société Nationale de Gestion du Stock de Sécurité Alimentaire
UEMOA	Unité Economique Monétaire Ouest-Africaine
UGCPA	Union des Groupements pour la Commercialisation des Produits Agricoles
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
UNPCB	Union Nationale des Producteurs de Coton du Burkina Faso
UPPAH	Union Provinciale des Professionnels Agricoles du Houet
URCPO	Union Régionale des Caisses Populaires de l'Ouest
USAID	United States Agency for International Development
WAEMU	West African Economic and Monetary Union
WAMZ	West African Monetary Zone

Chapter 15

APCAM	Association Professionnelle des Chambres d'Agriculture du Mali (The Professional Association of the Chambers of Agriculture of Mali)
BNDA	Banque Nationale de Développement Agricole (National Agricultural Development Bank)
CAADP	Comprehensive African Agricultural Development Policy
CONOESAM	Coordination Nationale des Opérateurs Economiques du Secteur Agro-Alimentaire du Mali (National Coordination of Economic Operators of the Agri-food Sector in Mali)
CFA	Communauté Financière Africaine (African Financial Community)
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
INTSORMIL	International Research Consortium on Sorghum and Millet
IER	Institut d'Economie Rurale (Mali) (Mali Rural Economy Institute)
IMS	Initiative Mil-Sorgho (Millet-Sorghum Initiative)
MISTOWA	Market Information Systems and Traders' Organizations in West Africa NEPAD New Economic Partnership for African Development
NGO	Non-Governmental Organization
OECD	Organization of Economic Cooperation and Development
OMA	Observatoire du Marché Agricole (Mali) (Mali Agricultural Market Information Network)
PACCEM	Programme d'appui à la Commercialisation des Céréales au Mali (UPA-Canada) (Mali Cereal Marketing Support Program)
POs	Producer Organizations
PRMC	Programme de Restructuration des Marchés Céréaliers (Revamping Cereal Markets Programme)
ROESAO	Réseau des Opérateurs Economiques du Sahel et de l'Afrique de l'Ouest (Network of West African Agrifood Stakeholders)
SDDR	Schéma directeur du développement rural (Mali's Rural Development Strategy)
SME	Small and Medium Enterprises
SODOUF	Société Doucouré et Frères (Doucouré & Bros Company)
SWAC	Sahel and West African Club (part of the OECD)
ULPC	Union Locale des Producteurs de Céréales de Dioila (Local union of cereal producers)
WAEMU	West African Economic Monetary Union
USAID	United States Agency for International Development
WFP	World Food Programme
WTO	World Trade Organization

Chapter 16

AfDB	African Development Bank
CEMAC	Central Africa Economic and Monetary Community (Communauté Économique et Monétaire de l’Afrique Centrale)
FCFA	Franc de la Communauté Financière d’Afrique
FAO	Food and Agriculture Organization of the United Nations
GIC	Groupement d’Intérêt Commun
IFAD	International Fund for Agricultural Development
IITA	International Institute for Tropical Agriculture
INS	National Statistical Institute
IRTCM	Regional Initiative for Cassava Marketing and Processing
ITC	International Trade Center
PNDRT	National program for the development of roots and tubers
PPTE	Very Indebted Least Developed Countries

Rebuilding West Africa's Food Potential: Synthesis and recommendations

Aziz ELBEHRI

1. Why rebuilding ?

The price hike on international food markets in 2007-2008 was a turning point in world agriculture. The crisis jolted governments of developing countries and their development partners into renewed focus on agriculture after a long period of relative neglect. A broad consensus emerged, calling for increased investments in agriculture and rural development in order to enhance productivity and meet the heightened challenge of food security. The crisis also heightened awareness of the degree of vulnerability for the majority of farmers in developing countries, who could not respond with higher production because the expected supply response to rising prices did not occur.

For West Africa in particular, this episode reinforced the need for a major rethinking of agricultural development and induced a policy correction towards staple food, which had been long neglected in favor of a few export commodities. The West African governments also responded to the disruptions to food trade by redefining food security in terms of self-sufficiency, increased reliance on domestic supply of staple food crops and lower reliance on imports. In the short run, this gave rise to crisis-induced interventions to stimulate production (national initiatives on rice, maize or cassava, depending on the country) and a new impetus to raise productivity in the medium term. The crisis also gave a new momentum to the CAADP process.

More importantly, the post-crisis environment gave rise to a new *modus operandi* giving greater importance to broader agricultural diversification with increased focus on staple food crops. Considered key to food security, these crops have now received more attention, with attempts to address the huge productivity gaps. However, too narrow a focus on staple food products alone is neither feasible nor desirable. The staple food markets would not be sufficient to harness the full agricultural potential in West Africa, given the diversity of growing conditions and agro-ecological systems. Moreover, achieving greater food security requires not only improving food availability but also requires greater access to food which comes through enhanced sources of income that can be facilitated by diversification of agricultural enterprises. Diversification must also continue to give due importance to cash crops and exports, which continue to generate substantial revenues despite the relative erosion of global market shares. Consequently, the new development paradigm embraces diversification that covers both food staple crops and cash crops.

There is clearly a need to rebuild the West Africa food productive capacity through broad-based diversified agriculture. Such rebuilding must be based on the triple objectives of enhancing productivity, fostering market-based competitiveness and ensuring smallholder inclusiveness. In West Africa, improving productivity requires disseminating yield-enhancing best practices, addressing the serious soil fertility depletion, addressing land tenure pressures, and raising returns to labour. Improving productivity also requires managing risks, tackling vulnerabilities, and strengthening resilience of staple

food production. Competitive agrifood value chains must rely on solid demand, supportive industries, quality inputs and firm rivalry; agrifood chains also require an enabling legal and policy environment and coordination among value chain actors.

It is essential to develop inclusive value chains in order to achieve stronger agricultural growth and improve the livelihoods of the rural poor. Given the myriad constraints facing small-scale farmers, greater effort must be deployed to ensure that markets are more inclusive of small-scale producers – including women, who play a significant role in staple food value chains. Women face additional constraints in accessing resources (land, credit, technology, training, extension) and therefore require gender-targeted interventions. As an illustration, much of the rice produced in Burkina Faso is parboiled by women, who play a central role in the potential development of the rice value chain; however, women face a huge set of constraints (in access to credit, training, organization and capacity), which prevents them from playing a far more dynamic role in turning rice into a thriving agro-industry.

Clearly, policy support is crucial to induce the required value chain transformation in West Africa. Equally important is an understanding of the role of the key players essential for such transformation – the public sector, private agro-industry, the finance sector, and the producers and their organizations. Understanding the respective roles of each of these players is an essential part of formulating the required market and institutional reforms and delineating the right policy environment.

2. Getting policies right: priorities for the transformation of the staple food chains in West Africa

The essential players in agrifood value chains can be grouped into four broad categories (or market agencies): (i) public agencies; (ii) agro-industry (input suppliers, processors); (iii) financial institutions; and (iv) producers and their organizations. Each of these players plays a critical and well-defined role within the agrifood system.

The role of the public sector is to provide the catalytic interventions required to create the enabling environment and the right policy setting. However, the full development of staple food value chains rests primarily on the private agribusiness players, including those of small- and medium-scale, who contribute to market creation, innovation and enhancement of quality standards. A dynamic agro-industry also depends on well-functioning credit institutions that forge commercial partnerships with processors, input suppliers and producers, contributing to funding as well as financial training and capacity building. Finally, no value chain can thrive without the producers and their organizations – the necessary market agency that can contribute to more dynamic and inclusive value chain development.

The public sector supports the food value chain development by setting the overall policy environment guided by broad strategic objectives – namely, food security, poverty reduction and growth. The public sector aims to create the enabling environment for business (security, legal frameworks, infrastructure, research and development), and to support smallholder-inclusive market participation. In the context of food value chain transformation, the priorities for policy support include the following: (i) fostering private input markets and providing incentives for their uptake by farmers; (ii) supporting dissemination and transfer of information, including market signals to stimulate exchange and to improve quality and value; (iii) increasing high-impact investments targeting the development and transfer of technologies,

promoting private sector participation, reducing investment risks and promoting public-private partnerships; (iv) equalizing the market opportunities for domestic producers vis-a-vis competing imports and harmonizing trade policies with domestic support measures; (v) promoting schemes to encourage greater engagement and developing stronger linkages between producers and buyers; and (vi) strengthening the capacity of small farmers and their organizations to expand market participation.

2.1 Boosting productivity: promoting private input markets and creating the correct incentives for input uptake

Among the key drivers for enhancing productivity of staple food crops are policy incentives and measures that foster higher input use by farmers. The focus must be placed on encouraging private initiatives and market-based schemes, while public agencies can play an important direct role in seed research and development, as well as catalyzing privately-led commercial seed production and distribution. At the initial stages of input market development, the public sector can also lower the cost of inputs to producers by subsidizing private bulk purchases and providing tax incentives for private input networks and dealers. Another critical public role is to enforce the quality controls on fertilizers and seeds.

On the other hand, direct fertilizer or seed subsidies by the government to farmers have rarely worked; they are unsustainable and subject to leakages (including smuggling across borders) and have very low impact apart from a temporary boost to production. Far more seriously, direct input subsidies tend to discourage the emergence of viable and private provision of inputs to producers. Fertilizer subsidy programmes, often used by governments, have rarely been successful. For example, Nigeria tried a fertilizer input subsidy, only to abandon it as unworkable, leaky and inefficient. Instead, Nigeria turned to indirect support for input uptake by facilitating access to credit. There are, however, noteworthy experiences with targeted subsidies taking place in East Africa (Rwanda, Malawi) that could be replicated in West Africa.

Providing credit to increase input use has many advantages, not least of which is the flexibility it offers producers in choosing the optimal fertilizer management for their situation, depending on the production system as well as the state of soil fertility. In Benin, the *Projet de Gestion Intégrée de la Production et des Déprédateurs* (GIPD) offers a successful case of an integrated fertilizer programme which combines organic and mineral fertilizer techniques to deal with depleted soil fertility resulting from previous excessive fertilizer applications.

Increasing the use of inputs is only the first step to enhancing productivity. The latter also requires facilitating improved access to appropriate technologies and equipment by small scale farmers and small and medium enterprises. This in turn requires various interventions and supportive measures that include subsidized credit and investments for targeted productive assets and solving the land tenure constraints which block investment opportunities for small scale producers, including women, and reduce access to credit. Better access to input, equipment and technologies combined with technical and managerial training (through training centers, farmer field schools) all combine to improved returns to labor. These measures must be integrated with value chain or sectoral development strategies.

2.2 Resolving the perennial credit problem for small-scale farming: innovative solutions for staple food value chains

Access to finance by small-scale producers and value chain operators is the foundation of a well-functioning value chain and ensures steady agricultural development. For the majority of small scale producers, access

to credit for staple food production is either unavailable or comes at prohibitive interest rates. Unlocking credit and finance constraints remains a huge challenge for agrifood chain development. At the Making Finance Work for Africa (MFW4A) Conference, held in Kampala Uganda in 2011, a declaration of principles was made on enhancing financial capability in Africa. The Kampala principles provide some useful guidelines in the search for solutions. Some of the relevant principles seek to: (i) ensure legislation to remove barriers to financing agriculture operations such as warehouse receipts and contract farming, and support the emergence of viable local rural financial institutions; (ii) develop financial markets to support the enhanced capacity of financial institutions to lend and meet the market demand; (iii) strengthen farmer organizations so that the production end of agricultural value chains becomes an effective influence on agricultural finance policy-making; (iv) improve financial literacy and farmer business education, inclusive of both men and women, as well as youth; and (v) ensure a sustainable flow of information on markets, output prices, cost of inputs, and cost and conditions of finance and credit.

Innovative solutions are required for staple food crops and can involve the public sector or public-private partnerships. Some finance models that have been applied with some success to cash or export crops could also be tried with staple crops. Among these are: (i) the social lender model (which focuses on lending directly to producer organizations and small-scale businesses); (ii) direct financing of outgrower schemes where producer-buyer relations already exist; and (iii) finance schemes that involve two or three partners, including a finance institution and producer organization, with a government agency (sometimes with donor financial support) often supplying a guaranteed fund to back up the programme.

One example is Ghana's National Rural Growth Programme (NRGP), which has test-piloted a new credit system as part of the value chain development targeting industrial crops, exported fruits and vegetables, crops grown especially by women, and livestock. Under the programme, farmer groups, including those participating in outgrower schemes, can register as a company known as a Special Purpose Vehicle (or SPV). The SPV has access to commercial bank finance and can provide farmers (or outgrowers) with input credit (fertilizers, herbicides, etc.), machinery and other mechanical services, as well as training in group cohesion and coordination. The programme appears to be working, with a steady increase of participants – over 2 500 Ghanaian farmers (as of July 2012) benefit from the credit system – and with high repayment rates (91-98%).

Nigeria offers a different model to facilitate access to credit for value chains. Under the incentives-based Shared System, the government of Nigeria, through the central bank, provides incentives to commercial banks to lend to private agribusinesses by reducing their investment risks in the agricultural sector. As a result, many commercial banks in Nigeria have expanded their lending and investment activities, focusing particularly on seed production where they have been actively seeking potential partners to expand seed production and distribution.

Another promising approach to facilitate access to credit for producers in staple food value chains is the inventory credit or warrantage system. Under this system, producers stock specific quantities of surplus production (usually cereals or other easily storable crops) in a reliable warehouse, jointly managed with a financial institution. The stored crop is used as collateral in order to access credit. Once the credit is reimbursed, the producer can retrieve the production and sell it when market prices are at their seasonal peak. The warrantage system, first introduced by FAO in Niger, has since spread to several countries of the region and is being taken up by a growing number of cereal-based producer organizations. Under the European Union-funded project, All-ACP Programme for Basic Commodities in the African-Caribbean and Pacific (ACP) countries, FAO examined several producer organizations in West Africa and concluded that, while warrantage is a powerful institutional innovation for credit access, its success depends on a number of critical conditions being met, such as: (i) the presence of a local financial partner; (ii) a functioning producer organization with sufficient internal coordination capacity and sufficient storage capacity; (iii) a storable commodity subject to

predictable cyclical prices (high and lows within a season); and (iv) ability of the producer organization to fulfil contract obligations vis-a-vis the financial partner.

2.3 Enabling policies to foster inclusive agribusiness and the catalytic role of public-private partnerships

The vast majority of staple food products (cereals, roots and tubers, livestock, horticulture) serve domestic, informal markets in developing countries. Despite the expansion of supermarkets, most small farmers (60-80%) continue to market their goods through traditional informal channels and street markets.

There is a strong business case for agri-processors to source directly from small farmers, as the former can benefit from known efficiency and comparative advantage of the smallholder farmers and reliability of secured supplies. The answer depends on the levels of risk and how they are addressed. Among the risks faced by agribusiness are difficulties getting smallholders to comply with standard requirements and to fulfill commitments, as well as problems with communication and coordination. Farmers dealing directly with agribusiness typically require a higher level of negotiating capacity and better internal coordination to meet contractual obligations than they generally have; these depend on better organization and a higher degree of market and business capacity.

The transition of small-scale farmers from subsistence to commercial agriculture depends on finding ways for smallholders to move up the commercial and market integration ladder and, inversely, on opportunities for agribusiness to source more of their raw agricultural products from small-scale producers.

A particular form of supply relationship between agro-industry and small-scale producers is the outgrower scheme – a supply contractual arrangement through which private industry provides services to small farmers in the form of extension, training and inputs, in return for a supply of raw agricultural products at set prices. The outgrower scheme, found predominantly within the export-oriented value chains, is favoured by governments and development partners as a means to encourage more small-scale producers to participate in value chains. However, in practice, the outgrower scheme doesn't always work well and can result in frequent side-selling by farmers or contract-breaking on the part of the producers. This is the case for the oil palm industry in Ghana, where side-selling by farmers is rationalized as a consequence of oil palm mills raising input prices and lowering the prices offered for fresh fruit bunches without consultation or coordination with supplying farmers. The farmers often respond by selling on the open market instead, where prices are higher. This case illustrates the importance of close coordination in price negotiations between agribusiness and supplying farmers, which implies relationships that build trust and seek win-win outcomes on prices, quality and supply for both sides. Other conditions for success include merit-based selection of participating farmers and an emphasis on farmer training. The same requirement for close coordination and transparent negotiations also applies to commercial agreements between outgrower farmers and input suppliers.

Successful cases of good working linkages between agribusiness and small-scale producers also exist. Senegal offers a good example involving a dairy agriprocessor and milk suppliers from Richard Toll, east of Dakar. In this case, a privately-led initiative (Laiterie du Berger) was established to produce dairy products using milk sourced from local farms. The dairy processing unit collects, processes and sells milk in the Dakar market and offers its milk suppliers services to improve quality, as well as yield-enhancing techniques. Additionally, an NGO is involved in providing training to participating dairy farmers, focusing on capacity building not provided by the agriprocessor. However, the successful experience in this case

is linked to the localized nature of a captive dairy market with only one operating agriprocessor within the region. These conditions strongly favour a closer business relationship featuring coordination and collaboration.

Public-private partnerships for value chain development

Both the public and private sectors are essential players in the rebuilding of the region's food potential, but with different roles and objectives. Public-private partnerships can be an effective instrument for creating the synergies required to achieve competitive and inclusive value chains. There are a number of best practices to illustrate how these can work in staple food value chains. One example is from the rice value chain in Senegal, where the government, concerned about improving local rice supply, has supported the creation of a privately-led consortium to process and distribute local rice to urban markets through a network of rice importers. The consortium is composed of 13 import marketers and 6 producer organizations, plus processors. Within a short period, the company managed to improve the rice quality offered into the market; it was also working on building up rice collection and processing capacity, which requires heavy investments in processing machinery.

A second example is from Ghana, which started the Outgrower and Value Chain Fund (OVCF). Through this programme, the government aims to improve access to medium-term and long-term financing for productive investment by small-scale farmers participating in outgrower schemes. The OVCF facility brought together farmers, technical operators (processors, exporters or aggregators) and banks. Several factors have contributed to the success of the OVCF programme, including: (i) a tripartite contract arrangement (between farmers, technical operators and banks); (ii) provision of quality technical and financial services and access to information; and (iii) transparent pricing and knowledge of financing for value chain links by participating banks. A noteworthy feature of the programme is the enforcement of merit-based eligibility criteria for each of the three main categories of stakeholders.

Another successful case of a public-private partnership, also from Ghana, is the government-supported, privately-led Root and Tuber Improvement and Marketing Programme (RTIMP). The programme offers services to cassava producers and processors to enhance post-production stages. The RTIMP works with cassava producer groups and focuses on productivity-enhancing activities, such as multiplying and distributing improved planting material and supporting good practice centres, exposure visits and financial analysis of chain activities. The programme also supervises a network of small plots in which participating farmers grow improved varieties, as well as good practice centres to process cassava using standardized equipment. A noteworthy feature of the programme is that farmers are required to pay for all training services they receive. Another crucial criterion is pre-screening for producer groups to ascertain readiness before enrolment. To ensure sustainability of the programme, a business advisory committee focuses on self-financing options as part of an exit strategy when the government/donor funding support ends.

2.4 Examining the critical role of intra-regional trade in rebuilding West Africa food potential

Enhancing access to markets, whether local, regional, or international, is the basis for sustainable food value chain transformation in West Africa. Yet there is strong evidence that this region as a whole continues to undertrade, compared with its potential, with intraregional trade being particularly weak. Locally grown maize, for example, only accounted for three percent of Economic Community

of West African States (ECOWAS) imports from 2005-2009, too small a share even if doubled or tripled by informal trade. Likewise, sorghum and millet – other important staples in the region – could be intraregionally traded much more than is currently the case, since food agriprocessors (breweries, feedstock manufacturers and others) find it much easier to import sorghum or millet from outside the region than to source locally.

While informal cross-border trade does take place, and covers a range of food products (palm oil, maize, sorghum, cowpea, onions, live animals), it still constitutes relatively small quantities, which cross borders largely through a network of personalized business relations. The transaction costs of the cross-border flows are very high, as indicated in part by the large price differentials (often double or more) between production centres and urban consumption markets. These high transaction costs are largely due to lagging transport and communication infrastructures, fragmented regional markets and lack of predictable trade policies. In addition, the trading network is weak as there are very few large-scale commodity brokers (which are common in Southern Africa) who can perform the function of market regulators on a larger scale and have the flexibility to switch from one trade corridor to another and to take advantage of new business opportunities.

The real challenge for West Africa is learning how to unlock the intraregional trade potential and expand staple food markets as part of the broader strategy to rebuild West Africa food potential. This is a tall order, as it requires overcoming a number of constraints – institutional, regulatory, infrastructural and technological. Moreover, it requires a regional approach and the need to align and harmonize policy across the countries of the region. The institutional setting is provided by ECOWAS and the West African Economic and Monetary Union (UEMOA), the two regional organizations mandated to work towards closer economic integration; moreover, the strategy framework exists and is provided by the CAADP process and its associated regional agricultural strategy – namely Regional Agricultural Policy for West Africa's ECOWAS (ECOWAP) and for UEMOA¹ (Agricultural Policy of the Union). In theory, trade facilitation and market development figure prominently under the CAADP (especially Pillar II). Yet in practice, there are many hurdles that stand in the way of achieving greater integration through the free movement of people, goods and services, as well as the weak implementation of other policy instruments such as the common external tariff (CET) and the ECOWAS Trade Liberalization Scheme (ETLS).

Innovative strategies and approaches are required to overcome the hurdles facing trade facilitation and to resolve the conflicting goals among countries that seek greater economic integration while enacting divergent trade policies. Those policies are often reversible and based on narrow short-term goals; hence, they are not conducive to a favourable investment climate. Improving intraregional trade in staple foods requires, among other things, greater effort at raising awareness of the true economic costs of intraregional trade barriers. This requires better and more systematic quantifying of the economic and business costs of existing trade restrictions, and using these findings to communicate to the policy-makers about the importance of food security from the regional perspective and about the role trade can play in the process. Some initiatives have begun to quantify the trade costs. For example, ECOWAS-commissioned studies and supported by the USAID Agribusiness and Trade Promotion (ATP) project offer useful first estimates of the economic costs arising from delays along major West African trade routes and show how they add to transaction costs, making the traded products uncompetitive. Beyond political commitment, there is also a need for greater interagency coordination within countries, especially between relevant ministries (agriculture, trade, health) and internal and transborder security agencies (police, customs, etc.).

¹ West African Economic and Monetary Union, grouping together 8 countries: Benin, Burkina Faso, Ivory Coast, Guinea-Bissau, Mali, Niger, Senegal and Togo.

Overall, to improve trade conditions within the region, a number of measures and initiatives need serious consideration. Among these are the following:

- (i) promote awareness of and adherence to trade rules, especially at the level of border officials, police officers and other control agents, who are often unaware of the correct existing regulations;
- (ii) push for stronger commitment to free trade by ensuring that national trade-related measures or policies (such as seasonal bans on exports) do not conflict with regional trade openness and commitments under the ETLs and the common external tariff (CET);
- (iii) adopt harmonized rules and regulations (e.g. sanitary and phytosanitary standards, quality standards);
- (iv) initiate measures to reduce transportation costs, which remain too high because of poor truck and road conditions and excessive regulation; and
- (v) combat corruption at checkpoints and other points of trade control.

2.5 Considering the essential role of producer organizations as a market agency in the food value chain transformation

Smallholder relations to market can be broadly divided between subsistence (30-50%), occasional marketing (20 to 30%), regularly selling to markets (3 to 15%) and purely commercial (less than 2%). The majority of small-scale farmers are not "organized" and when they do organize, they choose groups and structures, traditional or formal, which respond to their various needs, whether economic, social or even political. As farmers make the transition from subsistence farming to commercialization, the market becomes an important driver and farmers often find it necessary to aggregate in groups or organizations that can help reduce transaction costs, improve access to credit and productive assets and develop the required capacity to negotiate economic or commercial arrangements with partners (input suppliers, service providers, agriprocessors).

As stated above, producer organizations are one of the four central market agencies required for the transformation of staple food value chains (the three others being the public sector, agribusiness and finance). In almost all initiatives, schemes and programmes that require participation of farmers, producer organizations become the preferred vehicle to reach farmers and implement interventions. In much of West Africa, a large number of producer organizations and federations formed during the 1990's following the structural adjustments, the liberalization and privatization push, and the reduced role of the state in agricultural support. The national federations (like CNOP-Mali, CNOP-Guinée) played a role in representing farmers interest in policy processes. At the regional level, ROPPA (Network of farmers and agricultural producers' organizations of West Africa) emerged to play an advocacy role on behalf of farmers at the regional level and contributed to the elaboration of the regional agricultural policy ECOWAP.

Still, as a market agency, most producer organizations remain weak with limited capacity to deliver economic services to its members. The few notable exceptions (Federation Paysanne de Fouta Djallon in Guinea, Faso Jigi in Mali, UGCPA in Burina Faso) have all benefited from lengthy donor assistance that helped them improve their market performance and reach some degree of self-reliance. But the majority of producer organizations with economic or market objectives exhibit weak capacity to effectively engage the market both due to internal factors (weakly inclusive governance, limited technical and managerial capacity, weak group cohesion) as well as external constraints (lack of support from public institutions, weak/difficult business opportunities with input suppliers, difficult relations with finance/credit institutions, or weak negotiating power with agri-business partners).

These characteristics of the majority market-oriented POs are rooted in how these producer organizations are formed, by whom, and for what. Typically, producer organizations that are initiated

by governments to provide single purpose tasks tend to perform poorly when viewed as market agents. For example, in Senegal, cooperatives established by the government have only been weakly effective, as members restrict their participation to selling just enough to recoup their debts. A similar problem is observed in Nigeria, where farmer groups formed by the government remain weak because they only serve as conduits for delivering government services to farmers without expanding their capacity to become autonomous self-run institutions that can leverage existing market opportunities. In Liberia, the government and donors pushed for the formation of farmer cooperatives, but they met with limited success, as the groups sought only the acquisition of freely-provided assets and resources, creating a minimal level of cooperation. Single-purpose groups formed by agribusiness do not necessarily fare any better and may also remain fragile if their sole purpose is to facilitate the delivery of products to the agro-industry, without the accompanying measures that enable these producer groups to enhance their internal capacity to bargain effectively in the marketplace and develop viable commercial relations.

Building producer organizations that are self-run, autonomous and capable of operating independently in the marketplace requires a number of essential conditions. The first is the existence of a business or market opportunity (or opportunities) around which the producer organization can focus its strategy, interventions and organization. Next is the requirement for good internal governance and coordination, as a foundation for effective decision-making and cooperation leading to high performance. Third is the requirement that the producer organizations have members with homogeneous goals and expectations to avoid conflicts, gridlock and lack of collective action.

These are the essential minimal requirements that must be met to ensure that the producer organization can become an effective market agency. Beyond these requirements, the producer organization should aim, with time and experience, to build its capacity and credibility, first between leaders and members, and then between the organization and its technical partners (agro-industry, finance, etc.). How fast a producer organization can achieve full capacity depends very much on the enabling environment, both economic and institutional. The existence of dedicated public agencies tasked to provide strategic support to POs is an important institutional pre-requisite. Also, vis a vis private sector partners, the existence of alternative options for farmers to access inputs and to sell their products can strengthen their ability to negotiate with a particular technical partner on behalf of members and hence raise the odds for win-win outcomes for both sides.

One important requirement is that support to producer organizations must include cost-sharing by the farmers receiving the services. Not only this will strengthen the needs-based training, it will also encourage merit-based membership. Donor-funded projects, in particular, need to insist on cost sharing with beneficiary farmers and avoid providing free services that send the wrong signal to farmers and cannot be sustained beyond the project's short life span.

While there is a general consensus that market-oriented producer organizations need strengthening, there are few proven methods to apply for this purpose. One approach is to review successful experiences and draw the proper lessons from. Examples of noteworthy experiences are the Confédération Nationale des Organisations Paysannes de la Guinée (CNOP-G), Senegal's FONGS (Federation des organisations non-gouvernementales du Sénégal) and Burkina Faso's UGCPA. One can also apply the "inclusive business model" principles to diagnose constraints and propose solutions to improve the producer-buyer linkages. This method has focused on cooperatives specializing in niche and high-value marketable or exportable products. The approach can be effective in cases where an untapped value addition opportunity exists. However, the application of business principles in the case of producer organizations or cooperatives remains narrow, focusing on a single segment within a value chain taken in isolation

from broader requirements of governance, coordination and capacity to address a range of market issues faced by producers.

An alternative approach, developed by FAO, is the GAIN (Governance, Autonomy, Integration, Needs-based) methodology, which performs a complete diagnosis of a producer organization with the aim to initiate endogenous change processes that progressively transform the producer organization into a self-reliant, economically autonomous market agent. The GAIN methodology applies a participatory, iterative framework to tackle the market opportunities and the issues of internal governance and coordination and to examine potential partnerships with external economic and institutional partners. The methodology generates a road map for corrective measures to build capacity and targeted training needed to meet the identified new market opportunities, as well as the institutional and governance structure for the producer organization. The GAIN approach was successfully applied in two West African countries - Burkina Faso and Mali - plus Cameroon from Central Africa - as part of the All-ACP Programme for Basic Commodities in ACP countries

Some West African governments have begun to initiate programmes specifically designed to strengthen producer organizations, as part of their CAADP-linked support to value chain development. For example, Ghana has established a desk for farmer business organizations to build their capacity, as well as a directorate for Women in Agriculture to ensure that investment initiatives are gender-neutral. Ghana's Market-Oriented Agricultural Programme (MOAP) targets POs and is test-piloting an approach that aims to bring POs into a progressive multi-stage development process, leading to the business-ready stage. This is done through a set of incentives for the producer organizations and training programmes for members that are tailored for different stages of business readiness. However, the programme is still in the pilot stage and would need to be successfully integrated into a reformed extension service.

3. Commodity-specific priorities for a transformation of food value chains in West Africa

3.1 Export commodities

Traditional exported crops (cotton, coffee, cocoa) – Completing the transition from state-controlled to state-supported, privately-led value chain development model

Export-oriented value chains continue to have considerable weight in government programmes and development strategies despite the setbacks in export markets experienced since 1990s, and the collapse of the state-controlled development model. Under the new agricultural paradigm, based on state-supported, privately-led food value chains, traditional export commodities will continue to play a significant role in income generation and employment. For the most part, policy and institutional reforms are still unfolding towards a liberalized market. Under the new model, agribusiness actors and producer organizations are expected to play enhanced roles, while the public sector will shift away from direct control and towards indirect support. The state will continue to support market services (market information, research, extension, disease and quality control), enhance productivity (improved seeds and production technologies), address market failures (credit, inputs) and strengthen the legal framework for commercial transactions and business arrangements. These supportive measures,

coupled with strong incentives for producer organizations, can significantly reduce the number of intermediaries in the value chain and help farmers capture a greater share of the value added.

Non-traditional exported food (horticulture) – *Increasing market opportunities and strengthening inclusiveness of small farmers*

High-value horticultural export crops face two challenges: how to expand export market opportunities and how to benefit small farmers, who tend to be excluded from these high value markets. High-value export markets are an important segment within a diversified agricultural portfolio in the region. The expansion of horticultural crops in the 1990s in West Africa is a strong indication of the huge export potential in the region for a variety of tropical fruits and vegetables. Even more growth potential is possible if the local and regional markets can also be tapped. This should provide a larger basis for developing an agriprocessing fruit and vegetable industry. This, in turn, requires overcoming a number of market impediments resulting from the tightly integrated and coordinated agro-industry, often led by international food companies or global food retailers. These companies are the primary demand drivers that impose stringent standards and certification requirements to meet the demands of a high-income consumer market. Within this structure, small-scale suppliers in West Africa are easily outcompeted and tend to be excluded from the high-value markets. This results in a segmented market, in which the high end is serviced only by large-scale farms or estates, leaving small-scale farmers to produce for low-end markets where quality requirements and prices are lower.

This poses a dilemma for governments who promote these high-value export crops as pro-poor and it requires corrective action to ensure greater smallholder market participation. Studies on horticultural exports from West Africa have shown that effective and targeted interventions can include: (i) strengthening farmer cooperatives; (ii) targeting subsidized investments for qualified producer groups; and (iii) increasing incentives to diversify markets, giving greater emphasis to domestic and regional markets. An agro-industry strategy that targets local or domestic markets can serve as an important strategic stepping stone towards a more competitive agro-industry capable of expanding market penetration internationally. In addition, focusing on regional markets with less stringent standards (i.e. food traceability) can provide the space and the time to develop more inclusive markets, giving smallholder farmer groups an opportunity to develop the marketing capability to share in the value addition. Some farmer groups can also become competitive enough to compete in the international markets as well.

3.2 Staple food value chains

Staple food supply chains generally exhibit a lower degree of integration and a much broader range of marketing channels than export-oriented supply chains. Also, farmers are both producers and consumers of staple food. With low unit values, staple crops also offer lower incentives to manage risks in assuring supply and product quality and standards. Staple food value chains in West Africa face cost disadvantages when the market becomes regional and international, partly as a result of high logistical costs (e.g. for rice). Long-term competitiveness is also a concern in West Africa, as the soil mining and fertility depletion is not sustainable and returns to labour remain comparatively low.

While staple crops, especially cereals, roots and tubers, require significant upgrading of the agriprocessing capacity and better coordination strategies between farmers and agriprocessors, not

all countries are at the same stage of development. In some countries there is little post-production processing capacity – for example, Burkina Faso, which places priority on the introduction of processing technology to build up the initial processing capacity. By contrast, countries like Nigeria and Ghana have a more highly developed agriprocessing industry and therefore place greater priority on improving the price incentives and access to credit and on fostering a favourable business environment.

Staple food crops cover a wide range of products. In this section, we group six of the most important commodities from the region into four broad categories. These are:

- (i) Staple crops with huge growth potential, both regionally and internationally, which are subject to two-way trade (as imports and exports) (oil palm);
- (ii) Staples with huge production deficits and large import dependency but with large potential for expanding domestic supply (rice);
- (iii) Staples with large potential for enhanced production and productivity and great potential to feed the agro-industry, given the multiple market uses (maize, cassava); and
- (iv) Staples with large subregional coverage and critical importance for food security, but with low productivity due to policy neglect, despite a huge potential for transformation into commercial value chains (sorghum, millet).

Oil Palm value chain – Ensuring inclusiveness of small farmers and small and medium enterprises along with demand-driven sector expansion

The oil palm sector in West Africa has strong growth potential due to increasing demand, both domestically and internationally. The strong economics of scale of oil palm plantations favour large-scale investments and create a bimodal market structure where a few large-scale plantations coexist with a large number of small and medium-sized producers. Oil palm production in West Africa largely follows this bimodal market structure across the main producing countries (Cameroon, Cote d'Ivoire, Ghana, and Nigeria). The oil palm value chain is thus privately-run, with the government playing an indirect supportive role, encouraging outgrower schemes as the preferred model for smallholder inclusion. A study from Ghana showed that the outgrower scheme is leaky, with frequent side-selling (or contract-breaking) problems as participating farmers complain of little control over input (fertilizer) prices or the fresh fruit bunch prices they receive. In this case, the absence of a participatory platform to establish prices, coupled with the weak negotiating capacity of farmers (who are not organized into groups), combined with the possibility for farmers to sell on the open market, all contribute to the frequent occurrence of side-selling.

The main lesson to draw from this case is that the public can do more to correct the existing market failures and to facilitate conditions for greater transparency in the palm oil market. Among the possible interventions is to even out the playing field between large and small-sized mills by creating investment funds targeted at small and medium-sized oil palm mills and tied to commercial arrangements with small-scale producers. These investments would expand a mill's capacity, improve product quality and yields and ensure greater procurement from small-scale producers, both men and women. The second possible intervention is to allocate funds to support the autonomous creation of oil palm producer groups and encourage greater coordination capacity in order to ensure better access to credit, improve market opportunities and enhance producer groups' bargaining capacity with oil palm processors. These lessons and required responses also apply to other oil palm-producing countries, to the extent that they have the same market structure and their smallholders face the same impediments to market participation.

Rice value chain – *Improving the competitiveness and supply of local rice and reducing dependence on imports*

Among the major staple food commodities in West Africa, rice occupies a unique position. It is one of the few food commodities for which consumption has risen significantly faster than production over the past two decades, largely due to a very high rate of urbanization and low rice productivity growth, making the region increasingly and unsustainably dependent on imports. The share of rice consumption covered by domestic production has fallen from 70 percent in the mid-1990s to less than 30 percent currently. Moreover, as imported rice began to dominate consumer markets in much of the region, it became increasingly difficult for local rice to compete, which discouraged investment and further eroded the incentives to produce and supply rice to the local market.

These trends became untenable and politically unacceptable following the food crisis of 2007-2008, prompting the region's governments to rethink their reliance on food imports and shift their food security strategy towards self-sufficiency. However, such a shift requires a range of measures to raise rice productivity, as well as removing market and institutional barriers, in order to enhance the supply of local rice into the urban markets. The first responses were crisis-focused, relying mostly on fertilizer and seed subsidies, which are known to have only a short-term, limited impact. What is required is the type of incentive that can ensure a sustainable supply of rising surplus production into the urban markets and ensure expansion of local rice market shares. These incentives would include facilitating collective storage, improving rice quality and marketing, and enhancing coordination among value chain actors, given the weak rice value chain linkages that currently exist among farmers, input suppliers and rice millers.

A coherent rice development strategy must endeavour to erase the existing disincentives revealed in the case of Mali through a study on expenditures and investments in agriculture by the Organization for Economic Cooperation and Development (OECD) and FAO. The study showed that, despite heavy investments in rice (compared with other cereals), disincentives for rice production remained because critical complementary measures were missing, including initiatives to strengthen producer organizations, improve coordination among value chain actors, and harmonize import policies with domestic production targets.

Similarly, in Senegal, a country that depends even more on imported rice than Mali, the post-food crisis commitment to rice consisted of limited interventions with minimal, limited long-term impact in terms of raising the share of local rice in the domestic market, despite the post-2008 boost to rice production. Senegal's response to the crisis consisted of supporting fertilizer and seed subsidies and making substantial infrastructure investments in the River Valley region. However, the impact was minimal because marketing is not well-organized and the volumes marketed are not large, despite a boost in yields and unmet demand for the high quality rice produced. The lesson from these cases is that a coherent rice development policy must complement the needed investments in order to raise productivity. Such a policy must include measures aimed at strengthening producer organizations, improving coordination among value chain players, and harmonizing rice import policy with domestic rice supply support.

Maize value chain – *Harnessing the potential of a key feedstock for the region's agro-industry*

Maize is grown in significant quantities over large areas in most countries of West Africa. Maize is a subsistence crop that is being used increasingly as a cash crop. The potential demand growth for

maize is substantial, given its multiple market applications, especially under unrestricted regional trade. Given the low average level of fertilizer use and the limited seed distribution network, there is a large potential for productivity increase in maize. Along the value chain, maize faces great variability in price, quality and quantity, as a result of deficient market information systems, transport and infrastructure impediments and weak enforcement of legal rules and business contracts.

Addressing both the maize productivity gap and the market constraints requires coherent price and investment strategies that combine both market and institutional reforms. The following is a list of priority actions that can be undertaken (with varying levels of priority, depending on the country and on local market and structural conditions):

- (i) Support innovative credit access schemes, including public-private partnerships and warrantage, to facilitate producers gaining sustainable access to fertilizer, seeds and quality-enhancing techniques;
- (ii) Establish technology-assisted price and market information systems generated and used by value chain actors (e.g. the maize interprofession) under public-private initiatives;
- (iii) Offer subsidized investments in storage facilities to eligible producer organizations and cooperatives;
- (iv) Provide subsidized investments in small- and medium-scale upgrades of agriprocessing or milling units to enhance processing capacity and improve quality standards;
- (v) Offer publicly-funded, privately-provided and needs-based training programmes for leaders and members of eligible market-oriented producer organizations;
- (vi) Establish legal frameworks for enforcing commercial transactions and ensuring adherence to safety and quality standards and regulations;
- (vii) Establish the institutional frameworks for the creation of producer organizations, cooperatives, business networks and interprofessions to enhance value chain coordination and strengthen the linkages; and
- (viii) Support multi-stakeholder meetings to exchange information on the maize value chain, develop partnership opportunities (such as public-private partnerships) and debate policies and initiatives related to the maize sector.

Sorghum-Millet value chains – Ending policy neglect so as to enhance food security, foster agriprocessing, and promote market penetration for sorghum and millet

Sorghum and millet are two of the most critically important food security crops in the Sahel (the 15 countries comprising the CILSS (Permanent Inter-State Committee for Drought Control in the Sahel) group stretching from Senegal to Chad). Their adaptability to light soils and lower rainfall make them highly suitable for cultivation where other crops are not feasible. Over 50 percent of the Sahel population depends on sorghum and millet as the primary food source. Yet, owing to policy neglect (much of it due to bias towards commodities for exports or for domestic urban markets) and the resulting lack of incentives, these crops are typically grown with little or no input and produce low yields, an outcome compounded by lower-fertility soils. Consequently, these crops remain largely subsistence crops offering limited surplus to market and lower market penetration compared to maize or rice. As a result, sorghum and millet value chains remain underdeveloped, with little processing apart from small-scale milling.

The potential contribution of these crops to food security is substantially larger than what currently exists. The average yield for sorghum/millet throughout the region is around half a tonne per hectare and could be easily doubled or tripled with existing technologies (improved varieties and fertilizer management techniques developed over the years by the INTSORMIL project and field-tested by the Sasakawa 2000 project).

Within the Sahel countries, the lack of policy incentives and the absence of a serious development strategy for these otherwise strategic food security crops are not surprising but this urgently needs

correction. No food security strategy within the Sahel region can exclude sorghum and millet; they require priority support. Given the similar development status of these crops in many of the Sahelian countries of West Africa, a coherent sorghum and millet policy and investment programme would target the following priorities:

- (i) Create the required market, price and credit incentives needed to increase adoption of improved technologies by farmers and to improve yields;
- (ii) Promote higher marketable surplus by subsidizing investments in producer-run storage facilities to improve marketing and introduce supply and price risk-management schemes;
- (iii) Provide subsidized credit and investments for small- and medium-sized agriprocessing units through public-private partnerships in agriprocessing mills (which use sorghum and millet in animal feed, as well as processed and semi-processed food and beverage products);
- (iv) Encourage demand for sorghum and millet food products by strengthening food quality control measures and supporting improved quality packaging through subsidized investments; and
- (v) Support the emergence of strong and market-oriented producer organizations for sorghum and millet by funding training and capacity based on need, and by subsidizing investments in storage and encouraging public-private partnerships involving producer organizations, finance institutions, and agriprocessors.

Cassava value chain – Accelerating transformation from subsistence into a commercial value chain

Cassava (like maize) is also widely grown and consumed in much of West Africa and plays a major role in the region's food security. Throughout the region, cassava production is characterized by labour-intensive traditional techniques, predominantly carried out by women. Like sorghum and millet, cassava exhibits characteristics of a semi-developed value chain – namely, low marketable surplus, low labour value added, and low yields. Marketing channels are typically undeveloped (apart from small niche exports) and the cassava value chain has a low level of organization and poor linkages among players.

Like maize, cassava has a huge potential to serve as feedstock for a whole range of food, feed, and industrial products. Unlike the readily storable cereals, cassava is a tuber that is quickly perishable after harvest, which makes processing an immediate, critical post-harvest step for generating marketable products. For this reason, increasing cassava yields alone is not enough to turn the production surplus into marketable products along the value chain. Adequate post-harvest processing is a prerequisite.

Several governments of the region have initiated programmes to promote the cassava supply, especially following the 2008 food crisis. In Cameroon, an eight-year International Fund for Agricultural Development (IFAD)-funded programme on cassava (from 2004-2012) illustrates the type of unbalanced approach to commodity development in which too much effort was focused on production and yield increase, without the necessary, complementary measures in processing and marketing. Indeed, the programme succeeded in introducing higher-yielding varieties and raising production by participating farmers but there was no similar impact beyond the farmgate, as processing and marketing received very little focus and much of the added production could not properly be processed and marketed as originally planned. The initial limited processing capacity (a result of weak producer organizations and unreliable processing equipment suppliers) and the lack of reliable marketing channels for cassava products were not significantly addressed by the project. In contrast to Cameroon, Ghana initiated the RTIMP, which aimed at supporting cassava-processing enterprises and piloted initiatives to ensure that production and processing linkages are integrated. The programme is ongoing but already appears to be successful given its judicious focus on post-production processing through capacity building and incentives.

The lessons from the experiences of these country show that, given the current pre-commercial cassava development stage in much of West Africa, a coherent strategy for a competitive and inclusive cassava value chain would include the following initiatives and priorities:

- (i) Establish initiatives to improve cassava productivity through new varieties, farmer field schools and labour-saving technologies, especially those targeting women who perform the hard labour associated with field operations;
- (ii) Introduce and support small-scale processing technologies for use by functional cassava producer cooperatives; such support requires access to machinery, training and follow up; the support should be government-facilitated and, if possible, privately-delivered, involving equipment suppliers, credit providers and buyers;
- (iii) Subsidize investments to small- and medium-scale processing units and provide the required training capacity to producers and specialized processors;
- (iv) Provide subsidized credit, training and legal supervision to processing equipment suppliers;
- (v) Develop technology-assisted market and price information on cassava products covering both local and regional markets; make accessible, timely, and useful information available to producers and buyers, supported by information technology; and
- (vi) Encourage a network of cassava producers, processors and traders at national and regional levels to share best practices, coordinate markets and contribute effectively to policy formulation, industry regulation and public-private initiatives targeting cassava value chain development in the region.

4. Conclusions: Towards an accelerated transformation of food value chains in West Africa

The present chapter laid down the argument for rebuilding West Africa's food potential, identified the respective roles for the key market agencies (public, agro-industry, finance and producers), and reviewed the specific development needs of the most important value chains in the region (aside from livestock and seafood products). What implications can we draw from the study findings in support of the implementation of the ECOWAP/CAADP process and the related national programs?

Within the CAADP process and following the ECOWAS agricultural regional policy (ECOWAP), the region's countries have developed national agricultural investment plans (NAIP) which represent the programming framework for interventions and investments in the agricultural sector mobilizing both internal resources and donor assistance. These NAIPs have identified priority value chains based on their agro- ecological potential and socio- economic impact. At the regional level, ECOWAS developed its regional agricultural investment plans (RAIP) to complement the NAIPs focusing on a limited number of strategic issues relating to supply, trade, and food access, as well as the overall enabling environment for regional investments. The RAIP aims to build on the interdependencies between countries to accelerate the agricultural transformation in the region.

Among the objectives of the RAIP is "the promotion of strategic products for food security" chosen on the basis of production potential, importance and changes in populations dietary habits, and import substitution for products with large import dependency. Given these criteria, the priority commodities highlighted under the RAIP include rice, cassava, corn, livestock and meat products, as well as fish products.

In many countries of the ECOWAS region, the NAIPs' implementation has begun. There is an urgent need for supporting the implementation process and providing guidance in how best to translate the strategy framework into an effective plan of action. Moreover, as the process of finalizing NAIPs/RAIP in the region is continuing through 2015, there may also be a need to assess the impacts the NAIPs and RAIP would have had in accelerating the growth and development of the priority value chains in the region.

On this basis, what lessons and recommendations can we derive from the present study that can guide the CAADP process and accelerate the implementation of the NAIPs/RAIP in West Africa? In response, three sets of recommendations can be put forth:

- (i) The strategic need to diversify agriculture requires balancing out staple food with export-oriented value chains and the correct articulation of the criteria that can ensure its successful implementation;
- (ii) How to design a workable implementation plan for a coherent investment program under the NAIP based on the triple criteria of *Need*, *Capacity*, and *Impact* assessment
- (iii) Execution, implementation and coordination, taking into account the requirements of inclusive-governance, decentralization, and subsidiarity.

4.1 Towards a diversification strategy for value chain development

West Africa has traditionally relied on relatively few export-oriented commodities for its agricultural development (peanuts, cocoa, coffee, and cotton) while staple crops and animal products that form the bulk of population consumption needs received much less policy support. As an illustration, a close examination of the Mali government expenditure patterns in agriculture show a disproportionate share of expenditures going to few urban based food products (rice) or crops generating export earnings (cotton). Throughout the region, private investments in agri-business tend to favor few export commodities with high commercial potential (oil palm, tropical fruits). The same preferences appear evident among the privately-led initiatives for agricultural investments in Africa, such as The African (Accelerated) Agribusiness and Agro-industries Development Initiative (3ADI), Grow Africa, African Agriculture Fund, etc. Likewise, national farmer groups (federations, platforms, etc.) tend to focus largely on staple food commodities that are most grown and consumed by farmers, as they represent a large share of their source of food security, income and livelihood.

Under the ECOWAP regional agricultural policy, the ECOWAS Commission applies the "food sovereignty" criteria for selecting its strategic commodities (rice, maize, cassava, meat products, and fish) for priority investments in the region. At the country level, national governments have also defined their own set of priority value chains for priority investments under their NAIPs. Still, a diversified agricultural development requires a long term growth strategy and hence broadening the selection criteria for priority value chains for early and concentrated interventions with the high spillover potential for the rest of agriculture. Examples of key criteria to consider are:

- (i) Contribution to food and nutrition security, as measured by volumes of production, share of consumption in domestic diets, and potential for import substitution;
- (ii) Overall contribution to rural household incomes and livelihoods, as measured by the number of employed men and women in the production, processing and marketing;
- (iii) Contribution to the national economy and general budget, as measured by market value added, value of export revenues, etc.

Clearly taking these criteria into account should yield a core set of priority value chains that would necessarily differ by country. An accelerated and integrated program for developing these priority

value chains should fuel an agro-industry development with positive spillover effects on other locally important value chains that contribute to food supply or has a significant export growth potential and contributing to increased farmers' incomes (examples: cashew nut, sesame, shea butter etc).

4.2 Supporting implementation of the National Agricultural Investment Programs (NAIPs): A triple criteria assessment for an integrated investment strategy

To facilitate implementation of the NAIPs, priority actions and targeted interventions targeting the priority value chains should be formulated and developed on the basis of detailed assessment covering three primary criteria, namely:

- (i) **Need:** Actions and interventions requiring investments should be prioritized based on the value chain specific development needs as determined by agronomy, agro-ecological conditions, scope for productivity increase, and critical bottlenecks identified along the various value chain stages, including post-harvest, processing and marketing. Such a need assessment – with input from all the key market agents- should identify not only the critical areas for interventions, but also the optimal sequencing for maximum impact
- (ii) **Capacity:** This criterion relates to evaluating available capacity, whether human (technical, including research and extension, managerial including planning and monitoring), financial (from all possible funding sources) or infrastructural (storage, laboratories for quality testing, communication systems, roads and transportation). The capacity assessment should also be closely linked to the need assessment outcomes and be formulated at the value chain level, when necessary
- (iii) **Impact:** The impact assessment criterion evaluates the scope for market expansion (such as irrigation potential, readily achievable yield improvements, degree of trade substitution, etc.), potential income generation and employment addition.

These assessments should be multi-stakeholder led and guided by a technical team with the required expertise to guide weighting options and to tackle measurement issues and option tradeoffs.

Beyond the value chain-specific options and identified interventions, an integrated investment strategy must also include a number of critical cross cutting needs that must be established or supported. These crosscutting actions may vary across countries depending on the development stage and the institutional environment of the country, and can include, among others:

- (i) Creation of educational and training institutes to provide the necessary professional and technical training to farmer leaders, technical agents and commodity experts in production technique, processing, marketing, finance etc.;
- (ii) Agencies or institutions dedicated to capacity development for producer organizations and their leaders including women;
- (iii) National centers for value chain risk assessments, risk management, and financial education;
- (iv) Observatories to monitor and develop trade information rules and coordination, among others.

4.3 Coordinating the strategy implementation

The implementation of the NAIP and its eventual success will depend largely on the degree of participation of the four key market agencies (public, agribusiness, finance, producers) and the importance given to participatory governance and to effective coordination. The success of inclusive governance in the process of NAIP implementation requires that full account is given to the goals and strategies and needs of each of the four key market agencies from which synergies, complementarities

and win-win options are derived. To be effective, the participatory governance must intervene at the stage of formulation and development of priority actions and interventions (described in 4.2 above). Also, for effective coordination and inclusive participation, it is necessary to establish a transparent mechanism for sharing data and information between the key actors to allow them to formulate clearly-articulated positions, an essential step that would ensure that all players are actively contributing to the elaboration of the CAADP-inspired national investment strategies. This, in turn, requires strengthening the internal organization and coordination of the private actors, from the agro-industry or from POs, to become effective.

More critical is the degree of readiness of producer organizations and related meta-structures (platforms, regional organizations) to contribute credibly to the process. A particularly relevant institution that could play a critical catalytic role in the process is the value chain-specific interprofessional organization. Many countries of West Africa are at various stages of legal and institutional reforms that encourage the emergence of the value chain interprofessions. However, the credibility of these institutions or their performance depends largely on the strength and the capacity of the member associations.

As stated above, inclusive governance is essential for successful value chain development through the implementation of NAIPs. Successful initiatives and best practices from the region can demonstrate the critical importance of good governance in such processes. A good example is provided by Ghana's Medium Term Agriculture Sector Investment Plan (METASIP), which illustrates the type of inclusive sector strategy development and inclusive governance applied to priority commodity chain investments. The programme follows a sector-wide approach, pursuing broad-ranging interagency consultations for the design, supervision, and implementation of its activities, all guided by a Steering Committee whose membership includes relevant government agencies, ministries, and producer organizations. A noteworthy element of the programme is the attention given to enhancing the capacity of producer organizations to strengthen their bargaining power and enable them to link up with regional groups.

An example of multistakeholder coordination for value chain development at the local level is provided by Ghana's NRGp programme, which set up the District Value Chain Committee (DVCC) that includes producer organizations, financial institutions, agro-input dealers and marketing companies, not only at national but also at local (district) level. Such location-specific forums can be more effective when they are focused on specific value addition issues with input from participating parties to share information and build partnerships. The DVCC coordination has ensured continued mobilization of new funding and has brought new participants into the NRGp programme, especially local banks, whose number increased from 2 in 2009 to 24 in 2012.

In general, the blueprint described above can serve as a guide to facilitate the implementation of the CAADP-derived national agricultural investment plans in West Africa. The proposed outline is also very timely given that over half the region's countries have just embarked on implementing the national strategies developed over the last several years. It is hoped that the lessons learned from the case studies summarized in this chapter and detailed in this volume can provide the necessary input for accelerating the process.

General introduction and book content

Aziz ELBEHRI

In the aftermath of the food crisis of 2007-2008, a World Summit on Food Security was organized by the Food and Agriculture Organization of the United Nations (FAO) in November 2009. Among the summit conclusions was the affirmation that greater efforts must be deployed to ensure that markets work for, and are more inclusive of, small-scale producers, especially in developing countries. This conclusion arose from the recognition that, despite the surge in food prices, small farmers in developing countries were not able to benefit by responding with greater food supply. The expected supply response to rising prices did not occur. A myriad of public and private market failures stood in the way and became glaringly evident following the food crisis.

For West Africa in particular, this episode reinforced the urgent need to make a major correction in food policy and redirect attention towards staple food commodities, which had been long neglected in favour of a few export commodities. While this shift in focus can be traced to the establishment of the Millennium Development Goals (MDGs) and the Comprehensive African Agricultural Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD), it was never followed by the needed boost in new investments in agriculture. There was a noticeable change in the trends in agriculture investments, which had been declining since the mid-1980s. The development aid and investments that followed the post-2000 MDGs targeted mostly non-agriculture goals (health, education, girls' schooling, etc.) and focused on transportation, infrastructure or aid for trade, which were thought to be more effective in boosting agricultural productivity than direct investments.

It took the food price crisis of 2007-2008 to jolt both governments and development partners into action. A new consensus quickly emerged, calling for substantial investments in agriculture and rural development to enhance agricultural productivity in order to meet the challenge of food security – an area that became, once again, an international top priority.

In this context, West African governments responded to the heightened concerns over food insecurity and disruptions to food trade flows by turning their focus to the long-neglected basic food commodities. Supported by donors and buoyed by renewed interest in agricultural investments, a number of national initiatives were launched to stimulate the domestic production of staple foods such as rice, maize and cassava. More than merely a shift of direction, these developments called for a major paradigm shift in agricultural development, away from what had traditionally been a narrow focus on a few export commodities (cotton, cocoa, coffee, groundnut) and towards embracing a more diversified approach to agricultural development.

However, in practice, these responses took the form of the usual interventionist tools, such as direct subsidies to inputs (for a quick boost to production) and, when possible, investments in expanded irrigation schemes. On the demand side, many governments also responded by lowering trade barriers to facilitate more imports. Yet these measures did not add up to a comprehensive or coherent strategy aimed at rebuilding long-term food potential. These national initiatives lacked a fully-integrated policy response aimed at improving competitiveness through cost-cutting investments and incentives designed to promote effective and inclusive food value chains.

It is widely recognized among development specialists that staple food development models require, among other things, the following prerequisites: (i) a coherent investment framework targeting staple

food commodities; (ii) consideration of the whole value chain approach to development, covering production and post-production stages; and (iii) an awareness that achieving both competitiveness and inclusiveness requires the active involvement of public agencies, private entrepreneurs and producers represented by strong organizations.

In this context, staple food commodity models differ significantly from export-focused cash crop models. Staple food crop production presents a number of distinguishing features, including the involvement of a large number of small, highly heterogeneous farmers; women often play an important direct role in the production, trading and small-scale agroprocessing. Farmers producing staple foods also tend to face greater difficulty accessing inputs, are exposed to greater risks (in production, marketing and prices) and have limited market access for their products. On the demand side, staple food commodities can have multiple market outlets, including local, national or regional markets. Moreover, production of staple crops – especially the cereals, roots and tubers that predominate in West Africa – requires a significant upgrading of the agroprocessing capacity, including better coordination strategies between farmers and agroprocessors.

Downstream on the value chain, development of inclusive staple food value chains requires tackling problems related to the general business environment, weak or inefficient contract enforcement, infrastructure deficits and dissemination of agricultural research. In addition, building long-term competitiveness in staple foods is specifically problematic in West Africa, as soil fertility is a serious and worsening problem, while returns to labour are relatively low. Yet given the low productivity and competitiveness of staple foods in general, there is still a huge scope for improvement and for further reductions in unit costs. Clearly a case for active public and private engagement is evident, but the key question is how and under what institutional set-up should this engagement be established, given the specificities of staple food systems.

The chapters of this book represent an empirical and normative contribution to the development framework for value chain models appropriate for West Africa and its dominant commodities. The book is regional in scope and covers the 15 West African countries plus Cameroon and Chad (part of the central Africa, CEMAC region). The value chain case studies covered in the book are broad-based and fairly representative of the major crop systems in the region, including traditional export crops (cotton, cocoa, groundnut), high-value export commodities (horticulture, mango, banana, pineapple), staple food crops (palm oil, rice, maize, sorghum, millet, cassava) and milk. The country case studies include: Burkina Faso (maize, cotton, mango); Cameroon (cocoa, cassava); Cote d'Ivoire (cotton, cocoa, banana); Ghana (cassava, mango, oil palm, pineapple); Mali (cotton, rice, sorghum, millet); and Senegal (rice, groundnut, horticulture, milk).

Book content

The book is divided into two parts. Part I provides analyses of market, policy and institutional drivers, and issues relating to food commodity chains, with a particular focus on staple foods within West Africa. Part II contains a large number of case studies treating specific value chains and countries or groups of countries.

Part I begins with an introductory **Chapter 1**, by *Elbehri, Kaminski, Koroma, Iafrate and Benali*, that describes trends and indicators of food demand and supply in West Africa. On the demand side, the chapter describes trends in population and urbanization and the food consumption patterns most prevalent in the region. On the supply side, agro-ecological systems, as well as the major crops and livestock products, are described in terms of importance, distribution and productivity levels. Development indicators, such as infrastructure, regulation, research and development (R&D), foreign

direct investments (FDI) and trade flows, are described and show that the region as a whole lags behind other regions, even compared to other parts of Africa. This precarious situation has roots in the agricultural development pathways followed by most countries of the region since gaining their independence, which can be summed up as a narrow specialization in a few raw commodity exports with relatively little spillover effect on the broader agricultural sector or the national economy.

This last point is taken up in **Chapter 2**, by *Elbehri and Benali*, which also sets out the essential thesis of the book, namely the need for West Africa to broaden its agricultural and commodity development strategy beyond export crops and redirect the emphasis towards staple food crops as well. In this chapter, the authors provide an analysis based on a historical comparison of different commodity development models. The three groups of commodities compared in the paper are: a) state-controlled traditional export commodity models (cocoa, cotton, coffee, groundnut), which dominated much of West African agriculture starting from the colonial period, continuing past independence and up to the 1980s; b) private agribusiness-dominated, high-value, non-traditional export commodities; and c) staple food models, which began to draw government attention after 2000 with the establishment of the MDGs, and more urgently following the 2007-2008 food crisis. Export commodity models represented the continuation of West Africa's colonial heritage and showed the limits and the built-in inefficiencies of a state-controlled, commodity-run system. Throughout the region, these export models experienced serious implosions by the early 1990s. The non-traditional, high-value export commodity model (which took off during the 1990s) coincided with post-structural adjustments, state retreat from agriculture, and the rise of both agrifood systems consolidation and the emergence of global value chains (best illustrated by the development of food supermarkets). This privately led value chain model offered a sharp contrast to the original state-run model and showed the effects of privately led emphasis on efficiency and competitiveness. However, this was often at the expense of inclusiveness, as small-scale farmers found themselves shut out of these value chains because they were less able to compete with more resource-endowed producers or downstream value chain actors (buyers) with greater market power. Lessons from these two export commodity models were drawn for the staple food value chains, serving domestic and export markets equally. The chapter concludes with an outline of a staple food development model, involving multiple actors – state governments, private agroprocessors, producers and credit suppliers – all playing critical roles.

Chapter 3, by *Soule*, and **Chapter 4**, by *Achancho*, review the national investment strategies for staple food value chains in West and Central Africa, respectively. In Chapter 3, the author describes the strategy development processes and country priorities and evaluates their strengths and shortcomings in light of each country's capacities and stated development objectives. Next, the author reviews the Economic Community of West African States (ECOWAS) regional investment programme for promoting strategic products and examines its coherence with national investment strategies. Chapter 4 introduces the current agricultural policy developments of the Central African region, analysing in greater detail the case of Cameroon. The author notes that, despite a favourable attitude towards agriculture recently, the Cameroon staple food policies generally lack a coherent approach to value chain development, with processing and marketing being more weakly addressed in existing programmes. Equally lacking is a set of adapted credit and finance schemes to meet value chain development needs.

Chapter 5, by *Mas Aparisi, Balié, Diallo, Komorowska, and Keita*, provides a detailed analysis of Mali's country sector policy by examining its national agricultural expenditures. The study, which is part of the Monitoring African Food and Agricultural Policies (MAFAP) project, used national expenditure data from 2005 to 2010 and quantified the incentives and disincentives for agricultural production. This study illustrates how the outcomes of public decisions on incentives may actually diverge from the stated goals in support of food value chains. The authors found that, during the study period, public expenditures (of which 70 percent are from donors) have heavily favoured grains, especially rice, with a disproportionate

amount going to input subsidies, and much less going to research and extension services – the types of investments widely recognized to have higher payoffs in terms of improved productivity. Expenditure patterns also show bias towards some export commodities (e.g. cotton) while import substitutes receive substantial disincentives. Following the food crisis, incentives for thinly traded commodities (maize, millet and sorghum) worsened, as the government encouraged imports (especially rice), which disadvantaged producers. The study vividly illustrates the lack of policy coherence between the declared aim of boosting production and contradictory price policies that discourage domestic supply. Despite heavy public expenditures on rice, parallel policies facilitating imports benefited consumers but penalized producers and wholesalers who did not benefit as they should have from high international prices. Studies like these can have a huge impact on policy design and advance our understanding of the widely recognized but ill-defined incoherence between domestic and trade food policies.

Chapter 6, by *Nwuneli, Diaw, Kwadzokpo and Elbehri*, moves the focus away from the public sphere and into private agroprocessing. In this chapter, the authors use several case studies from West Africa to tackle the questions of how to motivate small and medium-sized agribusinesses to develop food value chains from the home market, and how to include smallholders in the process. For both questions, the authors argue that critical policy support is needed to ensure the objectives. Also, government-supported investment programmes must be inclusive of the small and medium-sized local enterprises that process locally produced food and contribute to employment. Such measures would have strong implications for trade policies, requiring harmonization with domestic support measures aimed at stimulating domestic food supply. Business opportunities for working with smallholders would require that participating producers and their organizations be market-oriented and selected on a system based on merit and on the ability to deliver on contractual agreements. Successful partnerships between smallholders and agro-industry require addressing various risks related to the difficulty of complying with standards and traceability, issues of trust and loyalty (e.g. side-selling under outgrower schemes) and issues of communication and coordination. In the end, successful sourcing by agribusinesses from smallholders hinges on the latter being properly organized, with demonstrated credibility and with sufficient skills to engage in business, trade and economic activities on behalf of the organization's members. Policy support for market institutions is a critical element in the process.

Chapter 7, by *Elbehri, Lee, Hirsch and Benali*, delves into the central issue of producer organizations as market agents and explores how to make them critical players contributing to development of an inclusive food value chain. Although the need for strengthening producer organizations is often cited in commodity development analyses, there are few effective approaches that demonstrate how best to transform producer associations or groups into credible economic agents and reliable business partners. In this chapter, the authors describe a methodology called GAIN (Governance, Autonomy, Integration, Needs-based) and present both a diagnostic tool and a transformation pathway to facilitate smallholder progressive market participation and build the capacity for smallholders to become effective, credible players in the marketplace. The GAIN methodology follows an iterative approach, combining an internal "strategic" assessment of the organization with an evaluation of opportunities for partnership with its immediate potential economic and institutional partners, and derives a road map for economic self-empowerment. The methodology was successfully applied to several producer organizations in West Africa, specifically in Burkina Faso, Cameroon and Mali. The authors conclude that the GAIN methodology is flexible and can be adapted to various organizational situations and degrees of complexity and can be scaled up to national level and used as part of policy instrument and institutional reforms.

Part II of the book offers a broad range of the value chain case studies, describing traditional export commodities: cocoa and cotton (Burkina Faso, Cote d'Ivoire, Mali); non-traditional, high-value export crops: horticulture (Senegal) and mangoes (Benin, Burkina Faso, Ghana); import-export staples: oil palm

(Ghana); highly-imported crops: rice (Mali, Senegal); and lightly-traded staple crops: maize (Burkina Faso), sorghum and millet (Mali) and cassava (Cameroon).

Chapter 8, by *Abbott*, provides a detailed analysis of cocoa and cotton sectors, drawing from the author's own research in Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Mali and Nigeria. The paper is broad-ranging and covers policy processes, institutional reforms and market drivers and how these affect small farmer incomes within the cocoa and cotton sectors. The author argues that raising incomes for small farmers in these export-based commodities could be achieved by "shortening the marketing chain", thus providing farmers with a greater share of the value added in final consumer products. This can be done by increasing the market power of farmers through strengthening farmer organizations and correcting market failures along the value chain that influence credit, inputs, quality and information. Moreover, the author delves extensively into institutions and policy options aimed at raising smallholder farmer income, particularly as reforms change existing value chains. Addressing market failures would require recognizing geographic and agronomic specialization, scale economies and spillovers to other markets. The author places greater emphasis on the policy regimes that foster market institutional development, including the provision of public goods (market information, research, extension, disease control) and creation of a legal framework for private trade of commodities (such as a system of warehouse receipts). However, the author concludes that, given constraints on marketing interventions, much greater gains to small farmer incomes could be achieved by enhancing productivity.

Chapter 9, by *Swinnen, Colen and Maertens*, tackles the development of high-value non-traditional horticultural export crops in West Africa and addresses obstacles to smallholder market participation. The paper describes horticultural commodities, drawing from various case studies in West Africa, with a particular focus on French beans and industrial tomatoes from Senegal. Horticultural trade growth has expanded since the 1990s from various African countries, even though West Africa as a region has lagged behind other regions of the continent. Smallholder market participation varies widely across horticultural crops. Among the key drivers are the consolidation of food processing and the rise of private market standards, which generally tend to reduce the participation of smallholders in these markets. The authors stress the positive impacts of horticultural crop export on participating farmers' incomes and on employment for local rural labour; however, these impacts are dwarfed by the general trend of smallholder exclusion as these producers are outcompeted in the vertically- integrated horticultural value chain. These outcomes somewhat weaken the government argument that promoting high-value export crops is a pro-poor policy. While there are explicit attempts to encourage product sourcing from smallholders by promoting contract farming, these are essentially private transactions subject to market forces (opportunities and risks). One often repeated solution is to promote sustainable partnerships between producer organizations and agroprocessors and buyers. Yet this, too, requires innovative approaches and hinges on the existence of strong and credible producer organizations. Moreover, the empowerment of farmers and their ability to become effective players depends on having alternative options to access inputs and to sell products. Hence, diversification of options for farmers in input and output markets is considered to be a key prerequisite for greater inclusion.

Chapter 10, by *Van Melle and Buschmann*, examines mango value chains under different business models surveyed from three countries: Benin, Burkina Faso and Ghana. The authors compare three models with respect to smallholder market participation: a) mangoes for local markets; b) processed mangoes for urban markets; and c) mangoes under intensive contractual arrangements. Survey results show that smallholder market inclusion depends on: a) product quality positively linked with the presence of fixed buyers, which would offer better incentives to control the highly prevalent fruit fly; b) price negotiation ability for farmers, which is lower for farmers in remote areas, given the perishability of mangoes; c) addressing transaction costs arising from farm location remoteness, bad roads and poor transport quality, and high post-harvest losses. Comparing the different models, the study finds

that, for the processed mangoes for urban markets, a higher level of cooperation among farmers has improved smallholder business performance, inducing higher net investments. Ghana, which has a relatively better business environment, showed a higher net investment index compared with Burkina Faso. Under the intensive contractual model, smallholder business performance and market efficiency also improved but net investments were lower than in the previous case because of dependency on the lead firm and the weaker position of the autonomous farmers. Here, too, stronger cooperation among farmers could reduce this constraint. The authors conclude that institutional and policy support for smallholders to enhance market participation must emphasize: a) strengthening farmer cooperatives; b) providing external support through subsidized investments; and c) increasing incentives to target domestic and regional markets, as pursuing export markets may not always be the best business option. While export markets are targeted because of their higher prices, they may also exhibit high costs and risks and low competitive advantage.

Chapter 11, by *Ofori-Budu and Sarpong*, provides an in-depth assessment of the oil palm industry in Ghana and examines the conditions under which smallholder-inclusive oil palm expansion could be achieved. The oil palm sector, driven by strong demand both domestically and internationally, is expanding in several West African countries. In the case of Ghana, the authors compare three key supply models for oil palm: a) fully integrated agro-industry companies; b) processing companies that source from small-scale producers via outgrower schemes; and c) small-scale independent producers. Noting that the current oil palm production expansion in Ghana is driven by large-scale agro-industry, the authors explore ways in which small-scale producers could also participate in the process. The authors also examine the current policies and investment strategies, as well as the types of existing contractual arrangements between processors and producers. The authors conclude that the key to improved smallholder inclusiveness lies in strengthening the cost competitiveness of small-scale oil palm processors. The authors also point out the problems with outgrower schemes, due in part to weak management and poor coordination that result in side-selling (selling outside contracts). This issue undercuts support from government and development partners (e.g. World Bank) for outgrower schemes as a way to ensure small-scale producer participation in a development programme led by large private agroprocessors. One solution to remedy the limitation of the outgrower scheme is to tackle the tendency of producers to operate individually. This will require incentives to encourage the emergence of organized groups of producers who can improve relations with input suppliers, enhance product output and strengthen price bargaining power with agroprocessing mills. The authors conclude that the optimal strategy to promote development of the oil palm sector requires appropriate policy support measures that target small- and medium-scale processors as key intermediary agents between small-scale producers and the rest of the oil palm value chain. Policy support should also include measures and incentives to strengthen market-ready producer organizations.

The next two chapters address the rice value chain in West Africa. **Chapter 12**, by *Colen, Demont and Swinnen*, examines rice in Senegal and evaluates the recent government initiative to boost rice production and self-sufficiency in the aftermath of the 2007-2008 food crisis. Rice in Senegal, as in much of West Africa, is a heavily imported commodity as demand far outpaces local production. Because urban consumers have acquired a strong preference for rice (mostly broken type), the government has long pursued a liberalized import trade regime which conflicts with the government efforts towards boosting domestic production. Another challenge facing the domestic rice market in Senegal is how to successfully link smallholder rice producers with large urban markets. At stake is the need to increase marketable surplus, as well as to improve rice quality to conform to urban consumer standards. The authors examine the causes of the low penetration of local rice into urban markets, and find that rice supply is constrained by the lack of fully functioning fertilizer and seed markets. Among the suggested remedies is to encourage new types of farmer cooperatives that can collectively act to reduce transaction costs, improve access to credit and enhance market penetration. Current producer organizations exhibit

low performance, due in part to the heterogeneity of their members, which limits collective actions such as negotiating marketing credit or developing long-term relationships or agreements with buyers/traders. Another key obstacle facing domestic rice producers is the urban consumers' perception that domestic rice is of low quality. Moreover, industrial rice millers lack sufficient working capital to purchase paddy rice and have very limited access to commercialization credit. Overall, lack of coordination between the different actors, combined with the dominant proportion of small transaction volumes, significantly reduces marketing margins for local rice and also reduces incentives for investments to improve the supply of local rice to urban consumers. The food crisis of 2007-2008 did push rice importers to turn to local rice, but the above-cited obstacles need to be resolved to unlock the potential of the domestic rice market.

Chapter 13, by *N'krumah, Elbehri and Legret*, examines the state of the rice value chain in Mali, in a post-food crisis context. In Mali, rice is the third most important commodity in value terms, after livestock and cotton. Rice production potential in Mali is large compared with neighbouring countries because of the availability of untapped irrigable land. Moreover, consumer preferences for rice in Mali are hugely in favour of local varieties. The rice sector is generally competitive but there are still huge gaps in rice productivity and more improvements are needed to remove various marketing constraints. Among the critical measures needed to improve domestic supply are the expansion of irrigation schemes (through public-private investment partnerships), better fertilizer distribution, and expanded adoption of the improved variety, NERICA ("New Rice for Africa"). Institutional reforms are critically needed; these include promoting professional producer organizations capable of facilitating access to credit (in part through the practice of warrantage), managing local irrigation schemes and providing extension services (using trained relay farmers). To improve marketing, it will be necessary to improve the quality of paddy rice and strengthen the agricultural information dissemination systems. On the policy side, to date the state has been involved primarily through input subsidization and investments to expand irrigated areas. However, strengthening producer organizations, enhancing coordination among the value chain actors and harmonizing import policies with domestic rice support initiatives are among the key missing links awaiting a coherent and inclusive value chain development strategy for rice in Mali.

Chapter 14, by *Kaminski, Elbehri and Zoma*, examines the maize value chain in Burkina Faso. In West Africa, maize is hugely important for agricultural transformation, intraregional trade integration and food security. Maize can serve multiple market outlets (food, feed and industrial applications) with significant opportunities for expansion and agroprocessing development. In the case of Burkina Faso, the authors examine the key obstacles facing maize value chain development and review the incentives required to transform maize from a predominantly self-consumed crop into a cash commodity serving the needs of several growing market outlets (processed food, animal feed, breweries). Driven by strong and multiple demand sources, incentives do exist for greater uptake of productivity techniques (fertilizers, seeds) and improved maize supply quality (including post-harvest). However, the maize sector continues to be hampered by multiple market and institutional failures. On the marketing side, maize value chain actors confront large seasonal price variability and variation in supply and quality. Institutional obstacles include the lack of an effective legal system and weak commercial and market transactions, all of which limit the growth potential for the agroprocessing sector. Institutional-type reforms include support to credit schemes and incentives such as subsidizing collective storage for use in inventory credit (warrantage). As was pointed out for other commodities, successful institutional reforms hinge on the emergence of credible and business-oriented producer organizations able to mediate between producers and credit institutions to facilitate adoption of new technologies and to perform collective purchases and sales. Maize trade within West Africa is much lower than its potential. However, improving maize intraregional trade requires a better understanding of the economic and business costs of current barriers to trade, as well as better communication with policy-makers about the magnitude of the resulting costs to national food security. Policy-makers also need to be convinced that removing these barriers can generate benefits

far greater (and more lasting) than the short-term benefits that result from blocking trade based on narrow temporary concerns about food insecurity within the national borders.

Chapter 15, by *Kaminski, Elbehri and Samake*, provides an analysis of sorghum and millet in Mali. These two crops are among the most important commodities for food security for the majority of populations throughout the Sahel region. Yet these crops have by and large been among the most neglected, with very little state or policy support despite their huge importance. The widespread cultivation of sorghum and millet throughout the Sahel arises from their adaptation to the prevalent types of soils in the region (deep and light-textured, with high water storage capacity), enabling sorghum and millet crops to produce even under lower rainfall conditions. However, these same soils exhibit low fertility – an endemic problem, requiring special fertility-enhancing programmes to improve productivity. By and large, sorghum and millet exhibit very low yields (which could easily be doubled, even with readily available technologies) and most of the production is used for self-consumption, with highly variable marketable surplus. Consequently, sorghum and millet value chains remain relatively undeveloped and thinly-traded and experience little processing apart from small-scale milling. Policy support to improve the productivity of these crops has been virtually absent, apart from the notable U.S.-funded research programme INTSORMIL (International Sorghum and Millet Collaborative Research Support Program), which developed improved crop varieties and tested fertilizer and other management techniques specific to sorghum and millet for the Sahel. Yet these technology innovations have not been taken up by farmers due to the absence of price and market incentives. The absence of policy support for these crops is puzzling in light of their importance for national food security. A coherent and supportive sorghum and millet policy and investment programme should target the following priorities: a) providing price and credit incentives to encourage higher input uptake and include better-adapted varieties to boost yields; b) promoting greater marketable surplus by subsidizing producer-run storage facilities that are able to improve marketing and to manage supply and price risks; c) encouraging medium-sized agroprocessors through subsidized credit and investments and promoting public-private partnerships for agroprocessing investments to stimulate demand (sorghum- and millet-based brewery uses, animal feed, and processed and semi-processed food products); d) encouraging demand for sorghum- and millet-derived food products by strengthening food quality control measures and supporting improved quality packaging (especially targeting fast-growing urban markets); and e) supporting the emergence of qualified producer organizations and cooperatives through targeted subsidized investments and training and by building technical and managerial capacity for leaders to help them improve their market participation.

The final **Chapter 16**, by *Emmanuel*, reviews the cassava value chain in Cameroon. Cassava, like maize, is potentially a very important commodity in West Africa (south of the Sahel) for agricultural transformation and food security. In Cameroon, cassava is the most consumed staple food (representing 20 percent of cultivated land and 46 percent of national food crop production). Production is largely labour-intensive, using traditional techniques that are mostly handled by women. This crop is beset by the same types of bottlenecks found in other underdeveloped value chains: low yields; unavailability of improved varieties for better/more efficient processing; inconsistent supplies of cassava by-products; difficult market access/significant market access constraints; and low level of value chain organization. The chapter reviews a national programme to boost cassava production that began in 2004. The programme managed to raise yields significantly for participating farmers, due to the introduction of new and better-yielding varieties. However, the programme faced serious constraints in processing and marketing, revealing policy and institutional weaknesses along the cassava value chain. Because of the rapid perishability of cassava, serious logistical and quality constraints remain to be resolved. One important step is to address post-production handling by targeting semi-industrial processing in order to unlock the cassava supply potential and open up the multiple marketing outlets to stimulate both demand and supply of this versatile commodity. Correcting for marketing problems would require, among other things, the development of customized market information systems and the provision of incentives to producer organizations to engage in economic activities, secure access to credit, improve small-scale cassava processing and develop more efficient marketing options.

Part 1

**POLICIES, PRIVATE INITIATIVES AND
ROLE OF PRODUCER ORGANISATIONS IN
FOOD CHAIN STRATEGIES**

Chapter 1

West Africa staple food systems: An overview of trends and indicators of demand, supply, and trade

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1. Introduction

The food price crisis of 2007/08 provided the needed jolt to West African governments, and elsewhere among developing countries, to stimulate a new impetus toward staple foods, characterized by: (i) renewed interest in investments targeting staple food value chains; (ii) a recognition of the importance of considering the whole value chain, including post-production phases; and (iii) an awareness that effective staple food value chains require the active involvement of both the public sector and private entrepreneurs, as well as strong and credible producers' organizations playing their roles.

Economic studies on staple value chains in West Africa are relatively sparse and only of recent vintage, having been done mostly in the aftermath of the food price crisis of 2007/08. Moreover, existing studies tend to be uneven, with relatively more work reported for highly-traded commodities like rice; significantly less is known about major import-substitution staples of the region, especially sorghum, millet and cassava. This volume attempts to close this information gap and to offer a comprehensive and even-handed analysis on a wide range of staple food systems that are among the most important for the region.

Staple food crop development presents a number of challenges, given the large numbers of small farmers involved, the weak mobilization of stakeholders, poor soils and seeds and the inadequate capacity of smallholder farmers. Staple crops, especially cereals, roots and tubers, can either be stored or directly consumed on-farm, as well as directed to various market outlets. In West Africa, staple foods currently require significant upgrading of the agroprocessing capacity, including better coordination strategies between farmers and agroprocessors. Yet investments in staple food value chains continue to be hampered by the perception of low incentives and higher risks for farmers and private agribusiness actors. Such challenges require tackling problems related to the general business environment, weak or inefficient contract enforcement, infrastructure deficit and diffusion of agricultural research. In addition, building long-term competitiveness in staple foods is problematic, as soil fertility is a serious and worsening problem, while returns to labour are relatively low. Given the low productivity and competitiveness of the staple foods in general, there is still a huge scope for yield and efficiency improvements and for further reductions in unit costs. Clearly there is a case for active public and private engagement, yet the real question is how, and under what institutional set-up, this can be achieved, given the specificities of the staple food systems.

Developing staple food value chains requires fresh thinking and a different *modus operandi* than is used for export commodities (cotton, coffee, cocoa). Demand drivers for staple food commodities (cereals, roots and tubers, oilseeds and livestock products) are domestic, and can vary from local to regional in scope. Staple food commodities present particular development challenges, as they involve a large and highly heterogeneous number of small-scale producers, where women are often important players in production, trading and small-scale agroprocessing. Consequently, staples require quite different development models compared with those that prevail for traditional export commodities.

Policy priorities for rebuilding the productive capacity of West Africa's agriculture can start by expanding the knowledge base on staple value chains in West Africa, ensuring appropriately targeted public sector investments combined with private sector engagement to enhance competitive systems, and promoting smallholder inclusion in the value chain by enhancing the roles and capacities of producers' organizations.

In this introductory chapter, we provide a brief overview of the key indicators and drivers affecting demand and supply of staple food value chains in West Africa. Following this Introduction, Section 2

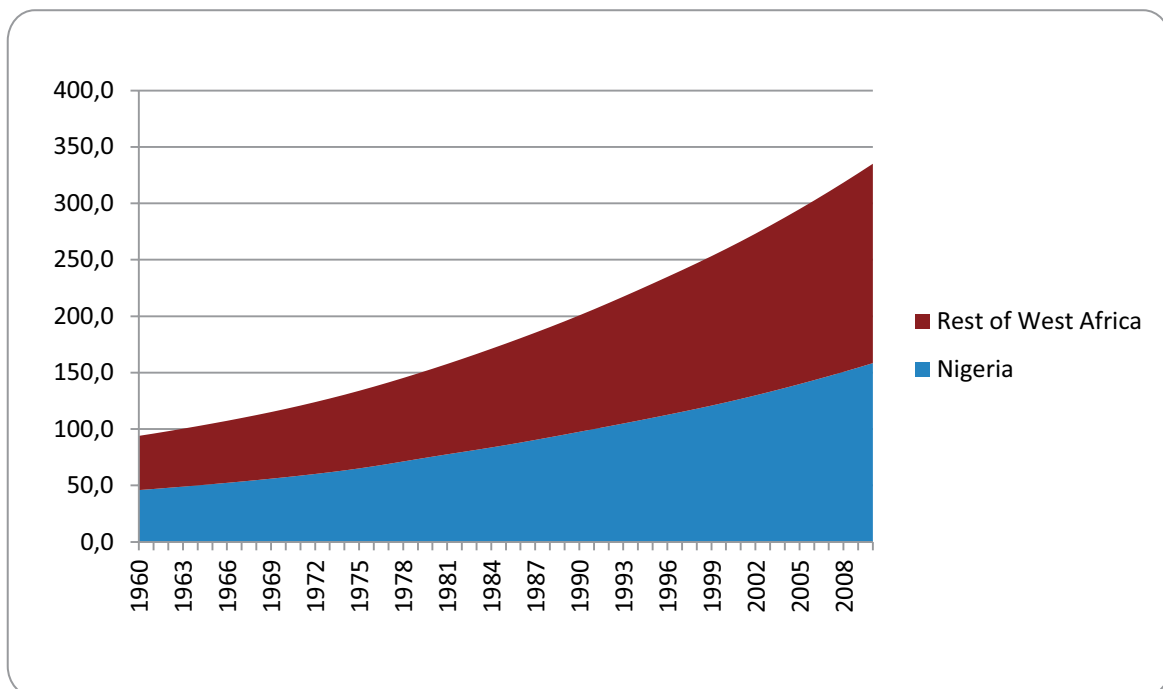
reviews the demand drivers affecting current and future food demand in West Africa, especially the critical roles of population growth and rapid urbanization of the region. The section also succinctly reviews broad highlights of staple food utilization, consumption patterns and overall demand. Section 3 reviews food supply drivers and summarizes some of the key productivity indicators, such as yield, land use and soil fertility. Section 4 addresses food trade, which fills the gaps between demand and supply. This section distinguishes between formal trade flows and the informal trans-border trade within West Africa, which is very important and has only recently begun to be documented. Section 5 reviews a number of salient issues specific to some of the major staple food value chains in the region, providing an introductory preview of the more detailed treatments in the case studies that appear later in this volume.

2. West Africa's staple food situation: A review of demand drivers

2.1 Population and urbanisation trends

Since 1960, when most West African countries were gaining independence, the total population of the region (including Cameroon and Chad) was just over 90 million but in the course of 50 years the population nearly quadrupled, reaching 342 million by 2011 (see Figure 1). Such huge population growth has had a fundamental impact on the economic position of the region and on the demand on its resources, including food.

Figure 1. Population growth in millions for West Africa (plus Cameroon and Chad)

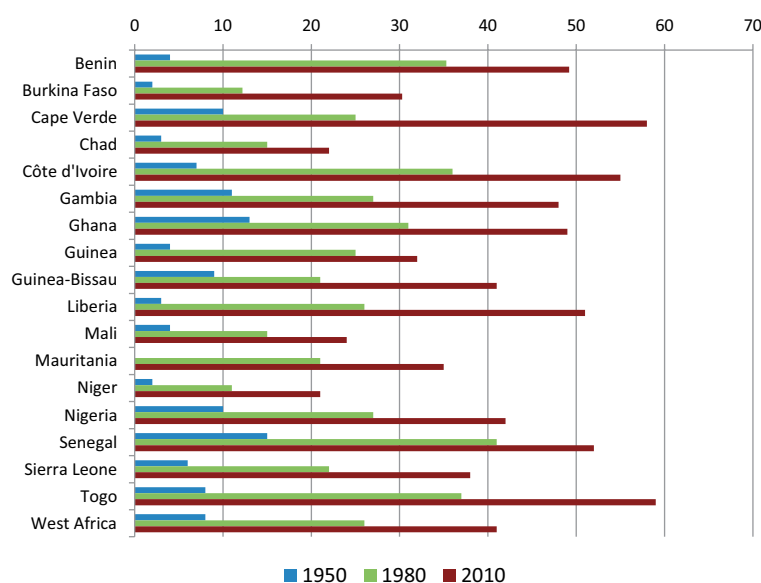


Source: World Bank, World Development Indicators (2012)

Parallel to the population growth, a second phenomenon, equally significant, was the substantial shift of the population from predominately rural to urban (see Figure 2 below). Huge migration to the cities produced a

much faster growth of the urban conglomerations than the average population growth would indicate. This also changed the balance of the labour force available between urban and rural areas, creating a massive pressure on food demand as the population of consumers grew more than rural populations (consisting of both producers and consumers). Equally significant for agricultural and food systems are changing consumer preferences, which are creating powerful drivers in the demand for some food products.

Figure 2. Rate of urbanization (in %) in West Africa from 1950-2010



Source: OECD-CSAO (2013)

2.2 Food demand trends: utilisation and food consumption

A. Staple food consumption in West Africa: dietary systems and recent trends

West Africa covers a wide range of agro-ecological systems, from arid to semi-arid, sub-humid and humid climates. These climates dictate what is typically grown and consumed. Consumption patterns vary according to countries, regions or even localities within the same country that feature diverse climates. We can identify two large groups of countries on the basis of dominant food consumption (ACI, 2011):

- Countries relying predominantly on **cereals**. This covers largely the Permanent Interstate Committee for Drought Control in the Sahel (CILSS) countries including: Burkina Faso, Chad, The Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Sierra. This group divides into countries relying mostly on sorghum and millet (Burkina Faso, Chad, The Gambia, Mali and Niger), countries eating mostly wheat (Mauritania), and rice-eating countries (Guinea-Bissau, Senegal and Sierra Leone)
- Countries from coastal West Africa relying equally on **roots and tubers** and on **cereals** for their basic diets. These include: Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria and Togo. In all these countries, consumption of cassava dominates, followed by yam (except for Côte d'Ivoire where yam is preferred over cassava). Banana plantain is also consumed in significant quantities in Cameroon, Côte d'Ivoire, Ghana and Guinea. Rice and maize consumption are also high in these countries, reaching at least 85 kg/person/year.

Table 1 below compares the consumption patterns between the coastal and Sahelian countries. Given its size and importance in the region, Nigeria is described separately.

Table 1. Caloric consumption (in Kcal/day/inhabitant) in West Africa in 2003

	Sahelian	Coastal	Nigeria
Cereals	1 684	934	1 253
<i>Maize</i>	191	307	179
<i>Sorghum</i>	374	64	362
<i>Millet</i>	604	36	294
<i>Rice</i>	372	441	284
<i>Wheat</i>	122	116	127
Starchy Roots	29	676	511
<i>Cassava</i>	15	371	249
<i>Yams</i>	4	231	204
<i>Sweet Potato</i>	7	11	37
Oilcrops	75	98	90
<i>Groundnuts</i>	69	66	39
Meat/Livestock	78	54	39
<i>Beef</i>	29	13	12
<i>Poultry</i>	12	15	4
<i>Goats and Sheep</i>	22	5	7

Source: Haggblade *et al.* (2012), retrieved from FAOSTAT Food Balance Sheets.

B. Consumption patterns and the urban/rural market divide

Much of staple food production in the region is self-consumed, with two-thirds of production consumed by rural households (ACI, 2011). Among the dry cereals, maize is a relatively more marketed crop, with a ratio of 58/42 marketed to self-consumed production. Moreover, local rural population centres (as opposed to large urban centres) are also increasingly sources of food market outlets for cereals, roots and tubers, as large urban markets continue to lack sufficient market integration.

Urban markets represent a growing marketing outlet for local staple food, accounting for a sizeable share of total consumption. Estimates for the major consumed products have been placed at 60 percent for rice, 42 percent for maize, a minimum of 40 percent for roots and tubers, including cassava, 23 percent for sorghum and 19 percent for millet. Among the cereals consumed in urban markets, rice has by far the largest share; this share has been estimated at 76 percent in Burkina Faso, 92 percent in Côte d'Ivoire, 60 percent in Ghana and Senegal and 72 percent in Nigeria. For cassava, almost 50 percent of regional production is consumed outside rural areas.

The expanding of urban markets represents a key driver for the growth of staple food value chains and for local farming systems. In addition to urbanization and demographic patterns, another demand driver is the emergence of a middle class more demanding of higher-quality food products and of safe food. This indicates that there are potential value-generating outlets for local production if adequate marketing and processing

strategies are harnessed in the region. According to an AFD-CIRAD-IFAD (2011) (henceforth ACI study), urban markets represent FCFA 150 000 to 200 000 of purchasing power per inhabitant, thus forming a major staple food demand source in the region – far greater than export market outlets. For example, in Burkina Faso in 2009, staple food urban markets (the retail end markets) generated USD 297 million of transactions, whereas export markets registered only USD 260 million of revenues. In Côte d'Ivoire, local urban markets generated USD 1 090 million compared with USD 634 million of export revenues. In Senegal, local urban markets generated USD 740 million against USD 34 million of export revenues (ACI 2011).

Box 1. The phenomenal surge of rice consumption in West Africa: A combination of population growth, urbanization, and import facilitation policies

Rice is among the staple foods most tightly connected with increased urbanization in West Africa, as a result of its greater reliance on imports and import-easing policies. Rice demand has been rising at a sustained pace since the 1960s and has been mostly satisfied through imports. Rice consumption in West Africa grew from an average of 1.3 million MT in the 1960s to nearly 6 million MT in the 1990s and almost 10 million by 2006. Population growth accounts for much, but not all, of this increase: consumption grew from 13 kg per person in the 1960s to 19 kg per person by 2006. Population growth (which averaged 2.7 percent through the 1990s, easing slightly to 2.6 percent between 2000 and 2005) cannot explain the accelerated increase in rice consumption over the last few years. This seems rather to be principally the result of two factors: income growth and urbanization. In West Africa, rice consumption complements other staples, such as sorghum and millet, as these foods tend to be consumed at different times of the day. Variants of sorghum, millet and rice are also consumed as cakes or fritters, mostly as street food or snacks. The main substitutes for rice in urban areas are cassava (*gari*, *fufu*) or pounded yam and *banku* (made with maize) or *acheke*.

Consumer preferences vary greatly between and within countries. Rice preferences, for example vary across markets. In Ghana, 5 percent broken non-aromatic Thai rice dominates but aromatic jasmine Thai rice has gained market share, representing over 20 percent of rice imports in recent years.

The West African rice market is increasingly heterogeneous, as reflected in the procurement practices of several large international rice importers, such as Louis Dreyfus, Olam, CIC and others, who operate through individual country offices that understand and cater to the specific needs and preferences of consumers in those countries.

In many West African markets, local rice continues to be hampered by lower quality (higher levels of impurities), resulting in discounted prices and lower demand. The preference for imported over local rice is more prevalent in the coastal countries that depend more on such imports. However, in Mali and Guinea, consumers prefer local rice in terms of freshness and taste. Local rice also plays an important role in certain urban markets in Senegal (Saint Louis area) and in Nigeria (Kano area) (USAID, 2011).

Box 1. The phenomenal surge of rice consumption in West Africa: A combination of population growth, urbanization, and import facilitation policies (Cont.)

According to the Africa Rice Center, consumer preferences in West Africa can be summarized as follows:

- (a) *Long-grain white rice* with an intermediate level of starch dominates the markets in most of West Africa, except for those markets that prefer parboiled or broken rice (see below). Preferences for broken rice differ between countries. In Ghana, most consumers prefer rice 0-5 percent broken, but 25 percent broken is also used in limited quantities, and 100 percent aromatic broken rice from India and Pakistan can also be sold. In Burkina Faso, Côte d'Ivoire and Mali, the predominant consumer preference is for 25 percent broken rice.
- (b) *Broken rice* is sold as a low-quality, low-cost product in most markets, but is the preferred rice product in Senegal and Mauritania. According to Slayton, about 500 000 MT of Thai Jasmine broken rice is typically imported into West Africa, with three-quarters of this amount imported by Senegal and about 15 percent by Mauritania. Overall imports of broken rice to West Africa are calculated by ITC using UN COMTRADE data at 1.5 million MT, of which 50 percent is imported by Senegal (USAID, 2011).
- (c) Parboiled rice can be either of high quality (with a golden tinge) or low quality (with a dark color and sometimes an odor). Burkina Faso transforms a large share of its rice production into parboiled rice; this is done mostly by women. Nigeria is one of the largest importers of fully-milled, high-quality parboiled rice and Liberia is one of West Africa's top importers of low-quality parboiled rice.
- (d) Aromatic rice is a growing rice market segment that commands premium prices (USD 300-400/MT over non-aromatic rice) and is imported mainly from Thailand (the benchmark) and Viet Nam. Ghana started the trend toward this rice market segment, but it is also gaining popularity in other parts of West Africa.

Since 60 percent of West Africans are projected to live in urban areas by 2020 and the number of cities with more than 100 000 inhabitants will grow from 78 in 2006 to more than 200 in 2030, demand for imported staples such as rice is likely to increase. This requires a significantly upgraded staple food processing capacity in the region.

C. Staple crops and non-food markets

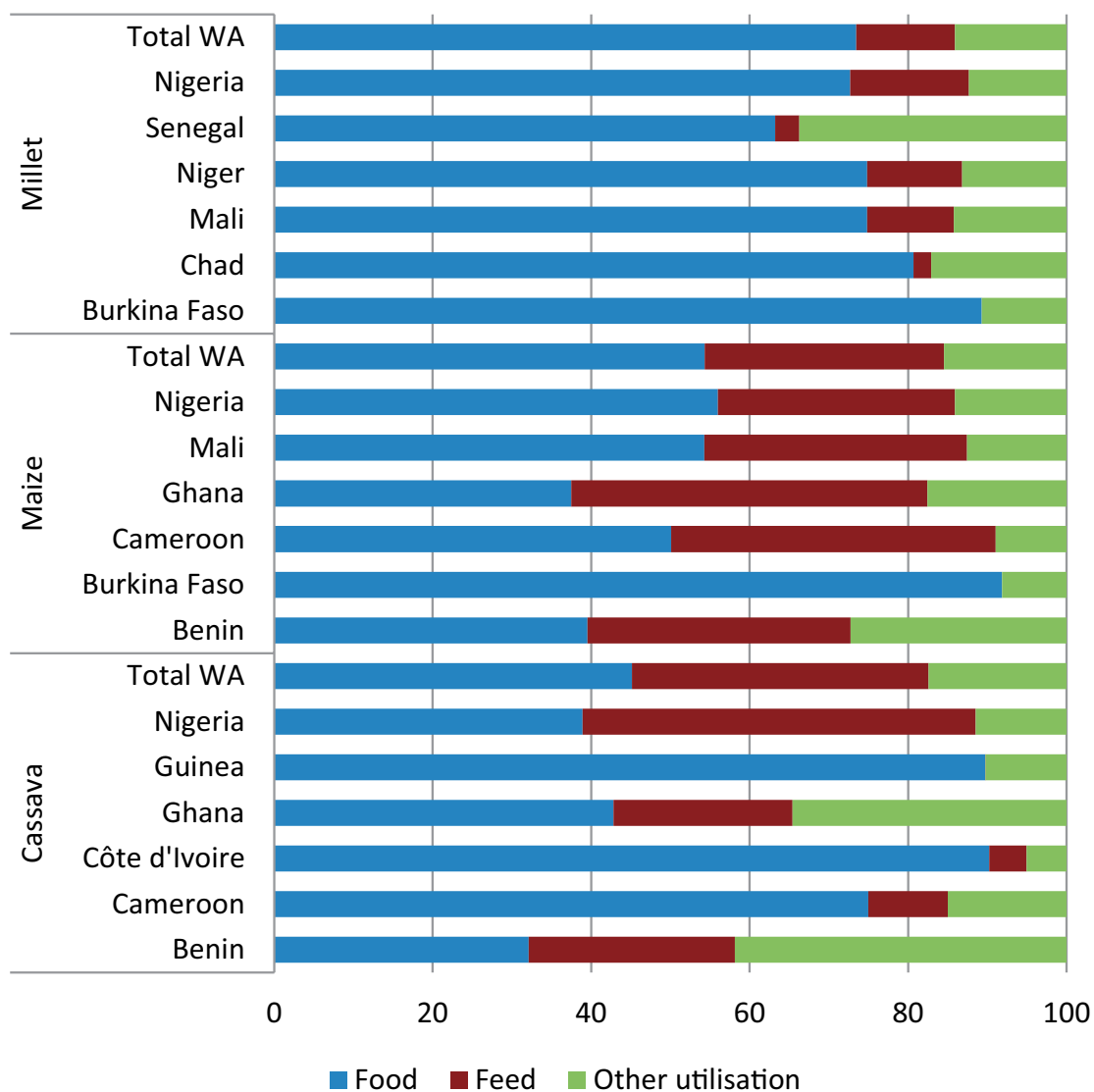
Staple food crops can serve a whole range of market outlets outside of direct food consumption. Staples like maize² and cassava³ can be used as raw inputs into a wide range of food, feed and industrial products, offering endless possibilities for agroprocessing development and huge multiplier effects within the local or regional economies.

² Maize flour, or meal (*sadza*, *nshima*, *ugali* and *mealie pap* in Africa); maize meal (replacement for wheat flour); corn-bread and other baked products; corn syrup (sweetener instead of sugar) in thousands of food products such as soda, candy, cookies and bread; cornstarch (a thickening agent in soups); corn for feeding cows, hogs, catfish and chickens.

³ Cassava uses include starch for adhesives, corrugated boards, gums, wallpaper, foundries, well-drilling, paper industry, textile industry, wood furniture, particleboard; biofuels; alcohol products; dusting powders; drugs; plastics; packaging; stain remover; concrete stabilizer; and remoistening gums.

Figure 3 below summarizes the shares of three types of uses (food, feed and industrial processing) for maize, cassava and millet for the top six producers in West Africa.

Figure 3. Staple crop utilization shares (in %) by top producers (2009)



Source: FAOSTAT (2012)

Maize

Looking at maize utilization by country in the region, we observe growth in maize feed use, though with a high degree of variability across countries and areas. In Benin, maize feed use represents two-thirds of national supplies, up from less than 8 percent in the early 1990s. Burkina Faso has a low maize processing capacity, given that 92 percent of national supply is used directly as food. For Mali and Cameroon, the maize food share has declined from 80 percent to 55 percent over the same period. It has remained at around 70 percent in Togo, 65 percent in Côte d'Ivoire and around 55 percent in Nigeria over the last two decades. Ghana has exhibited a significant increase in maize feed use, from 40 percent in 1990 to 55 percent recently. However, processed products continue to represent a marginal share for maize, although this has actually decreased.

Cassava

A review of cassava utilization trends in the last two decades shows that the share of production for non-food use has been growing in many countries, such as Benin and Nigeria. In Nigeria, feed use has overtaken food use in recent years, now representing around half of its national supplies, compared with only one-third in the early 1990s. In Benin, cassava food consumption has been growing steadily, but non-food use has grown even faster. In Cameroon, there is little movement in processed cassava while food consumption has risen sharply in recent years. (See Chapter 16 for a detailed treatment of marketing and processing constraints on cassava in Cameroon.) In Ghana, feed uses have increased from 15 percent to 25 percent of national supplies, while other utilizations have remained around 30-35 percent. Overall for cassava in West Africa, the share of feed use grew from 23 percent to 37 percent of regional supplies between 1990 and 2009.

Millet

Millet is produced largely for direct food consumption, although a small share of millet goes to other uses. In Senegal, about 100 000 tonnes (or 20 percent of total production) is for non-food use; this share has increased in recent years, rising to one-third of total millet, with two-thirds going for direct food consumption. In Guinea, there has also been an increase in non-food use for millet in recent years. One can find the same trend for Mali, showing a slow increase of non-food millet use over the last decade, although food consumption of millet has grown faster over the same period. Some countries, such as Senegal and Guinea, have diversified millet somewhat towards other utilizations.

Oilseeds

Most of the oilseed production (groundnuts and palm oil) increasingly targets export markets and is less and less directed to regional ones. For palm oil, most top-producing countries split the production between domestic use for food consumption and for exports (to neighbouring countries or internationally). Côte d'Ivoire has the highest self-consumption level of palm oil, with 95 percent of output locally consumed as food, compared to 40 percent for Cameroon and Nigeria and only one-third for Ghana. Over time, the share of palm oil exports has increased for the top producers, especially Ghana (from one-third to two-thirds) and Nigeria (from 30 percent to 70 percent of production exported).

Livestock and meat products

The livestock sector in West Africa could be called the "silent giant". The sector is huge, with over 60 million head of cattle, 160 million small ruminants, and 400 million poultry (OECD/CSAO). In addition to its importance for food security and nutrition, providing protein sources which are in deficit in the region as a whole, livestock plays an enormous role as a source of capital and security for small-scale herders and farmers. Yet despite this fact, livestock is not given the investment priority it deserves and consequently production continues to be seriously underdeveloped.

Consumption statistics are scant as well, and no reliable analyses quantifying household meat and protein consumption in the region have been made. Some information on the consumption of poultry is beginning to emerge, as this subsector is showing signs of growth in some markets, especially in coastal countries near large urban agglomerations. It is believed that poultry consumption is mainly sourced from domestic production, which accounts for over 80 percent of consumption (Schneider and Plotnick, 2010), although imports of frozen chicken have been rising, especially from Brazil and the European Union (EU). Poultry consumption is projected to grow and to rely increasingly on imports (especially European-subsidized, poultry-related by-products). A widening gap between regional production and demand is anticipated. Currently, imports represent only 28 percent of the consumption markets (FAOSTAT, 2012). Indeed, the gap between domestic production and demand has been increasing over the years, from 16 000 MT in 1990 to 50 000 MT in 2000, and is expected to increase further to 62 000 MT by 2015 (Dieye *et al.*, 2004).

3. Staple food in West Africa: An overview of supply drivers

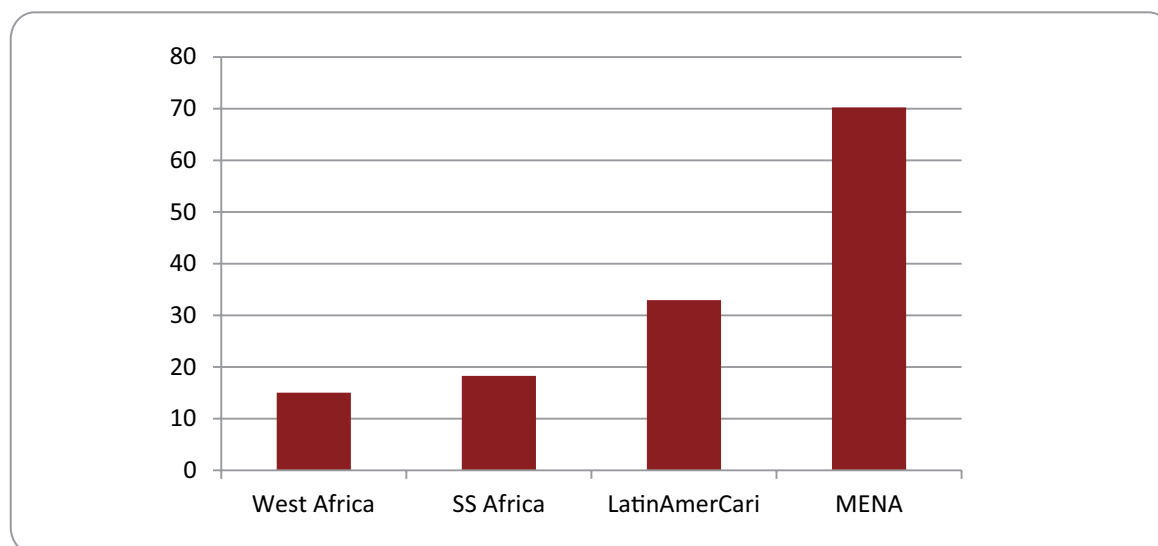
3.1 Strengthening the production-supporting environment

In this section we will review briefly the state of the key drivers affecting unit cost of production, including infrastructure (hard and soft), land, energy and other inputs, as well as the institutional setting, such as the business environment, legal enforcement of rules and transparency, and bureaucratic red tape and other transaction impediments. Attention to all these elements is essential to enable rebuilding of the productive capacity of the staple food systems and to strengthen agroprocessing and market creation opportunities. This should stimulate demand for enhanced production and delivery of high-quality, high-value products, equally benefiting small-scale producers and small businesses, as well as larger-scale operators.

A. infrastructure (roads; communications)

Hard Infrastructure: The provision of infrastructure is essentially a public responsibility, although there are opportunities to engage the private sector in joint investments under appropriately designed public/private partnerships (PPPs). The lack of paved roads (see Figure 4 below) and well-maintained infrastructures is an impediment to market and business operations and slows down prospects for faster integration. Such a sub-optimal state of road infrastructure also raises business and market risks, increases lead time and costs and hampers competitiveness. Infrastructural constraints (transport, communications) also seriously impede farmers' responses to market price signals and value chain incentives. In West Africa, it is estimated that about 40 percent of the cost of food comprises just transport costs.

Figure 4. Share of paved roads (2004)



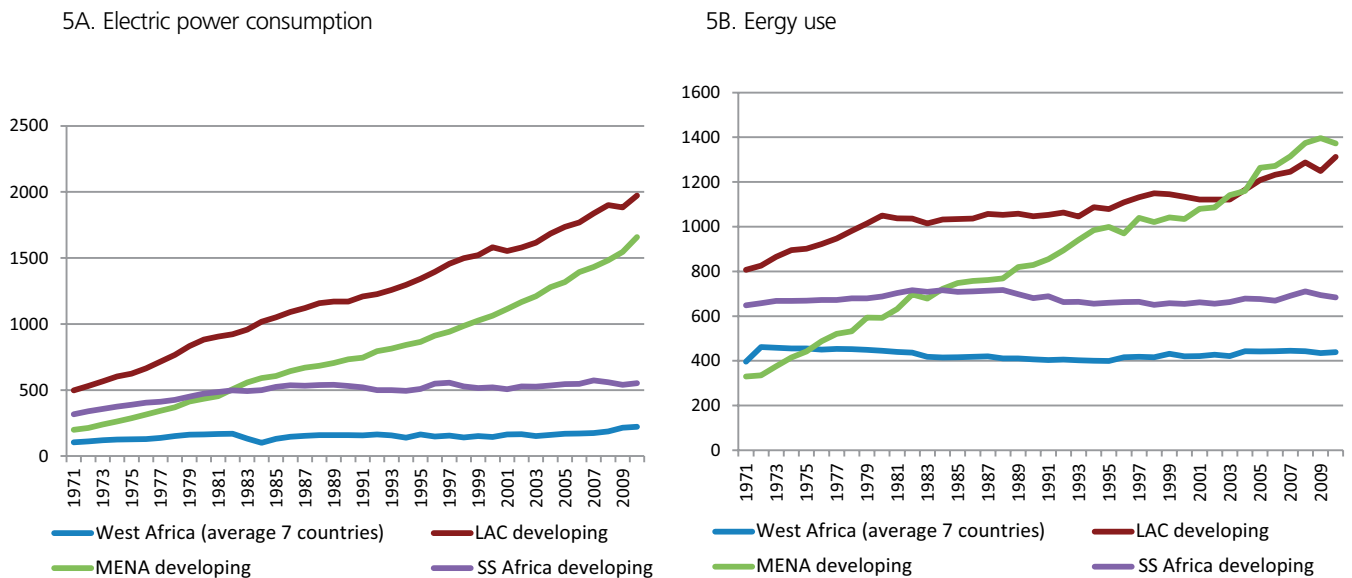
Source: World Bank, World Development Indicators; authors' calculations.

Soft Infrastructure: The lack of adequate communication infrastructure seriously impedes trade, especially for landlocked countries. The latter are doubly handicapped by poor road conditions as well as inefficient regulation of the trucking industry, resulting in exorbitant inland transport prices (Teravaninthorn and Raballand, 2008), which are much higher than in other parts of sub-Saharan Africa. According to a 2009 World Bank report, only 16 percent of roads in Burkina Faso are paved and require low maintenance. Air freight is constrained by the large number of low-capacity airports. Trans-border trade is also costly because of inefficient custom institutions, in spite of the revival of trade corridors between Togo, Ghana and Benin. Poor phone networks (despite improvements for mobile access) and Internet, along with high associated costs, deprive business operators of the opportunity to lower transaction costs and enhance business and marketing.

B. Energy use, utilities and costs

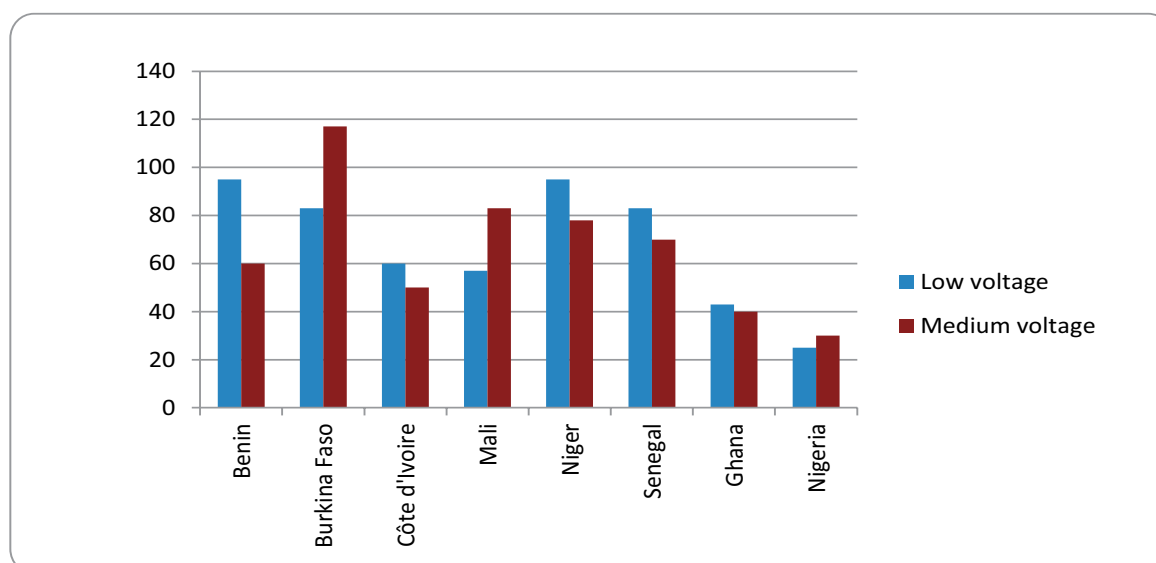
Data on electricity and energy use on a per capita basis reveals the serious deficit for West Africa as a region. There has been no progress in building up the energy infrastructure needed since the early 1970s, beyond keeping up with population growth (as shown by the flat lines for West Africa in Figures 5A and 5B below). By contrast, among developing countries, North Africa and the Near East showed robust and steady growth on par with the trends observed in Latin America. The bleak energy use picture for West Africa is closely linked to the very limited agroprocessing capacity, which continues to languish from insufficient energy availability and high energy costs.

Figure 5. Electric power consumption (kwh per capita) and energy use (kg oil equiv. per capita)



Source: World Bank, World Development indicators; authors calculations

Unreliable power supplies are a huge constraint and entail additional costs and loss of competitiveness for the countries which suffer from them, such as Benin and Burkina Faso, as shown in Figure 6 below. Where the electricity potential is limited and imports are significant, associated difficulties may rise in conjunction with other failures, such as the monopolistic distribution seen in Burkina Faso (high prices and low quality of provision).

Figure 6. Cost of electricity in some West African countries (CFAF/ Kwh)

Source: World Bank, CEM Burkina Faso (2009)

C. Regulation and corruption

Enforcement and credibility of the rule of law and the formal regulatory framework are major factors determining the business environment and their deficiency can pose a serious impediment to investment and to food agroprocessing development. A study by the World Bank, covering many West African countries, quantified these costs for private enterprises. Results are summarized in Table 2 below. The addition of security costs and costly time to import and export costs means that between 5 and 8 percent of sales are lost due to the aforementioned inefficiencies, putting a strong constraint on overall competitiveness.

Table 2. Indirect and invisible costs as percentages of firms' sales

	Indirect costs			Invisible costs				Total indirect and invisible costs
	Transport	Telecom	Customs	Losses due to power outages	Cost of manager's time to deal with regulations	Cost of corruption: informal payments to get things done	Cost of security measures	
Burkina Faso, 2006	2.23	0.70	1.63	1.20	0.05	1.48	0.86	8.20
Benin, 2004	-	-	0.48	1.16	0.06	4.27	0.57	6.55
Mali, 2007	1.96	0.86	0.26	1.39	0.05	0.24	0.12	4.60
Uganda, 2006	1.08	0.50	0.52	28.16	0.06	2.18	0.43	32.93
Zambia, 2007	0.61	0.71	0.68	1.79	0.04	0.05	0.93	4.81

Source: World Bank, Enterprise Surveys (2004-2007) Estimates are based on at least 15 observations.

D. Transport

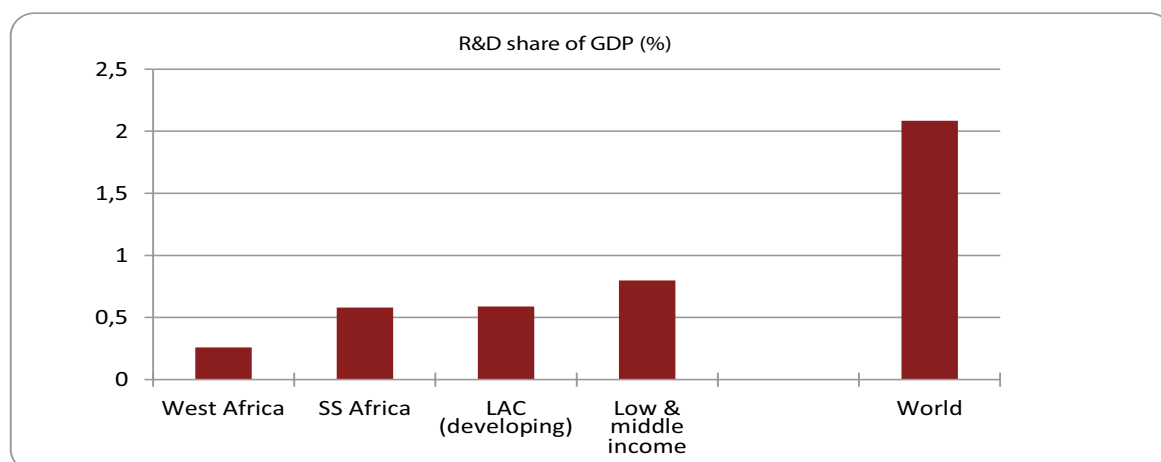
Transport services play a significant role in marketing and trading costs. The current status of transport services in West Africa constitutes a serious impediment to further development and expansion of intra-regional trade, in light of the huge untapped potential. In West Africa, transport costs (vehicle operation, license insurance, tolls, etc.) are higher compared with other regions in Africa. Transport tends to offer lower-quality services at higher prices, due in large measure to the regulations and market access barriers imposed on the trucking industry, as well as the corruption practices in freight-sharing schemes that tolerate the continued operation of older fleets. Generally, bad road conditions are the main cause of high variable operating costs, as they increase fuel consumption and maintenance costs, as well as reducing the longevity of vehicles (Teravaninthorn and Raballand, 2008).

In West Africa, even within the international corridor routes where road quality is good or adequate, transport costs are still too high owing to the influence of truck cartels (informal market-sharing arrangements), existing regulations (through freight bureaus and shippers' councils) and the absence of competition from alternative transportation (rail services).

E. Investments- research and agricultural productivity

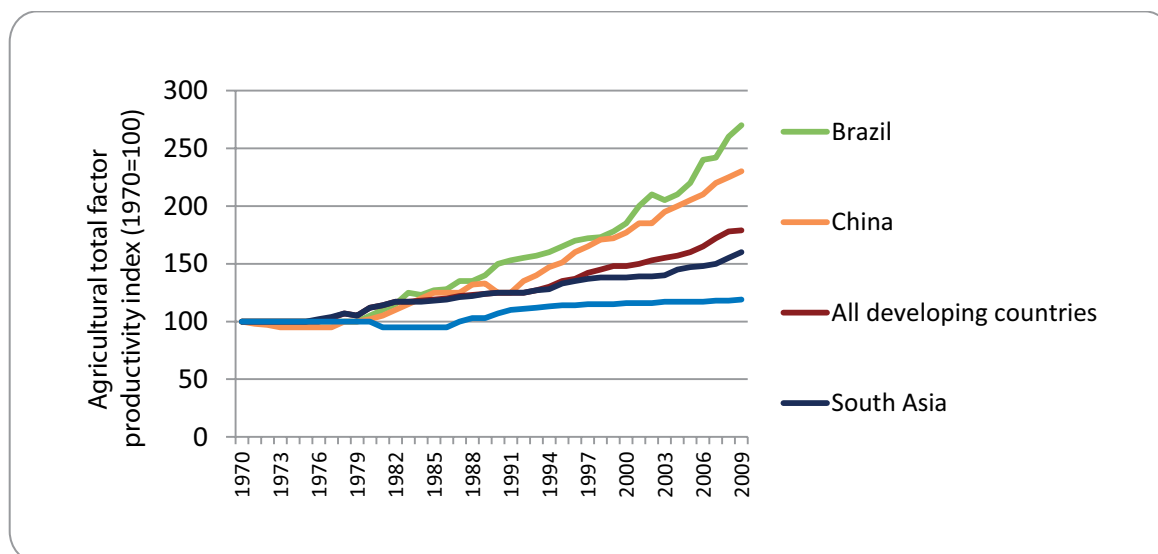
In West Africa, spending on research and development (R&D) is minimal, averaging about 0.25 percent of gross domestic product (GDP), with no change since the 1990s.⁴ This is minimal even compared with elsewhere in Africa (overall Africa's spending on R&D averaged over 0.55 percent). According to an Agricultural Science and Technology Indicators (ASTI) global assessment report on agricultural R&D for 2012 (Bientema *et al.*, 2012), during 2000-2008, close to half of the reported countries in sub-Saharan Africa recorded negative yearly growth in public agricultural R&D spending, ranging from - 0.2 to - 12.0 percent per year, despite an overall aggregate spending increase for sub-Saharan Africa by about a third for the same period. The declining spending levels were particularly severe in French-speaking West Africa. For a number of West African countries, such as Burkina Faso, Guinea, Senegal and Togo, the completion of large donor-funded projects with World Bank financing, left a significant lack of R&D in these countries (IFPRI, 2012).

Figure 7. R&D share of total GDP for West Africa and other comparable regions and the world (averaged over the period 1997-2009; various reporting years)



Source: World Bank, World Development Indicators (various years)

⁴ 10-year average for reporting countries: Burkina Faso, Ghana, Mali, Nigeria and Senegal (World Bank, WDI).

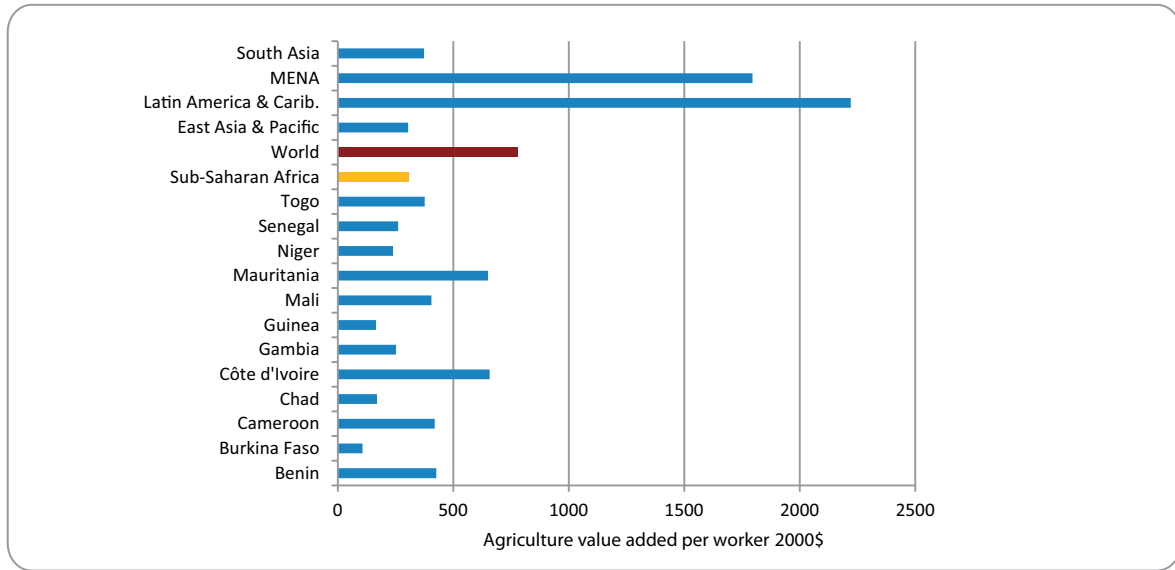
Figure 8. Trends in total factor productivity for sub-Saharan Africa and other developing regions

Source: Fuglie 2012

Developing countries that sustained higher agricultural growth since the 1980s – measured as total factor productivity (TFP) – demonstrated a strong commitment to complementary policies and institutional reforms besides increased agricultural R&D spending. Among these reforms are improved incentives for farmers, macroeconomic stability, relatively strong extension and rural education systems, and improved rural infrastructure and market access (Bientema *et al.*, 2012)

Available data show that more than 50 percent of total foreign direct investment (FDI) inflows to sub-Saharan Africa target natural resource sectors. The agricultural sector in the region has attracted modest FDI. A United Nations Conference on Trade and Development (UNCTAD) FDI brief shows that in the case of Nigeria, the FDI stock in the country is 17 times higher for extractive industry compared with agriculture (USD 6417 million compared with USD 386 million in 1992). Moreover, most of the agriculturally-oriented FDI is geared to high-value export commodities. Examples from the 1990s show that the major FDI projects include Del Monte's investment of more than USD 9 million in bananas in Cameroon, Lonrho's USD 7.5 million investment in tea estates in Tanzania, and Aberfoyle Holding's multimillion dollar investment in palm oil in Zimbabwe (Mugabe, undated).

It is not surprising that agricultural productivity (measured as agricultural value added per 100 workers) remains relatively low compared with other developing regions, as shown in Figure 9 below. In contrast to West Africa, the low rates for developing Asia reflect a much higher population density rather than low productivity *per se*.

Figure 9. Agricultural productivity (agricultural value added per worker)

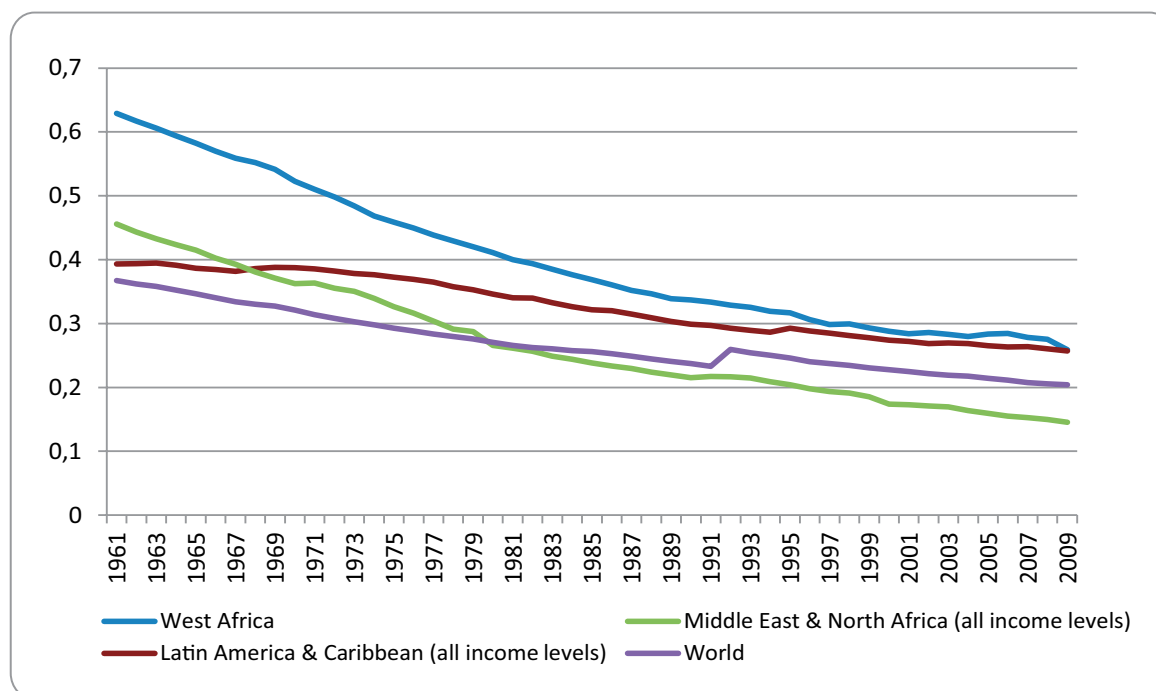
Source: World Bank, World Development Indicators; authors' calculations.

Having reviewed a number of key economic indicators affecting the food supply potential of West Africa, we now turn to the staple food systems, describe their production patterns and review their current productivity status and potential, with particular reference to the key staple food crops in the region. Among the productivity variables we will review are the yield patterns, as well as soil fertility – a key impediment to future food productivity growth in the region.

3.2. Staple food production: composition and trends

Compared with other regions, West Africa (and similarly elsewhere in Africa) started out with a relatively high ratio of land per capita (over 2/3 ha per capita in 1960). But since then, the strong population growth has significantly reduced this ratio to less than 1/3 ha per capita. Compared with Latin America, West Africa had over 50 percent more land per capita in the beginning of the 1960s; however, that advantage all but disappeared with both regions reaching the same level – around 0.26 ha per capita – by 2009.

Figure 10. Available land per capita in West Africa and other regions (ha per capita)

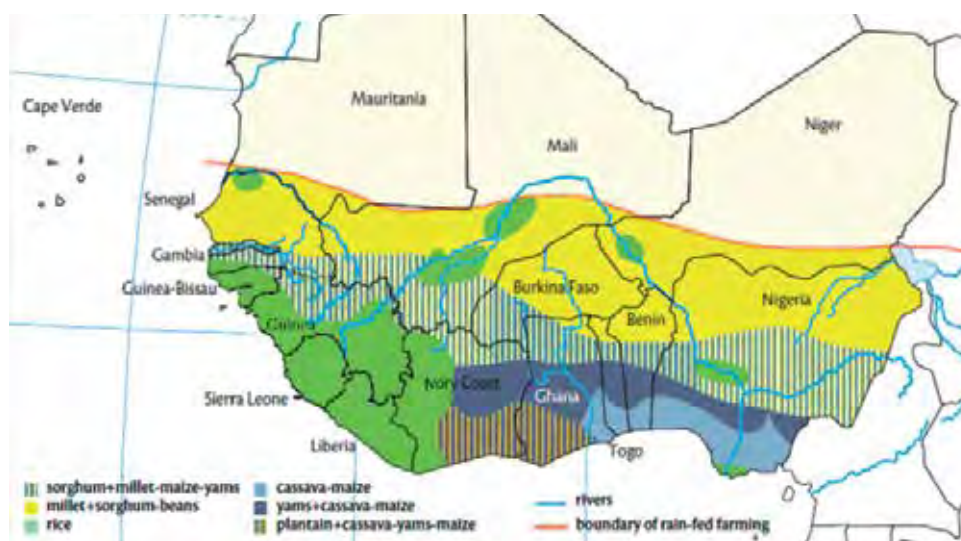


Source: World Bank, World Development Indicators; authors' calculations

B. What food does West Africa produces?

The major food crops produced in West Africa are reported in Table 3 and in Figures 11 and 12. We see from Table 3 the predominance of cereals and roots and tubers in the top 10 crops, but also a variety of other cash crops, fruits and vegetables in the top 20. The region also has an extensive livestock production, averaging over 216 million head of cattle, 69 million head of sheep and goats and over 450 million head of chicken for the period 2005-2010. In Figure 11, we see the geographical distribution of the major food crops, with the Sahel countries dominated by cereals (sorghum, millet, maize, rice and *fonio*); further south in the coastal countries we also find roots and tubers (cassava, yams and plantain).

Figure 11. Geographical distribution of the major food crops in West Africa



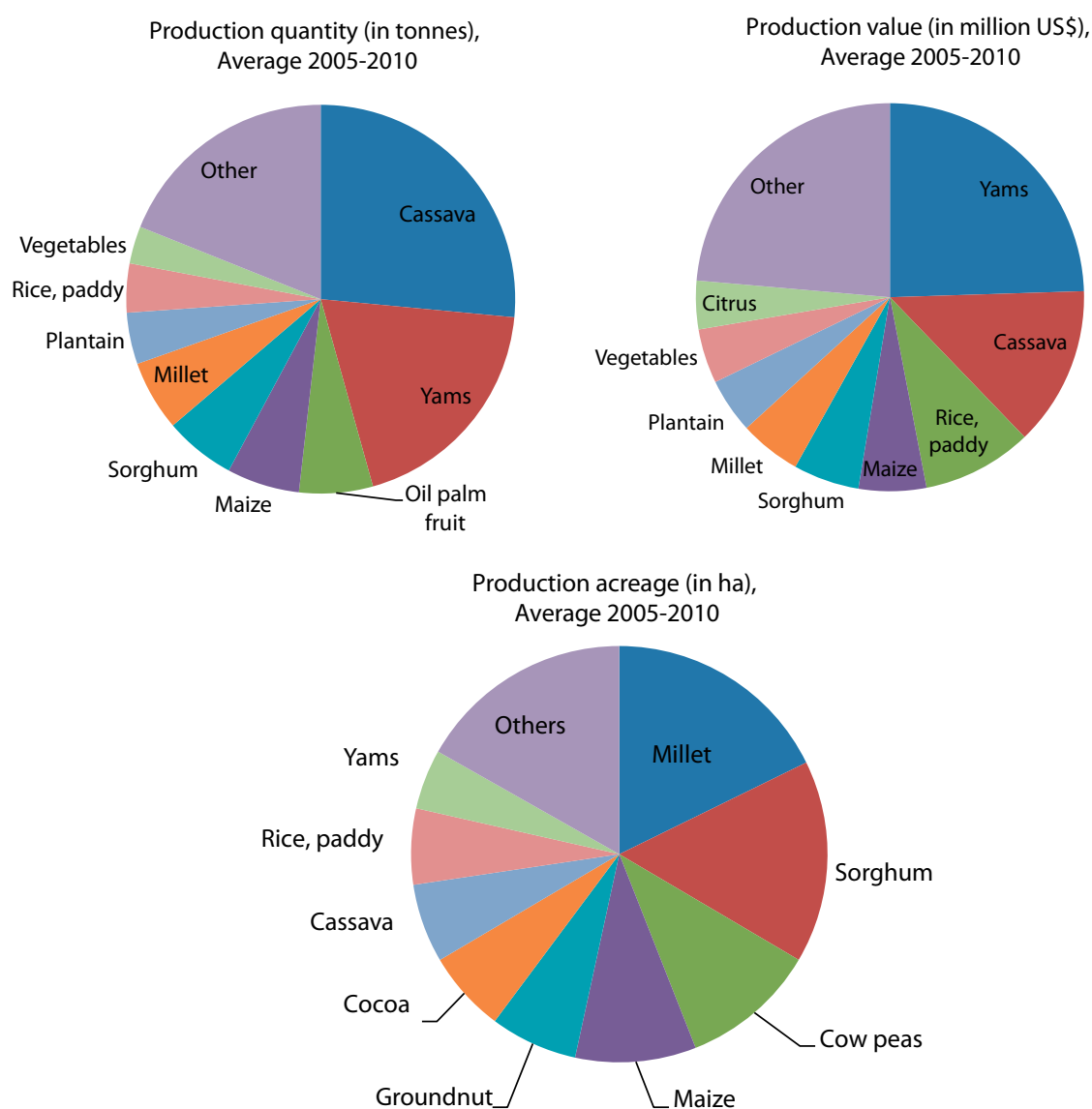
Source: Bureau Issala, Chaléard J.L. and SWAC; extracted from Blein *et al.* (2008)

Table 3. Top 20 food crops in West Africa ranked in terms of production volume, value and acreage (average 2005-2010)

Production acreage (in 1000 ha)*			Production Quantity (in 1000 tonnes)*			Value (current million US\$)*		
Crop	Average 2005-2010	Rank	Crop	Average 2005-2010	Rank	Crop	Average 2005-2010	Rank
Millet	16,68	1	Cassava	65,66	1	Yams	24.996	1
Sorghum	14,79	2	Yams	47,54	2	Cassava	13.569	2
Cow peas, dry	9,92	3	Oil palm	15,20	3	Rice, paddy	9.358	3
Maize	8,83	4	Maize	14,98	4	Maize	5.749	4
Groundnuts	6,38	5	Sorghum	14,65	5	Sorghum	5.603	5
Cocoa beans	5,95	6	Millet	14,51	6	Millet	5.236	6
Cassava	5,76	7	Plantains	10,62	7	Plantains	4.666	7
Rice, paddy	5,55	8	Rice, paddy	10,10	8	Vegetables, fresh	4.627	8
Yams	4,38	9	Vegetables	7,71	9	Citrus	4.119	9
Oil palm fruit	4,24	10	Taro (cocoyam)	7,69	10	Cocoa beans	3.535	10
Seed cotton	2,24	11	Sugar cane	7,17	11	Groundnuts	3.031	11
Cashew nuts	1,73	12	Groundnuts	6,95	12	Cow peas, dry	2.967	12
Plantains	1,52	13	Cow peas, dry	4,72	13	Palm oil	2.859	13
Sweet potatoes	1,30	14	Sweet potatoes	4,20	14	Chillies/green peppers	2.182	14
Taro (cocoyam)	1,14	15	Citrus	3,95	15	Tomatoes	2.083	15
Vegetables	1,05	16	Tomatoes	3,25	16	Taro (cocoyam)	1.762	16
Coffee, green	0,96	17	Cocoa beans	2,71	17	Cashew nuts	1.717	17
Pulses, nes	0,82	18	Seed cotton	2,36	18	Maize, green	1.441	18
Melonseed	0,82	19	Other fruit	1,98	19	Sweet potatoes	1.415	19
Citrus	0,80	20	Onions, dry	1,95	20	Onions, dry	1.108	20

Source: FAOSTAT (2012); *Note: The data is for West Africa plus Cameroun and Chad; for value of production Chad is not included.

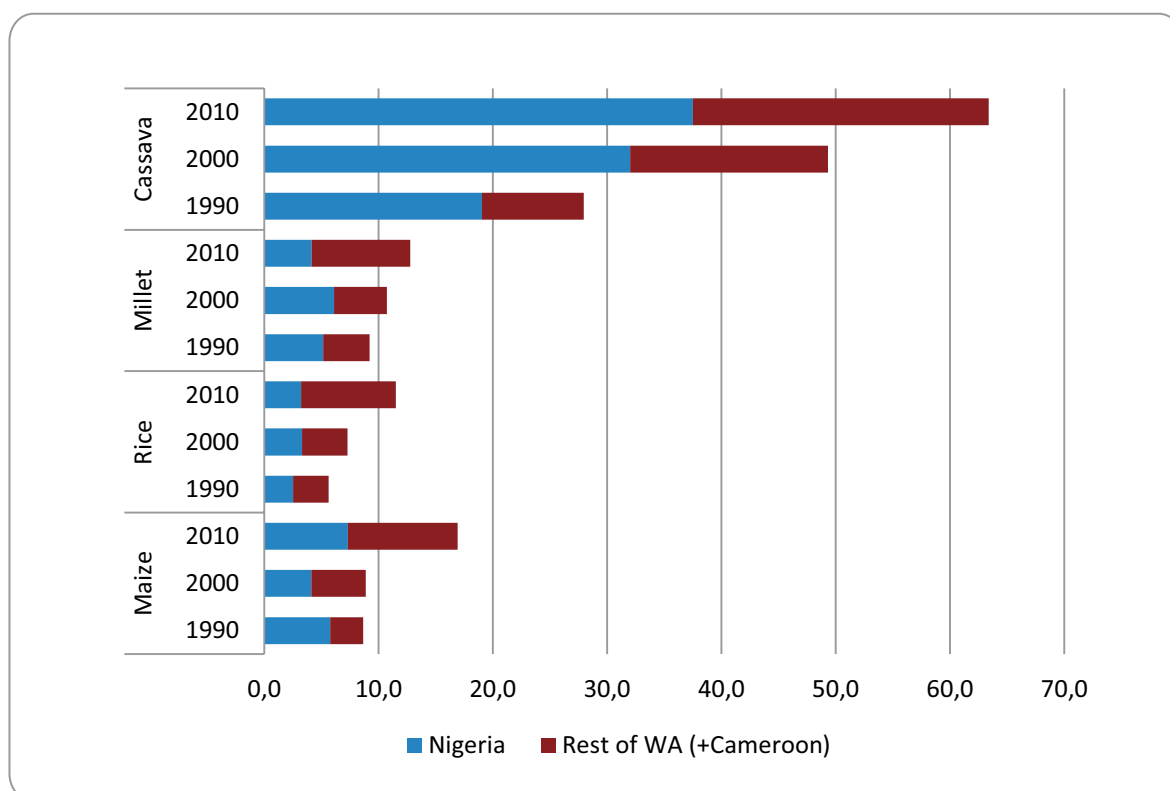
Figure 12.* Top commodities produced in terms of volume (12A), acreage (12B) and value (12C)



***Note:** The data for value of production does not include Chad.

Source: FAOSTAT (2012)

Nigeria represents about half of West Africa in terms of population, and the size of its economy dwarfs the other countries of the region. For most staples, Nigeria alone produces half or more than half the production of all the rest of the region's countries. However, the growth rate of Nigerian staple production has been slower than in neighbouring countries, allowing them to catch up with Nigeria and chip away at its regional market share (Figure 13).

Figure 13. Nigeria's share of staple crop production in West Africa (MT)

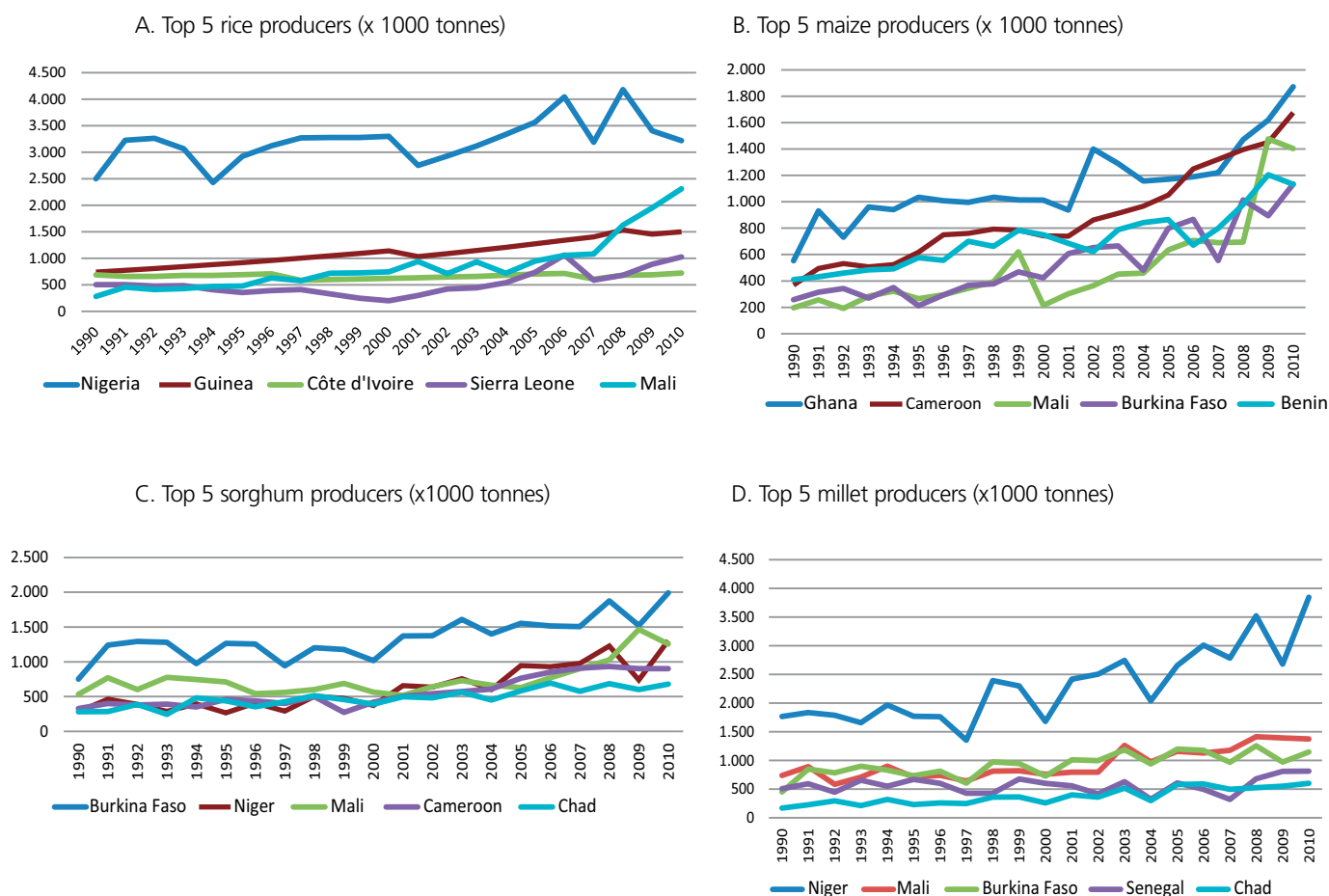
Source: FAOSTAT (2012)

In terms of production patterns, staple food production, on aggregate, has increased more slowly during the 1990s but the pace has picked up since 2000. The trends are general across staple crops and for many countries of the region. Maize, rice, and cassava production have exhibited the highest per annum growth rates (by a factor of between 2 and 2.7) while sorghum and millet have increased more modestly (by a factor of 1.5)⁵ The growth of production has been based on bringing more land into production, with some increase in labour and land productivity as well. However, these modest productivity increases are way below the levels required to ensure better food security and reduced trade deficits. Further productivity increase is highly likely since the yields of most crops are currently rather low compared with yields in other African and developing countries.

a) Cereal production in WA

Cereal production trends by crop are reported in Figures 14A to 14D.

⁵ Production growth has also been significant for other roots and tubers, such as potatoes which have been multiplied by 10 times since the 1980s (AFD-CIRAD-IFAD 2011).

Figure 14. Cereal production trends in West Africa since 1990

Source: FAOSTAT (2012)

The ACI study (2011) showed that in both rural and urban areas, regional demand for rice has far outpaced production levels since the middle of the 1970s; the gaps have been filled with ever-increasing imports, especially from Asia. Almost half of the rice consumption (48 percent) is currently from imports; urban consumers do not turn more to local crops, even when rice prices increase. Countries like Côte d'Ivoire, Ghana and Senegal produce less than half of their consumption. Consumption projections by 2025 show a doubling in rice demand (mostly driven by urban markets), which would require tripling of production if greater reliance on imports is to be avoided.

Figure 14A above shows that during the period from 1990 to 2009, there was hardly any change in production for Côte d'Ivoire, a steady increase for Guinea, and erratic production changes for Nigeria. Several other West African countries boosted their production since 2007, notably Sierra Leone. The most dramatic rice production increase took place in Mali, since the onset of the food crisis in 2007/08.

For maize (Figure 14B), apart from Nigeria (which alone produces as much as the next top seven countries in the region and where maize production has been fluctuating), the production patterns for maize among the top producers showed a relative stagnation during the 1990s but with some increases from 2000 to the present. Benin, Cameroon and Ghana have seen maize production go up since 2000. Burkina Faso's production has been steadily rising since the mid-1990s, while Mali has experienced the most dramatic maize production increase since 2008, with a trend similar to the one experienced for rice.

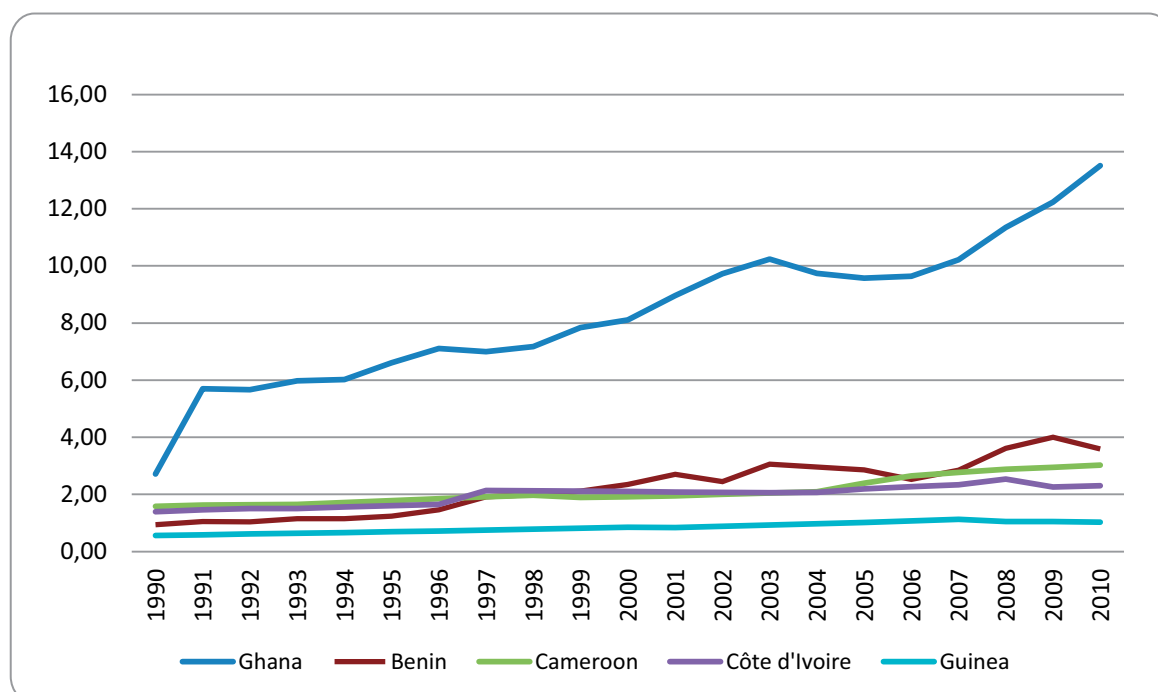
The top sorghum producers, outside of Nigeria, all exhibited a slight increase in production during the last decade (mostly since 2000. Figure 14C). Mali experienced a relatively sharp increase in sorghum production between 2005 and 2009, while in Chad, sorghum production only slowly trended upward since 2000. Burkina Faso is the second largest sorghum producer (outside Nigeria) but production levels are quite variable from year to year.

For millet, there was no significant production increase in the region and there was only a slow increase among the top producers (outside Nigeria), with the exception of Niger (Figure 14D). At the aggregate regional level, production has been more or less stable during the 1990s throughout the region but increased during the last decade as areas expanded; one possible explanation is that farmers returned to millet as some traditional export crops were contracting due to collapsing prices. Chad has been steadily and slowly raising its production, now reaching a level of 0.5 million tonnes – about the same level as Senegal. The latter has not significantly increased its millet production before 2009.

Overall, the current patterns of millet and sorghum production would not be sufficient to meet expected demand increases (from 35 to 75 kg/capita/year), especially in rural Sahelian areas (ACI, 2011). Even a production boost of 20 percent will not come close to meeting the increasing consumption demand. Regional deficits of 4.8 million tonnes of millet and 2.5 million tonnes of sorghum by 2050 are to be expected if further productivity increases are not realized.

b) Roots and tubers

Figure 15. Top West African cassava producers (x 1000 tonnes)



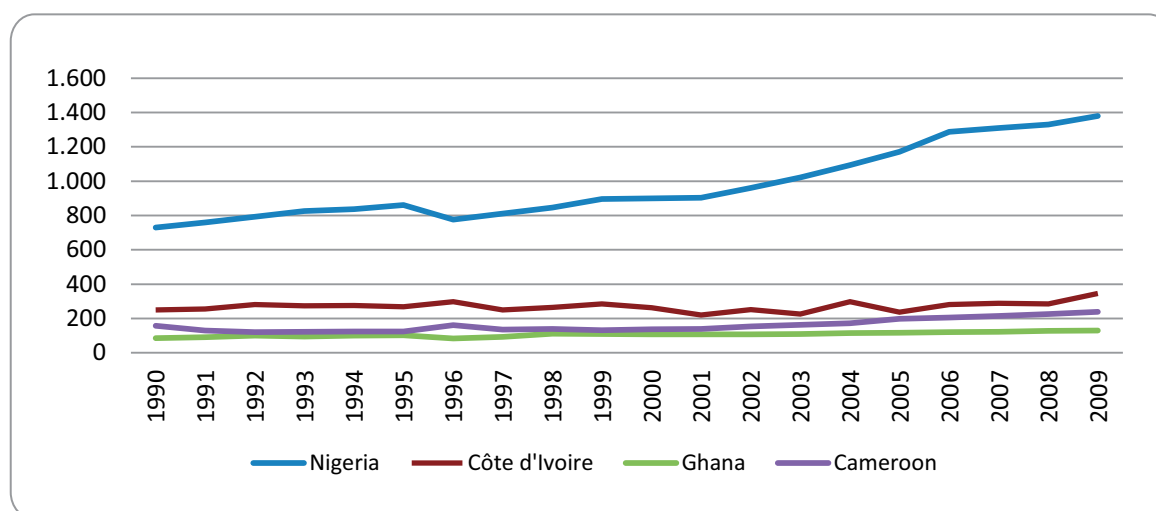
Source: FAOSTAT (2012)

Very little has changed among the small producing countries in the region over the last two decades, due principally to the fact that data for cassava are not collected in as consistent a manner as for other staple crops. Among the five top producing countries (producing over 1 million tonnes by 2010), Ghana has expe-

rienced the most dramatic production increase, growing from 6 million tonnes in 1991 to over 13 million tonnes in 2010. The other big producers (Benin, Cameroon and Côte d'Ivoire) also increased cassava production but at a slower rate. The regional giant (Nigeria) increased cassava production from about 20 million tonnes in 1990 to over 45 million tonnes around 2008 but dropped below 40 million by 2010.

c) Vegetable oils: The rising oil palm and the contracting groundnuts

Figure 16. Top 4 palm oil producers in West Africa (x 1000 tonnes)



Source: FAOSTAT (2012)

The main growth in palm oil production over the last two decades has been in Nigeria, where production rose by 84 percent from 1990 to 2010; production for all other countries in the region, including Cameroon, contracted by an aggregate 22 percent over the 1990 to 2010 period. Hence, all the West African growth in palm oil production appears to be solely the result of production expansion in Nigeria – although poor data collection might also be responsible for this observation.

Oilseed regional production remains low (palm oil and groundnut production only represent 3 percent of global oilseeds production and 1 percent of global exports) compared with the global demand and the huge export potential for West Africa (FAOSTAT 2012).

Table 4. Palm oil and groundnuts production and consumption trends in West Africa 1990-2010

	Palm oil production	Groundnuts production (with shell)	Groundnuts yields	Palm oil consumption	Groundnuts consumption
1990	1.2 MT	2.6 MT	978 kg/Ha	1.1 MT	2.4 MT
2000	1.5 MT	5.2 MT	1132 kg/Ha	1.6 MT	5.4 MT
2010	2 MT	6.4 MT	978 kg/Ha	2.7 MT	6.4 MT
90-2000 AAGR	2.3%	7.2%	1.5%	3.8 %	8.4 %
2000-10 AAGR	2.9%	2.1%	-1.5%	5.4 %	1.7 %

Source: FAOSTAT (2012); AAGR: average annual growth.

d) Livestock products

The livestock sector occupies an important place in West African economies. The region has about 25 percent of the cattle in sub-Saharan Africa, 33 percent of the sheep, 40 percent of the goats and 20 percent of the camels (Mulumba *et al.*, 2008). The share of animal production in agricultural GDP ranges from 5 percent in Côte d'Ivoire to 44 percent in Mali. In the landlocked countries of the Sahel, the contribution of livestock to agricultural GDP is 40 percent.

Animal production systems can be roughly divided between purely pastoral systems, livestock mixed with farming, and small ruminant rearing. Pastoral systems account for a third of the cattle and half of the small ruminants, but supply 60 percent of cattle meat, 40 percent of small ruminant meat and 70 percent of milk. Agropastoral or mixed small farming systems are expanding, relative to purely pastoral systems. Rearing of monogastric livestock plays an important part in the economies of the coastal countries. In this regard, West Africa is the main producer of pig meat on the continent, with Burkina Faso, Cameroon and Nigeria leading the way. Pig meat production has undergone major growth since 1980, rising from 106 000 tonnes in that year to 330 000 tonnes in 2005 (Mulumba *et al.*, 2008). Poultry production (broilers and eggs) has experienced a similar pattern of growth over the last two decades, starting from slightly more than 300 000 tonnes in the early 1990s, increasing to 495 055 tonnes in 2007 and 551 386 tonnes last year (FAOSTAT, 2012).

However, regional production of meat and dairy is still far from meeting the increasing demand from population and urban growth. By 2015, demand is estimated to reach 3.5 million tonnes for meat products (from cattle, small ruminants, poultry and pigs) and 4.5 million tonnes for dairy products. While production has doubled since 1961, with an annual average growth of 2 percent, progress has been erratic, oscillating between periods of growth followed by years of decline (2.2 percent in 1971 and 1975 and 5.0 percent between 1986 and 1989). The region is also uneven in terms of livestock production per capita. Although Nigeria produced 280 000 tonnes of meat, or 33 percent of regional production in 2005, at country level this represented only 2.13 kg per inhabitant, a per capita production lower than the regional average (Mulumba *et al.*, 2008). In the Sahel countries, annual per capita beef and veal production is higher than in Nigeria (8 kg in Burkina Faso, 7 kg in Mali and 6 kg in Niger). Dairy production per head of cattle is low compared with potential. Gonçalves (1995) estimated milk yields to vary from 0.5–2 L per day, depending on the breed, style of livestock management and milking method. It was generally accepted that breeds yielding 0.5 L per day could produce more than 2 L with management and feed improvements (Agyemang *et al.*, 1997).

The West African region is recognized as a reservoir of great genetic diversity, with multi-functional livestock rearing. About 13 cattle breeds of the shorthorn type and 12 of the zebu type have been recorded in the region. Yet the intrinsic zootechnical characteristics of small ruminants, poultry and pigs are not well-documented, even as their genetic diversity and the potential for increasing their meat yields (from large animals) and milk yields (from sheep and goats) are undisputable (Gbangboche *et al.*, 2005).

Protein consumption required for minimum daily nutrition is far from being met on average in the region. The minimum calories required by a 65 kg person in a situation of food security is 2 400 kcal (the norm established by FAO), which is generally supplied by cereals and roots and tubers. The diet should also include at least 55 g of protein for the well-nourished –although it can be as low as 17 g for the less affluent. At the regional level, however, per capita daily consumption is about 2 320 kcal, lower than the FAO norm. Moreover, protein deficiency is more widespread in the coastal countries, where the typical diet contains only 45 g of protein, as against 60 g in the Sahel countries.

Intraregional trade in livestock is insufficient considering its potential, but generally follows a flow from landlocked Sahel countries towards the coastal areas. West Africa can be divided into three large blocks: (i) the

countries of the Gulf of Guinea (Benin, Cameroon, Côte d'Ivoire, Ghana, Nigeria and Togo), the countries on the Atlantic seaboard (the Gambia, Guinea, Guinea Bissau, Liberia, Mauritania, Senegal and Sierra Leone) and the land-locked countries of the Sahel (Burkina Faso, Chad, Mali and Niger). Apart from Nigeria, the countries on the Gulf of Guinea are net importers of livestock products, those on the Atlantic seaboard trade very little among themselves, and the land-locked countries basically supply those on the Gulf of Guinea (except for Cameroon) with products from the beef and veal commodity chains. For example, between 2000 and 2003, Mali exported close to 6 500 tonnes of live cattle to Senegal (valued at CFAF 5.75 billion or over 12 million USD) and 16 617 tonnes to Côte d'Ivoire (valued at CFAF 11.84 billion or over 25 million USD).

3.3 Crop productivity trends

A. Soil fertility

Tackling the soil fertility problem is a key prerequisite for rebuilding West Africa productive potential. More than half of food production in the Sahel countries is composed of sorghum and millet, two cereals typically grown in dry areas. As soon as rainfall is higher or when irrigation is possible, these crops are replaced by maize or rice, crops more preferred by urban consumers.

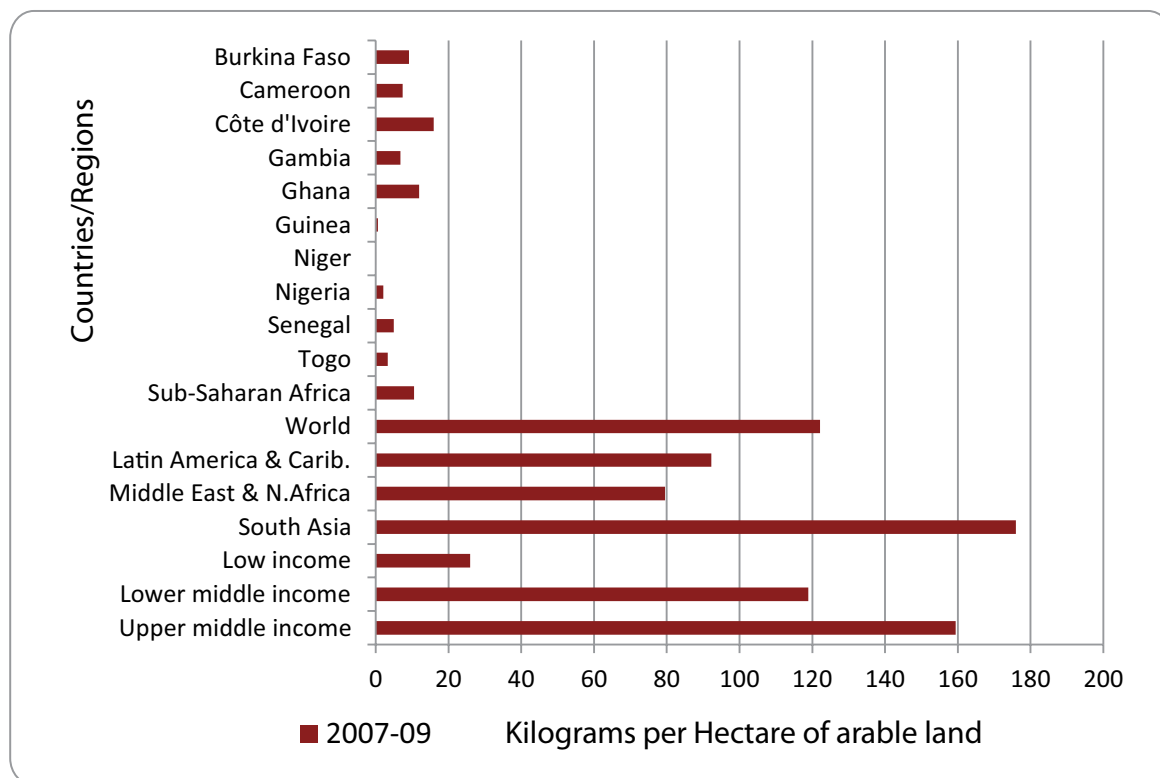
Soil fertility trends in the region are a cause for concern. From the agro-ecological perspective, the production of millet and grain sorghum, particularly in the Sahel, has historically developed on the lighter soils of the region (e.g. the groundnut basin of Senegal, the Maradi zone in Niger) which provide several advantages, such as reducing manual fieldwork hardship, simplifying the preparation of land and allowing for early planting (Jouve, 2012). But their main advantage lies in the water retention properties of these soils, a result of the sandy texture, which limits direct evaporation, minimizes runoff and optimizes the absorption of rainfall and depth to store almost all rainwater. All these properties have helped these soils adapt to the aridity and favoured crops like sorghum and millet. The downside is that soil fertility is very fleeting and decreases precipitously after a few years of cultivation, resulting in a reduction in crop yield. These sandy light soils have a low content of clay humus complex – an important source of minerals that can be released into the soil for plant use and nourishment. This clay humus/mineral deficiency depletes these soils of needed fertility rather quickly after a few years of cropping which can show up in lower yields. The concern is that this is not an isolated situation but covers a large swath of cultivated lands in the region.

When population density was low, farmers could practice long fallow periods (leaving the land to rest from cropping), which allowed soil fertility restoration. But this is no longer possible, due to mounting population pressures and resulting expansion of cultivated lands. As less and less fallowing is practiced, the change is reflected in increased rates of soil fertility loss and consequently in the negative impact on yields (Jouve, 2012). Alternative soil fertility management strategies are required if yields are to increase or be maintained. Such management of soil fertility would ideally combine mineral and organic fertilizers. New methods of fertility restoration would include cereal-legume association, application of manure or compost and the introduction of trees in the cultivated area. These practices are known and already practiced on a small scale by farmers, especially near their farms (thus giving these management systems an intensive character). But the bulk of cultivated land is not affected; consequently, for much of the land, there is a regressive evolution of fertility resulting from lower yields.

The use of fertilizers is essential, especially phosphate for which soils are generally deficient. Similarly, the addition of nitrogen has a quick and positive impact on the increase in biomass and yield (as shown by tests conducted by FAO, ICRISAT, and IFDC). However, soil fertility cannot be managed solely through continuous input of mineral fertilizer, as this can cause the acidification of soils over the long term. It is also necessary

to use other methods of managing this endogenous fertility. Given the low levels of fertilizer use in West Africa (as shown by Figure 17 below), there is still more scope to improve fertility through use of a judicious management system.

Figure 17. Fertilizer consumption in West Africa, 2007-2009

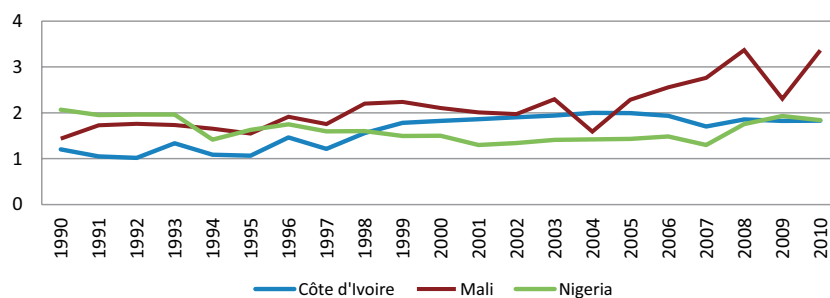
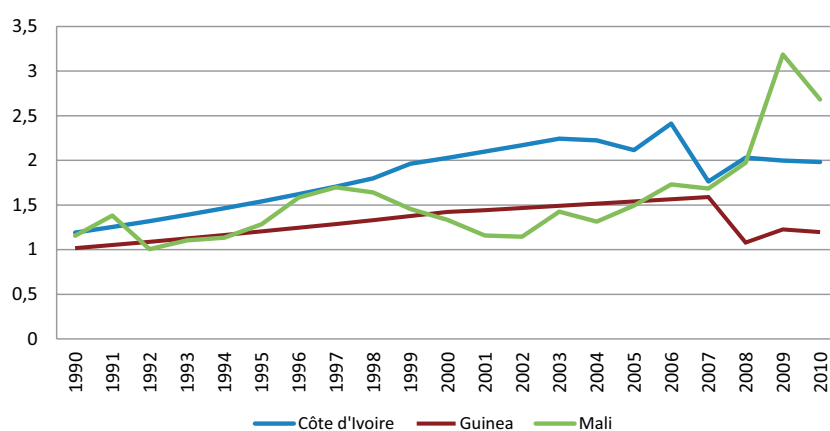
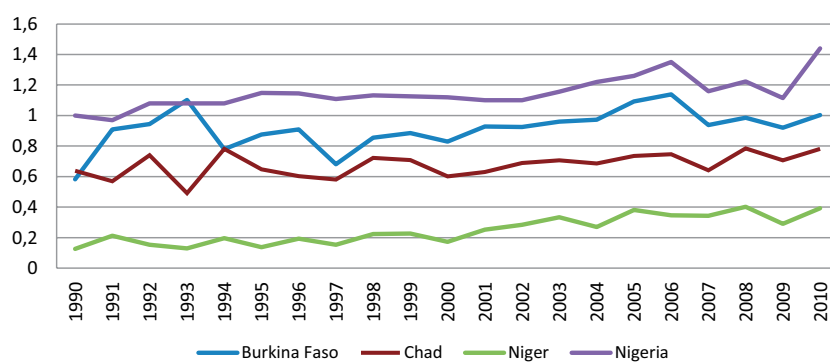
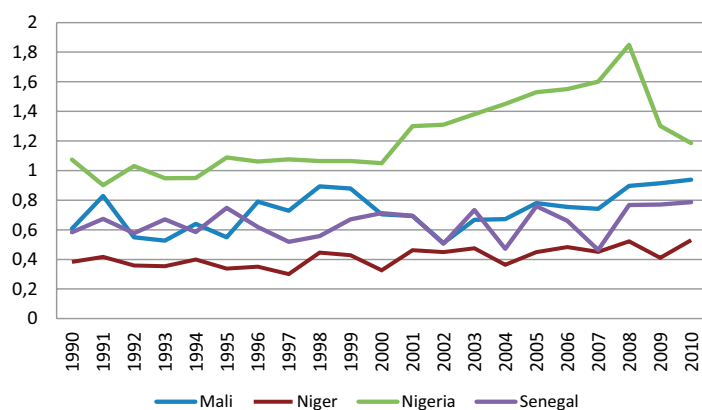


Source: World Bank; World Development Indicators

B. Staple crop yields

i) Cereals

Cereal yields in the region can easily double if soil fertility is improved. This necessarily requires improving access to inputs, and thus to credits. Such a yield boost also requires finding ways to minimize climate risks to production in dry areas, such as improving individual and collective storage, as well as stabilizing prices, given that price variability is the main economic risk confronting the small farmers of the region.

Figure 18. Cereal yield trends in West Africa**A. Paddy rice yield (tonnes/ha)****B. Maize yield (tonnes/ha)****C. Sorghum yield (tonnes/ha)****D. Millet yield (tonnes/ha)**

Source: FAOSTAT (2012)

Figure 18 shows the cereal yield trends for the main crops since 1990. Overall, rice yields stagnated over the last two decades and only picked up in the last four years (following the food crisis of 2007/08). Côte d'Ivoire, a big rice producer in the region, experienced no yield changes over the period; however, notable yield increases were observed for Nigeria and the most notable yield increase was in Mali. Typically, rice yields vary from 1 tonne to a little under 4 tonnes per ha, depending on the performance of irrigation and lowland cultivation techniques (ACI 2011).

For most countries, maize yields have also stagnated since the 1990s. Côte d'Ivoire experienced a maize yield boost for about five years during the second half of the 1990s but then yields stagnated after that. Mali, by contrast, has experienced a slow yield improvement since 2002 and a sharp yield boost since 2008, after the launching of a national maize initiative with distribution of inputs, notably fertilizer, which markedly affected maize yields.

Sorghum yields are very low, below 1 tonne per ha for all countries except Nigeria, whose sorghum yields are also quite low, as they remain below 1.4 tonne per ha. Yields elsewhere are also low and highly variable, with no noticeable trends since the 1990s.

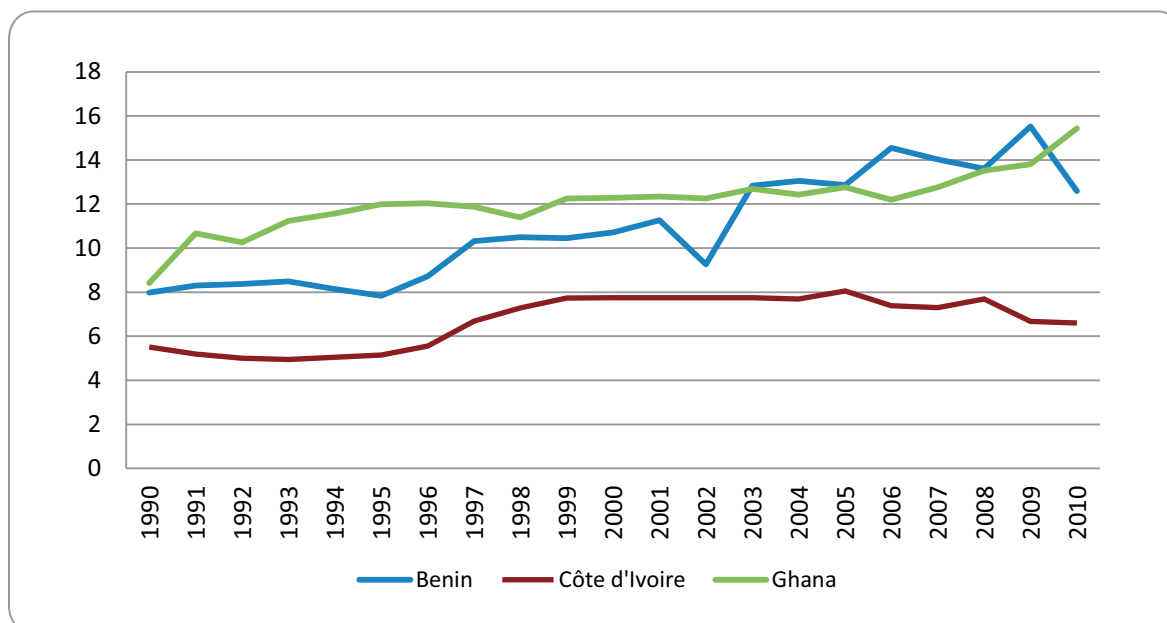
Millet yields are low and stagnant; most are below 1 tonne per ha (except for Nigeria). One of the region's top producers, Niger, averages only 0.5 tonne per ha. The other big producers (Mali and Senegal) have yields that are stagnated between 0.5 and 1 tonne per ha.

With these low yields it is very difficult to contemplate development of a value chain with marketable surplus leading to processing opportunities. The key challenge remains low yields; however, given the yield gaps, the potential for growth is huge.

Overall, there has been little yield improvement in millet or sorghum during the last decades, due to the near absence of public investment in R&D. These commodities (millet, sorghum and maize) have not been considered a priority for investments despite their huge role in food security for rural households, which makes them, on aggregate, among the top crops in the region.

ii) Roots and tubers: Cassava

The average yield for cassava in the region has hovered unchanged at around 10 tonnes per ha for much of the last two decades; it only rose a bit in the last few years to reach around 12 tonnes per ha. This is still far below the average yields obtained with new varieties, which can reach between 20 and 30 tonnes per ha in rainfed conditions and up to 60 tonnes per ha under irrigation. On a country basis, two of the top producers have been making steady progress in average cassava yields: Benin and Ghana. Nigeria has also increased cassava yield in recent years but the new average of 12 tonnes per ha is about the same as it was in 1990. Côte d'Ivoire, a large cassava producer by contrast, has made no significant progress in its cassava yields, which continue to hover around 8 tonnes per ha.

Figure 19. Cassava yield trends (tonne/ha)

Source: FAOSTAT (2012)

In conclusion, those general patterns hide not only many disparities between crops but also among countries and production basins, depending on the feasibility of irrigation, quality of extension and R&D services, accumulation of farm and human capital, and availability of agricultural inputs. More importantly, substantial and sustainable productivity increases are required in value chains for all staples, in order to catch up with other developing countries and respond to future projected demand at both regional and world levels.

4. Staple food trade in West Africa: A general overview of trends

In light of the significant, often undocumented, informal trade and commodity exchanges across borders within West Africa, it was deemed necessary to treat formal trade flows separately from informal ones.

4.1 Formal trade flows

In this general overview we review trade flows, separating those flows within ECOWAS from those taking place outside the region. Looking at trade statistics as summarized in Table 5, we see that the food import flows into the ECOWAS region are largely dominated by extra-regional exporters. Table 6 summarizes trade for rice, maize, oil palm, groundnut oils, poultry and cassava, within and outside the ECOWAS region and focusing on a few key countries, namely Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria and Senegal.

Table 5. Trade flows for six strategic commodities in six key ECOWAS countries

Country / Region	RICE ¹		MAIZE				GROUNDNUT	
			Seed		Maize Products			
	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World
To: ECOWAS								
1997-00	2.511	307.002	1.829	13.936	155	5.232	356	509
2001-04	8.500	719.620	5.086	18.863	457	13.779	233	2.192
2005-08	14.757	1.470.369	3.106	45.839	563	29.102	770	3.852
To: Burkina Faso								
1997-00	0	0	0	0	0	0	0	0
2001-04	3.248	34.782	654	20	156	510	47	32
2005-08	9.563	59.930	430	111	21	781	7	0
To: Cote d' Ivoire								
1997-00	0	0	0	0	0	0	0	0
2001-04	3	167.399	21	1.175	0	4.866	6	19
2005-08	1	334.886	2	3.457	58	8.200	6	35
To: Ghana								
1997-00	0	0	0	0	0	0	0	0
2001-04	0	117.295	0	66	0	970	243	39
2005-08	1.669	156.803	42	9.499	75	627	26	16
To: Mali								
1997-00	927	16.775	62	1	15	793	67	17
2001-04	2.108	24.768	266	32	5	796	36	167
2005-08	4.409	48.502	734	223	215	1.658	482	420
To: Nigeria								
1997-00	3.270	110.960	0	20	828	528	194	26
2001-04	1.639	222.935	0	1.335	2.825	3.047	11	86
2005-08	768	332.770	0	127	3.285	9.549	0	333
To: Senegal								
1997-00	5	137.649	74	5.104	1	920	0	5
2001-04	0	196.709	0	11.610	50	1.199	0	714
2005-08	0	396.995	0	23.847	7	2.728	179	1.029

Source: WITS - Sept. 2010

Note: " 0 " imply a minuscule value; ¹ Rice : Paddy + milled rice; ² Cassava: cassava products (starch).

Table 5. Trade flows for six strategic commodities in six key ECOWAS countries (Cont.)

Country / Region	PALM OIL		CASSAVA ²		POULTRY			
					Live Poultry		Poultry Meat	
	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World
To: ECOWAS								
1997-00	28.592	8.340	59	45	21	1.117	196	36.469
2001-04	41.347	51.115	21	222	151	2.017	552	121.218
2005-08	56.789	85.722	77	721	18	4.572	316	149.686
To: Burkina Faso								
1997-00	0	0	0	0	0	0	0	0
2001-04	3.452	1.136	0	0	20	63	8	25
2005-08	12.820	642	0	0	13	82	15	20
To: Cote d' Ivoire								
1997-00	0	0	0	0	0	0	0	0
2001-04	7	15.549	0	0	0	704	46	9.351
2005-08	3	5.151	55	1	0	1.168	15	4.454
To : Ghana								
1997-00	0	0	0	0	0	0	0	0
2001-04	1	13.897	0	3	0	941	18	35.627
2005-08	205	25.063	0	100	8	2.713	33	59.145
To : Mali								
1997-00	843	119	0	0	12	39	7	27
2001-04	4.639	1.024	0	0	7	36	40	117
2005-08	20.874	3.675	1	0	0	152	37	212
To: Nigeria								
1997-00	204	1.501	0	0	0	931	0	13.244
2001-04	649	10.910	0	49	0	462	338	33.882
2005-08	560	3.076	0	76	0	0	159	49.545
To: Senegal								
1997-00	878	5.149	2	44	0	280	0	2.062
2001-04	7.670	5.654	4	68	0	175	0	17.296
2005-08	21.012	19.164	10	397	0	263	0	11.578

Source: WITS - Sept. 2010

Note: " 0 " imply a minuscule value; ¹ Rice : Paddy + milled rice; ² Cassava: cassava products (starch).

In the case of rice, we have seen that consumption and food demand in the region far exceeds local production. Rice imports into the ECOWAS region have continued to expand substantially from all sources during the last 12 years, with the rest of the world (primarily Asia) dominating imports in the most recent period. Some countries (Burkina Faso and Côte d'Ivoire) became rice importers only after 2000. It is worth mentioning that these reported import flows reflect only the commercial rice imports and exclude food aid, which can be substantial in the region.

Rice import sourcing varies by country depending on whether the country is on the coast or landlocked. Burkina Faso and Mali depend more on intraregional trade and have expanded rice imports from ECOWAS⁶, while coastal countries like Senegal import directly from overseas, importing only a small amount from within the region. Nigeria's rice imports, on the other hand, decreased as a result of policy decisions (import bans).

Maize production is far more significant within the region than rice and the region could very well be self-sufficient. Maize imports are dominated by primary production (seeds) for direct food consumption, with very little trade in semi-processed (flower) and processed maize (starch). There has also been a huge increase in seed maize imports from outside ECOWAS. However, the rest of the world dominates the semi- and fully-processed maize markets. Landlocked countries like Burkina Faso and Mali depend more heavily on the ECOWAS region for their maize seed imports than coastal countries like Côte d'Ivoire and Ghana, which import more readily from outside the region.

Substantial increases in poultry and egg imports from outside ECOWAS to meet the growing demand in fast-expanding urban centres is a recent phenomenon that is puzzling, given the huge potential for home-grown production. This seems to point to a huge, untapped domestic poultry industry, especially if it were fully integrated with the cereal systems that dominate in the region. For the time being, consumer demand is met through imports of live poultry, especially from Europe. Looking at production and trade trends, we see that only two countries have made any significant move to expand poultry production, namely Côte d'Ivoire and Ghana. Nigeria, has tried to restrict imports (the only import level that declined within the region for the period analysed) through restrictive import policies. Nigeria imposed a ban on imports for a large number of food products in order to stimulate domestic production. For semi-processed and processed products, there was a huge import expansion for the other ECOWAS countries from both Europe and the rest of the world. All these developments may indicate a huge potential for more integrated, large maize-poultry systems within the region. However, for this to happen, the existing bottlenecks relating to energy (electricity), cold storage facilities and transport costs would need to be overcome.

Within the vegetable oil complex, oil palm has both strong official and unofficial intraregional trade, especially in crude palm oil, the form most used for food consumption in Africa. Nigeria dominates the region in imports of primary products (palm nuts and kernels), while very little is imported by other countries. For palm oil (processed), the data show an explosion of imports from the ECOWAS region into many countries, such as Burkina Faso, Mali and Senegal, which import palm oil from coastal countries of West Africa, especially Côte d'Ivoire. Nigeria has expanded production of oil palm, resulting in less reliance on imports. Groundnut oil, the second most important vegetable oil in the region, has also showed increased imports into the ECOWAS region, with Mali and Senegal importing relatively more than the other countries. On the export side, Senegal dominates the market, with continued groundnut oil exports to the rest of the world but only minimal exports to other ECOWAS countries. In many countries, local production and processing account for a large share of domestic consumption.

⁶ There is also a large informal rice trading across neighboring countries led by informal traders who move (smuggle) rice across borders from low-tariff countries into highly-protective ones and escape from customs' control.

Primary cassava (tubers) is exported from the ECOWAS region into Europe, largely to serve the African diaspora. More intra-ECOWAS trade takes place in primary cassava. Only Côte d'Ivoire exports processed cassava from within the region. Countries like Ghana, Nigeria and Senegal import processed cassava (starch) mostly from Asia or Latin America. Given the huge production potential of cassava in the region, importing cassava starch points to a very weak agroprocessing industry, and hence to the still untapped potential for value chain development in this crucial regional food crop.

In summary, this very succinct review of food import patterns into and from the ECOWAS region points to two broad conclusions. First, there is clear evidence of the poor agroprocessing capacity of the region as a whole, with respect to the major food products produced, consumed and traded. This explains the much higher reliance on imports than the potential or comparative advantages would seem to indicate. Second, the fact that coastal countries (Côte d'Ivoire, Ghana, Senegal) import more from outside while landlocked countries import from within the region points to significant transport and infrastructure bottlenecks impeding regional trade.

4.2 Intra-regional trade in staple food

Low intramarket integration, as is still the case for West Africa, translates into more price variability and more uncovered risk for producers, as well as for traders and other stakeholders. Hence, when intraregional markets are underexploited, marketing opportunities are weakened, creating disincentives for regional investments. Conversely, expanding intraregional trade in food value chains can provide significant spillover to the local economies and create a regional market for high-end products.

The institutional setup for market and economic integration in West Africa has been in place since 1993, when ECOWAS was established to promote a free trade area within West Africa and push for a free circulation of goods and services and preferential agreements for investments and migration (UNCTAD, 2009).⁷ ECOWAS created a customs union for the whole region, building on the regimes in existence in the West African Economic and Monetary Union (WAEMU). It is the one region in Africa that has managed to put in place, at least officially, free mobility of goods, services and factors of production. However, in practice, there are still numerous barriers to translating such a commitment into a reality.

Among these are the effects of geography. Landlocked countries are particularly vulnerable as they are still tied to trade outside of ECOWAS but face poor infrastructures and other burdensome non-tariff barriers. As a consequence, these countries incur the costs of crossing the borders of their neighbouring countries (over which they have no control) in addition to their own, which results in high trade costs. Another key determinant affecting regional integration is the "Colonial Pact" signed by the French-speaking countries, which mandates France to have complete oversight of 60 percent of their financial reserves and euro-peg of the African Financial Community (CFA), which ties these economies with European macro-economic cycles (i.e. inflation, interest/exchange rates). Successful economic and monetary integration under such conditions is difficult.

Another factor impeding greater intraregional trade integration is the general category of transaction costs, which include weak attraction forces (cultural, historical, geographical) and strong opposing forces, such as cumbersome, slow trade procedures and informal taxation at the borders as non-tariff barriers. Administrative procedures can also be very costly, as shown by the World Bank data (2009); import/export procedures are

⁷ Within ECOWAS, the WAEMU represents the French-speaking countries with a common currency (the CFA Franc), harmonized business law, and some convergence among macroeconomic policies. There is also the WAMZ which groups together the non-CFA currency countries.

more time-consuming and costly (with more documents) than in any other region in the world. Many causes can be invoked: electronic breakdowns, poor capacity and coordination in the inspection services, red tape, delays in duty refunds and insufficient opening times, all of which lead to important delays.

The political will to leverage cross-border trade as an economic growth engine is still weak, in part because of lack of evidence credibly demonstrating the costs – to government budgets, private actors and to the local economy as a whole – that are arising from the various barriers to intraregional trade. As long as such cost/benefits analyses are not done in a credible and systematic way it will be hard to move political will in the direction of support. Recent projects in the regions, such as the USAID/ATP project to promote regional trade (see box 2 below), contribute to fill this huge data gap. Moreover, there is a widespread perception that restricting cross-border trade is good for domestic food security, especially in drought years or deficit-production situations. Yet another factor is a persistent widespread mistrust and lack of credible dialogue between policy-makers and the private sector, which has often resulted in trade restrictions, such as export bans.

Box 2. Enhancing regional trade and value chains: the USAID Agribusiness and Trade Promotion project

Regional trade has always existed and been significant in West Africa but in a mainly informal way and actual figures and statistics are difficult to cover. Since 2008, USAID has been funding the Agribusiness and Trade Promotion (ATP) project in the region, aimed at increasing the volume and value of formal intraregional trade in selected commodities, especially staple foods such as maize, livestock, rice and millet/sorghum, as well as onion. This project has brought more knowledge about actual trade into the region, including in its informal aspect, and has examined the different constraints that hamper regional trade in West Africa, as well as the actual trade flows in the region. This has contributed to the clear identification of trade constraints at the farm level, at the transport and infrastructure level, in the linkages between and among actors, and at the policies and regulations level.

The project contribute to data collection for a long period and at the market level. The project has begun implementing solutions to address these issues and facilitate a more official and formal trade, based on higher predictability, better transport logistics and open markets. These efforts involve: capacity building and training efforts at the farm level to improve the use of technology; building human and institutional resources; promoting transportation improvement; improving market information systems; and facilitating policy development.

The project also relies on partnerships with local and regional organizations such as CILSS, WAEMU and ECOWAS for data collection purposes and also to collaborate on efforts to address the above-mentioned constraints. This will also enhance the sustainability of these efforts beyond the end of the project and its related funding as these organizations would supposedly continue with data collection on a long-term basis.

5. Staple food value chains in West Africa: Selected priority issues

In this section, we will review a few of the key issues for upgrading selected staple food value chains in West Africa, focusing on priority measures and initiatives most linked to enhanced competitiveness and inclusiveness. Except for poultry, each of the commodity chains described in this section is treated in more detail in later chapters of this volume.

5.1 Rice

In several countries of the region, the rice value chain offers a strong potential for growth and expansion if it can be sustained by renewed investments in rural infrastructures, improved access to production, storage and marketing financing, and enhanced organization of producers to upgrade the quality of produced rice supplied to the market. Many limitations continue to hamper the competitiveness of the sector, including limited industrial processing facilities and outdated irrigation infrastructures.

For the rice value chain, much of the development potential hinges on the capacity of producers and processors to improve productivity through higher yields (via irrigation schemes) and to upgrade the quality of rice to consumers, all of which could improve the competitiveness of local rice relative to imports. Recent policy-led efforts devoted to production enhancement are beginning to bear fruit (e.g. distribution of the higher-yielding NERICA variety). However, less attention has been given to post-production activities (processing and marketing). This has resulted in an unbalanced effect of increased production, which shows up in lower producer prices and results in disincentives for continued rice production. A major concern is the low quality of local rice, and the high level of impurities in paddy rice, which persist throughout the processing stages up to the final product, resulting in a discounted price that keeps local rice less competitive. Linked to this constraint is the lack of organizations and market-savvy producer groups that could ensure better quality of locally-produced rice and defend coherent policies that would level the playing field between domestic and imported rice. By contrast, rice importers tend to be well organized, sufficiently informed about prices and capable of exerting effective political lobbying for open import policies. Moreover, the lack of effective reliable and timely information systems (with credible information on stocks and production shortages by locality) hinder appropriate policy decisions regarding rice imports. Consequently, enhancing the penetration of local rice into urban markets remains a major challenge.⁸

5.2 Maize

Maize offers huge potential, not only as a multi-market value chain (food, feed, industrial use) but also for greater intraregional trade and for building up value chain linkages with the nascent poultry sector. Increased maize competitiveness starts with improved productivity through yield increases. The low average yields suggest the possibility of yield improvement even with existing technologies, provided that an efficient system of quality distribution and good soil fertility management are achieved. Fertilizer use is key to boosting maize yield and a proper strategy (not centred on the inefficient policy of fertilizer subsidy) is urgently needed, which requires the development of an effective input market that can assure fertilizer availability and access for maize producers. Such a strategy must also include a quality control system, as

⁸ For detailed treatment of productivity-enhancing initiatives, see Chapter 13 for Mali; Chapter 12 examines rice in Senegal and addresses the quality problems facing local rice; Chapter 5 examines how, also in the case of Mali, policies and investment choices can hinder rice producers even when a government intentionally commits to promoting domestic rice production.

well as extension and farmers' field schools to educate farmers on the proper use of fertilizer. More critically, such a strategy needs to address the credit-input linkages and encourage market-oriented schemes, such as warrantage, to overcome the credit access problem. Whether maize is grown within the cotton-cereal systems or outside them (as with maize-cassava), the maize value chain has such a huge potential that it needs to come into its own with a development strategy that combines with development of the poultry sector and enhances intraregional trade of this regionally-strategic commodity.

Following the food crisis of 2007/08, many West African governments have turned their attention to maize development, seeing in maize a coveted target to enhance food security. To address the credit-input deficit, several private-public, tripartite initiatives for credit facilitation were initiated. Such an initiative involves three partners: the government (through a funding donor), a locally-based micro-finance institution and a well-established farmer organization representing beneficiary farmers. Moreover, other schemes, such as inventory credit (warrantage) are being promoted in West Africa; cereal-based farmers' organizations (in Burkina Faso, Mali and Niger) have been among the early adopters. The maize value chain and its professional organizations need to be developed from the ground up. Another goal for maize value chain development is to reinvigorate the role of interprofessions that cover all the maize value chain players including end users (such as animal feed producers). The legal frameworks or bases for these private sector-led, value chain-specific interprofessions have been progressing in the legislatures of many countries. However, a legal framework is only the first step, as the proper functionality of such interprofessions can evolve along with the structuring and the development of the maize value chain itself⁹.

5.3 Poultry

Demand for poultry products is growing rapidly in the region, as urbanization and changing consumer preferences evolve. However, the poultry value chain is still in its infancy and faces various challenges. The value chain has a very low productivity, especially in rural areas and for traditionally-bred chicken, with inefficient production practices and weak veterinary services exerting a negative impact on the quality of the production and the marketability of the products. At the downstream end of the value chain, storage facilities are very limited, while transport and global infrastructures are still underdeveloped. The well-known border corruption and red tape obviously impede regional trade in poultry, allowing easy imports of products to capture the fast-growing urban markets. Poultry product imports from Europe have expanded, particularly since the implementation of the Common External Tariff (CET) within the ECOWAS. For the domestic poultry sector, market formality is precarious, due to lack of information services, as well as difficult access to credit. The environment for the value chain is also quite unfavourable, with weak government policies in support of the livestock sector in general and poultry, specifically; even when such support is provided, it is generally badly-implemented.

Broadly speaking, two poultry production systems coexist: (1) traditional production for self-consumption or local markets; and (2) modern poultry production serving the urban centres. The latter system is expanding very fast but from a very low starting base. Coastal countries (e.g. Côte d'Ivoire) have more developed poultry value chains than landlocked countries (e.g. Burkina Faso), which experience difficulties exporting to neighbouring countries because of quality standards or lower protein content (maize, sorghum) requirements. For poultry, non-tariff barriers play a bigger role in hampering intraregional trade, which is minimal, despite the potential zero tariffs within the region.

Given this strong competition with imports, development of domestic production requires complementary border measures. The application of import restrictions on poultry in Senegal and Nigeria has played no small part in allowing the growth of domestic production. The question is whether the local

production of chicken and eggs has achieved or can achieve efficiency gains to withstand external competition on its own. However, the challenges are daunting and need tackling.

On the positive side, the poultry industry is relatively well-structured, with strong growers' unions and interprofessional bodies that can play an important role in the future development of poultry regional value chains. Spillover effects on other sectors are numerous, illustrated by the benefits of regional integration of several countries in reproduction, feeding, slaughtering, equipment and agricultural by-products. The policy framework can be improved to harmonize protection levels within the region. Policies should also be more conducive for the poultry sector, with strong biosecurity standards and norms, better infrastructure for trade and market access and access to financial resources for smallholders. Moreover, best production practices, including dimensions of biosecurity, should be disseminated among the poultry producers in the region to ensure a higher productivity.

5.4 Cassava

Cassava is a major staple food crop for much of West Africa south of the Sahel. Like maize, cassava and its related products cover a wide range of value-added food products, including flour, starch, glues and biofuels. In addition, the development of the feed sub-sector and downstream linkages with poultry and beef sectors are important market outlets for cassava throughout the region. Like maize, cassava can also play a major role in regional trade and food security, given the broad consumer base in the region. The cassava value chain can briefly be described by the following characteristics: (a) it has multiple final products; (b) it is a highly perishable crop needing immediate processing to produce widely marketable products; (c) it is harvested as a tuber and can be consumed directly on-farm; (d) it is largely produced by small-scale farmers, especially women; and (e) it is a low-value raw crop made essentially of starch. However, the potential for cassava value chain development is huge, with many still untapped opportunities in the value chain, starting from the dried cassava subsector, the flour and feed subsectors and growing demand from supermarkets and the bakery industry.

However, cassava value chains are far less developed in much of West Africa compared with major Asian producers (India and Thailand). Being a traditionally self-consumed crop, cassava production continues to languish under low yields and underdeveloped value chains, lacking fully-developed processing and marketing channels. Traditionally, this crop has not received the attention it deserved from governments and relatively little has been invested in the crop, especially in the much needed R&D of new varieties to boost yields and new technologies to improve processing, especially for small-scale producers and groups. Women play a big role in cassava production, traditional processing and marketing. Recent development initiatives targeting cassava in the region have demonstrated the potential productivity improvements for this crop. The introduction of new cassava varieties in Cameroon as part of an IFAD-funded development programme resulted in significantly increased yields, offering a potential for surplus production to be channelled for agro-industrial processing. However, increasing production for a bulky crop, which is not easily stored, poses problems if no parallel advances in processing and marketing are developed simultaneously.

A coherent development strategy for the cassava value chain needs to be centred around a network of small-scale processing facilities that can receive surplus production. Besides a variety of final food products, cassava-derived animal feed and starch for industrial applications will form strong demand-pull forces. A number of differentiated cassava value chains can develop. These can include: dried cassava production for local markets and cross-border trade; high-quality cassava flour for food and industrial production; and animal feed products for regional markets. For the dried cassava value chain, the performance of farmers' organizations (for bulking, storage, and marketing) is a crucial factor for success. In the cassava flour value chain, the

main bottleneck is quality assurance and control that could be provided by an established leader in milling and packaging. Market linkages between millers and supermarkets/bakers constitute another important area for value chain expansion. For cassava-based animal feed outlets, logistical costs for management of huge quantities and competition from other commodity feed sources (maize, mostly) are important factors. While recent efforts have demonstrated the capacity for boosting cassava yields, the key challenge for the cassava value chain lies in the simultaneous development of processing and marketing of cassava by-products. A coherent development strategy is required, given that the majority of producers are small-scale, mostly women, often with rudimentary techniques and limited access to credit and necessary market information and know-how.¹⁰

5.5 Oilseeds

The oilseed sector has a lot of potential for growth, owing to the important and fast-growing domestic, regional and international demand for vegetable oils. The oilseed complex in West Africa is dominated by palm oil, groundnut and cottonseed. Niche markets include sesame, cashew, coconut and shea. For palm oil, the regional leaders are Côte d'Ivoire, Ghana and Nigeria, which together have the potential to meet the whole regional demand.

Like all other major commodities in West Africa, the agroprocessing of oilseed products continues to be limited compared with its potential. The oilseed complex has undergone a major transformation in West African countries over the past decades, characterized largely by a reversal of trade position from net oilseed exporters to net importers. Senegal, once a major producer and exporter of groundnut, has experienced an implosion of the sector and become a net importer of vegetable oils (palm oil, colza, and soy) far outpacing its dwindling groundnut exports.¹¹

The palm oil value chain is receiving increased attention both from national governments and investors. The key issue is how to ensure that palm oil value chain development is built on sound competitive foundations, as well as being inclusive of small and medium processors and effectively linking agroprocessing with small-holder producers. This can only be achieved through strong government policies that fully recognize the central role of the private industry but also build guarantees for smallholder inclusion.¹²

For niche oilseed markets, the scope for value addition is very large when comparing the potential with the current situation. For example, Burkina Faso is the world's top producer of shea nut, but less than 10 percent of exports are in the form of shea butter, due to lack of chemical extraction capability for processing, lack of packaging facilities and lack of organized interprofessions capable of tapping into the lucrative export markets of North America (World Bank, 2009), where shea butter prices are at least three times as high as in Africa – or even higher with quality assurance (USAID, 2004).

Finally, vegetable oil trade within the region is huge, tough, informal and not officially recorded, which raises transaction costs, uncertainty and time, and hence limits exchange compared with its potential. In general, and despite the strong complementarities in vegetable oil supply and demand among ECOWAS member states (with the exception of Benin and Senegal), intraregional trade in oilseeds continues to be hampered by a whole host of constraints, including policy uncertainty – such as when countries impose tariffs on their neighbours despite the existence of a common external tariff (CET).

¹⁰ Chapter 16 addresses the particular case of cassava value chain in Cameroon.

¹¹ See Chapter 2 for a section on Senegal's groundnut.

¹² Chapter 11 addresses this issue in the case of oil palm industry in Ghana.

6. Conclusion

This introductory chapter provided a broad survey of the demand and supply drivers affecting the growth and development of staple food systems in West Africa. On the demand side, the increased population, fast-growing urbanization and changes to consumers' preferences are affecting not only future food demand but also the composition, quality and form of the food to be consumed, and hence will influence the shape and scope of food value chain developments in the region. Also, as demand growth continues to outpace supply growth, reliance on imports is unlikely to abate and the only question is whether the pattern of food trade can shift significantly toward more intraregional trade or continue to depend largely on trade flows outside of the region. On the supply side, the lower productivity growth coupled with soil fertility challenges are posing serious obstacles to enhanced production potential in the region for the major food crops produced and consumed. Recent events (such as the food crisis of 2007/08 and its aftershocks) repositioned agricultural development to the centre of regional development strategy and West Africa could undertake its own Green Revolution. However, the path is not going to be easy and will require a judicious combination of policies, private initiatives and more effective producer engagement to ensure that targeted markets, value chains, and food systems are not only highly competitive but also inclusive of small-scale men and women producers, guaranteeing the widest distribution of economic returns and hence improved food security and reduced hunger. The following chapters in this book address this central issue in greater detail.

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Chapter 2

A historical comparative analysis of commodity development models in West Africa and implications for staple food value chains

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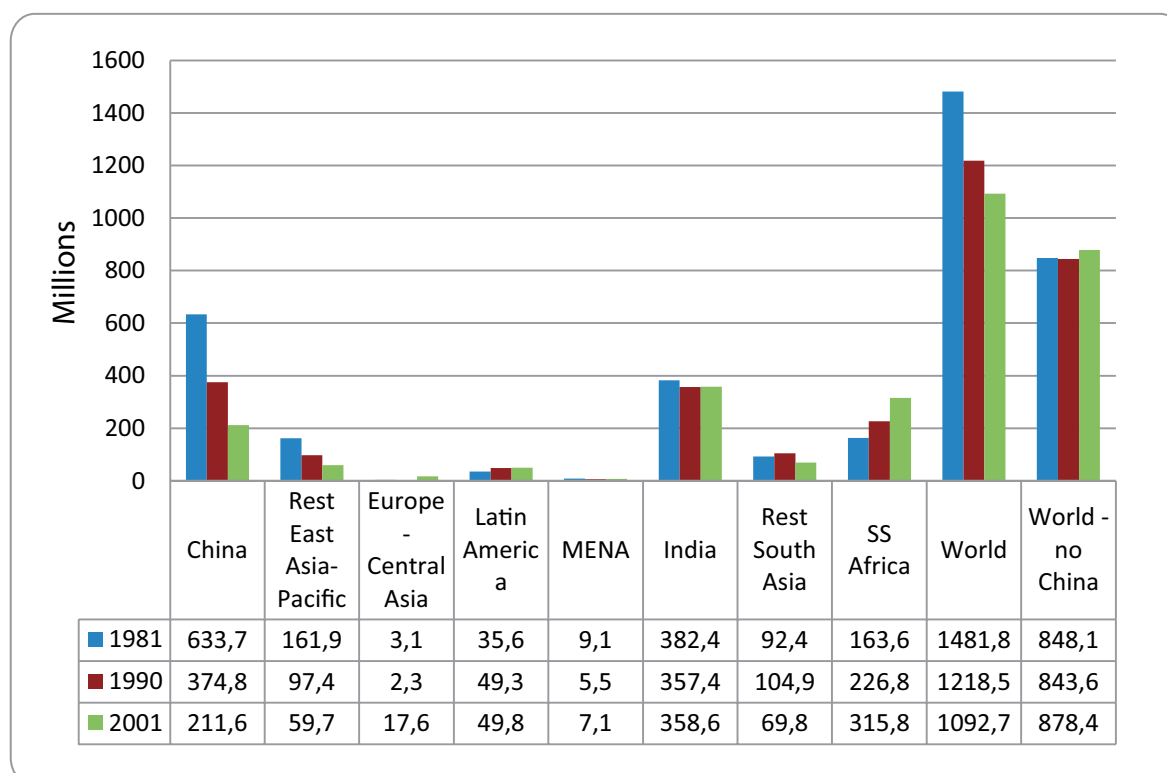
1. Introduction and motivation

1.1 General context and scene setting

After gaining their independence, West African countries have continued to rely on the same “traditional” export crops (cotton, coffee, and cocoa) that dominated during the colonial administrations. Following the structural adjustment programmes in the 1980s, the state’s interventionist policies in the management of key export sectors were gradually receding, giving way to liberalization and privatization. This development coincided with the emergence of global food value chains driven by agrobusinesses and food retailers in high-income countries. For some West African countries, new opportunities opened up for producing and exporting non-traditional high-value food products (horticulture, floriculture). However, despite the positive impact on participating farmers and local employment benefits, these high-value export value chains have had minimal aggregate impact on the agricultural sector as a whole and could not compensate for the negative impact from the collapse of the traditional export markets.

Another key factor accounting for the deterioration of the export position of West African countries was the continued erosion of competitiveness vis-à-vis other emerging suppliers in the developing world, in both traditional and non-traditional food commodities. For West Africa, the combination of weak levels of agricultural investments, restricted market access in Organization for Economic Cooperation and Development (OECD) markets, and timid engagement by the private sector following the state retreat all contributed to a significant erosion of agriculture performance in the region. The food-deficit situation continued to worsen as populations increased and rapid urbanization continued apace, resulting in ever-growing rural poverty, precarious food security and increasing dependency on food imports (Rakotoarisoa *et al.*, 2011).

For a few years after the conclusion of the Uruguay round in Marrakesh, there was growing recognition among developing countries, especially the poorest ones, that the new World Trade Organization (WTO) agreement failed to live up to its promise and that developed countries had not liberalized agricultural subsidies and labour-intensive industries (textile quotas) as promised. When trade ministers met in Seattle in 1999 to launch a new round, they were met with huge and violent protests that succeeded in derailing the ministerial meeting (Table 1). The protesters did manage to get their message across – that the world was failing in its battle against poverty. Apart from China, the condition of world poverty had barely improved and was particularly devastating for sub-Saharan Africa, which saw the number of people in absolute poverty nearly double, from 164 million to over 316 million from 1981 to 2001 (World Bank, 2004, see Figure 1).

Figure 1. Growth in population in absolute poverty (less than 1 US\$/day, in millions)

Source: World Bank (2004)

A year after the Seattle meeting, 150 heads of State met at the Millennium summit at the United Nations headquarters in New York to sign the Millennium Development Goals (MDGs), committing to reduce poverty by half by 2015. The fulfilment of the MDGs would require substantial new investments towards basic education, health, infrastructure and agriculture. In 2002, 50 heads of state and 200 ministers, including from industrial countries, committed to raising development aid to 0.7 percent of national gross domestic product (GDP). In 2005, during the G-8 summit at Gleneagles, Scotland, leaders of G-8 countries agreed to wipe out debt owed to the World Bank/International Monetary Fund (WB/IMF) by 18 of the poorest countries (including 14 in Africa).

Within Africa, and in response to the MDGs, at the 2001 summit meeting at Lusaka, Zambia, the leaders of the African Union launched the New Partnership for Africa's Development (NEPAD) – an economic development programme of the African Union. NEPAD articulated four core objectives: eradication of poverty; sustainable growth and development; economic integration; and empowerment of women. By 2003, the Comprehensive Africa Agriculture Development Programme (CAADP), an agriculture component of NEPAD, was launched to improve agricultural productivity in Africa. That same year, during a summit at Maputo, Mozambique, African governments and heads of state endorsed the Maputo Declaration on Agriculture and Food Security in Africa, committing 10 percent of their national budgets to agriculture and rural development. In West Africa, the Economic Community of West African States (ECOWAS), an organization representing 15 West African countries, developed its own regional CAADP, known as ECOWAS Regional Agricultural Policy for West Africa (ECOWAP), to serve as a blueprint for national development and investment strategies for agriculture by member countries (Table 1).

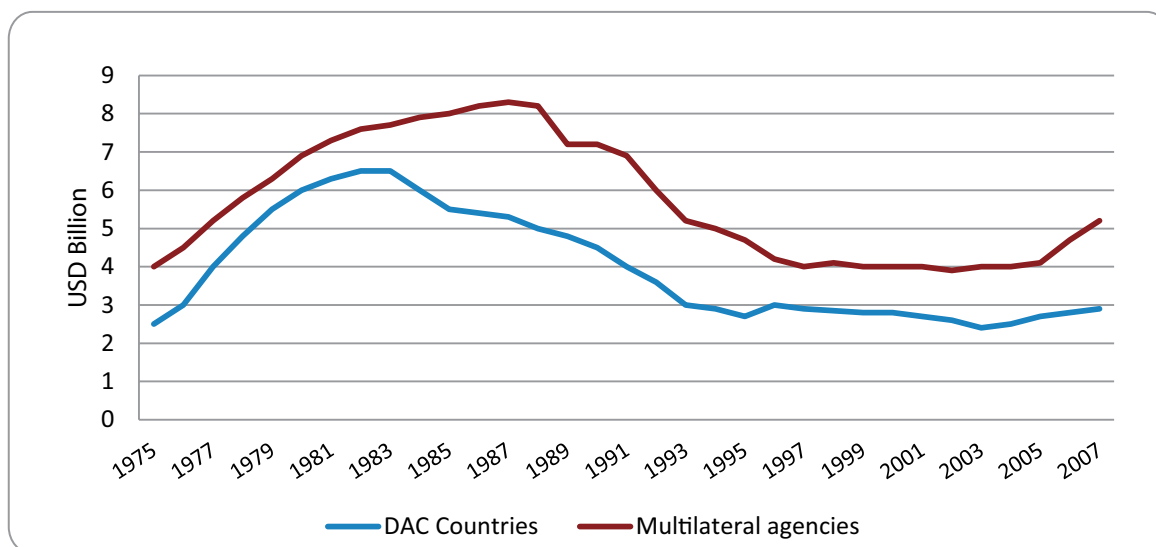
Table 1. Selected key global and African developments related to agricultural development

YEAR	PLACE	EVENT
November 1999	Seattle, Washington, USA	WTO ministerial meeting to launch a new round was violently disrupted by protesters
September 2000	New York City, New York, USA	150 heads of states met at the Millennium summit at the UN to sign Millennium Development Goals (MDGs) to halve poverty by 2015
July 2001	Lusaka, Zambia	The New Partnership for Africa's Development (NEPAD), an economic development programme of the African Union, was established (NEPAD's four core objectives: eradication of poverty, sustainable growth and development, economic integration, empowerment of women)
March 2002	Monterrey, Mexico	50 heads of states and 200 ministers, including from industrial nations, committed to raise development aid to 0.7% of national GDP
2003		Launch of the Comprehensive Africa Agriculture Development Programme (CAADP) aimed at increasing agricultural productivity in Africa
July 2003	Maputo, Mozambique	African governments and heads of state endorsed the "Maputo Declaration on Agriculture and Food Security in Africa", committing 10% of national budget to agriculture and rural development
2005	Gleneagles, Scotland	Leaders of G-8 countries agreed to wipe out debt owed to WB/IMF by 18 poorest countries (14 in Africa)
2005		ECOWAS heads of states adopted the ECOWAS agricultural policy (ECOWAP) as an a coordination instrument for CAADP, the agricultural component of NEPAD
June 2008	Tokyo, Japan	G-8 summit set up 10 billion euro fund for agricultural projects, launched a Global Partnership on Food Security and organized the first meeting of the G-8 Agriculture Ministers, to be held in 2009
November 2009	Rome, Italy	FAO organized a global summit on food security following the high food price crisis of 2007/08

Source: compilation by authors

Yet progress on the ground was slow and very little impact was felt at the local level by either farmers or small agribusinesses. This is because new investments in agriculture, by either development agencies or national governments, had not materialized. The trend towards decreased aid to and investment in agriculture has continued since the mid-1980s (see Figure 2). This is partly because the new investments committed toward the MDGs were focusing on areas outside of agriculture (health, education, girls' schooling, etc.). Also, the prevailing view among international development agencies was that investments in transport, infrastructure and aid for trade could be more effective in boosting agricultural development.

Figure 2. Trends in aid to agriculture and rural development (ARD): 1971-2009, 5-year moving average commitments, constant 2009 prices



Source: OECD (2009) Statistics are from Official Development Assistance (ODA) and concessional multilateral flows for the agricultural sector (including forestry and fishing) and rural development. DAC refers to the 24 countries of OECD that are members of the Development Assistance Committee (DAC).

The shift toward agriculture came with the onset of the world food price crisis of 2007/08, which jolted both governments and donors into action. A new consensus emerged quickly, calling for substantial investments to agriculture and rural development and to increase agricultural productivity and meet the challenge of food security, especially among the poor countries, a large portion of which are in sub-Saharan Africa. In 2008, at the G-8 summit in Tokyo, Japan, G-8 leaders set up a 10 billion euro fund for agricultural projects, launched a Global Partnership on Food Security and planned the first meeting of the G-8 Agriculture Ministers, to be held in 2009.

Parallel to the renewed interest and political commitments towards agriculture and food security, African governments also began paying closer attention to basic food commodities in response to heightened concerns over food insecurity and disruptions to food trade flows. Supported by donors and renewed agricultural investments, a number of national initiatives were launched to stimulate the domestic production of staples such as rice, maize and cassava. This represents a major paradigm shift for a region that had traditionally been narrowly focused on export commodities (cotton, cocoa, coffee, peanuts) as drivers for agricultural development.

Yet to develop the staple food systems for food security requires not only stimulating production, but placing equal emphasis on the whole value chain, including processing and marketing. Moreover, a coherent development of the staple value chains for food security would require not just strengthening competitiveness but also ensuring smallholder-inclusiveness to improve incomes more widely. This then requires a different value chain development model than the export cash crop models.

The central purpose of this chapter is to delineate features of a suitable staple food development model in contrast to the traditional export commodity model. Staple food value chains are characterized by a multiplicity of market outlets (self-consumption, sales of surplus to local, regional or international markets) and by dominance of small farmers who typically confront greater difficulties accessing inputs and credit and face higher production and marketing uncertainty and risks. These staple food value chains also lack

the proper incentives to mitigate risks and to provide assurances to agribusiness, industry or consumers in the areas of quality requirements or higher standards. Moreover, small-scale producers, having a limited bargaining capacity, capture too small a share of the added value generated along the value chain. Finally, staple food producers typically suffer from inadequate public support and insufficient partnership with agroprocessors.

1.2 Study objectives

In this chapter, we explore the central question concerning the extent to which staple food value chains can be promoted through a different development model compared with the commodities models that prevailed in the past relating to export commodities. We do this for several reasons. First, understanding the policy processes and the institutional setting that led to the export commodity models can illuminate what a suitable staple food value chain model would look like in light of the distinction between staple and cash crops. Second, answering this question is critical for value chain policy design and for effective investment strategies, given the renewed interest in staple foods. In some countries, governments are attempting to reapply schemes used for traditional export commodity chains to staple crops. This may not be the optimal option as there may be different institutional and market structures at play that require alternative approaches. Other voices are calling for a return to the role of market controls and the re-activation of parastatal agencies, while still others call for hybrid models combining public and private roles in managing staple food value chains. However, there is an increasing view that gives a prominent role to the private sector to lead the way for the development of staple value chains. The role of producer organizations is also highlighted as central for the growth of inclusive value chains, given the dominance of small-scale producers – both men and women – and the need to aggregate farmers to acquire enough clout to become effective economic players in the market.

To undertake this comparative analysis, we take a historical perspective and divide commodity development models into three categories coinciding with three broad epochs in the recent history of West Africa: (1) the colonial period (up to 1960) and the post-colonial export-oriented period (1960 through 1980); (2) the post-structural adjustment period (1980-2000) where new impetus was given to privatization, the retreat of the state (and development partners) from agriculture and the emergence of non-traditional export foods; and (3) the post-2000 period (starting with the MDGs and the focus on poverty reduction) and the shifting interest towards staple food value chains. Table 1 summarizes the key periods for West Africa with respect to the prevailing commodity models.

Table 2. Key epochs for West Africa relating to value chain development models

Period	Prevailing commodity/ value chain model	Key commodities/Key players
Colonial period (1920's to 1960)	State supported, private-led value chains focusing on exportable raw commodities	Cocoa, cotton, coffee, peanuts Parastatals; private value chain actors; European/ international consumers
Post-independence (1960-1980)	State-controlled (parastatals), integrated value chains for exportable raw commodities	Cocoa, cotton, coffee, peanuts Parastatals
Post-structural adjustment (1980-2000)	State retreat from commodity chains, emergence of non-traditional export food products	Private-led value chains in selected high-value export food (horticulture)
Post-MDG (2000-2007)	New priorities for food import-substitution value chains (food security)	Transition period (liberalization of state-controlled commodities, selective rise of the agribusiness-led value chains)
Post-food crisis (2007-now)	New initiatives to support production and supply of staple food crops, alignment of new policies and investment strategies focusing on staple foods	Initiatives for rice, maize, cassava, multiple private and state-based players, new emphasis on public/private partnerships, stronger role for producers' organizations

Source: Authors

The objective of this chapter is to conduct a comparative analysis of three agricultural sector development models in West Africa, which coincide with three historical periods in the region. The three commodity models compared are:

1. Traditional export commodity model; state-controlled (coffee, cocoa, cotton, groundnuts).
2. Non-traditional value chain export model; private agribusiness-led (horticulture)
3. Staple food commodity model; multi-actor and multi-market model (cereals, roots and tubers, livestock).

The aim is to examine the key features of the first two export commodity models, compared with the third staple food domestic commodity model and draw the appropriate conclusions as to the key features of a commodity model suitable for staple foods. The approach is comparative, drawing from historical development models and noting lessons from their successes and their failures.

For policy analysis, the approach we take draws from institutional economics and focuses on policy processes, distinguishing between policy actions (instruments) and policy actors (institutions). We view sectoral policies and strategies as path-dependant, built over past experiences and very difficult to reverse unless the economy comes under unexpected and significant external shock. Examples include the oil crisis of 1973 and the world food price crisis of 2007/08.

In each of the export commodity cases examined, we follow a simple analytical framework, described in Table 3 and summarized below:

- Policy instruments (actions) are evaluated through the following performance indicators: (i) efficiency; (ii) impact of the instrument on targeted beneficiaries; and (iii) cost/sustainability of the action.
- Policy actors (institutions) that initiate and manage these instruments are examined on the basis of: (i) their objectives and aims; (ii) the resources mobilized to achieve them; (iii) the degree of harmonization among different instruments; (iv) the concordance or conflicts between the objectives of key players; and (v) the governance and the relative power or weakness of different players.

- The commodity cases examined are evaluated according to: (i) the improvement of productivity trends; (ii) the distribution of added value among the value chain actors, including farmers; and (iii) risk-management mechanisms for the commodity, subject to international conditions, etc.
- Also included is a review of other relevant internal or external factors, developments or shocks that contributed to the commodity's good performance, stagnation or decline.

Table 3. Analytical framework for policy analysis of value chain models in West Africa

Analytical framework for policy analysis of value chain models in West Africa		
	ACTIONS (Instruments/Measures)	ACTORS (Institutions)
Policy actions and actors analyzed	<ul style="list-style-type: none"> • Subsidies (fertilizers; credit) • Taxes • Regulations (laws; licenses) • Price regulation/controls 	<ul style="list-style-type: none"> • Ministries/specialised agencies • Parastatal (commodity) agencies • Agro-industry/ private actors • Producer groups; Cooperatives/PO • Professional organisations/NGO
Analysis of policy institutions and policy processes	<ul style="list-style-type: none"> • Efficiency • Effect on target beneficiaries • Cost/benefit 	<ul style="list-style-type: none"> • Agency objectives (maximizing revenue; profit; market share) • Governance: power structure; bargaining capacity; shared information • Relationships between actors (coordination; harmonisation, conflict; mistrust) • Benefits and risk sharing across actors
Drivers of value chain performance and sustainability	<p><i>INTERNAL</i></p> <ul style="list-style-type: none"> • Indicators of long term productivity trends • Distribution of value added among the value chain actors • Risk management instruments and their effectiveness <p><i>EXTERNAL</i></p> <ul style="list-style-type: none"> • Technological developments • Changing food demand trends • Emergence of commodity substitutes • Changing competitiveness among competing suppliers • External shocks 	

Source: Authors

The above framework is applied for analysis of three export commodities (groundnuts, cocoa, cotton), two high-value export commodities (pineapple, banana) and two staple crops (cassava, maize). The commodity/country pairs examined are summarized in Table 4, along with selected features.

Table 4. Commodities studied and their key characteristics

	Commodity / country	Key actor(s)	Primary market	Degree of integration	Role of smallholders	Potential for growth
Traditional export commodities	Groundnuts (Senegal)	State; parastatals	Export and domestic	Integrated internally up to exports	Large number of smallholder producers;	Limited (strong competition from substitutes); degraded soils

Table 4. Commodities studied and their key characteristics (Cont.)

	Commodity / country	Key actor(s)	Primary market	Degree of integration	Role of small-holders	Potential for growth
Traditional export commodities	Cocoa (Côte d'Ivoire)	State; parastatals	Export (Europe)	Vertical integration with multinationals	Large; diverse size of farmers; tied to cocoa collection and initial processing	Limited growth; some recovery due to improved prices; but return is slow
	Cotton (Mali)	State; parastatals	Export (Europe)	Vertical integration up to exports	Numerous small-scale producers; closely linked with cotton buyers (inputs, prices)	Weak; prices; yields; and changing relative incentives are unlikely to see a significant return of cotton
Non-traditional high-value export commodities	Banana (Côte d'Ivoire)	Private; agro-industry	Export (international and regional)	Integration with Nordic retailers	Two segment market- small scale excluded from export opportunities	Medium growth; standards may be a limiting factor
	Pineapple (Ghana)	Private; agro-industry	Export (international and regional)	Integration with Nordic retailers	Two segment market- small scale excluded from export opportunities	Medium growth; standards may be a limiting factor
Staple food value chains	Cassava (Ghana)	Private; mostly small scale	Domestic; regional	Limited	Smallholders dominate the value chain, especially women	Huge potential for growth; food demand; industrial demand
	Maize (Burkina Faso)	Private; multiple actors	Domestic; regional; multi-market outlets	Limited	Smallholders dominate the value chain especially women	Huge potential for growth; food demand; industrial demand

Source: Authors

2. Traditional export commodity model: historical overview and case studies

2.1 Overview

Colonial legacy

During the colonial period in West Africa, great efforts were made to introduce new value chains deemed suitable for the agro-ecological conditions of the sub-region. The objective of the colonial administrations was to launch new agricultural sectors with great demand potential in the processing and consumption centres in Europe. The main crops introduced to the region were cocoa, coffee, cotton and groundnuts (palm oil is native to the region) (Blein *et al.*, 2008). The table below summarizes the dates of introduction of these crops in the region.

Table 5. Dates of introduction of traditional cash crops in West Africa

Crop	Date of introduction	A few examples
Coffee	1790-1930	Cape Verde - 1790: Arabica Liberia - 1875: Arabica – 1945: Robusta Côte d'Ivoire – End 19th Century – Beginning 20th Century Guinea - 1895: Arabica – 1910: Robusta Cameroon - 1913: Arabica – 1930: Robusta Togo - 1923: Robusta Benin - 1930: Robusta
Cocoa	1822-1920	São Tomé and Príncipe - 1822 Ghana - 1871 Côte d'Ivoire - 1890 Cameroon - 1920
Cotton	1820-1921	Attempts in Senegal - starting in 1820 Togo - 1900 1914: Niger Basin
Groundnut	Starting in 1830	Start of production in West Africa - 1830

Sources: ECOWAS-SWAC / OECD (2007a, b and c)

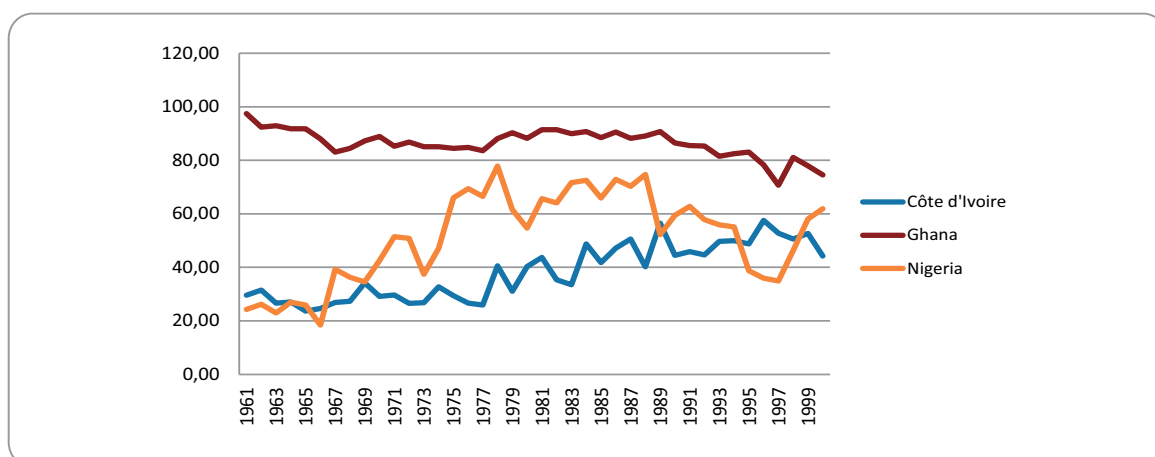
A set of state agencies and companies was established to lead and oversee these new value chains when these new crops were introduced. In the case of cotton, for example, France created the French Company for the Development of Textile Fibres (CFDT) to develop national value chains with the support of the Research Institute of Cotton and Exotic Textiles (IRCT).

Continuity after independence

Once they gained independence, West African states maintained the same structures and management methods for these value chains while nationalizing some agencies. The newly independent states badly needed to appropriate these export revenues to meet their development needs (Akiyama *et al.*, 2001). Keeping the same priority for these already well-developed and structured export sectors, governments allowed national producers who had been excluded under the colonial administration to have access to these sectors. This strategy focused on exporting a few raw agricultural products while rendering the region's agriculture poorly diversified with a limited number of sectors representing a significant portion or even a majority of agricultural exports revenues in some countries (particularly coffee and cocoa between 1960 and 1990, groundnuts in the 1960s-1970s and cotton starting in the 1970s).

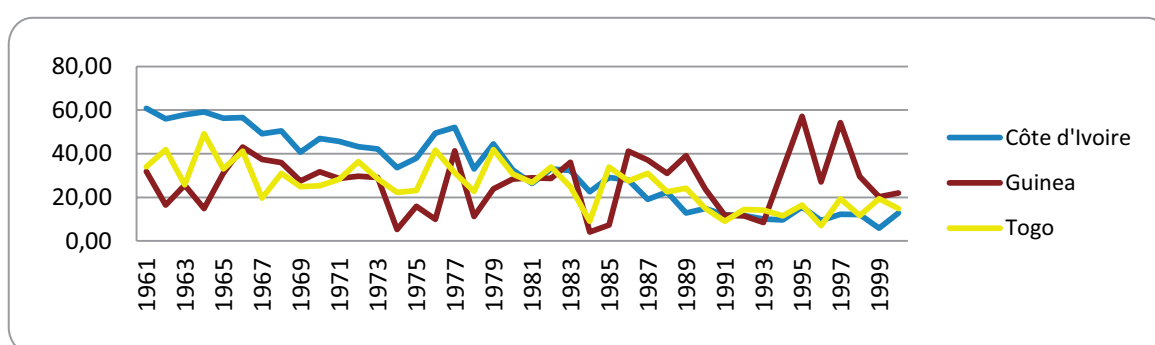
Indeed, as suggested in Figures 3 through 6 below, countries in West Africa strongly favoured some of these cultures. Thus, between 1960 and 2000, cocoa exports represented nearly, or even more than, half of agricultural exports from countries such as Côte d'Ivoire, Ghana and Nigeria. Coffee experienced a similar trend, representing between 30 percent and 60 percent of agricultural exports from major producing countries in the 1960s and early 1970s for Côte d'Ivoire, Guinea and Togo, although there has since been a decrease for Côte d'Ivoire and Togo. Groundnuts and cotton experienced opposite trajectories in terms of export share. While groundnut first strongly dominated agricultural exports for the two major producers – Nigeria and Senegal in the 1960s – it then experienced a strong downward trend, leading to a significant reduction of its share in the 1970s. In contrast, cotton crops evolved with a growing influence from the 1970s to rapidly become a real force in agricultural export countries such as Benin, Mali and Burkina Faso (with the exception of the period from 1995-1997).

Figure 3. Share of revenues from cocoa exports to total agricultural exports, 1961-2000



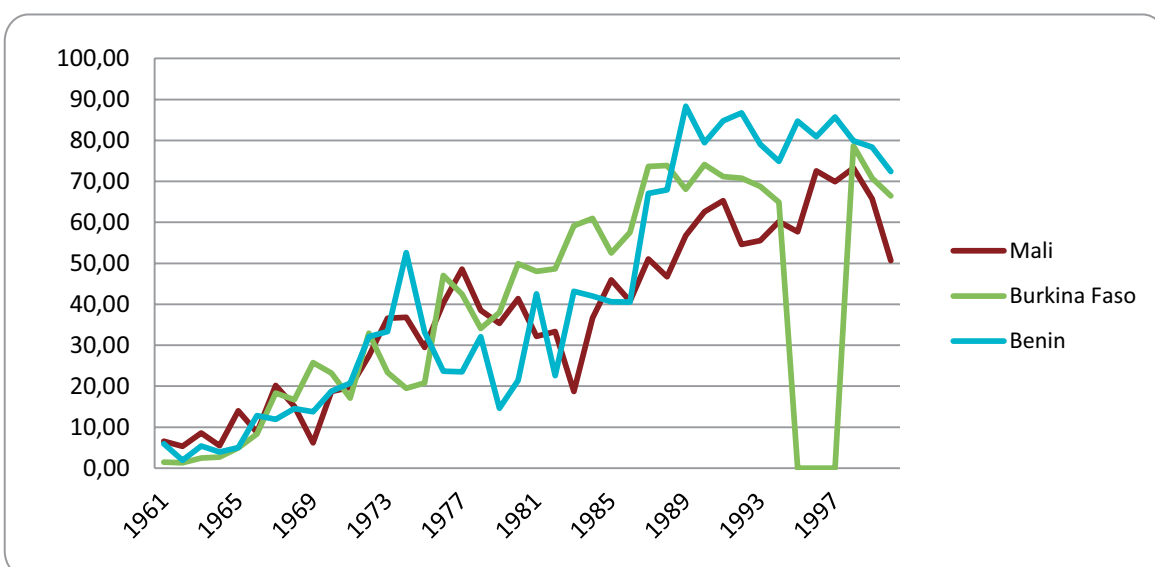
Source: FAOSTAT (2012)

Figure 4. Share of revenues from coffee exports to total agricultural exports, 1961-2000

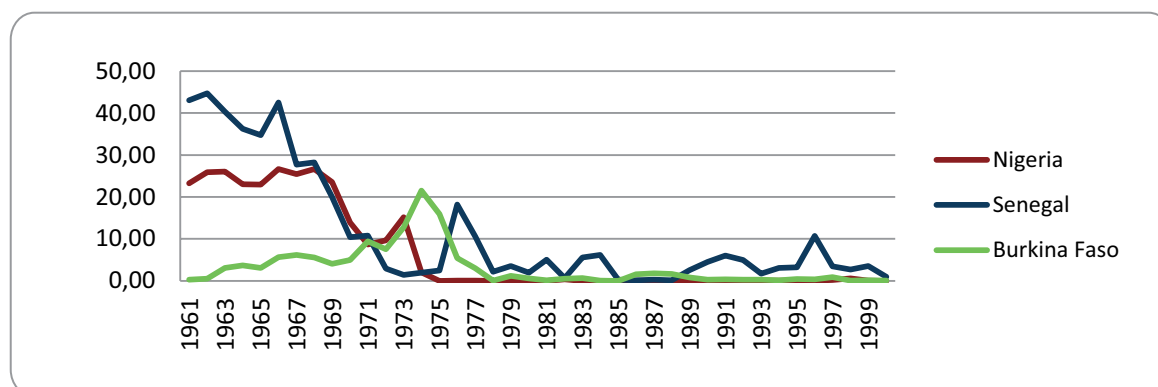


Source: FAOSTAT (2012)

Figure 5. Share of revenues from cotton exports to total agricultural exports, 1961-2000



Source: FAOSTAT (2012)

Figure 6. Share of revenues from groundnut exports to total agricultural exports, 1961-2000

Source: FAOSTAT (2012)

For a number of countries, economic development has been largely focused on these flagship cash crops, including groundnuts in Senegal, cocoa in Côte d'Ivoire and Ghana, cotton in Benin, Burkina Faso and Mali.

Institutional set up

These value chains were strongly supervised by the state through parastatals that intervened both upstream and downstream of production. This model was used, for example, in the cocoa sector in Côte d'Ivoire until 1999, with the Agricultural Products Price Support and Stabilization Board (CAISTAB) and for coffee and cocoa in Cameroon until 1994, with the National Cocoa and Coffee Board (ONCC) (Varangis and Schreiber, 2001). These agencies included government marketing boards that had the marketing monopoly, including for exports (Varangis and Schreiber, 2001). These state offices also controlled processing and determined price levels allocated to producers (Akiyama *et al.*, 2001; Akiyama, 2001; Varangis and Schreiber, 2001). In some countries, stabilization funds were established. According to Varangis and Schreiber (2001), these regulated the domestic and export markets, as well as producer prices. The emergence and consolidation of international agreements on some of these crops (International Coffee Organization, International Cocoa Organization) also justified the existence of these parastatals as they were in charge of controlling national quota exports and participating in negotiations – for example, for the coffee sector (Akiyama, 2001). These sectors were therefore also supervised internationally.

West African states have also relied on other types of organizations, such as development companies (e.g. the Society for the Development of Oil Palm (SODEPALM) in Côte d'Ivoire and the Sugar Company of Comoé (SOSUCO) in Burkina Faso) that were directly involved in production. Governments have also supported the establishment of state cooperatives that helped support small producers in each of these sectors. These cooperatives were also responsible for providing inputs and other services to producers. Above all, they responded to the public sector's will to have a contact partner in rural areas, as was the case in Senegal (Socodevi, 2008). Moreover, they could also weakly self-organize, given that governments have often sought to control producers by limiting the number of organizations and promoting their "champions" to obtain political support from rural populations (Murphy, 2010).

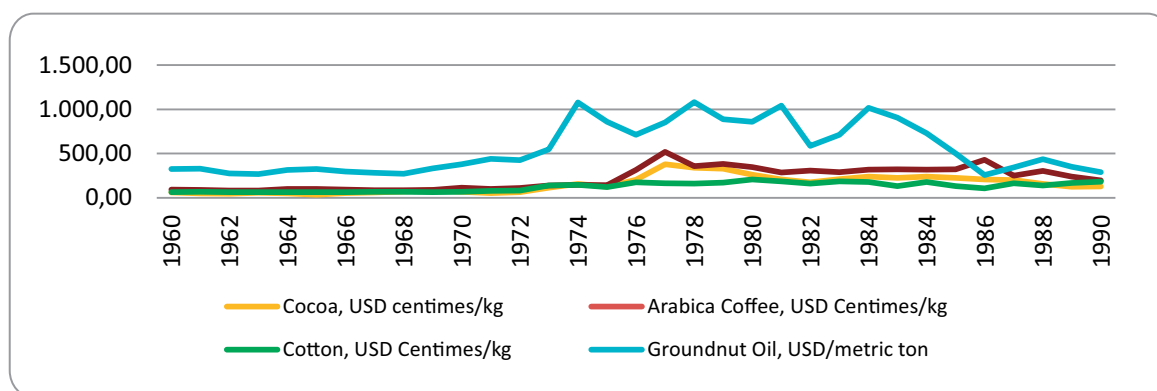
The slow decline and demise of the export commodity model

From the second half of the 1970s, the changing economic environment had a significant effect on the sustainability of this approach, particularly with the decline in international prices for these crops (Figure 7). After the 1973 oil crisis, soaring prices for other agricultural products increased revenue for these countries but also increased prices for energy and imported agricultural inputs (especially fertilizers). As a result of their increased income, these countries indebted themselves heavily, based on optimistic projections regarding

future export earnings. But the ensuing collapse of prices meant that these indebted countries have been unable to pay their debts, given their emaciated revenues.

Declining prices have also caused the collapse of international agreements on these products and goods, thus ending any international trade regulation for them. Countries in the region have therefore suffered a significant loss of income – agricultural and non-farm – which had been drawn primarily from these exports. They also gradually lost their market share in these sectors, starting in the 1980s, with the rise of other competing regions, such as Southeast Asia. In addition, it was during this period that the African continent, including West Africa, became a net food importer, largely because of the significant increase in population in the 1960s and increased consumption per capita (Rakotoarisoa *et al.*, 2011). The loss of export revenues has also made it difficult to finance these imports.

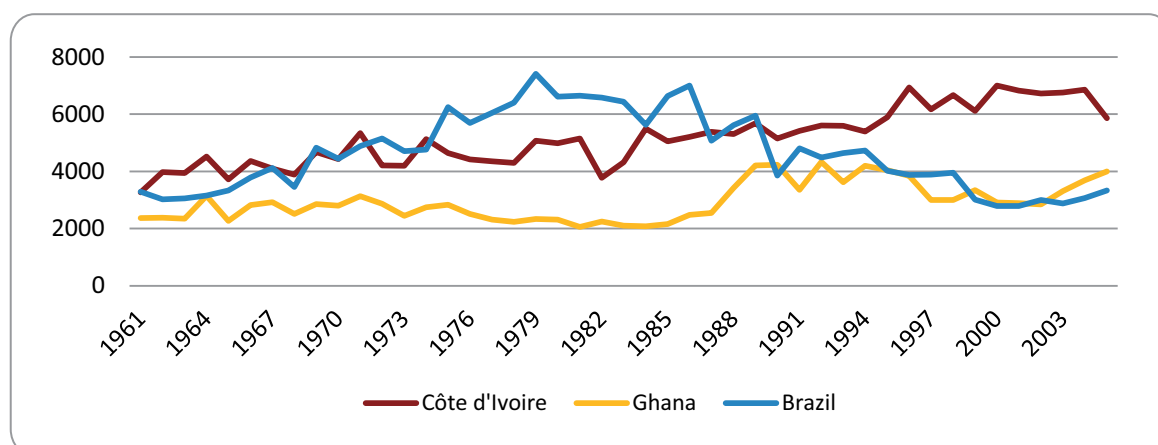
Figure 7. Evolution of international commodity product prices (1960-1990)



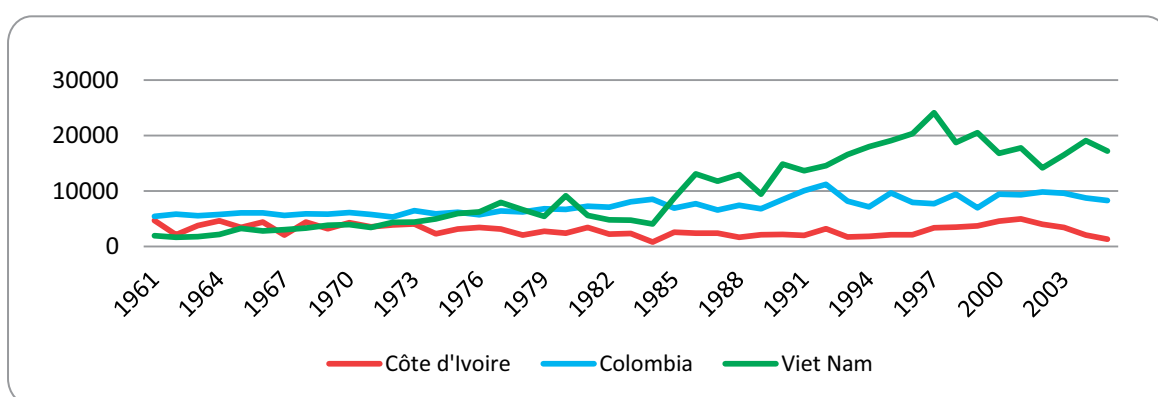
Source: World Bank Data (2012)

This new situation revealed and exacerbated the flaws of the institutional configuration in the export model strategy. Agriculture parastatals were faced with extremely low prices for the sectors concerned, making it more and more difficult to subsidize them, and therefore creating many fiscal deficits. At national level, the mismanagement of these organizations intensified the financial pressure, resulting in significant operating costs, red tape and rampant corruption (Murphy, 2010). This all led to a decline or even collapse of the quality of services provided by these agencies throughout the value chain. The drop in prices could not be compensated by productivity gains within each value chain, partly because parastatals had the monopoly, which resulted in a lack of incentive to be competitive. Moreover, although the state had previously reaped benefits through the control of these sectors, it reinvested very little in research and development,² meaning that yields achieved in these sectors evolved only slightly in the 1970s and 1980s (Figures 8, 9 and 10) and did not increase steadily, especially in comparison with other competing regions.

² Consumer spending has been preferred, especially to meet the needs of growing populations.

Figure 8. Evolution of cocoa yields (Hg/Ha) for some major producing countries (1961-2005)

Source: FAOSTAT (2012)

Figure 9. Evolution of coffee yields (Hg/Ha) for some major producing countries (1961-2005)

Source: FAOSTAT (2012)

The fact that public officials predominate in these sectors has weakened other actors who could potentially be involved along these value chains, impeding them from fully participating; this includes producers' organizations and associations and other private actors, such as traders at all levels, specialized companies and product processing units, which are often dependent on the issue of licenses by public authorities and confined to a minor role in the national market. The weakening of these actors has somehow deprived the system from finding alternatives to cope with its difficulties and has mainly favoured the sector losing competitiveness and productivity.

Given the difficulties faced in these value chains and the reversal of the dominant economic paradigm, donors and international development organizations have begun to promote deregulation and the state's gradual withdrawal by implementing Structural Adjustment Programmes (SAPs). These sought to revive economies in developing and least-developed countries by restructuring the different sectors through liberalization. In parallel, intergovernmental groups (IGG) were focused on strengthening markets that became the cornerstone of the agricultural sector's development in the new dominant paradigm. Liberalization was quickly placed at the centre of aid conditionality and was carried out in West Africa through a long process. Table 6 below provides an overview of the progress over time of the liberalization phase and the gradual end of the value chain supervision.

Table 6. The liberalization process for a few basic agricultural sectors in West Africa

Country	Agricultural sector	End of liberalization process
Nigeria	Cocoa	1986
Niger	Groundnut	1988
Cameroon	Coffee-Cocoa	1994
Ghana	Cocoa	1995
Ghana	Cotton	1995
Burkina Faso	Cotton	1996
Togo	General	1996
Côte d'Ivoire	Cocoa	1999
Benin	Cotton	2000
Côte d'Ivoire	Cotton	2004
Senegal	Groundnut	2004
Mali	Cotton	Ongoing

Source: compiled by authors

In fact, as shown in Table 6, while SAPs were promoted from the early 1980s, liberalization took much longer, proceeded piecemeal, and reached varying degrees of completion. The reasons for this are numerous. First, the high degree of government dependence on the cash crop revenues made it difficult to withdraw state control; additional factors were lack of viable alternatives and lack of a private sector ready to take over, as well as weak producer organizations, having found it difficult to manage some of the previously state-run services effectively. However, the mounting and unsustainable indebtedness of the parastatals and the serious macro-economic imbalances that resulted made it difficult for the government to resist or to reverse course.

2.2 Case studies

A. The groundnut value chain in Senegal: slow decline of a state-controlled sector

From the beginning, the colonial administration supported the development of the groundnut sector in Senegal by building infrastructure to transport crops, starting in the early 1920s, and by setting up development agencies and research centres to support producers (Freud, 1997). In 1936, eight companies were active in the groundnut value chain (Freud, 1997). Following its independence, the Senegalese economy continued to support the groundnut sector, particularly export production, which accounted for 80 percent of exports (Brüntrup *et al.*, 2008).

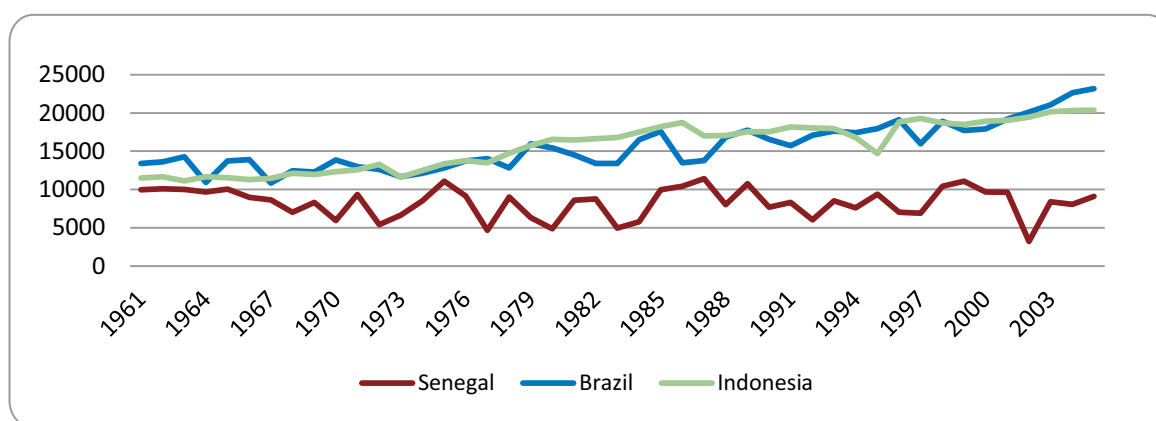
The Senegalese government strongly managed the sector through many successive parastatals over the years (Brüntrup *et al.*, 2008; Ndiaye, 2008). Since 1966, the National Office of Marketing and Development Assistance (ONCAD) has been the cornerstone of the groundnut policy in Senegal. Indeed, it annually fixed the producer price (Ndiaye, 2008) and was responsible for supplying inputs and seeds, modernizing equipment and transportation, marketing the production, and especially supervising

cooperatives that were created mostly through the government that marketed their crops (Freud, 1997). The Senegalese company for the commercialisation of agricultural machinery (SISCOMA), created in 1963, aggregated all groundnut production that transited for further processing, thus benefiting from a strong monopoly position. The value chain was even more tightly controlled given that the Senegalese government supported and managed the main producer associations and organizations, especially in the 1970s. Nationalizing oil mills gave rise to the National Seed Marketing Company (SONACOS), in charge of marketing groundnut oil, with a monopoly over production exports. Agricultural extension strategies were also developed through SODEVA (Society for Development and Agricultural Extension), which replaced the French SATEC (Society of Technical Assistance and Cooperation) that had ensured agricultural extension in the sector from 1964 to 1968.

France continued to subsidize the groundnut sector in Senegal, in part because of the strong presence of the French company Lesieur, which enjoyed a local monopoly on vegetable oil markets. However, from the 1980s, the industry was faced with increasing difficulties, in part because the new management was burdened by bureaucratic weight, as well as weak technical capacity and expertise, leading to poor decision-making and resulting in decreased performance.

These difficulties gradually led to liberalizing the sector. In 1979, the ONCAD was eliminated to reduce debt linked to administrative constraints. In 1985, the state ceased to support access to credit for farmers, who were then forced to contend with higher market interest rates and more stringent conditions. This was followed by a slow erosion of yields (see Figure 10). From the 1990s onwards, the sector has faced a real crisis, as a result of gradually declining competitiveness due to the rise of alternative oilseed oil products in the global market (palm oil, cottonseed, rapeseed, sesame), which caused groundnut market share erosion and falling export prices. The scheme's excess profits were not reinvested enough in research or infrastructure to maintain the sector's competitiveness. After keeping it alive through subsidies for several years, despite a constant decline, France finally withdrew its support.

Figure 10. Evolution of groundnut yields (Hg Ha) for some major producing countries (1961-2005)



Source: FAOSTAT (2012)

The state's withdrawal had disastrous consequences for all areas in the country where groundnut was the main crop, with rural poverty worsening. The state also pulled out of the value chain's upstream sector by reducing its agricultural extension services (SODEVA was abolished in 1998) and ceasing to support supplying farmers with inputs. Finally, in 2004, the state's disengagement process was completed with liberalization of SONAGRAINES, along with the state selling most of its shares. The only exception is the 120 XOF (African Financial Community francs) so-called "backup price" maintained by the state, which is considered far too low by producers (Brüntrup *et al.*, 2008). Despite the state maintaining a subsidized price, liberalizing the

groundnut sector has had a negative impact on the value chain; the private sector has had no incentive to invest in a market losing competitiveness with other products and this has resulted in an institutional vacuum in Senegal's first export sector.

This has significantly and negatively affected incomes of groundnut producers, greatly impoverishing them, dragging down rural economies and increasing widespread poverty. Worse, many farmers were not able to replace groundnut with other more profitable crops since in many cases the sandy soils (better adapted to groundnut) were so depleted that they could not easily support other crops. Many producers have therefore been forced to continue to grow groundnuts despite lower returns.

The tragic outcome of the groundnut sector in Senegal clearly illustrates the weakness of making the agricultural sector as a whole dependent on a single lead crop that may have boomed in the past but has no real long-term sustainability. The groundnut sector was strictly controlled and managed for a long time, through the efforts of the various Senegalese parastatals or through grants by the French government. This allowed it temporarily to maintain a dynamic value chain but the state structure could not hold fast against a progressively unfavourable international economic situation and the rise in the world market of more profitable and competitive substitute products (such as sesame or rapeseed). When Senegal was forced to liberalize groundnut production at the same time that France withdrew its financial support, the sector's collapse led whole parts of the economy and small producers involved in the value chain into precarious conditions because the private sector has neither invested nor truly become involved.

In summary, the case of groundnuts in Senegal is a classic example of a sector inefficiently run by the state, without the inclusion of sufficient safeguards to ensure continued productivity increases and long-run sustainability. The state controlled the entire value chain, reaping much of the value added as long as world prices were sufficiently higher than the price floors guaranteed to farmers. Private agroprocessors (including the monopoly-holding company, Lesieur) also enjoyed a near monopoly on the vegetable oil market, depriving the sector of the healthy competition that would have ensured continued investment in productivity-enhancing technologies and strengthened competitiveness. Producers of groundnuts, despite their organization into cooperatives, were the weakest link in the chain. The government agencies merely used the cooperatives to supply the needed inputs and to collect the raw product for later marketing and processing. Farmers had little bargaining power to influence prices, ensure upgraded technologies or extract a greater share of value addition. Over time, the sector saw its competitiveness diminished by both the increasing loss of soil fertility through continued cropping and the rise of substitutes in the world oilseed market. These factors, along with inefficient management of parastatals, progressively combined to erode global demand for groundnuts and groundnut oil and depress its prices. Eventually, the parastatals started operating at a loss, which could only be remedied through a temporary infusion of subsidies, without an accompanying strategy to redress the loss of competitiveness. The lack of private sector enthusiasm for investing in a value chain already in decline hastened the final collapse of the state-controlled model for the groundnut value chain.

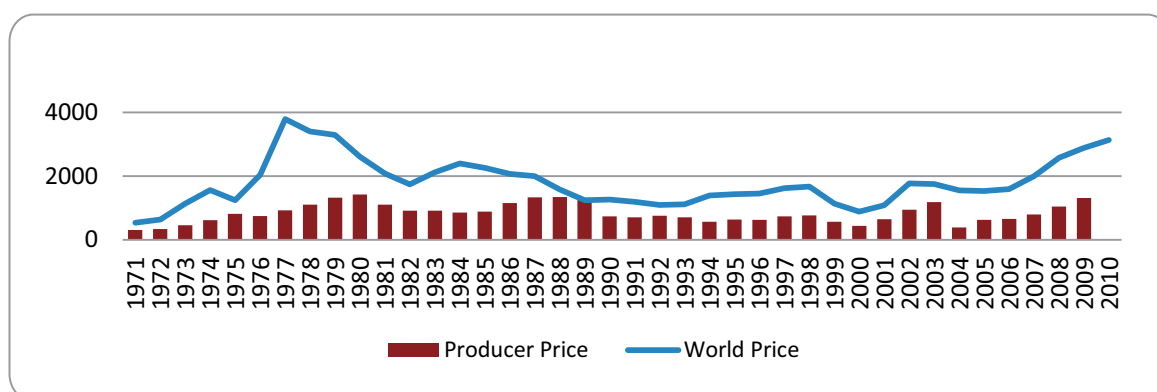
B. The cocoa value chain in Côte d'Ivoire: a failed case of cooperatives control

Like groundnuts in Senegal, cocoa was supported in Côte d'Ivoire by the French colonial authorities, although to a lesser degree and at a later date. In Côte d'Ivoire, the interest in growing cocoa began in 1912, and was based on a colonial-style production (ECOWAS-Sahel and West Africa Club/ OECD, 2007). To support cocoa production, the colonial administration also established a research centre, as well as a price system that excluded domestic producers from the sector until its abolition in 1944 (ECOWAS-SWAC / OECD, 2007). In 1955, the colonial authorities set up a stabilization fund that was maintained after independence in 1960, and taken up by President Houphouët-Boigny. Indeed, since

independence, the government of Côte d'Ivoire has sought to control national cocoa production, given the large share it has held on the world market (FAOSTAT, 2012). From the 1960s onwards, the first management model in Côte d'Ivoire relied heavily on CAISTAB (a stabilization fund), which comprised a wide range of powers, including establishing fixed prices throughout the value chain, thereby affecting the incomes of all the actors involved by fixing allowed costs and margins (Varangis and Schreiber, 2001). CAISTAB also monopolized the marketing and export of cocoa.

Indeed, any exports by individual operators had to receive CAISTAB's approval. Private operators, producers or producer organizations/cooperatives could sell cocoa in the internal market but were still under the control of CAISTAB, which defined each actor's margins, or flattened transport prices through a system of subsidies and repayment by traders who provided the transport (Varangis and Schreiber, 2001). CAISTAB was also responsible for product quality. It also controlled prices given to farmers, guaranteeing them a minimum income. These prices also mitigated changes in international prices through selling in futures markets (selling and buying to be executed in future transactions with pre-agreed prices); this provided some price stabilization throughout the year. In this system, producers and their organizations lacked resources compared with this monopoly and therefore could not influence it as they were dependent on it. Private operators were mostly French intermediaries who "specialized in trading" and profited from import-export operations.

Figure 11. Producer prices compared to world prices in the cocoa sector in Côte d'Ivoire (USD per tonne), 1971-2009

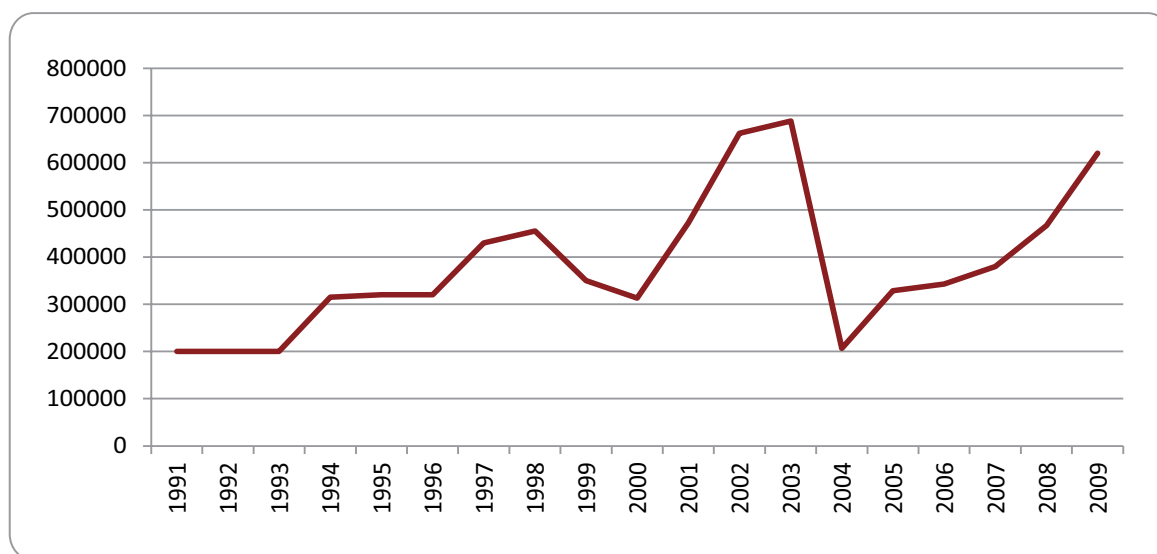


Source: FAOSTAT (2012) and International Cocoa Organization (2012)

With the state's monopolization of the sector (through CAISTAB), risks were pushed upstream and absorbed by producers, while benefits were largely absorbed by the state in the form of substantial revenues related to indirect production taxation and also by intermediaries who shared sales and export margins. CAISTAB also faced financial difficulties for various reasons. The administrative and organizational operations proved ineffective and poorly suited to manage price risks, which had serious consequences when cocoa prices fell. Indeed, in 1988, a significant drop in cocoa prices led to the collapse of the International Cocoa Organization's international stock system and to strong budgetary pressures for CAISTAB. According to Varangis and Schreiber (2001), until 1986, CAISTAB could accommodate price changes simply by adjusting prices offered to producers. But the price drop below USD 3.00 per kilogram, mainly due to failure of the international agreement on prices, led to serious difficulties for producing countries such as Côte d'Ivoire and agencies such as CAISTAB, which resulted in a drop by half in real output prices (1989/90). The financial crisis in the sector had made its circumstances unsustainable.

Liberalization and privatization of the sector had become inevitable. In 1996, domestic prices previously fixed by CAISTAB were partially removed,³ while CAISTAB's marketing of cocoa was limited to 15 percent of annual production, thus leaving room for private operators. Finally, its expenditure and budget were scaled down. Three years later, in 1999, faced with the limitations of these partial reforms, the government invited private operators to be part of CAISTAB's organigram, while fixing and price regulation were abandoned. Although this liberalization allowed for greater participation of private actors, the effect on producers was generally negative because they became exposed to more pronounced price volatility. Indeed, although producer prices rose immediately after liberalization, they fell in the years immediately following (as shown in Figure 12 below).

Figure 12. Evolution of producer prices (FCFA per tonne) in the cocoa sector in Côte d'Ivoire (1991-2009)



Source: FAOSTAT (2012)

For small farmers who depend on these crops for their income, negative effects of falling prices (such as in 2004) can have much longer-term harmful consequences than the benefits gained by temporal price increases (such as those of 2002 and 2003). One of the criteria for long-term viability of these export sectors is based on an effective system of price stabilization.

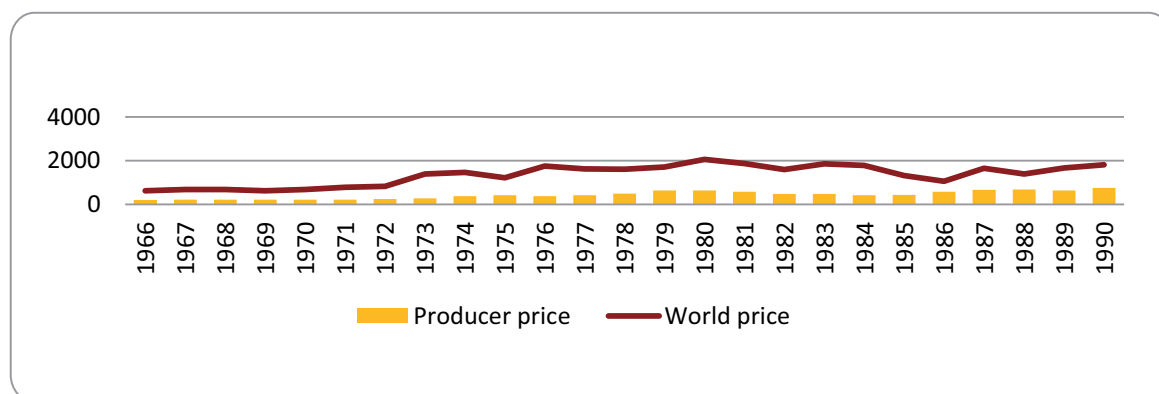
In summary, this is a clear example of a value chain controlled by a single parastatal whose singular objective was to extract maximum rents and revenues, without investing back into the value chain to ensure sustainability and long-run viability, especially given that the commodity is produced and sold as raw fruit to a global market that is increasingly competitive and therefore subject to high price variability. The value chain was also run with little consideration for including small-scale producers who absorb a higher share of risk compared with parastatals and private actors downstream. Moreover, there were no attempts to break the monopolies of multinationals and initiate local processing opportunities or to introduce market-based risk management instruments. All this condemned the system to become less viable over the long run. This is also a clear example of how not to have a value chain that is linked to multinationals and subject to their market controls but run entirely by a parastatal (in this case CAISTAB), controlling everything from price regulation to pre-setting each actor's margin and profits. Such a system proved to be unstable and incapable of withstanding and surviving such huge swings in world prices as have happened in the past.

³ In 1996 they were only removed from group purchasing centres for cocoa beans and from transport costs.

C. The cotton value chain in Mali: A weakened sector, too important to privatise

France's interest in cotton in Mali started in 1921 when the first infrastructures were built that eventually led to creation of the IRCT (1946) and the CFDT (1949). The latter was given the mandate of providing a stabilization fund that guaranteed prices to producers. After independence, the Malian government maintained the CFDT to regulate the sector (Tefft, 2004). Its strategy was based on intensifying production by developing quality fertilizer and providing it to producers, as well as promoting animal traction and facilitating purchase loans (Tefft, 2004). This highly-regulated production intensification strategy was successful for several years with a significant improvement in yields. The CFDT administratively fixed prices and protected producers against the volatility of international prices. Between 1960 and 1972, cotton producers were paid, on average, 30 percent of world prices. The CFDT also exercised a monopoly in collecting, ginning and marketing of cotton and ensured the export of cotton production.

Figure 13. Producer prices compared with world prices for cotton (fibre) in Mali (USD per tonne) 1966-1990



Source: FAOSTAT (2012) and World Bank Data (2012)

Once the contract between the French CFDT and the government of Mali expired, the latter partially nationalized the sector by creating the Malian Company for Textile Development (CMDT)⁴ and controlled exports through the Malian Import and Export Company (SOMIEX). In this way the government sought to strengthen its control over this export crop of prime importance that generated nearly USD 33 million in 1974 and roughly USD 96 million in 1985 for the state (with a tripling of income in ten years, FAOSTAT, 2012). The role of the CMDT has been expanded compared to that of the CFDT, by supplying new services such as agricultural training (in maize production and metalwork), equipment supply, construction and maintenance of rural roads, health infrastructures and drinking water, and agricultural research (Tefft, 2004; Tefft, 2010). This is in addition to its traditional role, namely providing services directly related to cotton production and maintaining the system of setting producer prices, input supply and access to credit.⁵

Over 30 percent of rural households in Mali produce cotton. Given the importance of cotton in Mali's rural economy, it was customary for cotton producers to organize themselves to better serve their interests and influence the state-dominated management of the sector. Many village associations were formed in Mali from 1974 on, when the CMDT was created; by 1987, the number of these associations

⁴The CFDT maintained 40 percent of shares in the new national carrier, which facilitated continued technical and financial collaboration between the CFDT and the French government (Tefft, 2004).

⁵Credit was managed by the Société de Crédit Agricole et Equipement Rural (SCAER) until 1980 (Ministry of Agriculture of Mali, 2011) before the National Bank for Agricultural Development (BNDA) took over to address the various management problems faced by SCAER (Tefft, 2004).

had risen to 950 (Tefft, 2004). The CMDT, realizing it could not block them, decided to involve them as local relays to reach cotton farmers, providing services, inputs and necessary credit and receiving in return the collected cotton production (Bonnassieux, 2002; Tefft, 2004).

The period under the aegis of CMDT has been characterized by low production profitability (compared with the CFDT). This may indicate that the new management under CMDT did not include technically and managerially qualified officers as did the previous structure under French administration. The many shortcomings of CMDT have been revealed as well, such as excessive costs, poor resource management, duplication of responsibilities and a lack of cost control (Tefft, 2010). Moreover, the international price situation was not favourable. Thus, between 1974 and the mid-1980s, the CMDT lost about XOF 130/kg of cotton fibre (Tefft, 2004). Under these conditions, maintaining subsidized prices became more difficult and several times (in 1985, 1992, 1995 and 1999), the CMDT had to provide producers with prices that were lower than world prices.

Given these difficulties, the institutional changes in the sector have led to an increased – albeit still limited – role for private actors. The CMDT is now a mixed public/private structure (60 percent controlled by the Malian government and 40 percent by private French actors). At the producer level, village associations are better developed and grouped under a single union (Union of Cotton and Food Producers, SYCOV). However, their room for manoeuvre to influence the sector management has remained very limited, while the international cotton trade situation tended to gradually worsen. The devaluation of the XOF in 1994 allowed some recovery in producer prices for a period of time; however, in the early 2000s, cotton prices fell⁶, causing a real crisis for the value chain and the CMDT.

Faced with these difficulties, the sector's management is not strong enough. This is reflected, for example, in difficulties providing inputs of adequate quantity and quality, as well as in their price increase. Similarly, the quality control by some of the responsible organizations has also declined, which has led to deterioration of the production quality. Ultimately, neither the village associations nor their union were strong or credible enough to mount an effective bargaining campaign on behalf of cotton producers. Moreover, they had little bargaining power vis-a-vis ginners, as cotton producers had fewer alternatives (given the long-standing state neglect for food crops, which had stagnated under very low yields and undeveloped marketing channels; see Chapter 15 regarding the case of sorghum and millet). As a result, cotton production declined sharply in 2004 as many farmers began turning away from this crop. Since then, the country has lacked the ability to forge a new and viable long-term strategy for this sector on which a large number of Malian households continue to depend, fostering an endemic structural crisis. As the value chain's liberalization is still not complete, the CMDT continues to be in charge of some of the traditional management functions.

In summary, the cotton value chain in Mali has gone through a long series of episodes of state control, first by the French (CFDT) and then by the Malian government (CMDT). The value chain was tightly controlled and vertically integrated and for a period yielded positive results, especially when yields were improving and world demand was strong. However, over time, both internal and external factors combined to undermine the long-term viability of this strategic sector. Poor management and poor decisions by the CMDT, combined with falling world prices (due to subsidies in richer countries, the rise of fibre substitutes and productivity improvements by competitive suppliers such as China and Brazil) offered a bleak prospect for this sector for all the major producers in West Africa. Because cotton producers did not have any economic or bargaining leverage (despite being organized as village groups or unions) the state could dictate the prices they received, which were just above the "walk-away price"⁷ but no higher; the average price received was way below the world market price (Figure 13). Under the steady decline of world prices, the state itself started losing money, and eventually pushing the whole sector into a state of crisis. But a simple and clean-cut

⁶ In 2001 the price of cotton fell by 42 percent (Tefft, 2004).

⁷ Price below which farmers will have no incentives to grow cotton.

total liberalization of the system proved too difficult to withstand; hence, there was a protracted period of half measures and attempts at partial liberation measures. Meanwhile, many cotton producers began reducing cotton acreage, turning to alternative crops (rice, sesame, maize, etc.).

D. Lessons learned from these case studies

The export commodity model illustrated by the three cases just analysed has a number of common features. It is state-run (usually led by a parastatal that intervenes across the value chain) and the private players (agroprocessors and farmers) have relatively little bargaining power whether they are organized (as in groundnuts and cotton) or not (as in cocoa).

Initially, export commodity producers were benefiting, as yields improved through investments in research and provision of inputs, and as long as world prices were much higher than received prices, even accounting for variability (see Figure 11 for cocoa and Figure 13 for cotton). For example, cocoa farmers in Côte d'Ivoire "rarely received more than 50 percent of the export price" (Varangis and Schreiber, 2001). Also, as long as world prices fluctuated above the floor (received) price, farmers could count on this price stability and continue to engage with these commodities, especially as the alternatives (food or cash crops) offered less revenue. However, over time, the parastatals reduced the fixed producer prices (from their stable position in the 1980s) as world prices kept falling, sometimes by half, as in the case of cocoa in Côte d'Ivoire. Losses to income were simply passed on to farmers.

Apart from the basic processing activities off the farmgate (ginning for cotton, or roasting for cocoa), most of the private actors were intermediary marketers and traders who had established business relations with European importers. These intermediary actors ensured profit margins for themselves and thus were less vulnerable to price fluctuations. This was not the case for producers, who not only had to face declining price factors over time but had to contend with rising input prices, further squeezing their margins and revenues. Therefore, under this value chain model, producers absorbed much of the risk.

In all three cases analysed, producers have been the big losers when commodity markets were in crisis. This is partly the consequence of the monopolistic structure of the export commodity model, as well as the lack of attractive alternative enterprises for producers. Another important finding was that even when producer organizations existed (groundnut cooperatives in Senegal, cotton farmer groups in Mali) they were largely ineffective in leveraging their organizational power and therefore could be easily controlled by the state agencies. This suggests a serious organizational weakness in these producer organizations and a need to establish different forms of governance and structure, suitable for economic and market-oriented approaches. All this requires a serious look at how these organizations should be structured and governed, and how their internal capacity can be enhanced in order to become credible economic partners fully capable of engaging with the market (see Chapter 7 for a full treatment on this subject and the methodology proposed to create such market-oriented organizations).

The governance structure of the export commodity model was skewed in such a way that too little of the income extracted from the value chains (captured disproportionately by the parastatals and, to a lesser extent, the intermediate marketers) could find its way back as investment for improving farm-level productivity, maintaining competitiveness of the value chain and introducing risk mitigation measures (such as insurance) to strengthen farmers' resilience against risks and uncertainty and thus ensure sustainability.

When these internal factors were combined with external trends (long-term price declines, rising competition, emergence of substitutes, etc.), returns from these export commodities dwindled, putting

all the players into a precarious situation that eventually led to the collapse of these value chains and failure of the state-controlled export commodity model.

Liberalization of these sectors was not a panacea. Farmers who continued with these export commodities (though with lower acreage) had to deal with increased production and transport costs while facing more difficulties in accessing inputs and credit (Murphy, 2010), not to mention greater exposure to price variability with the removal of minimum price floors. Liberalization has exposed farmers to increased variations in world prices with no improvement of average received prices⁸. These losses have more than offset financial gains acquired through tax abolition. In fact, these cash crop production systems were destabilized enough to result in a serious demise of the state-controlled value chain model.

3. High-value private-led export commodity model

3.1 Context and significance

The continued erosion of competitiveness of traditional export commodities through the 1980s and 1990s, and the liberalization that followed, opened the door for growth and investments in a number of non-traditional, high-value export commodities in many West African countries, notably in horticulture and floriculture. Swinnen *et al.* (2009) calculated an agricultural growth index and showed that, a decade following the reforms, traditional export commodities grew only by about 35 percent, compared with 50 percent for non-traditional, high-value exports and 60 percent for staple food sectors.

In some African countries, private agribusinesses managed to integrate the rapidly transforming global food system, producing and exporting niche products from horticulture and floriculture. During the 1980s, the global food system experienced significant structural changes as a result of rising demand, changing food preferences, growth of supermarkets and technological advances that facilitated long-distance trade of perishable products within shorter periods (Takane, 2004; Murphy, 2010). Demand for fresh fruits and vegetables has risen strongly in high-income countries, such as in Europe (Singh, 2002), creating new export opportunities for African producers for a variety of high-value products. These developments have greatly facilitated long-distance trade and opened new opportunities for new value chains to develop or expand, including from West Africa with its comparative advantages (low cost of production and labour) and the possibility to produce off-season. Moreover, African producers and exporters have been able to exploit the links that already existed, with European buyers allowing for easier market penetration in some cases.

Unlike the traditional export commodities, these high-value export products were largely driven and run by private actors and agribusinesses, while the state played only an indirect role. The high-value chain commodities are organized according to vertically-coordinated supply chains, dominated by a very small number of agrifood multinationals. The value chain leader is the retailer at the downstream end of the value chain, who dictates the terms of trade, sets the product quality specifications, and imposes standards and other conditions demanded from suppliers (such as EurepGap). Producers and suppliers at the upstream end could either comply or be left out of the market altogether. This meant that farmers and agribusinesses had to have a large enough size, capacity and capitalization to withstand the costs of compliance and to make the investments necessary to capture market shares.

⁸ Delpuech *et al.* (2010), show that the actual price of cotton production in West Africa's three major cotton producing countries (Benin, Burkina Faso and Mali) has not really increased with liberalization.

On the plus side, these non-traditional export commodities offered new scope for diversification with strong returns on investments and with added local employment benefits. For example, 10 000 people worked in the banana sector in Cameroon in 2003, 35 000 people in the banana and pineapple sectors in Côte d'Ivoire in 2002, and 12 000 people were employed in the string bean sector in Senegal in 2005 (Maertens *et al.*, 2009). On the downside, these non-traditional export value chains had limited impact on agricultural development and did not offer an alternative of comparable size to the common traditional exports, which were still far more significant for the national economy.

Table 7. Employment in exporting horticultural sectors in Cameroon, Côte d'Ivoire and Senegal

Country	Production	Year of survey	Number of employees in the sector
Cameroon	Banana	2003	10 000
Côte d'Ivoire	Banana and Pineapple	2002	35 000
Senegal	String Beans	2005	12 000
	Cherry tomatoes	2006	3 000

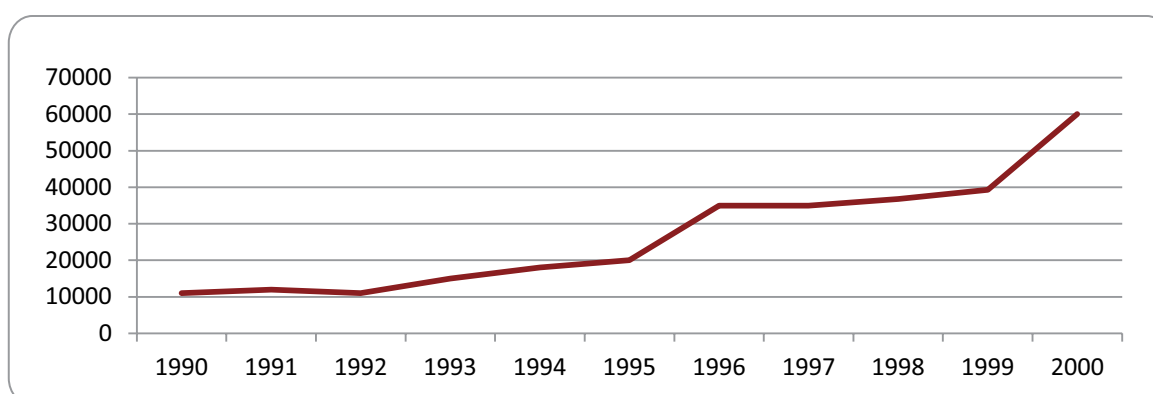
Source: Source: Maertens *et al.* (2009)

3.2 Case studies

A. The pineapple value chain in Ghana: Strong potential but not for smallholders

Pineapple is one of the leading horticultural export crops in Ghana (Danielou and Ravry, 2005). Pineapple exports doubled from 1997 to 2004, reaching 70 000 tonnes sold for a value of USD 22 million, making it the number one export in value (Danielou and Ravry, 2005) (Figure 14). Ghana quickly built a competitive advantage over other suppliers by using a reliable national airline system, a reliable harbour and lower production costs (Danielou and Ravry, 2005). The pineapple value chain is essentially run by the private sector, dominated by medium to large-size farms upstream, and by export companies supplying European supermarkets. Farms producing pineapple rely on their strong capacity to meet the required standards and to adjust to changes in demand requirements by European buyers.

Figure 14. Evolution of pineapple production (tonnes) in Ghana, 1990-2000



Source: FAOSTAT (2012)

Smallholder farmers also produce pineapple in Ghana, as this product is accessible and labour-intensive (Takane, 2004). However, smallholders are excluded from the pineapple export value chain because they are unable to meet the stringent standards and specific quality specifications of European retailers. Among these is the requirement to buy only the Smooth Cayenne pineapple variety. Small producers were not able to switch easily from existing varieties, due to the expense and investment required, and were thus excluded from European markets. As small farmers lost export market share because of the change of variety demanded by buyers, their incomes fell.

The sector is segmented: medium and large farms dominate export production and small farmers produce pineapple for the local market, with smaller income prospects. Thus the stringent standards serve as a real barrier for smallholders who would otherwise have the capacity to produce and supply these exportable commodities, as they have no difficulty acquiring productive capital or obtaining credit for inputs (Ravry and Danielou, 2005).

In summary, the case of the pineapple in Ghana is an example of a value chain focused on an export market led by multinational food retailers whose primary objective is to meet high-income consumer demands for diversified, high-quality food products. The effect on the producers upstream is to favour large-scale and well-capitalized producers who are able to make a successful entry into the market. Small farmers who have the capacity to produce and supply are handicapped by their inability to meet the compliance costs. Thus the value chain, to the extent that it offers significant scope for growth and expansion, needs a policy framework that will not only enable sustained competitiveness but also enhance smallholders' capacity to participate in the value chains. This could be accomplished by expanding market outlets and providing incentives for value addition to the products serving domestic or regional markets, thus contributing to more inclusive value chain development. Clearly the impressive growth of the export volume (and value) for pineapple from Ghana points to a real competitive advantage; however, the exclusion of smallholder producers with highlights a gap that needs to be corrected in the context of an agricultural growth strategy based on a wide diversification of inclusive value chains.

B. The banana sector in Côte d'Ivoire: Liberalization improves competitiveness but marginalizes smallholders

In Côte d'Ivoire, production of bananas is combined with mango and pineapple to form the so-called "fruit" value chain, which represents the second largest source of export for the country (OCAB, 2000). This production focuses almost exclusively on exports, as less than a third is for the local market. The banana sector has been heavily supervised since its inception during the colonial period. After independence, new institutions were created, starting with the Technical Assistance for the Modernization of Banana and Fruit Production Company (SOMOBAF) set up in 1962, and then the National Packaging Society (SONACO) established in 1963. Different cooperatives, grouped under a single large cooperative, managed banana production. The Côte d'Ivoire's Banana and Fruit Production Agricultural Cooperative (COFRUCI) was replaced in 1975 by the state-run Ivorian Fruits and Vegetables Marketing Company (Koffi Kouassi *et al.*, 2005) which folded three years later, opening the door for the return of a cooperative, reinstated as Producers' Cooperative for Commercialization of Fruits and Legumes in Côte d'Ivoire (COFRUITEL). This institution then experienced managerial and technical difficulties, resulting in a real crisis for the banana value chain and a significant drop in production (from 166 000 tonnes in 1974 to 86 000 tonnes in 1982) and fruit quality deterioration (Koffi Kouassi *et al.*, 2005). The COFRUITEL was disbanded in 1986, thus opening opportunities for autonomous export structures while the government withdrew from production altogether.

Since 1991, the Pineapple and Banana Producers/Exporters Central Organization (OCAB) has organized the value chain and the profession. OCAB is also responsible for transportation, while independent marketing Groups that are members of OCAB are in direct contact with importers with whom they establish trade relations, without state intervention. In 1992, the banana sector was fully liberalized, prompting the entry of multinational companies such as the CBS and Banador groups, which have invested in the sector (COGEA, 2005).

Deregulating the banana sector, along with fully involving private enterprises, has had a significant economic effect and the share of bananas in agricultural GDP has increased between 8 and 10 percent, with Côte d'Ivoire becoming "the first African supplier of bananas to the EU market" (Koffi Kouassi *et al.*, 2005). The economic situation of small producers, however, has not yet improved. Indeed, in 1982, smallholders were responsible for 24 percent of exports, but this share declined significantly starting in the mid-1980s, especially after the establishment of autonomous export structures in the early 1990s. By 1988, approximately 160 smallholder plantations generated only 5 percent of total exports. In 2000, there were only 52 small (less than 10 ha) banana plantations left in the country (Koffi Kouassi *et al.*, 2005). It therefore seems that liberalizing the sector has gradually marginalized small producers/growers, as most of them are poorly supervised and equipped and do not have sufficient resources to meet export production requirements, given their very low yield levels (5 t/ha) and their limited capacity to invest to sustain their competitiveness (OCAB, 2000). Following liberalization, the value chain has become more concentrated; it now has a small number of large producers while many small farmers have been forced to leave the sector (Koffi Kouassi *et al.*, 2005).

In summary, the lessons from the Côte d'Ivoire banana value chains are as follows:

- (a) A state company or a cooperative of producers (if managed like a parastatal) is an inefficient vehicle to manage an export-oriented value chain with multiple multinational competitors and diverse import markets requiring stringent standards and quality specifications. The numerous failed organizations that succeeded each other in managing the banana export market segment point to internal leadership and management weaknesses, as well as lack of adapted governance structures.
- (b) When the sector is fully liberalized and competition among private actors is allowed, this also tends to facilitate coordination (as done by OCAB) and to result in improved competitiveness and performance as shown by the market share gains following deregulation. However, greater competition and the entry of multi-nationals also meant squeezing out the small-scale producers, who ended up being marginalized.
- (c) In this case what seems to be required is fostering of a true banana interprofession, inclusive of smallholder producers' representatives. These representatives would need special incentives to strengthen their bargaining capacity and improve their ability to comply with higher standards, as well as training in technical, managerial and marketing areas so they can become more effective players within the value chain. Here the role of the state is to focus on creating the correct incentives needed to strengthen the inclusive side, leaving the goal of competitiveness to market processes and coordination among private actors.

C. Lessons from the case studies: implications for smallholder inclusiveness

Small producers of traditional cash crops (groundnuts, cocoa and cotton) were not always able to diversify their activities to other crops, especially in export markets. Capturing market shares in non-traditional high-value chains requires significant investments and added costs to comply with standards and more stringent quality requirements. Moreover, success in these markets requires strong and well-established organizational capacity, quality infrastructure for post-harvest handling and flexible logistics. For all these requirements, smallholders are at a disadvantage compared to entrepreneurs or medium- or large-sized farms (Fontan, 2006). The limited internal capacities and low assets of small producers cause them to be excluded from export value chains.

The tightly-integrated high-value export food value chains, the relentless drive to cut costs (including coordination costs) and the need to adjust constantly to quickly-evolving consumer preferences in high-income countries all combine to exclude small scale producers from participation. Consequently, small producers have found themselves marginalized and facing slow erosion of their export market shares. For example, like the banana sector in Côte d'Ivoire, small scale string bean producers in Senegal also saw their export share drop, from 95 percent in 1999 to 52 percent in 2005 (Maertens *et al.*, 2009).

However, there are many niche markets and high-value chains for which smallholder farmers can offer a comparative advantage and successfully partner with agribusinesses. This is especially the case for domestically-oriented segments of the high-value chain or when value chains rely on labour-intensive production, for which smallholders can be more advantageous. An example is the domestic segment of the pineapple sector in Ghana where small producers are still present. Subcontracting mechanisms have also facilitated integration and protection for small producers, particularly for less perishable products. Maertens *et al.* (2009) developed the example of outsourcing contracts for the string bean value chain in Senegal. Humphrey (2007) states that "small producers organized in subcontracting mechanisms were able to meet the most demanding markets requirements and demands." Yet cases like these remain rare and, while other opportunities exist, they remain to be fully developed.

One sure mechanism is to strengthen producer organizations to become credible economic players, effectively intermediating between small-scale farmers and their economic and business partners. Producer organizations with sufficient management capacity can effectively bridge the gap between production and product quality enhancement to ensure enhanced capacity to comply with private standards and successfully fulfil market requirements and contractual obligations. Developing a strategy for effective capacity building for the producer organizations is thus a central prerequisite for coherent development of competitive and inclusive value chains. It is also a key role for the public sector in fostering an enabling environment for value chain development.

4. Staple food value chains and the search for an appropriate development model

4.1 Characteristics of staple food value chains

Compared to export commodities, staple food value chains can have a far more significant impact on national food security and poverty reduction in West Africa. For example, the maize value chain in the region focuses on local and regional actors, from producers to consumers, through various retailers, processors and other intermediaries (Boone *et al.*, 2008). Similarly, millet and palm oil are largely consumed locally in the Western basin (CILSS *et al.*, 2010) and out of the 50 000 tonnes of palm oil produced in Guinea, only 9 000 are exported, implying that the rest is consumed locally. As another example, the rice produced in Guinea is almost entirely marketed domestically (CILSS *et al.*, 2010).

An institutional setting

A key feature of staple food value chains is the fact that these can be neither entirely state-run (as they have multiple purposes, numerous marketing channel possibilities, and no significant revenues to be directly captured by the governments) nor entirely by the private actors (as they have low margins of returns and higher risks and uncertainty in production and marketing). Rather, a mixed model is at work here, with policymakers and development partners promoting appropriate public/private partnerships

(PPPs)⁹ to promote investments in staple value chains. This goal is stated in many of CAADP's sectoral strategies, in which a prominent position has been given to the need to establish PPPs. However, in fact, the private sector participation in the staple food value chains is much lower than expected, pointing to serious constraints (meaning an unfavourable environment). In staple food value chains, the public role is limited, and focused on facilitating private-led initiatives to stimulate production, marketing and trade.

Trade policies also play an important role for staple value chain development. In this area, governments in the region tended to be interventionist, without the necessary coherence expected to harmonize the various declared strategy aims. Governments "occasionally resort to protectionist measures in case of poor cereal harvests" (Araujo Bonjean *et al.*, 2008). For example, at one point or another, Ghana, Nigeria and Senegal all taxed rice imports to control them and protect their national productions (Lancon-Benz and David, 2007). Burkina Faso, Mali and Niger have also not hesitated to ban grain exports in order to reduce price increases and allow the supply of local markets and populations (Boone *et al.*, 2008).

Structural impediments for staple food value chains

Staple food value chains face several structural limitations to their development:

- Staple food production is dominated by small-scale agriculture, with a large majority of farms of less than 5 ha. This implies insufficient capital assets, limited investments, and lack of access to inputs and technology to sustain higher yields.
- The problem of soil fertility is serious and quite widespread, compounded by the fact that staple crops tend to be grown in areas where rainfall is not always sufficient or abundant but subject to high variability. This also contributes to yields below the potential.

Other limitations of these sectors are closely linked to production upstream and downstream and producers face many obstacles and challenges:

- Staple food producers face an unfavourable policy framework and lack of marketing incentives. This includes limited access to information, inadequate extension services and limited access to inputs (fertilizers, seeds, etc.) and credit (Boone *et al.*, 2008; CILSS, 2010).
- Staple food value chains face obstacles to trade, especially at the regional level where the potential for exchange is higher. Regional trade in staple food products is greatly hampered by red tape at the borders, inconsistent and contradictory policies and different trade and unit standards.

The following two case studies will provide a specific context to describe these impediments and point to ways of overcoming them in order to realize the presumed potential of staple food systems in the region.

4.2 Case studies

A. The cassava sector in Ghana: A dichotomy between local markets and the export sector

Cassava is one of the most important crops in Ghana, seen from either a strictly economic point of view or in regard to food security. It is indeed the first crop in terms of quantity produced and the second in terms of value (FAOSTAT, 2012) as well as consumption, insofar as it constitutes 20 percent of daily calorie intake in the country (MAFAP Project, *forthcoming*).

⁹ Since there is no universally accepted definition of PPP, the 2005 World Economic Forum attempted to define the concept as involving "business and/or not-for-profit civil society organizations working in partnership with government agencies, including official development institutions. It entails reciprocal obligations and mutual accountability, voluntary or contractual relationships, the sharing of investment and reputational risks, and joint responsibility for design and execution", WEF (2005).

The cassava sector has three main processing options; these are *gari*, which is mainly for local consumption, cassava starch and cassava chips, which are both for export. Studies have shown that the industry favours local consumption and markets, however, while exports are marginal (MAFAP Project, forthcoming). Cassava plays a critical role in alleviating periods of food insecurity, as it is compatible with difficult production conditions and can be grown and consumed within a short period.

However, the various processing possibilities could be seized to develop the value chain, in a similar fashion to other initiatives undertaken by the Ghanaian state, such as the Presidential Special Initiative (PSI) launched in 2001, which focused on developing export opportunities, especially from cassava starch-derived products. To that end, the Ghanaian state implemented the Ayensu Starch Company (ASCO), resulting from a PPP charged with transforming fresh cassava production into starch. This initiative involved establishing contracts between cassava producers and ASCO, under which farmers received inputs and technical assistance. ASCO's implementation also fostered organization by farmers into several associations, but for the most part organization still remained weak (Global Donor Platform for Rural Development, 2011). The strategy eventually failed because it had underestimated competing cassava uses, especially for local consumption (MAFAP Project, forthcoming). ASCO had to close its doors in 2008; it had been underutilized due to the fact that producers preferred to orient their production toward local markets because they received higher prices than those offered by ASCO.

This experience illustrates the respective roles of the various actors in the cassava value chain. Research is handled by public institutions like the Council for Scientific and Industrial Research (CSIR) or the Crop Research Institute. The latter conducts research on production, and marketing. The public sector is also involved in agricultural extension and technical advice operations, through the Ministry of Agriculture and Food; however, a new approach seeks to give private actors a larger role in delivering technical advice and extension services (Djigma, 2011a). Cassava production is largely in the hands of small-scale producers. It is a flexible crop adapted to variable climatic conditions and can easily be grown even in low fertility soils, as it requires little or no fertilizer (Djigma, 2011a). Downstream, a larger number of small and medium enterprises handle cassava processing and marketing.

Cassava value chain development hinges on a dynamic processing segment. Options can include, on the one hand, better serving local market demand through a steady supply of *gari*, and on the other hand, developing high value-added processing for cassava starch¹⁰. This twin-track value chain strategy would require active involvement of several actors. First, the state can take the lead in improving deficient road infrastructure, which is a key obstacle. The state also has a role in promoting a transparent information system to encourage competitiveness along the value chain and attract more actors from the private sector.

Another key objective for the cassava value chain development is to promote better processing that will add value as well as reduce the large post-processing losses¹¹. This is squarely in the domain of private actors, who can mobilize expertise and technical capacity. In the area of research, both to stimulate productivity (research for new varieties and production processes) and develop new processing technologies, a strong relationship between the public and private sectors seems more suitable.

The role of producers and their organizations is also crucial in the cassava value chain development strategy. They must benefit directly from productivity-enhancing support and from the research findings. Through strong and self-reliant organizations, cassava producers can better leverage or access needed credit and marketing opportunities for their supplies or through sub-contracting arrangements (with processors, finance agencies, etc). In the end, the success of Ghana's cassava value chain development

¹⁰ As stated in the Medium-Term Investment Plan, which seeks to modernize agriculture in Ghana, including the cassava sector.

¹¹ It is now estimated that post-processing losses amount to about one third of the production.

strategy hinges on how effectively producers are integrated into the supply chain, whether for local or export markets.

Clearly, cassava value chain development in Ghana, and elsewhere in West Africa, must focus on creating the right dynamics within the sector to allow market-determined cassava by-products to be produced and commercialized. While local and regional markets are the dominant drivers, export opportunities may also develop and thrive as a result of a more dynamic cassava value chain. However, as the experience described clearly demonstrates, focusing solely on the export segment of a predominantly domestically-marketed commodity is not efficient. What is required is a focus on getting the fundamentals of the staple value chain in place. Market segments (whether local, regional or international) will follow as opportunities present themselves.

B. The maize sector in Burkina Faso: Obstacles and opportunities for a developing multi-market value chain

Maize is an important crop for food and nutrition security throughout West Africa. Burkina Faso, one of the key maize producers in the region, seeks to develop maize from subsistence to cash crop and to meet both the domestic and export markets. Indeed, since 2005, maize imports have been declining while exports are rising (Djigma, 2011b). Over the same period, maize market penetration reached nearly 75 percent of production in 2008 (Boone et al., 2008). The maize sector in Burkina Faso faces the usual constraints of a staple crop on the verge of becoming a fully-developed market-oriented value chain.

Maize potential is enormous, owing to its adaptability to various local conditions and also to the multiple market opportunities for food consumption, animal feed or industrial uses (via starch). The multiplier effects for the local economy, jobs and agro-industrialization are also substantial. However, to achieve the full potential of maize value chains, a number of constraints and bottlenecks must be removed. For producers there are two key constraints to overcome: insufficient access to credit for inputs to raise yields and productivity, and ineffective handling of maize surplus marketing that could be both efficient and remunerative. These constraints also require effective instruments to reduce risks (in production and marketing) and price variability.

The potential and the constraints for maize require a different value chain model than the ones that have prevailed for export commodities. In the case of maize (and other similar staple foods), whose production, processing and marketing are largely in the hands of private actors, the optimal value chain model must be multi-actor and based on coordination rather than on full vertical integration. In this model, the government plays a critical – but only supportive –role. Some of the current interventions (partial subsidies for fertilizers, direct purchases for national food security storage through the National Security Stocks Management Company (SONAGESS), price subsidies to deficit regions) could be revised or improved while other interventions could be strengthened (support for research and dissemination of improved seeds through the Institute of Environment and Agricultural Research (INERA), extension services and capacity building, construction of a better legal framework for commercial transactions, price and market information).

Maize marketing and processing is also dominated by a large number of small-size players with limited capacity for upscaling or for introducing productivity-enhancing technologies. Maize is collected off-farm by numerous collectors of various sizes who sell to wholesalers, who in turn deliver the maize via independent transporters to secondary or urban markets. Downstream in the value chain, maize marketing is hindered by weak legal protections and the resulting lack of transparency. As a consequence, maize markets remain

informal, operating without the support of an open and transparent market information system that could smooth out the transactions (e.g. in terms of weight, price and product quality). Moreover, the inadequate infrastructure, along with onerous customs and administrative procedures (including excessive red tape and corruption), keeps the unit transportation costs too high and hinders regional trade.

Maize processing (milling) is handled by a large number of milling operations. Small-scale milling is geared to meet farm maize consumption, while milling by the few large industrial mills is aimed at urban markets (Djigma, 2011b). To encourage more agroprocessing for maize, specific initiatives can be taken by the government, such as credit facilities for small and medium-sized millers to upgrade their capacity and their technologies. There is also a need to increase the processing capacity for maize to meet the growing domestic urban market. This should be private sector-led, with appropriate incentives from the government whose role is even more critical in fostering a favourable environment for facilitating maize trade locally and regionally (across borders).

On the production side, resolving all the various constraints faced by smallholders requires the presence of strong and credible producer organizations, capable of meeting the needs of their members. Properly structured and properly managed they can facilitate producers' access to funding and loans and quality inputs and also help facilitate producers' training and technology transfers (Djigma, 2011b). In Burkina Faso, producer organizations have a long way to go before they become effective and credible economic players. Starting in the 1990s, they emerged as a substitute for the retreating state in providing support to farmers (input procurement for producers, extension and technical advice, product marketing, etc.). Yet these organizations were, by and large, highly ineffective in performing these tasks as a result of both internal (governance, structures, overly broad objectives) as well as external (unsupportive environment) factors. Even the cooperative law (n°014/99/AN), which attempted to anchor the producer organizations along specific value chains and with an economic purpose, did not help much as they were better structured to advocate than to deliver tangible services to their members. These weaknesses are slowly being recognized and a new generation of cooperatives and unions are developing that recognize the importance of providing economic services for their members, which forces them to be narrowly focused along specific value chains.

In Burkina Faso, cereals have been represented by a quasi-interprofessional body, the Interprofessional Committee on Cereals and Nibbe (CIC-B), which is supported by the state and mandated to play the role formerly held by government agencies. In principle CIC-B is open to all players within the cereal sector (producers, processors, transporters and traders, and service providers), but its structure continues to be dominated by a few producer organizations and by a hierarchical leadership. Consequently, the broad coverage of its mandate (all cereals except rice) and the uneven representation of value chain actors have limited the effectiveness of the CIC-B to play the traditional role of a value chain interprofessional committee.

Access to inputs (improved seeds and fertilizer) and credit remains the key impediment to enhanced yields and productivity. The development and distribution of improved seeds is led by the state, though there is room for effective PPPs. For example, the direct subsidy of fertilizer by the government is highly inefficient, partial and financially unsustainable. More effective alternatives could include private schemes, such as the use of warrantage as a means to secure loans for inputs or other income-generating activities. A warrantage credit system consists of an agreement between a financial institution and a group of producers, by which credit is extended in exchange for placing cereals or other marketable products in storage for a period within a season. The loan is provided for use in an income-generating activity and should be returned with interest or the stored product can be forfeited to the bank, which can sell and keep the proceeds as payment for the loan. Loans are provided to individual farmers but the organization offers collateral.

Since its introduction in Niger by FAO in late 1990's, warrantage has attracted interest and is being promoted in various cereal-producing regions in West Africa. Currently, warrantage is being applied by a growing number of cereal-focused producer organizations in Burkina Faso. However, warrantage has its own requirements and conditions for success. Among these conditions are: (1) well-informed and trained farmers; (2) proper storage facilities; (3) existence of storable products; (4) sufficient volumes of good quality offered for storage; (5) cyclical variation of prices; (6) availability and level of credit; (7) stock controls; (8) proper farm accounts to determine effective surpluses by participating farmers; and (9) effective monitoring of the stocks. Producer organizations that have practiced warrantage are still going through a learning curve to ensure that all these conditions are satisfied.

Marketing surplus maize by farmers also requires organization among farmers, as well as proper structures to generate and disseminate market and price information, and effective instruments to manage and mitigate production and marketing risks. Developing a transparent market information system requires a solid institutional base to ensure openness, usefulness, accessibility and sustainability. Such a system should assist producers and value chain actors to better plan maize sales, negotiate effectively with buyers and manage stocks between surplus and deficit regions. The system should also assist the national authorities to plan for purposes of national food security. Critical information needed by maize value chain actors would include: maize quality; quantities by zone; varieties; retail and wholesale prices; stocks; transport costs and availability; prices at local, regional or international markets; and techniques for production and processing, as well as information on relevant laws and regulations, including rules and conditions for access to credit, inputs, etc.

Currently, several types of information systems exist that are fragmented and often unusable by the actors (both in terms of timeliness and information channels). A multi-stakeholder scheme for market information can be devised and preferably housed within a maize- dedicated interprofessions. Such a system must also be self-financed and anchored in a structure that can ensure proper monitoring and evaluation. Thus, a multi-stakeholder, privately-led system that is self-financed and geared to be widely available to all value chain actors is most suitable. Financing such a system on a sustainable level could include: (i) fees for service by information receivers; (ii) fees for participating and benefiting producer organizations, NGOs, cooperatives or others; and (iii) charges per use of mobile phones to receive information. Clearly, in order to be developed and fully operational, such a system would require protocol agreements involving multiple players, such as the maize interprofession, telephone carriers and all interested players within the value chain, as well as support from the state.

5. Conclusion

This paper examined three major value chain models prevalent in West Africa, using a historical framework for policy and institutional analysis with the aim to draw lessons for a new and suitable staple food value chain model.

The analysis of three case studies from traditional export commodities revealed the following salient conclusions: that poor governance can have a negative impact on competitiveness and productivity over the long run and that internal or external drivers cumulatively combine to reduce competitiveness of the sector and lead to its eventual demise. In all three cases analysed, state control of the value chain undermined the incentives for sustained investments and prevented research into productivity-enhancing technologies to improve yields, prevent reduction in soil fertility or make more efficient use of limited resources. State

agencies also suffered from an erosion of qualified technical and managerial talent, depriving them of the ability to carry out analysis, forecasting and planning, and resulting in poor decisions and myopic views of the value chain and future trends. Likewise, weak roles played by producers and their organizations were evident in most cases (even when producers were organized, as in Mali and Senegal). Without strong, capable and competent organizational leadership it is hard to ensure sustainably strong performance within the commodity value chain. Consequently, good and inclusive governance should lead to better long-term planning, especially if key players are involved. Agroprocessors need to coordinate among themselves and explore win-win opportunities with state agencies and credible producer organizations to forge contractual buyer-seller arrangements. Strengthening producer organizations to acquire economic and market credibility is an essential step toward value chain development.

For high-value export commodities run by the private sector and tied to global value chains led by retailers in high-income countries, the main lesson is that when the states do not interfere but allow the private actors to coordinate freely among themselves, they usually perform much better than when the state is in control. Examples of growing export markets and captured market shares can be found in West Africa. However, in each of these cases, the system is unfavourable to small-scale producers, who wind up marginalized. Greater opportunities exist for high-value products that have a sizeable outlet in the domestic market. In these cases, there are greater opportunities for agribusinesses to forge contractual or out grower schemes with farmers. However, evidence shows that actual cases of this kind remain few and far between and that more can be done to foster stronger supply/buy partnerships between agribusiness and smallholders.

What do these experiences say about staple food value chains such as maize and cassava, two critically important commodities in West Africa on the verge of becoming major cash crops serving the vast domestic and regional market? Staple food value chains (such as maize and cassava) can serve several important market outlets, all of which are potentially huge (food, feed and industrial use). In these value chains, the contribution of the state, though critical, is vastly different from the type of interventionism that prevailed (before its demise) with the export commodity models.

What follows are a set of recommendations on how to rebuild food value chains in West Africa, ensuring that they can be both competitive and inclusive of smallholders.

Recommendations:

Rebuilding the traditional export commodity model:

1. Strengthen risk-management capacity for farmers: this involves providing insurance, transparent and actionable market information, and technical, managerial, financial and leadership training.
2. Promote further processing to add value: work with agroprocessors and finance agencies under PPPs to coordinate investments in infrastructure, research, productivity-enhancing initiatives and training to raise the technical capacity of agribusiness managers and staff and to facilitate procurement from farmers.
3. Develop more transparent and inclusive governance: this requires promoting powerful, competently-led interprofessions and producers' organizations with qualified leaders who are well-informed and competent to best articulate the needs of the farmers and to bargain for win-win solutions with other value chain stakeholders. Good governance is built on the basis of empowered parties; this takes time but needs an enabling regulatory and institutional framework to build strong cooperatives and producer organizations capable of integrating the entire value chain interprofessions.
4. Clearly delineate the role of the state as that of regulator and facilitator but not direct manager of market operations and activities: the state must support the laws and regulations and provide the right incentives to allow private actors to coordinate their actions to create greater value along the

supply chain and share more widely in the added value.

5. Strengthen the economic capacity of producer organizations: while membership should focus on merit and active participation (and payment of dues), focus should be placed on ability and capacity to deliver economic services to the members and not simply on the function of general lobbying of the government to provide assistance to poor farmers.

Non-traditional high-value export commodity model:

1. Establish that the role of the state is to maintain and strengthen regulations to support high quality and standards.
2. Facilitate greater coordination among value chain players to enhance competitiveness of the export market; this is a role for the state.
3. Promote domestic demand to encourage more participation by smallholders and to compensate for their marginalization from the export market.
4. Facilitate farmers' organizations, enhancing their ability to bargain effectively, and to have greater access to information and technical, managerial and leadership training.
5. Encourage coordination between farmers and agroprocessors and facilitate opportunities for contractual arrangements.
6. Sponsor multi-stakeholder forums, fairs and other meeting opportunities to bring all stakeholders together to forge new relationships and business partnerships; this can be facilitated by the state.

Constructing the staple food value chain model:

1. Support research, development and distribution of improved seeds; this is a key role for the state.
2. Support and reduce the cost of credit for strategic staple food value chains that need special assistance, through credit rates.
3. Support a fertilizer supply strategy based on facilitating procurement, storage and distribution to reduce the cost to small farmers and enhance availability and timely access; the state should also strengthen the controls for fertilizer quality and ensure that information on fertilizer use by crop is fully transmitted to producers.
4. Reduce marketing risks by supporting private-led multi-stakeholder schemes to generate and distribute the needed market information to producers and value chain actors; such a market information system must be demand-driven, mostly self-financed and durable (i.e. sustainable).
5. Encourage warrantage credit system by co-financing storage for producers' organizations.
6. Harmonize marketing and trade policies to encourage local and regional trade in staples.
7. Provide support to producer organizations to become effective economic players; specifically, this would entail: (i) improving ability to negotiate credits and finance; (ii) improving capacity to conclude contractual arrangements with agribusinesses, including outgrower schemes; (iii) strengthening internal leadership capacity and governance to ensure enhanced role in the interprofession; (iv) training farmers in improving quality of products supplied, especially to agroprocessing with high quality requirements; (v) subsidizing technical managerial training for specific value chains and products.
8. Promote PPPs, which can take several forms within the staple food value chain model; specific actions include: (i) institutionalize dialogue between public agencies and private actors to break down mistrust, delineate the role of the state versus the private sector and build on new partnership opportunities for collaboration; (ii) ensure effective participation of all-inclusive private actors and producers during policy formulation and implementation; (iii) resist allowing the state to pick winners and losers among sectors or to push for a particular market segment (a typical bias of ministries and public agencies is to favour export commodities over products for domestic markets; instead the state should allow market forces to determine which opportunities and value chains to develop – whether for domestic demand outlets or for exports to regional markets or beyond).

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Annexe 1. A few parastatals and their functions

Country – main value chain(s)	Institution	Roles and tools
Cameroon – Cotton, Coffee, Cocoa	Office National de Commercialisation des Produits de base	<ul style="list-style-type: none"> • Infrastructure maintenance • Provision of inputs • Determines producer buying price • Cotton, cocoa and coffee export monopoly • Taxation of products • Issues export visas
Côte d'Ivoire – Cotton, Coffee, Cocoa	CAISTAB	<ul style="list-style-type: none"> • Determines prices along the value chain according to a rating grid • Production quality control • Taxation of production • Stabilizes transport costs • Production marketing • Distributes export quotas • Anticipated average sales Programme
Ghana – Cocoa	Ghana Cocoa Marketing Board	<ul style="list-style-type: none"> • Production quality control • Stabilises producer buying price • Buys production from producers through the <i>Produce Buying Company</i> monopoly • Export and local processing monopoly • Export Taxation
Mali – Cotton	Compagnie Malienne pour le Développement des Textiles	<ul style="list-style-type: none"> • Provision of inputs and credit • Provision of public services around production (agricultural training, provision of equipment, agricultural research) • Maintenance and construction of rural roads and infrastructure • Administrative fixing of producer prices • Imports / Exports control through the Société Malienne d'Importation et d'Exportation
Sénégal – Groundnut/ Oilseeds	Office National de Coopération et d'Assistance d'Aide au Développement (jusque 1980) puis Société Nationale de Commercialisation des Oléagineux du Sénégal	<ul style="list-style-type: none"> • Provision of equipment • Subsidised prices and inputs • Determines production prices • Processing monopoly • Marketing monopoly • Groundnut export monopoly • Supervision of Agricultural Cooperatives

Sources: Courade *et al.*, (1991), Tefft (2004), Conte (2004), Akiyama *et al.* (2001), Kaminski (2001), Yiriwa Conseil (2001)

Chapter 3

Analytical review of national investment strategies and agricultural policies for the promotion of staple food value chains in West Africa

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1. Introduction

Agriculture is one of the fundamental sectors for the economy of West African states. It accounts for about 35 percent of the Regional Gross Domestic Product and for 15 percent of export earnings; this can reach 30 percent if we exclude Nigeria. In some countries such as Guinea Bissau, agriculture contributes over 60 percent of national wealth creation (GDP and export earnings included). Some countries' economic soundness depends on the strength of their agricultural sector. This is the case for Côte d'Ivoire, which alone contributes about 53 percent of export earnings creation from agricultural products of the Region.

The main source of employment in the West African Region is agriculture. In fact, over 65 percent of the population works in the agricultural sector. More than half of them are women and more than two-thirds are young people. They operate mainly in family farms with an average plot size of around one and a half hectares. These farms provide more than 80 percent of the food needs of the Region.

However, the West African agricultural sector remains highly vulnerable to internal and external shocks. Internal shocks comprise the effects of climatic hazards (drought, floods), poor water management, attacks from predators, inadequate or absent technical, economic and financial services for small family farms. These recurring problems are exacerbated by the inadequacy or incompleteness and failures of public policy.

External shocks are mainly due to the destabilizing effects of agricultural policies in the North, including grants and other support to agriculture and dumping practices. Other factors such as those related to international trade rules, including the fact that the Agreement on Agriculture is quite averse to small farms, should also be taken into consideration. Indeed, as pointed out by Jadot, 1998, "The Agreement on Agriculture, in its essence, is much more *"favorable to intensive farming of the developed countries"*, than to smallholders and extensive farming in developing countries. Despite including a special and differential treatment, the Agreement on Agriculture is basically an update of the "Blair House" one reached between the United States and Europe. It considers "agricultural policies within a framework of sectors strongly influenced by liberal thought. Thus, agricultural policy tools are understood in terms of their more or less negative impacts on international trade rather than in terms of the objectives they seek to achieve (food security, rural employment, land use planning)" (Solagral, 2011).²

This largely explains the current characteristics of the West African regional agricultural sector, marked by one of the lowest levels of human productivity in the world. Certain crop yields are in certain cases ten times lower than those in Northern countries. Production growth is a result of the expansion of cultivated areas rather than yield increases. Over the last 20 to 25 years, the general trend in production growth is due to an increase in area while yields are almost constant (except for a few cases, such as rice in the Office du Niger). In the case of cereals, the increase in production is due to the doubling of acreage, while yields only rose by 14 percent (FARM, 2008). For tubers, between 1980 and 2000, production volumes were multiplied by seven while area expansion multiplied by nine.

Inter-annual production variations can be considerable and happen in a context marked by weak or inadequate storage and conservation facilities. This results in essential characteristics that are the mark by West African agriculture: the strong variation and volatility of commodity prices in general and food products in particular.

² Solagral, 2001, *Libéralisation commerciale et sécurité alimentaire*, working paper, 5 pages

Low productivity and high variation and volatility of prices have resulted in loss of market shares for products for which Africa had a clear comparative advantage. Southeast Asia emerging countries now challenge Africa. Thus, during the last thirty years, Africa has seen its "world market share of cocoa bean drop from 80 percent to 67 percent, coffee down from 26 to 15 percent and cotton go from 30 percent to 16 percent" (OECD, 2001). The same report states that the loss of revenue emerging from this market share has not been offset by the profits made in other sectors. Instead, we witnessed a contrary phenomenon "*between 1965 and 1985, the ratio of manufactured goods/total exports fell from 7.8 percent to 5.9 percent in sub-Saharan Africa, while it increased from 28.3 percent to 58.5 percent in South Asia*" (OECD, 2001). The situation has significantly deteriorated since then, as evidenced by the effects of the 2007-2008 food crisis in West Africa, the increase in the number of vulnerable people and higher imports of foodstuffs, including rice.

Similarly, West Africa which was the undisputed world leader in the production and exports of oilseeds during the 1960s and 1970s, now ranks behind Asian countries, and has also become a net importer. This situation contributes to worsening Sub-Saharan Africa's trade balance deficit.

This poor performance largely explains the very high prevalence of poverty. It affects approximately 30 percent of the population of the Region, and more than 60 percent of rural people, mostly farmers. Food insecurity affects about 17 percent of the 300 million West Africans. Approximately 40 million people are chronically affected by it, with peaks of 45 to 50 million in some years.

This poor level of performance of the agricultural sector contrasts sharply with the potential and strengths of the sector (large availability of arable land: less than 40 percent of the regional potential is farmed per year, less than 15 percent of the potential irrigable land is developed) and the rise of better organized actors both at national and regional levels.

Similarly, developing the agricultural sector has always played an important role in the well-known economic policies of the Region. In almost all countries, agriculture is considered the engine of economic and social development. However, one may wonder how far-reaching and effective the adopted policies and strategies have been. Indeed, regional agricultural policies have alternated from strategies in which the state ruled over the whole sector, to severe retrenchments where public action in the agricultural sector is small (on average 4 percent of public investment budgets are devoted to agricultural development in the Region). It is therefore no exaggeration to say that for a long time, agriculture has not benefited from real development strategies or long term supported incentive and regulation instruments. It is true that the situation varies from one culture to another and from one country to another. If staple foods do not seem to have attracted sustained attention, the same cannot be said about export crops such as cocoa, pineapple and banana in Côte d'Ivoire, rubber in Liberia, and to a certain extent, cotton in Benin, Burkina Faso and Mali.

Fortunately, the early 2000s seem to mark a turning point with the return to public policy marked by a real burst of willingness to start transforming the sector:

- a. In a sort of mea culpa, the World Bank, observing the limits of liberal policies undertaken during the 80s and 90s, has rightly suggested in its World Development Report, (2007 edition), the return to more dedicated public policies to i) improving the functioning of local and regional markets, ii) secure land tenure and access to water and iii) developing collective actions to reduce production and transaction costs for family farms.

- b. Heightening the regional integration process, leading to harmonizing sectoral policies (adoption of the Common Agricultural Policy of the Union, the Agricultural Policy of WAEMU in 2001 and ECOWAP / CAADP of ECOWAS in 2005). All these policies have strengthened numerous agricultural development strategies developed and started by intergovernmental organizations such as the Permanent Interstate Committee for Drought Control in the Sahel and the organizations responsible for the management of large river basins (Liptako Gourma, the Organization for the Development of the Senegal River, the Niger Basin Authority, the Lake Chad Basin Commission, etc.).

The agricultural policy of ECOWAS, ECOWAP / CAADP strongly emphasizes the development of family farms. Its vision states *“agricultural policy is designed to meet **the objectives of a modern and sustainable agriculture, based on the effectiveness and efficiency of family farms** and the promotion of agricultural enterprises through private sector involvement. While being productive and competitive in the intra-Community market and international markets, it must ensure food security and provide a decent income to its working population”*.

In its operational phase, the ECOWAS's agricultural policy has a regional agricultural investment plan incorporating policy instruments whose goal, in essence, is to help boost regional agricultural production, regulate the functioning of the market and provide better access to food for vulnerable populations. These instruments, accompanied by an operational structure and financing mechanisms, are supposed to address bottlenecks faced by small farmers effectively. They entail production incentives, market regulation and vulnerability management to improve vulnerable groups' access to food.

In support of this policy's implementation, national investment programs and a regional agricultural investment program have been developed and adopted by mutual agreement with all the technical and financial partners and socio-professional organizations. The Regional Investment Program has three main objectives: i) promoting strategic products for food sovereignty and security (maize, rice, cassava, livestock and livestock products), ii) promoting a favorable environment for regional agricultural development, and iii) reducing vulnerability and promoting sustainable access to food for the population at large.

WAEMU's agricultural policy, PAU, promotes a number of agricultural sectors: rice, corn, livestock and livestock products, oilseeds and cotton. PAU aims not only to develop a number of incentives such as small-scale irrigation and crop insurance, but also proposes to set up cooperation frameworks for the selected sectors.

The fundamental question is whether these policies and policy instruments are able to *“promote positive development of sectors favoring small farmers. Are these policies able to help restructuring professional agricultural organizations in order to promote synergies between their initiatives and the private sector to overcome some of the endemic constraints faced by small farmers such as supply of inputs and access to markets?”*

1.1 Survey questions

Several specific questions form the basis of this study:

- a. “What actions, initiatives and mechanisms are put in place by policy makers for better economic restructuring of cooperatives and CIGs specializing in food crop sectors (cereals, roots and tubers)?
- b. What initiatives have been fostered by agricultural policies that strengthen public-private partnerships to facilitate access to credit for producers and processors at the cooperative level and above?

- c. What does (or should) the state do to better regulate the sector and umbrella organizations to enable them to better fulfill their role within sectors in an integrated manner?
- d. What assistance must agricultural policy provide in order to better develop and distribute the necessary information to actors within food crop sectors?"

1.2 Objectives of the study

The general objective of this work is to undertake a review of national and regional investment policies and their impact on basic sectors in West Africa. Specifically, the study aims to:

- c. make an inventory of the state of development of national policies and investment strategies for agriculture, deployed by the countries of West Africa, particularly in relation to Pillar II of the CAADP process on developing competitiveness of the agricultural sectors and market access, and strengthening the capacity of professional and farmer organizations.
- d. examine the role that national policy can play to better facilitate improved restructuring of producer organizations given the specificity of the different commodity sectors. What types of training and assistance seem more likely to improve cooperatives' / CIGs' economic and technical capacity, including appropriate regulation of the different umbrella organizations throughout the value chain (regulating the ethical framework of transformers and agro-industry) and support marketing of surplus production?
- e. analyse through concrete examples of commodity sectors, the means by which policies, investments or public-private initiatives can help remove bottlenecks in one or more stages of the commodity sectors, including capitalization constraints, access to means of production and marketing of products at remunerative prices.

1.3 Methodological approach

This study is mainly based on a literature review of policies and strategies for agricultural development of West African countries. These policies and strategies are not only numerous and diverse in their essence, but also tend to change according to circumstances and economic policies that governments are faced with. Similarly, basic policies are rarely coherent with different emergency plans, as those adopted and implemented during the food crisis resulting from soaring commodity prices that began in 2007-2008.

However, since 2003, with the commitment of African leaders to allocate at least 10 percent of the investment budgets of their respective countries to the agricultural sector and the adoption of the ECOWAP/CAADP regional agricultural policy in 2005, agricultural development strategies are now more in line with the concerns of stakeholders in the sector. Unlike the old policies, new ones:

- a. have been developed through a participatory approach and have resulted in a pact signed between national actors (state, private sector, farmer organizations and civil society) and technical and financial partners, accompanied by reciprocal accountability commitments. They are therefore the result of a constructive dialogue between all stakeholders and take into account the priorities of each one.
- b. incorporate better coherence between national, regional and continental levels, according to principles of complementarity and subsidiarity. There is thus a strong interdependence in terms of the strategic orientation between national investment plans, regardless of their denomination, and the regional agricultural investment.
- c. are consistent with the Regional Plan, which foresees instruments for policy incentives whose

implementation involves and requires the commitment of governments, the private sector, farmer organizations, civil society and technical and financial partners.

Therefore the methodology of this study consisted in:

- a. analysing the characteristics of the West African agricultural sector, focusing on issues relating to production, as well as marketing of different products, be it locally, regionally and internationally.
- b. critically reviewing national agricultural policies and mapping key aspects of national policies for agricultural investments that have been adopted as part of the implementation of ECOWAP / CAADP in West Africa.
- c. critically analysing policy instruments that these plans incorporate and their ability to remove bottlenecks for small producers by improving productivity and the competitiveness of their products and market access.
- d. analysing the dynamics of peasant organizations (POs) around the agricultural sectors, why some have been successful and what are the causes of some unfortunate experiences.
- e. suggesting alternative strategies that enhance and promote investment in the agricultural sector. These proposals also incorporate a set of recommendations for specific public actions to better promote private sector involvement in the financing and especially to improve the synergy between the actions of peasant Organizations and other stakeholders in the agricultural sector.

1.4 The study's limitations

The simple fact that this is a literature review means that it does not necessarily allow for a correct and complete reading of the effects of policies on agricultural development or of their impact on structuring producer organizations.

Some West African countries have not yet finalized their new investment plan in the ECOWAP / CAADP process. The agricultural powerhouse of the Region, Côte d'Ivoire has yet to complete its agricultural investment plan.

Initiatives to promote commodity sectors are numerous and include a wide range of strategies. In the context of this work, it is almost impossible to list them all and to judge their relevance. This analysis seeks to rely on a number of experiences that remarkably helped structure farmer organizations both locally – rice in Mali, Burkina Faso, Niger, Senegal, onions in Senegal and to a lesser extent in Niger, potato in Guinea and cotton and the livestock sector at the regional level.

2. Retrospective analysis of the West African agricultural sector – constraints and development strategies

Several prevailing agricultural products, some of which were firmly established at the international level, characterize West African agriculture. West Africa remains the leading world producer of cocoa from Côte d'Ivoire, Ghana and Nigeria and of yams and cassava from Nigeria. It provides more than 75 percent of the world production of cowpea. Rubber production in Liberia, Nigeria and Côte d'Ivoire is starting to be significant. However, the Region remains a very small player in cereal production (millet, sorghum, maize, rice) for which it does not even contribute one percent of world supply.

The development of these sectors has not shown a similar trend and the status of West African Agriculture on the world stage has declined, as has its performance. As mentioned above, some sectors, where Africa in general, and West Africa in particular, has a clear comparative advantage, are experiencing a significant decline in their production. The most important one is palm oil crop for which Asian countries, and especially Malaysia have taken the lead.

In the past, development policies regarding the overall agricultural sector and particular commodity sectors have consisted of a series of measures that put institutions at the center of strategies: mobilizing mostly external financial resources, setting up producer cooperatives or village groups, supplying inputs and/or agricultural advisory services, collecting products with fixed prices all over the area within two or three product categories and product placement in the international market by companies and other public offices.

Mechanisms and provisions that were put in place during colonial times have been carried on with parastatal or public institutions that ensure quality control for agricultural products mainly aimed at satisfying the international market. Producers were confined for a long time to an executive role and were only made responsible at a later date. This has resulted in both state and non-state actors weakly internalizing strategies, generally perceiving the various initiatives as a means to benefit from international aid, rather than as real projects addressing the concerns of the state and the people. This results in local actors having low ownership of projects that ceased to exist as soon as external funding stopped.

2.1 Key development issues for agriculture

West African agriculture is undoubtedly one of the weakest in the world. While progress has been made over the last thirty years, many challenges still remain, including how to:

- a. properly feed a growing and ever more urbanizing population. This is confirmed by research conducted by the Sahel and West Africa Club; in 2030, about 450 million people, of whom 60 percent will reside in an urban environment, will populate the Region.
- b. provide a decent income for agricultural workers so that they may adequately meet mankind's five basic needs: food, health, clothing, shelter and education.
- c. protect the environment in a context in which natural resources are increasingly scarce including non-renewable ones, especially land.

Agricultural policies over the last thirty years do not seem to have been able to cope effectively with the main bottlenecks faced by West African agriculture.

A. Technical constraints

a) *Little use of technological innovations*

Inputs and mechanization are still scarcely used in West Africa. West African producers still rarely rely on production inputs, thus keeping production systems in an archaic state. The level of use of inputs – fertilizers, improved seeds and other technical production equipment – is the lowest in the world. Regarding fertilizers, for example, while Western Europe is the biggest consumer with an average of 236 kg/ha, followed by Asia, Sub-Saharan Africa is at the back of the pack with an average of 9 kg/ha (David-Benz et al., 2008). Fertilizer consumption and per ha in West Africa is around 10 kg, according

to FAO. Improved seed is of the same order of magnitude.

Access to these two factors is often subject to small producers joining groups that engage in producing cash crops: cotton, groundnut, or cultivating rice or onion on hydro-agricultural developed areas. Products are often purchased on credit at very high costs. Suppliers do not always honor delivery times and product quality is sometimes questionable. Moreover, the collateral guarantee system has not prevented governance problems that generally lead to small farmers finding themselves deeply in debt.

Mechanization – be it large or small – is growing very slowly in the Region. The use of tractors remains marginal, despite a significant increase in the vehicle fleet during the last twenty years. It more than doubled between 1980 and 2003 according to FAO statistics. The Region has also received significant donations from the People's Republic of China and India and acquired a large batch in the context of production stimulus plans that began in 2008, following the food crisis born out of soaring commodity prices.

Three countries have a much a larger fleet. Mali and Burkina Faso saw their number of tractors respectively go from 115 to 2000 and from 900 to 2600 in that period of time. Nigeria alone has more than half of the ECOWAS agricultural machinery. Machinery may be managed individually (as in the case of large agro-pastoral farms, especially in Nigeria) or collectively (Cooperatives for the Utilization of Agricultural Equipment). But overall, small rural producers often have to settle for basic rudimentary equipment, which limits their productivity, although progress has been made in this area with animal traction.

Given that West African soils are fragile as they are constantly subjected to high leaching and concretions related to climate variations, the use of mechanization to boost agricultural production is still very controversial. Many experts consider that mechanization helps accelerate land and biodiversity degradation. However, population pressure and increasingly fierce competition for natural resources require an intensification strategy in which mechanization may play a crucial role.

b) Issues relating to financing agricultural activities

The third category of technical issues faced by West African agriculture is related to the low level of funding. Funding of agricultural activities is one of the Achilles heels of the agricultural sector in Sub-Saharan Africa. Public investment in the sector is particularly low, with African states only allocating 4 percent of public expenditure to agriculture (FAO, 2008).³ At farm level, the situation is even more appalling. According to FAO, 2007, a minimum investment of USD 240 per hectare would be required in Africa with approximately USD 170 coming from outside sources. The dismantling of agricultural development banks has deprived many farmers of appropriate instruments to finance their activities.

Small farmers mainly have recourse to micro-credit systems that are expanding in many countries. These systems significantly supplement agricultural activity development by financing the downstream sector, including artisanal processing activities and marketing of products. New value chains have been promoted with micro-credit and so have small businesses ensuring, in terms of gender, fair

³ In West Africa, only a handful of countries spend more than 10 percent of their capital budget on agriculture. But in many cases, the budgets of the Ministry of Agriculture are used to pay civil servants rather than to implement key infrastructure for the agricultural sector.

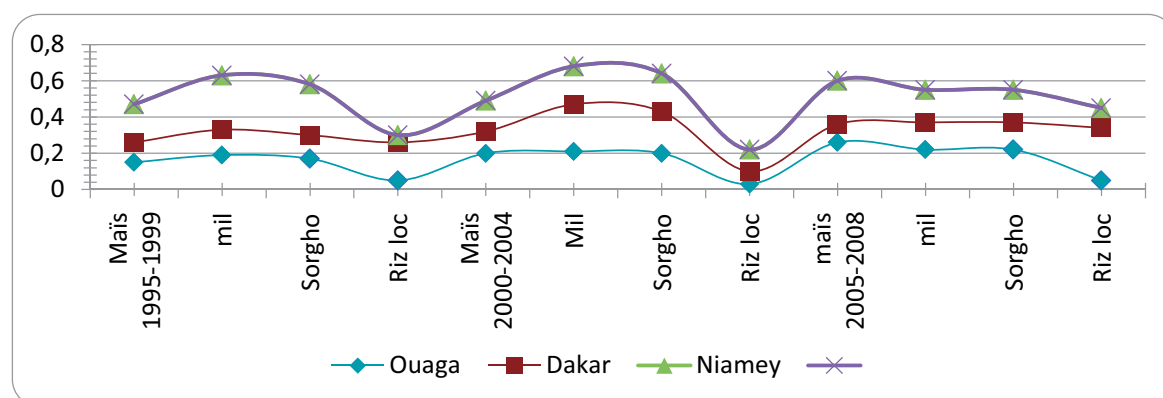
access to employment in rural areas. But microcredit cannot, by itself, transform agriculture into a real development tool. The links between micro-credit, that allows farmers to manage precariousness, and the banking system, that offers very rigid conditions to users of the sector, are missing. In order for farmers to be integrated into the market, a funding system that can manage their vulnerability to multiple shocks such as agricultural commodity price fluctuations and natural disasters (drought, flooding, etc.) is essential.

B. The imperfection of the market for agricultural products

a) Agricultural products' price volatility

Price volatility is a structural characteristic of West African agricultural markets. This instability has two components: intra-annual (between harvesting seasons and lean periods), and inter-annual, depending primarily on the level of production. Inter-annual and inter-seasonal harvesting price variations can, at times, vary in excess of 50 percent in some countries and for certain cereals.

Figure 1: Variation of consumer price index for cereals in West Africa
Examples of markets in Niamey, Dakar and Ouagadougou



Source: According to SIM/CILSS data

This price instability comes about for a number of reasons. Analysts often focus on the following two:

- Poor grasp of production techniques, including irrigation and storage. Less than 15 percent of arable land is irrigated. This means that cropping systems are highly exposed to natural shocks, floods, drought and deteriorating soil fertility, and cannot ultimately control the supply. Weak mastering of conservation and storage techniques and all kinds of predator attacks can be added to this. For some products, post-harvest losses can at times exceed 30 percent.
- Low levels of transformation, adding value and standardization of agricultural and food products are also a constraint to their movement at the regional level. On-farm consumption prevails – more than 60 percent of consumers are rural producers – and explains for the most part low levels of production transformation/development. Although artisanal food processing is growing at a rapid pace (Bricas and Broutin, 2005), local products are yet to benefit from large-scale processing according to international standards. Consistent quality of processed products is rarely guaranteed. Thus the movement of summarily processed goods is often limited to meet ethnic consumer niches (local, regional or international) or to simply meet food safety nets for vulnerable populations. This is the case of gari in Benin and of the Cameroon style cassava sticks, and limits the expansion of transactions.

b) The incompleteness of domestic and regional markets:

An endogenous integrated market stems from regional trade of agricultural and food products and enhances agricultural development. In West Africa, official statistics show that intra-community trade only covers about 15 percent of the total value of transactions in the Region. Several reasons may explain these limited local and regional food products transactions:

- The sectoral focus and structure of national economies, particularly strong similarities in product supply. Both local and regional production are very similar and barely altered by the seasonality of certain commodities' production⁴. If West Africa can boast it has varied agro-ecological zones which allow for a wide range of complementary products such as cereals, tubers, legumes and animal products, other African economic groupings such as CEMAC face a much bigger problem. Most countries in West Africa produce maize, which with millet, sorghum and live animals are the products that are most exchanged in the Region.
- Insufficient information for stakeholders, including small family producers on market opportunities. Despite the boom in new information and communication technologies and several information systems being in place, there are problems linked to information on the functioning of the market at all levels, whether local or regional. Small producers, generating most of the offer, which is subject to market transactions, are particularly affected and their inability to meet market demand (regular supply, product quality, poor knowledge of the level of demand) is in part related to their lack of access to information.

C. Failures of the regulatory environment

These are characterized by several prevailing phenomena that greatly hinder the performance of both local and regional trade: the gaps in services and transport infrastructure, corruption and red tape. Territorial networks and regional connections in transport infrastructure are the most obsolete in the world despite government efforts in recent years. The lack of maintenance has contributed to many facilities rapidly deteriorating, making the cost of transporting goods very high. In addition, illegal taxes levied on goods affect the price and travel time (Dupaigre et al, 2008). According to an ECOWAS study in 2000, there were illegal toll roadblocks every 14 kilometers on the Lagos-Abidjan axis and roadblocks every 5 kilometers on the Cotonou-Lagos stretch of road (120 km).

On top of these abnormal practices, which are real trade barriers, even within countries, many administrative barriers (abusive taxation, influence peddling, red tape) and the corruption of public officials (including justice and financial authorities) increase transaction costs.

Box 1. Transborder trade and transport costs in West Africa

The Director of Transportation Trade Hub, Niels Rasmussen, has said: "It takes about USD 4 800 and between 13 and 22 days to move a container from a ship anchored in the port of Tema (Ghana) to the importer located in Ouagadougou (Burkina Faso). To move a container in the United States over the same distance, for example, from New York to Chicago will cost approximately USD650 and will take only five days. This is all the more remarkable when you consider that labor costs in the United States are 25 times higher than in West Africa".

⁴ Off season crops increasingly counter the unchanging pattern of agricultural supply in some countries: for example, potato in Sahelian countries which mainly produce cereals.

2.2 Evolution of development strategies for agriculture in West Africa

The agricultural sector's development is one of the pillars of national agricultural policies in West Africa. However, the strategies underlying these policies have evolved depending on ideological orientations and government concerns. They involve different strategies as to where to focus funding, how to assist producers as well as considering targeted products and forms and methods to allocate essential inputs, such as fertilizer, seeds, small equipment and rural credit. Schematically we can distinguish two major phases of evolution.

A. The post-independence phase

This period, which spanned the 60s, 70s and 80s, was marked by a sector development policy and was based on remains and practices inherited from the trade economy. The period also coincides with the first Yaoundé Convention within EU/ACP relations which was very favorable to developing products for European industry, particularly in France. It enabled to develop five major agricultural sectors: groundnut, oil palm, coffee, cocoa and cotton. Public offices, continuum of colonial societies, specialized in managing these products in each country.

These intervention companies organized producers into cooperatives or village groups and value chains were structured around marketing and, at times, primary processing of products. They provided inputs on credit to farmers, would collect production at administered, pan-territorial prices and gave very small profit margins for producers. Producers played a simple executive role, exacerbated by their lack of organization and keeping their structures limited to the village level. In this system, farmer organizations were never prime contractors in the implementation of projects, programs or sub-programs carried out during that period. This era helped boost production of groundnut (Nigeria and Senegal), palm oil (Benin, Ghana and Nigeria), coffee and cocoa (Côte-d'Ivoire, Ghana and Nigeria) and cotton (Benin, Mali, Burkina Faso).

In practice, while coffee and cocoa have benefited from heavy investments and promotion of large growers, other agricultural commodities were confined to very fragmented smallholder production. Coffee and cocoa in Côte-d'Ivoire, Nigeria and to some extent in Ghana, rubber in Liberia reflect this strategy aimed at promoting economies of scale in agriculture. We note that this strategy has long overshadowed developing processing that would undoubtedly have been a powerful motivating factor in strengthening these sectors.

However, cash crops such as groundnuts and cotton have benefited from a slightly different strategy, which was based on small family farms and small and medium-sized primary processing units controlled by international companies. But the absurdly low prices offered to producers, who were at times forced to work in collective fields and to function within communitarization structures to pool access to certain production inputs, have not allowed these sectors to withstand various shocks.

Food crops received less sustained attention, even if heavy investments were made to promote certain products such as rice. In fact, during this period, large irrigation systems were constructed and were primarily intended for rice production (conversion of the Office du Niger in Mali, initially set up for cotton production, adjustments of the SAED in Richard Toll in Senegal, Jigawa, Kano and Sokoto in Nigeria, Malanville Benin, Niger valley in Niger, etc.).

Other food crops were developed through varietal research and chiefly through promoting market regulation offices (storage, administered marketing prices) and this became important as of the second half of the eighties, following famine crises that shook the West African Sahelian Region. This strategy has especially helped to start involving producer organizations in marketing certain commodities, along with setting up cereal banks and other collection operations and product sales. However, the scope of these local marketing units was too small to play effectively the role and function that the government gave them, namely, to regulate the market. In certain areas, they did mitigate food shortages and lean periods.

Some major lessons emerge from the development strategy of this period that stem from carrying out ineffective and inefficient policies.

Sector development strategies failed to improve crop productivity significantly crop productivity, which remains among the lowest in the world.

- a. They failed to improve the position of West African products on the international market. Worse, this has resulted in deteriorating terms of trade that have not only contributed to the impoverishment of farmers, but also to the increasing marginalization of the Region in the international arena. The Region contributes only about 0.2 percent of global trade transactions.
- b. They never succeeded in transforming or promoting farmer organizations so as to make them fully fledged partners or interlocutors of other agricultural stakeholders. They have rather confined them to the simple role of basic foils and underlings.
- c. Finally, they have failed to have agriculture fulfill its primary function, which is to guarantee the food security of the population. West Africa has become a net importer of food products including grains and offal, foodstuff for which the Region has significant untapped potential.
- d. However, these strategies have shown how much political will is needed to promote agricultural development in general, and sectors in particular. Sectors that have benefitted from various incentives have reaped substantial gains in productivity.

B. Change in the 90s and 2000

Structural reforms during the 90s, following the implementation of structural adjustment programs, particularly hurt West African agriculture. Instead of having reforms to promote this sector that mobilizes nearly two-thirds of the assets of the Region and provides more than one third of the wealth, they removed the meager subsidies governments allocated to agriculture through services that aimed at loosening bottlenecks.

Among other characteristics, reforms have resulted in transferring a number of functions previously performed by the state to the private sector and to farmer organizations: supply and distribution of inputs, farm advisory and extension services, management of primary collection and marketing of agricultural products, etc. The sovereign functions devolved to the state (orientation, regulation and control) are inadequately provided given the significant lack of financial and human resources.

The withdrawal of the state has been accompanied by the liberalization of trade policies: (i) internal liberalization on the one hand, abolishing public marketing monopolies, recognizing private operators, scrapping administered and pan-territorial prices, and (ii) external liberalization on the other hand, with reducing, or even eliminating, customs protection for many products in certain regional economic groupings such as the WAEMU.

The results for this period of deep reforms of agricultural and trade policies are somewhat modest and mixed. The transfer of skills to the private sector and POs was restricted for sectors mostly supervised by the state, usually for export (coffee, cocoa, cotton). Given the economic challenges facing these sectors (sources of foreign exchange), the state has kept some functions to mark its presence:

- a. Shared management with the private sector and POs of fertilizers and improved seeds supply and distribution system. Intermediary and consultation structures, including inter-branch organizations, have been established to promote dialogue between the different actors. These structures have been allowed to implement effectively financing mechanisms that enable managing of critical sector functions: maintaining asphalt and dirt roads, agricultural extension, research, etc. The management of the cotton sector in Benin, Mali and Burkina Faso largely applies this approach.
- b. Market regulation, marked by managing collecting production and sales on international markets, with fixed prices for transferring inputs to producers and for commodities collected. Prices indexed to international prices weighted by production costs and other expenses were subject to negotiation between the various players in the inter-branch organization.

Hence, public policy gave priority to the logic of projects and to many different initiatives, driven mostly by donors, international organizations and non-governmental organizations. As there were no clear incentivized policy instruments implemented in regard to production or marketing of food crops, these were neglected, thus increasing the Region's dependency on external food supplies (food aid and imports). From 2004 to 2006 (before the price increases on international markets), cereal imports accounted for USD 2.8 billion annually in ECOWAS, or 39 percent of food imports. Over the past ten years, this has increased by 230 percent.

However, this quasi-resignation of the state from the agricultural sphere has not only favored the private sector's initiatives, but even more so those of farmer organizations. POs are not confined to the role of "partners" in the many state and donor initiatives, they have also invested in a variety of activities that have made them true promoters of development. They mainly motivated their members to invent new ways to produce and market with usually very little external support.

These initiatives focus on collective actions to remove bottlenecks in the agricultural sector: i) securing production through actions aimed at ensuring better access of producers to production factors, ii) attempt to regulate local markets through collection, storage and grouped sales to mitigate the effects of price change and volatility, all of which are very damaging to stable incomes for producers.

In the case of the first point above, in several countries, organizations have tried to promote autonomous supply and distribution mechanisms of agricultural inputs, such as fertilizer. Benin's federation of producer organizations created a cooperative to supply and manage agricultural inputs. This initiative should have ensured agricultural producers timely access to quality inputs at unbeatable prices. Unfortunately, the initiative has been limited to providing inputs for cotton at the expense of other sectors, which involve more actors, but with a market that has fewer guarantees. This initiative was compromised because the state was heavily involved and economic operators often lacked transparency.

Regarding market regulation initiatives, they do not have a national, let alone regional, scope but are limited to a specific area, at the level of groups and cooperatives. These farmer-based organizations have taken advantage of market liberalization to couple initiatives that promote better food security with those that maximize producers' incomes. The collection, storage and sale transactions have increased, especially in Sahelian countries. Cereal banks and village granaries have transformed into

marketing cooperatives and other expanding systems such as warrantage. These initiatives do not have enough magnitude to influence the agricultural products market, particularly cereals.

Without supplementing or substituting policy instruments, these initiatives are experiences that current policies should build on to ensure the improved productivity and competitiveness of the agricultural sector.

In short, this period has not significantly changed the overall status of the agricultural sector, a sector that receives the lowest percentage of public investment. Instead, it marks a significant decline in funding efforts, characterized by weaker public resources, little intervention of the private sector, except in some downstream processing units and an insignificant input of foreign direct investment.

3. Recent innovations in agricultural policies

Since 2010, West Africa has initiated defining major sectoral policies. At national level, countries such as Senegal and Mali have gone beyond major strategies to pass agro-forestry-pastoral laws. At regional level, two agricultural policies prevail: the Agricultural Policy in the West African Economic and Monetary Union, the PAU, and the Agricultural Policy of the Economic Community of West African States, ECOWAP. The latter one not only includes all of its members, but also takes into account the PAU's direction, objectives and areas of intervention.

In 2005, West Africa defined and adopted its agricultural policy, the Comprehensive African Agricultural Development Program (ECOWAP/CAADP) to implement the agricultural component of the New Partnership for Africa's Development (NEPAD).

The operationalization of this policy began in 2006 with the development of the first action plan, followed by the formulation of national and regional investment programs. Regional investment programs were designed around six components that combine ECOWAP's three spheres⁵ and CAADP's four pillars⁶. According to the ECOWAS web-site, the six components are:

- **The improvement of water management** (irrigation, invasive aquatic plants, and capacity building for organizations in the cross-border basins);
- **Improved management of other shared natural resources** (transhumance, sustainable management of forest resources, and fish resources);
- **Sustainable farms** (integrated management of soil fertility, strengthened support services to producers, and dissemination of improved technologies);

⁵ ECOWAP's three major themes focus on: i) increasing the productivity and competitiveness of agriculture, mainly family farms, ii) implementing an intra-Community trade regime based on a free trade zone, iii) adapting the external trade regime based on the specific conditions of the agricultural sector.

⁶ CAADP's four pillars deal with: i) extending the area under sustainable land management and reliable water control systems, ii) increase market access through improved rural infrastructure and other trade-related interventions, iii) increasing food supply and reducing hunger across the Region by raising smallholder productivity and improving response to food emergencies, and iv) improving agricultural research and systems in order to disseminate appropriate new technologies.

- **Developing agricultural value chains and promoting markets** (development of the different food value chains including peri-urban, export crops, short-cycle breeding, agro-forestry products, non-industrial fishing and aquaculture; development of product processing; and promotion of national, regional and international trade;
- **Preventing and managing food crises and other natural catastrophes** (early warning systems, crises management systems, support for the rehabilitation of zones after crises, and development of compensation mechanisms/insurance against catastrophes);
- **Institutional strengthening** (integration of a standard approach, support for the agricultural and rural policy and strategy formulation capacities, sustainable financing of agriculture, communication, steering and coordination capacity building, monitoring and evaluation capacity building).

3.1 Scope and limits of national investment plans

Several West African countries have completed their national agricultural investment plan as part of ECOWAP/CAADP's implementation. These plans, that stem from national investment programs, are meant to reflect each country's agricultural development priorities. They are designed to boost agricultural production by an annual growth rate of at least 6 percenta, a percentage that is considered sufficient to reduce poverty by half by 2015.

Investment programs have the advantage of covering all aspects of the agricultural sector in the broad sense of the term. Although national investment programs incorporate the six ECOWAP/CAADP intervention components, they deal with agriculture, livestock, fisheries, forestry and sometimes the environment. Cross-cutting issues that are critical to agricultural development such as i) rural infrastructure, market infrastructure, funding, stakeholders' capacity building, coordinating the activities of the different institutions, research, etc., are often at the forefront of the proposed priority actions.

The participatory approach that characterized the program formulation process has resulted in this broad coverage. All actors involved in agricultural development – POs, the private sector, technical and financial partners – participated to varying extents in the development of national programs.

Developing the different agricultural sectors is given much prominence in these programs. Structuring the different sectors is emphasized in addition to planning activities to improve agricultural productivity and competitiveness. This means that the program will mainly consider:

- a. Developing provision of local services for producers that are adapted to their needs (supply of inputs: fertilizer and improved seeds, access to adequate financing, including seasonal loans, advisory services and other logistics requirements, etc.),
- b. Strengthening the structure and role of POs and farmer organizations through the professionalization of farmers,
- c. Establishing multi-actor consultative frameworks around strategic sectors, following the model of either inter-branch organizations, or the one of "sector panels",
- d. Creating new value chains (transformation, norms and standardization and implementation of traceability tools) to take better advantage of regional and international market opportunities.
- e. Promoting public-private partnerships by establishing multi-stakeholder contracts: POs, financial institutions, processors, credit distributors and other service providers in rural areas.

However, many analysts doubt that NAIPs, despite the general and specific advances they propose, have the ability to transform West African agriculture profoundly, both in terms of their design and the way they address agricultural development issues. For some, including development technical and financial partners, the program objectives are too ambitious, given present human, institutional, and financial capacities in the countries of the Region.

However, given the assets of these countries, the relevance of assumptions may be questioned: what agricultural development options will a country have to implement to achieve a growth rate of at least 6 percent for the sector to consider halving poverty by 2015?

In this context, the characteristics of these programs were drafted with the primary concern to determine the level of investment necessary to achieve the growth target of at least 6 percent, rather than the types of actions countries could actually implement.

Beyond this fundamental limit, these national investment programs also suffer from weak action proposals to promote the different agricultural sectors. These proposals provoked a number of criticisms.

- a. The first is related to the low prioritization of sectors to be promoted. Very few countries were able to prioritize the sectors that are considered as strategic in view of the previously established criteria: economic, social, financial, food security, etc. Thus, all products of each country's agrarian system are found in the national lists of sectors to be promoted. In the case of Benin, for example, thirteen commodity chains were chosen, with a focus on investing in three of them: rice and corn through the Emergency Food Security Program and cotton, which benefits from a more or less monitored existing framework. Some countries, such as Côte d'Ivoire, have made an effort to distinguish specific actions for export sectors compared to those meant to satisfy local food needs. Others, such as Ghana, are considering promoting two new sectors by region and by year over the five years covered by the program.
- b. The second one refers to the fact that these countries, which are in the same geographical economic integration area, have very weakly coordinated their choices and complementarity based on the comparative advantages of each country or production area. Rice and maize, for example, benefit from special programs in all countries of the Region: these most often project production levels well above national needs. The risk of reaching saturation on the regional market in the medium term is not excluded. Market integration options for certain sectors such as cotton, promoted by prestigious institutions like as the West African Development Bank West are not included in national investment strategies.
- c. The third regards the fact that the strategies that plan to encourage strong policies to promote agricultural sectors are weak. Strategies are not very readable in terms of incentives to be implemented so that production is boosted and placing products on the local, regional and international markets is facilitated.
- d. Incentive instruments to produce different products are inspired by methods and traditional approaches stemming from the green revolution: subsidized inputs (fertilizer, improved seed) funding basic land use improvement and small agricultural equipment. This approach has proven almost ineffective, as shown by the 2008 emergency experience. Input importers and distributors shared margins resulting from 50 percent inputs grants that states had granted to small producers. Not only was the measure limited to a small number of producers, but these did not reap its full benefit. This poor governance was accompanied by many other problems, including delays in product distribution, poor quality of inputs, etc.
- e. Worse, no program has estimated the cost linked to potentially extending input subsidies to all producers and for all chosen sectors. In regard to aspects related to financing, programs include establishing mechanisms and credit allocation tailored to the needs of producers, without specifying the level and operation modalities of the various facilities dedicated to these functions. The problem

is even greater as there is no clear definition of which categories of farms may benefit from the new instruments.

- f. As for aspects relating to how markets should operate, national investment proposals are mainly limited to measures facilitating trade: communication and road infrastructure and promoting outreach activities in rural areas. While trade regulation is under the jurisdiction of the regional bodies ECOWAS and UEMOA, states should still indicate in their program the types and levels of protection they desire for their domestic market to secure existing or planned investments.

Table 1. Summary of intervention components in National Agricultural Investment Programs

Country	Major investment components	Priority sectors	Incentive instruments / strategies	Estimated cost
Togo	<ol style="list-style-type: none"> 1. Sustainable natural resource management 2. Rural infrastructures 3. Development of food sectors 4. Development of cash crop sectors 	Cereals, roots and tubers, legumes, cotton, coffee cocoa and animal products	<ul style="list-style-type: none"> • Improved seed production and distribution • Mechanization • Promoting Small and Medium-sized Enterprises • Support to veterinary food and products supply 	570 billion XOF over 5 years
Benin	<ol style="list-style-type: none"> 1. Development of agriculture 2. Livestock Development 3. Development of fisheries and aquaculture 4. Sector management and administration 	Maize, rice, cassava, yams, cotton, pine-apples, cashew nuts, oil palm, horticulture, meat, eggs, fish and shrimp	<ul style="list-style-type: none"> • Seeds, quality fertilizer, appropriate funding available • Appropriate mechanization • Access to knowledge and professionalism • Land securing and management, market access 	436 billion XOF over five years
Nigeria	<ol style="list-style-type: none"> 1. Developing agricultural policy and regulatory system 2. Agricultural commodity market 3. Raising agricultural income with sustainable environment 4. Maximizing agricultural revenue in key enterprises 5. Water, aquaculture and environment resources management 	Rice, cotton, horticulture, cassava, cocoa, wheat, palm oil, livestock, maize and sorghum	<ul style="list-style-type: none"> • Rehabilitate and complete existing irrigation projects • Facilitate acquisition of farmlands and title holding for agricultural production • Ensure a high level of production, adoption and utilization of appropriate technology • Create a new generation of farmers 	13 billion naira over three years
Ghana	<ol style="list-style-type: none"> 1. Food security and emergency preparedness 2. Improve growth in incomes and reduced income variability 3. Increase competitiveness and enhanced integration into domestic and international markets 4. Sustainable land and water management 5. Science and technology applied in food and agriculture development 6. Enhanced institutional coordination 	Cocoa, oil palm, cotton, cassava, sorghum, rice, maize, millet, yam, cocoyam	<ul style="list-style-type: none"> • Ensure a high level of production, adoption and utilization of appropriate technology • Create a new generation of farmers • Development of pilot value chains for two selected commodities in each ecological zone 	416,1 million USD over five years
Mali	<ol style="list-style-type: none"> 1. Horticulture sector development 2. Irrigated agriculture development 3. Livestock sector development 4. Fisheries and aquaculture development 5. Decentralized management of natural resources and wildlife preservation 6. Support and assistance measures 	Rice, maize, wheat, sorghum, millet, fonio, Cotton, mango, potato and onion		1 614,7 billion XOF over 5 years

Table 1. Summary of intervention components in National Agricultural Investment Programs (Cont.)

Country	Major investment components	Priority sectors	Incentive instruments /strategies	Estimated cost
Niger	<ol style="list-style-type: none"> Promote access for rural populations to economic opportunities that create sustainable rural economic growth conditions Prevent hazards, improve food security and sustainably manage natural resources to secure living conditions of the population Strengthen public institutions and rural organizations' capacity to improve the management of the rural sector 	Livestock, millet, sorghum, cowpea, rice, onions, purple nut grass	<ul style="list-style-type: none"> Structuring of agricultural sector Securing incomes Agricultural inputs and products supply 	1 944,4 billion XOF over 9 years
Côte d'Ivoire	<ol style="list-style-type: none"> Improve access and use of agricultural and veterinary inputs Promote mechanization for farms and small processing units of agricultural products Strengthen extension services, research and development and training Strengthen production potential of cash crops Revitalize food crops, livestock and fisheries production Develop processing and conservation of crop, livestock and fisheries products 	Coffee, cocoa, rice, maize, cotton, banana, pineapple, cassava, and rubber	<ul style="list-style-type: none"> Professionalization of actors Good quality input supply Structuring sectors and value chains 	897 billion XOF over 5 years
Liberia	<ol style="list-style-type: none"> Land and water development Food and nutrition security Competitive value chains and market linkages Institutional development 	Rice, rubber	<ul style="list-style-type: none"> Ensure a high level of production adoption and utilization of appropriate technology Create a new generation of farmers 	227,5 million USD over 5 years
Sierra Leone	<ol style="list-style-type: none"> Smallholder production, intensification, diversification, value addition and marketing Small-scale irrigation development Market access Rural financial services Productive and social safety nets for livelihoods enhancement Agricultural sector 	Rice, maize, cassava	<ul style="list-style-type: none"> Ensure a high level of production adoption and utilization of appropriate technology Create a new generation of farmers 	403 million USD over 5 years
Senegal	<ol style="list-style-type: none"> Agriculture development Livestock development Fisheries development Environmental protection Cross-cutting programs Coordination and M & E 	Millet sorghum, maize, rice, horticulture, fruits, cotton, groundnuts, wheat, potato, onion	<ul style="list-style-type: none"> Capacity building for the different actors Structuring of the actors, Quality input supply Agricultural insurance 	1632 billion XOF
ECOWAS Region	<ol style="list-style-type: none"> Promote strategic products for food sovereignty and security Promote global enabling environment for agricultural development Reduce vulnerability and promote sustainable access to food for the population at large 	Rice, maize, cassava, livestock, meat and meat products	<ul style="list-style-type: none"> Co-subsidizing of inputs and farm equipment Disseminate small-scale irrigation technologies Market regulation policies 	900 million USD over 5 years, of which 150 from Commission's own funds

3.2 Scope and limitations of Regional Investment Plan

The Regional Agricultural Investment Program is in sharp contrast with programs and national investment plans, given its contents. It aims to provide answers to the main obstacles to agricultural growth and food security by simultaneously addressing production issues, trade issues, the overall environment of the agricultural sector and also food access issues.

It differs from other earlier major programs in the Region, by the fact that it:

- “brings national and regional priorities together in a common vision: NAIPs have priority programs that incorporate regional dimensions that exceed national institutions’ prerogatives and the regional investment plan takes these on.
- federates and articulates the investment approach and the policy instruments approach (regulations, incentives, etc.).
- federates common approaches developed in the various sub-programs of the RAIP around key issues”.

The Regional Agricultural Investment Program is structured around three objectives:

- a. **Promotion of strategic products for food sovereignty.** The plan gives priority to three food sectors considered strategic in terms of security concerns and food sovereignty in West Africa: firstly, rice, maize and cassava, secondly, livestock, meat products, and thirdly fish products.
- b. **Promoting an overall environment conducive to regional agricultural development.** This specific objective aims to build a commercial, physical, informational and institutional environment that will lead to a massive transformation of production systems and agricultural sectors in West Africa.
- c. **Reducing vulnerability and promoting sustainable access to food for the population at large.** This objective’s target is to help “ensure the food needs of vulnerable populations and reduce the structural vulnerability of populations in both rural and urban settings”.

A. Agricultural policy initiatives: intensification instruments

The agricultural policy is reinforced by defining three types of instruments aimed at creating incentive conditions that are essential to agricultural development. Two of these instruments deal specifically with promoting agricultural sectors: i) production intensification instruments, and ii) instruments for regulating agricultural markets.

They aim to ensure sustainable input and small innovative equipment availability at incentive prices for producers, which implies, among other things, easy access to credit. To do this, the plan envisages, among other incentives, implementing a mechanism for co-financing subsidized inputs and small agricultural equipment, through a tripartite partnership between: 1) countries, 2) ECOWAS’ Agricultural Development Fund, via financial institutions selected in each country and 3) farmer organizations.

This is an optional action, left at the discretion of governments, with the possibility of wide modulation by each state, within the design and implementation conditions defined at ECOWAS level.

- Opportunities for national modulation focus on:

- Choosing the subsidy rate by the country within the limits of an ECOWAS ceiling. Each state deciding to retain this measure would be free to set the subsidy rate they wish, within the ceiling set by the ECOWAS Community.
- Choice of targeting. Each country would also be free to focus this measure on a given category of producers, for example according to farm size, agro-ecological zones or particular crops.
- ECOWAS conditions are:
 - A voucher system. In line with the fertilizer strategy adopted by ECOWAS in 2006, the grant program should necessarily pass through a system of coupons that would be distributed to farmers.
 - A maximum subsidy rate. The eligible subsidy rate should be capped (e.g. 50 percent), to limit the cost of the measure, and avoid uneconomic use of fertilizers and competition distortion between Member States on agricultural markets. The level of subsidy could be modified in case of a high variation in international prices.
 - Management through a bank. The voucher system will be necessarily managed by a bank (from which the distributor would be reimbursed for coupons received from farmers).
 - Authorized distributors. Only authorized dealers will be entitled to participate in the program and be reimbursed for coupons they receive.
 - A maximum quantity of coupons per farmer. Quantities of coupons distributed should be capped by farm (for example, 100 kg), so as to ensure the programme does not benefit large farmers more than small ones. This limit may vary depending on the country, given the variability in the size of farms.

This instrument seems interesting and important, because it enables coordinating agricultural policy instruments between regional and national levels. It also allows targeting the sectors and farm types based on countries' priorities. Its cost is estimated at USD 100 million over the five years of the regional investment program. The following issues regarding feasibility need to be considered:

- a. Not taking into account this dynamic in national investment programs. As national programs were defined at the same time as the regional one, they could not include this proposal in the priorities, activities and actions to be enacted in the country over the next five years.
- b. Local actors' weak capacity, including producer organizations, in the management of such a device. Managing such experiences requires organization, mobilization and governance levels that neither governments nor POs have yet fully internalized. Managing similar experiments that are underway in southern Africa, particularly in Malawi, and which, moreover, do not involve the regional level, have turned out to be very difficult. They require a fairly complex organizational capacity of peasant networks at grassroots, national and regional level.

B. Agricultural policy initiative: market regulation

ECOWAS is proposing three types of regulatory instruments for the regional agricultural product market: i) instruments at the borders, ii) storage instruments (public and private) and iii) those relating to standardization and inter-branch organizations.

Instruments at the border. These are considered the most appropriate to regulate inter-annual and inter-seasonal price fluctuations and to limit forwarding international market imperfections onto national or regional markets. Local product prices may also be indirectly regulated by border instruments when they are tradable goods, that is to say, they can replace imports and are priced according to the volume of imports (e.g. local rice/imported rice).

To do this, ECOWAS is planning to establish a single common tariff policy throughout its territory. The drafting process of this policy is well underway. In February 2009, Member States agreed to the introduction of a fifth tariff band at 35 percent, bringing the maximum protection for the countries of the Region to 35 percent. The challenge is mainly to identify what products are to be classified in the fifth tariff band and what products will change category within the first four tariff bands of the Common External Tariff.

Establishing other trade defence measures is also planned, including protective measures that can cope with imperfections and fluctuations of the international market. In 2006, ECOWAS experts proposed a safeguard tax on imports (STI). However, it must be noted that these measures are somewhat offset by those suggested by producer organizations that recommend the use of variable levies, by far the most effective type of agricultural protection. Better still, farmer organizations require prior determination of common consolidated tariffs for the entire Region in order not to freeze products in fixed band custom duties. All this must be accompanied by registering ECOWAS's Customs Union as a legal personality of the WTO to negotiate on behalf of its 15 Member States.

Storage instruments. These are an important means to regulate and stabilize prices in domestic markets. They are best suited to local non-perishable products such as millet / sorghum, roots and tubers, generally considered as non-tradable. Stocks can also regulate intra-annual price variations. This strategy aims to revitalize and strengthen the various initiatives undertaken by the regional network of food security stocks (RESOGEST), producer organizations (bundling, warrantage, management cooperatives, mini foodstuff exchanges, etc.) and private operators. These can be physical or virtual, including financial, stocks.

Regarding **other instruments**, the following actions are planned:

- a. Initiate a standardization process that involves defining product specifications (size, impurity content, form, rate of broken rice for example), but also standardizing measurement systems used in periodic traditional markets. This can help to reduce price fluctuations and improve the use of tools such as storage. Standardization encourages developing commercial storage and getting credit institutions involved because it provides a transparent basis for assessing a product stock's value.
- b. Boosting inter-branch organization schemes. These are one of the oldest market regulation instruments, experienced in West Africa. All the sectors that were the jewels of West African agriculture were managed by inter-branch organizations: cocoa, coffee, cotton. These vary from one country to another, with inter-branch organizations that act as agencies, such as the Agricultural Markets Regulatory Agency of Senegal, cocoa "Boards" in Ghana and Nigeria, and consultation and coordination marketing boards in Burkina Faso for shea butter and milk.
- c. In recent years, local food products, such as rice, with major economic and food challenges, have gradually been more managed by inter-branch organizations. These aim at removing bottlenecks that hinder the agricultural sector's development by promoting collective actions: access to inputs and factors of production, marketing infrastructure (roads and storage facilities), primary collection, price level, etc.
- d. Public policy choices involved in promoting agriculture overall as well as specific sectors cover all dimensions. But it is clear that they tended to be more efficient for export sectors such as cocoa and cotton for which West Africa occupies a prominent place at the global level. Most public incentives have focused on these sectors as they brought foreign exchange to governments.

- e. By contrast, constraints to promote traditional sectors are still numerous. Producers in the food sectors not only face difficulties to access inputs and adequate financing but also local, regional and international markets. The many failures in the institutional environment and regulatory sectors account for the fact that these sectors have remained in a state of under-production that has been detrimental to improving living conditions for producers in general and especially for small farmers.

4. Strategic priorities for promoting agricultural sectors in WA

Most political and agricultural development strategies implemented over the last twenty-five years have been largely modeled on emergency management. Those of the 1980's and 90's were largely influenced by structural adjustment programs and have brought about a quasi-complete disengagement from states. They failed to deploy a number of strategies and measures to best exploit the agricultural sector's potential for growth and jobs that abound. This eventually led to two management systems coexisting with contradictory strategic directions: administrative management, even "tutelage" of certain sectors (input supply, administered and pan-territorial prices for products, product collection, e.g. cotton in West Africa) and an almost total liberalization of market-oriented food sectors.

Strengthening the duality between cash and market-oriented food sectors has increased major malfunctions within the agricultural sector, including its low capacity to respond to incentives and to local and regional consumer demand. More particularly, this prevented promotion of large-scale development of small businesses that generate added value and jobs in both rural and urban areas. Yet these enterprises bring support that is essential to build partnerships between the emerging private sector and farmer organizations. The latter's level of structuring sometimes suffers from policy ambiguities that affect them and the fact that they strongly depend on external financial and technical assistance.

It is now urgent to return to more appropriate public policy that can accompany the current changes and help improve productivity and the overall competitiveness of the agricultural, livestock and fisheries sectors. It is time to create the conditions so that family farms can develop, as they also offer less demeaning and alienating jobs for youth. This thrust should enable implementing incentives and help to remove the main bottlenecks.

4.1 The funding problem

West Africa spends an average of USD 8 billion on food imports, representing about 18 percent of the total value of all combined goods imports. But States only spend about 5 percent of their budget for investment in agricultural development. Despite the commitment, taken by heads of state in 2003 in Maputo, to allocate at least 10 percent of their capital budget to agriculture, the goal is far from being achieved.

Clearly, if the Region is able to disburse some USD 8 billion annually to acquire foodstuffs (CEA, 2008), it should be able to mobilize at least 4 to 5 billion dollars to build sustainable production bases, guaranteeing its food security and a smooth functioning of the internal market. The cost of the Regional Investment Program is estimated at USD 900 million over five years. This reflects a lack of political will that continued food (rice, wheat, sugar and milk) price increases on the international market should help to remove.

However, the way resources are allocated is perhaps more problematic than mobilizing them. So far, the largest investments have focused not only on large farms, but also on export sectors. It is urgent to expand funding availability through the private sector and mechanisms that contribute to mitigate the many risks that characterize the agricultural sector in general, and in particular traditional sectors, including products that are rarely or not traded on the international market.

This strategy involves the implementation of funding facilities dedicated to:

- a. a guarantee fund to cover part of the risks associated with production (access to inputs), processing and marketing of products,
- b. interest rate subsidies for agricultural and food operation
- c. direct subsidies to improve access to equipment and inputs.

ECOWAS's Fund for Agricultural Development will be housed at the EBID in Lomé and envisions a set of funding mechanisms that need to be refined and especially relayed at country level and to the actors involved in developing the agricultural sector. Farmer organizations will be responsible for an important part of its implementation, including:

- Better characterization and categorization of farms in each country. Defining the optimal size (surface by farmer depending on the area and production) will help achieve the key objectives of the Regional Agricultural Policy: ensure security and food sovereignty, reduce imbalances between territories and ensure farmers "decent incomes". Characterizing family farms will wisely permit to differentiate essential public support.
- Better structuring of peasant organizations that are currently shared between sector POs, largely dedicated to economic issues, general POs that focus on advocacy, activist Union POs, and the so called development POs. The status of all these organizations and their position in intermediation with other actors, including public authorities and institutions, need to be clearly defined.
- Management capacity building of POs in areas where they have had mixed results in recent years, i.e. economic activities. Indeed, managing grant and improvement mechanisms requires a level of governance that must be promoted at all levels including POs.

4.2 Guaranteeing access to productive resources: land, water

Beyond institutional and jurisdictional aspects, guaranteeing access to resources for agricultural development, land and water, raises the thorny issue of managing the demographic transition on the continent. The debate on land in terms of family farms' viability and efficiency needs to address: returns on investment, the ability to respond to the evolution of demand, and their survival, given how arable land resources are currently managed, including their fragmentation when divided for inheritance. The emerging need to consolidate land, following concerns to promote biofuel production and the renewed interest in mechanization to increase productivity, raises a fundamental question: To which areas will agricultural labor be transferred? (Blein et al, 2008).

Successfully managing the continent's demographic transition will impact on the success of current land reforms, or more precisely strategies for securing land tenure, that are being implemented in many countries to attract productive investments in agriculture. As D. Bloom and Willam (1998) pointed out, according to the demographic window principle, "every demographic transition, accompanied by an increased rate of activity, generates a surplus of economic growth. The Asian economic miracle and the strong growth in Southeast Asia countries are associated with such a strategy". West Africa will

definitely also face this situation, and extensive farm practices, which prevail today, are not sustainable in the long term.

There is still significant work to be done to exploit fully Africa' enormous potential of surface and groundwater resources. This mainly consists in developing water infrastructure, water retention and control of small-scale irrigation systems accessible to family farms. Good results around certain perimeters (Office du Niger in Mali with rice production, Kano and in Gigawa in Nigeria with tomato, potato and onion production) support establishing such incentives. Water management will secure the different sectors be they for export or for local and regional markets.

This should be done by generalizing experiences of partnership between governments, civil society and other water users, regulated by a water charter and will not only bring about a rational use of water, but also the development of a water management system suitable for all water uses.

In many Sahelian countries, small water management experiences help develop off-season crops and promote short marketing chains for produce. Tomato production in southern Burkina Faso and northern Ghana has been possible thanks to dams that facilitate irrigation. Similarly, rational management of lowlands has given a boost to women's rice production in many countries.

4.3 Developing collective action

Developing collective action can be a powerful promotion factor for the agricultural sector in West Africa. Indeed, collective actions can help by pooling resources to substantially reduce production and transaction costs and facilitate the connection of producers to local, regional and international markets. This consists in promoting a series of actions in commercial agricultural sectors, which provide outreach services that mitigate the effects of multiple constraints linked to developing the agricultural sector: input supply, extension services, water management and storage and market infrastructure.

Collective actions also put in place mechanisms and systems to facilitate farmers' access to credit and their market integration. They should also aim at promoting new value chains through diversification of activities and product processing: development of agro-food units and craft industries in rural areas.

Developing collective actions is also a powerful structuring factor for peasant organizations and sectors on the one hand, and establishing a partnership between the various stakeholders involved in the agricultural sector, on the other. It can be considered as a lever for organizing producers and an instrument of their efficiency.

However, developing collective action is only possible if producers benefit from a favorable regulatory environment: a healthy and transparent institutional framework, efficient public administration and a minimum of sustained attention to domestic production by government. In fact, the new emerging sectors in West Africa owe their partial success to existing specific incentive conditions, including:

- A partnership involving at least four categories of actors: i) farmer organizations as drivers of production development and at the center of the arrangement, ii) credit institutions and other institutions that provide local services, iii) the state that ensures appropriate regulatory institutional environment for the development of economic and social activities, iv) institutional actors who guarantee purchasing a part of small farmers' production at remunerative prices to stabilize their income.

Development of the maize, millet and sorghum sector in the Moun area in Burkina Faso is the result of this type of partnership between the UGC-PA and certain institutions. The UGC-PA brings together around 10 000 producers and ensures they benefit from agricultural inputs and other farming equipment thanks to funding from credit institutions. It collects the products that it sells to public institutions (SONAGES), charities (WFP) and others. Between 8000 and 10 000 tonnes of grain per year are marketed this way every year. The fact that official institutions guarantee this market is undoubtedly a key to the success of this collective action managed by the UGC-PA.

Structuring certain sectors requires collective action, including specific protection policies. This is the case of the onion sector in Senegal and the potato one in Guinea, which fully owe their expansion to the implementation of safeguard or, more precisely, trade protection measures such as import quotas from the international market. Limiting the volume of imports of these products at certain times of the year has increased domestic production, and has also helped structure organized producers around these sectors.

Developing collective action based on a good producer organization and the implementation of appropriate incentive policies allows producers to exploit the opportunities offered by domestic and regional markets for which the most optimistic estimates predict the volume to be approximately USD150 billion in 2030. This is essential to improve producers' incomes.

4.4 The trade policy reform, regional markets and international trade regime

A. Promoting the regional market

The regional market currently has 300 million consumers with nearly 500 million planned for 2050. This represents a huge opportunity to develop all of the agricultural sector's products, and especially for food supply chains. Currently less than 15 percent of the market demand is met by regional production. Setting up a trade policy that enables promoting community preference is essential to reverse this trend. Indeed, developing commodity chains is only possible if the regional market has an adequate level of protection that secures:

- a. profitability and rapid return on productive investments for different stakeholders, including foreign direct investments or those of local private operators.
- b. a safe, permanent and secure output, protected from the sometimes unfair competition of foreign imports.

The ongoing creation of ECOWAS's customs union provides a unique opportunity to implement this trade policy that is more in tune with the concerns of agricultural development in a regional "secure" environment.

The current debate on rice for which the Region has the necessary agricultural potential to produce the amount required by the regional market, is indicative of the need for such a policy. West Africa's growing dependence on global markets for its rice supply is the result of a vicious circle.

"Lest street protests, which could lead to question existing regimes' legitimacy, governments refuse to establish a level of market protection that would strongly encourage productive investment in rice production and allow hoping to eventually reduce reliance on the international market."

This strategy is even more difficult to understand given that world prices for this cereal show a constant upward trend over the last three years. Similarly, the downward trend in production in China, which will result in this country becoming a net importer, should stimulate a more proactive policy to promote rice production in the Region.

B. Reforming the international trade regime

If we can concede to some analysts that the poor performance of the West African agricultural sector is due to “States’ political and institutional deficiencies” we cannot ignore that it is largely the result of the international market’s imperfections and failures. Shocks resulting from the international market’s rules and operation are detrimental to the development of agriculture in general and to Africa’s sectors in particular.

The trade regime is very unfavorable to African smallholder farmers who, due to a lack of support, face competitors from developed countries on unequal grounds in their own market. Current negotiations both at the WTO and the Economic Partnership Agreement between the EU and ACP countries can represent a huge opportunity to redefine the contours of the international market and loosen the noose around African markets and ensure them a better space to maneuver.

However, these negotiations should lead to true liberalization of world trade: abolish all forms of support, tariff and non-tariff barriers, dumping. This would provide a real opportunity for farmers in West and Central Africa. This debate is even more crucial as the liberalization scheme – including the one currently proposed by the EU in different regions of Africa through its offer to access the market under the EPA – raises a few problems: issues linked to standards are not sufficiently taken into account.

However, ECOWAS should accelerate building the regional market, including implementing a customs union and precautionary trade measures that are adaptable to a changing international market. The agricultural policy’s road map gives clear indications in this area.

4.5 A sectoral approach to agricultural investments: case studies⁷

A. The case of Benin

In Benin, the GIPD Project (*Projet de Gestion Intégrée de la Production et des Déprédateurs*) focused on public policies implemented in support of the development of food value chains. Since independence, Benin has relied on cotton for its economic growth whose production level had fallen because of low prices. At one time cotton exports represented 40 percent of the nation’s export proceeds.

But since the collapse of cotton market, the country was forced to diversify its agricultural sector so as to reduce the nation’s dependence on cotton. In pursuance of that objective, Benin adopted its Strategy for the Re-launching of the Agricultural Sector, which focused on four agricultural commodities, namely groundnut, pineapple, rice and poultry.

⁷ This section is taken from the proceedings of the joint regional FAO-IFAD workshop held in Accra, Ghana, July 4-5, 2012 under the theme: “Rebuilding the Potential of West African Agricultural Production: Lessons from Country Studies, Policy Initiatives, and Private-Public Partnerships to Promote Smallholder-Inclusive and Competitive Food Value Chains.”

The rice value chain was given high priority because of the importance of rice in the nation's strategy to achieve food security and also because it had the most successful outcome. Local production of rice was below the consumption needs, while a boost to rice production could even open export opportunities to neighbouring Niger and Nigeria. The goal of the Strategic Plan for agricultural development was therefore to promote rice production and to minimise post-harvest losses by strengthening markets. The specific objective of the Agricultural Sector of the Strategic Plan was, among others, to increase the production of paddy rice from 72,960 tonnes in 2007 to 385,000 tonnes in 2015. Among the expected results of the program are improved farmer access to fertilizers and phytosanitary products, transformation and improved storage of rice and opening-up of rice production areas for easy access to markets.

The program will be anchored under the National Agricultural Investment Plan and existing legal and institutional structures providing the overarching necessary environment.

B. The case of Nigeria

Nigeria's agriculture was anchored on three pillars, namely the National Agricultural and Food Security Strategy, the Nigeria Vision 2020 Economic Transformation Blueprint and CAADP's National Agricultural Investment Plan.

Among the agricultural sector objectives and priorities is to achieve market-driven value chain development in Nigeria and farm-gate commercial storage as well as reduce post-harvest losses of agricultural production by an average of 50 percent and to expand the nation's foreign exchange earnings through agricultural exports and reduce the present level of food import by 50 percent in 2015.

Most importantly, Nigeria had initiated a system to facilitate the linkages between agro-input dealers and credit institutions. There are also efforts to integrate produce marketing with input marketing, including the establishment of a more effective food marketing information service to increase market transparency and enhance operational efficiency (Commodity Exchange for futures market). The goal is to transform Nigeria's agriculture into a commercial oriented sector with emphasis on food processing, promotion of locally produced food and new employment.

The constraints to value chain development include inadequate physical and financial infrastructure, low returns on investments, poor investment climate, and the need for appropriate policies that would drive growth, combat climate change and promote risk management. Concerning risk and risk management, the Central Bank of Nigeria had established a new mechanism aimed at mitigating agricultural financial risk, encouraging private bank lending and providing financial support to farmers. Nigeria has also targeted a set of zones and commodities (cassava, sorghum etc.) for agricultural investment.

C. The case of Ghana

Ghana developed the Medium Term Agriculture Sector Investment Plan (METASIP) in fulfillment of Ghana's participation in ECOWAS agriculture related initiatives, namely ECOWAP for West Africa and the NEPAD / CAADP as well as to implement its Food and Agriculture Sector Development Policy (FASDEP II). METASIP had six programs whose objectives were generally to improve the supply chain of staple foods such as cassava, maize and rice as well as the commercialisation of farming for increased income generation, especially by tapping into the market potential of the traditional cash crops such as mangoes, citrus, palm oil and rubber.

An important characteristic of the Plan was its sector-wide approach involving all the agencies and actors in the consultations for the design and participation of the supervision and implementation of its activities. The Plan established a Steering Committee with membership of all the principal stakeholders including relevant government agencies and Ministries POs. One of the priority areas of the Steering Committee was therefore to enhance the development of POs so as to make them viable economic units to strengthen their bargaining power and enable them to link up with regional groups.

The Steering Committee operates as a multi-stakeholder platform where members can raise, discuss and resolve issues and bring feedback back to the constituents. The SC is also supported by SAKSS, whose membership is comprised of representatives from policy and knowledge institutions as well as Civil Society Organizations (CSOs) and the private sector. SAKSS is also linked with West Africa's regional platform ReSAKSS. A secretariat and policy dialogue fora also supported the Steering Committee. The Steering Committee was working towards the formulation of a communications strategy to enhance prioritizing METASIP and integrating it into plans and budgets of state and non-state actors.

Like many other recent programs, METASIP has also adopted a value chain approach with a view to bring on board all operators and their activities in agricultural value chains to enhance efficiency, competitiveness and inclusiveness in order to promote transforming smallholder farmers toward a commercial orientation to modernise and improve their business's profitability. This required formulating strategies and approaches to integrate smallholder farmers in the value chain and to develop POs. They included encouraging the evolution of POs at the grassroots level and intensifying out-grower schemes. The Government of Ghana has also developed a policy to provide a framework for Public-Private Partnerships (PPPs) and, with the support of donors, the Ghana Commercial Agricultural Project. Its objectives are to improve the investment climate for agri-business and developing inclusive PPPs and enhance smallholder linkages in selected value chains. One key challenge to the implementation of METASIP includes the mobilisation of funds to enable civil society organizations to participate actively and play their expected role in the METASIP process.

5. Conclusion

Investment policies, specifically directed to promoting the agricultural sector in West Africa remain very selective or even discriminatory. While agriculture, livestock and fisheries export sectors receive full attention, food sectors, which are essential for people's food security and regional market integration continue to be marginalized.

Most incentive policies have focused on cash crops, thus perpetuating the trading economy that promoted sectors oriented towards the international market. Despite recent developments resulting from reforms at both national and regional levels, agricultural sectors are still poorly prepared to take advantage of the huge opportunities offered by domestic and regional markets.

There seems to be a considerable gap between implemented strategies and policy instruments and the heavy trends in West African agriculture and the changing international context. They tend to reproduce the formulae that helped boost Asian agriculture, but seem less appropriate in today's context.

In West Africa, distancing to initiate strategic thinking for agriculture seems to be sorely lacking and also the political will to implement specific policies to develop the different sectors. The complexity of West African agriculture, its relations with other activity sectors, the nature and level of organization of its actors, its very high exposure to internal and external shocks require implementing strategies investment that can:

- a. Minimize the risks associated with agricultural activities, i) facilitate access to inputs and productive resources, ii) develop collective actions through better structuring of sectors and organizing of the actors.
- b. Better target sectors that ensure food security and sovereignty, decent income for farmers, and balanced land use planning. This targeting should allow implementing essential public incentives for agricultural development.
- b. Develop mutually beneficial partnerships between all actors involved in rural development in general, and in agricultural development in particular.
- d. Promote a regulatory environment conducive to agricultural development, i) promoting the regional market, ii) incentive investment policy (tax exemption).
- e. Promote the regional market by making it a key factor for the development of agriculture and small family farm production.
- f. Reform the international trade regime, which remains very unfavorable to smallholder farms

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Chapter 4

Review and analysis of national investment strategies for agricultural policies in Central Africa: The case of Cameroon

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1. Introduction and objectives

Agricultural policies in Central and West Africa have long focused on developing traditional export sectors as they bring in foreign exchange earnings. This has resulted in marginalizing consumer products (cereals and food products) on which small farmers depend for their survival and integration into the economy.

Starting nearly a decade ago, issues and challenges related to food security have become more critical, with rapid population growth and fewer people working in agriculture.

The new agricultural policies, inspired by the master CAADP / NEPAD program reflect the growing interest in improving the competitiveness of smallholder farms that face input supply and market access as some of their main obstacles. However, (i) an important gap that enables smallholders to participate in the development and implementation of agricultural policies still exists, (ii) the added value in the main commodity value chains is distributed unfairly at the expense of small farmers who account for a significant portion of agricultural production, (iii) and commodity sectors (cereals and food products) almost completely lack inter-branch organization.

Moreover, food crops are essential in ensuring the population's food security and improving farmers' incomes and people's living conditions (fight against poverty), especially in rural areas. These broad issues call for analyzing and understanding the situation of the main food production chains and the policies developed to improve their performance. This will help identify bottlenecks and raise government agencies' awareness on integrated support solutions to food supply chains.

This study focuses on analyzing agricultural policies in Central Africa and their impact on commodity value chains and will cover five main areas:

1. An inventory of national policies and strategies for agricultural investment implemented by countries in Central Africa (Cameroon, in particular) and other countries² (such as Gabon, the Republic of Congo and the Central African Republic);
2. Analyzing these strategies and policies' components that directly affect the development of commodity chains. The various direct and indirect initiatives, aimed at strengthening the competitiveness of different sectors, their members' (colleges, links, etc.) competencies and creating added value, will be identified and enumerated;
3. Activities aiming to organize and structure producers into viable economic entities (cooperatives, economic groups, unions, federations, etc.) and the support given to the different functions of the added value chain within sectors will be examined;
4. Policies and specific actions taken by the state to remove capitalization constraints, ensure access to means of production and product marketing at remunerative prices will be analyzed;
5. Objective indicators (including an application of the state's human capacity to carry out these programs and identify concrete gaps and deficiencies) will clarify how these so-called new policies actually take into account promoting strategic products for domestic consumption (food sectors).

Concretely, this study aims to answer the following questions:

- ✓ To what extent are national strategies likely to promote the development of sectors that support small farmers?
- ✓ How do the development and implementation of these strategies allow producer organizations set

² Most of the analysis focuses on the case of Cameroon. For other countries in the sub-region study is limited to the presentation of a summary of key information and direction.

up better structures to participate in managing selected sectors with more equitable distribution of the added value in each sector?

- ✓ Which mechanisms and tools are available to small producers and their organizations to bring about new synergies between the private and the public sectors to manage major constraints such as input supply and access to market?

This study is based on two sources of information. First, a literature review consisting in a synthesis of existing documents and analytical reports on policies' effectiveness as well as consultations with various stakeholders and organizations that have contributed to its development. Second, primary data were collected from different categories of stakeholders including farmer organization members of commodity sectors. In-depth surveys of eighty farmer organizations in several sectors have been conducted, including cooperatives / grassroots Common Interest Groups (CIGs), regional unions and federations, private sector operators, technical and financial partners, as well as public project and programs managers and ministry officials in Cameroon. One of this survey's objectives is to identify possible bottlenecks in these sectors and to identify links with policies that have been implemented.

The primary data from surveys of stakeholders have been processed, coded and entered using SPSS 12.0 software to design the input mask (input interface) from the interview guides and statistical processing of data (descriptive statistics) and Excel 2007 to process the tables for further analysis.

2. Inventory of national policies in the CEMAC area

2.1 Overview of the agricultural sector in the CEMAC zone

The CEMAC zone, which covers six countries, namely Cameroon, Congo, Gabon, Equatorial Guinea, Chad and the Central African Republic, lies between the 24th north latitude degree and the fifth south latitude degree, and between the 8th and 28th longitude degrees. It covers a total area of more than 3 million km², with 1.24 million km² for Chad alone. Thanks to its geographical location, the CEMAC zone benefits from a diversity of agro-ecological zones that can be grouped into five main types summarized in the following table:

Table 1. Agro-ecological zones in Central Africa

Zone	Vegetation Cover/Rainfall	Production type
Saharan	Desert on 2/3 of Chad Rainfall from 0 to 300 mm	Bare soil, palm oasis. Rangelands for nomadic goats and camels.
Sahelian	Extreme north of Cameroon, southern third of Chad Rainfall between 300 and 700mm	Dry area: herbaceous vegetation (shrubs). Oasis dates production, camels, donkeys.
Sudano-Sahelian to Sudanian	Northern Cameroon, CAR, and southern Chad Rainfall between 700 and 1000 mm to 1200 mm	Shrub land type vegetation. Cereal production (millet, sorghum, maize, rice), fruit and vegetable crops, cotton, and oilseeds (groundnut, sesame); livestock on natural pastures.
Sudano-Guinean to Guinean	Central Cameroon, west and center of the CAR, southwestern Congo, southern Gabon Rainfall 1200-1600 mm	High woodlands vegetation, sparse forests. Roots and tubers production (cassava, yam, taro, potato), cereals (maize, sorghum, rice) and cattle rearing in pastures.
Equatorial forest	Southern Cameroon and CAR, northern and central Congo, much of Gabon, and all of Equatorial Guinea High humidity area with annual rainfall between 1600 and 2500 mm, even 4000 mm (coastal and southwestern Cameroon) or even 12000 mm (Debunsha on the slopes of Mount Cameroon).	Roots and tubers production (cassava, yam, taro, cocoyam), fruits (avocado, mango, etc.), bananas, plantain and export crops (coffee, cocoa, palm oil, rubber, tea); also important forest resources (wood), fish and wildlife.

After the hydrocarbon sector that has an expanding production in 5 of the 6 CEMAC member countries, agriculture is the main economic activity. Overall, more than 50 percent of the CEMAC population is dependent on agriculture. Although the situation varies widely from one country to another, the agricultural sector employs close to 65 percent of the area's working population and contributes about 25 percent of gross domestic product in the sub-region.

A. Cash crops

Coffee (Arabica and Robusta), cocoa, cotton in all its forms (fiber and unginned), rubber, sugar cane, tobacco and sweet banana are the main agricultural products that are considered as cash crops.

The cocoa and coffee sectors have a very promising outlook. In Cameroon, for example, the improvement of market prices and the implementation of programs to support production (seedling supply and treatment) have led producers to initiate planting. Local artisanal processing is also experiencing a boom especially for the production of cocoa butter and powder whose profitability is at least 3 times higher than raw beans.

The cotton sector, mostly grown in northern Cameroon and Chad, is doing relatively poorly. Given that producers receive low payments, the most important indicators are declining, including harvested area, production, the actual number of producers and yields. In Cameroon, for example, the areas used for cotton production have been reduced by 43 percent, going from 231 993 hectares in 2005 to 133 000 hectares in 2008. Over the same period, the number of producers has dropped from 300 000 to 218 000, a decrease of nearly 27 percent.

Cameroon is the largest producer of palm oil in the CEMAC sub-region with a cultivated land area estimated at 70 000 hectares in 2010. Private industrial companies handle much of the production. Palm oil (or red oil) plays an important role in food security, because it is used in a wide range of local dishes.

Global demand for crude palm oil increases annually by nearly 4 percent, and this provides a positive outlook for the sector's development, as by-products are still largely under-utilized in the sub-region. Challenges faced by farmers to develop this sector are linked to the lifting of restrictions on access to land, improving the rate of oil extraction and regenerating orchards.

Dessert banana faces difficult conditions in the global economy. The dessert banana production is more developed in Cameroon, where it contributes to nearly 30 billion XAF in export revenues.

Rubber production is being developed in Cameroon and Gabon by large agribusiness firms. The rubber sector suffers from the effects of the recent global economic crisis that resulted in a drop in vehicle sales in America and Europe, leading to the decline of orders for rubber. This sector deserves special attention given the number of jobs it generates and its contribution to the trade balance.

B. Food-producing agriculture

Food-producing agriculture continues to be the main source of food and survival for people, while generally remaining at the level of subsistence farming. The products are very varied: cereals (maize, millet and sorghum, paddy, etc.), roots and tubers (cassava, cocoyam, taro, potato, yam, etc.), oilseeds³ such as groundnut, cottonseed, etc., fruits and vegetables, including citrus, pineapple, tropical fruits, legumes and pulses, spices and condiments, leafy vegetables and mushrooms, plants and ornamental flowers, etc.

Among these products, there are some export production activities in small quantities in certain niche or specialty markets in Europe or the United States (manioc paste, pineapple, papaya, flowers, pepper, etc.).

CEMAC countries' dependency on imports varies from one country to another. In Gabon, more than 70 percent of staple foods are imported (milk and dairy products, wheat, potatoes, oils and fats, vegetables, maize, etc.) while this percentage rises to 100 for rice and 95 percent for beef, pork and poultry.

The main crops in Chad, which lies in the Sahel, are millet, sorghum and maize and are permanently exposed to climatic and production shocks: low and erratic rainfall, locusts. These factors expose

³ Except for oil palm.

populations to starvation. In addition, production capacity is hindered by current civil insecurity due to armed conflict in the country and neighboring countries, which contributes to food insecurity.

Central African Republic (CAR) has an important beef production sector. However, general food supply remains insufficient for the needs of the population. To compensate for this deficit, the country permanently imports cereals, especially rice and flour, and other products such as sugar, onions and edible oils.

Equatorial Guinea also relies on exports for the majority of its food products consumption (rice, maize, plantain, various tubers, oils, etc.).

Cameroon has relative self-sufficiency but more than 75 percent of the rice consumed is imported, despite a significant production potential. Cameroon remains CEMAC's breadbasket and the leading supplier for Gabon, CAR and Guinea in food crops (plantain, cocoyam, cassava, tomatoes and various vegetables, etc.).

Overall we note the inability of the various CEMAC countries to meet their food needs and significantly reduce their dependence on food imports. Thus, despite the potential offered by CEMAC's geographical location, food production agriculture remains somewhat undeveloped. Weaknesses stem from inefficient production systems and ineffective policies that are meant to support the development of agriculture, particularly food production agriculture on which the majority of the population depends for its survival.

The main challenge in the field of food production is to evolve to intensive rural production that will: (i) ensure food security and self-sufficiency (ii) supply the processing industry and create an internal market and consumer base for commodity sectors and finally (iii) increase exports and improve the balance of trade.

2.2 Challenges of regional integration into the CEMAC zone

CEMAC is part of a larger whole, called ECCAS (Economic Community of Central African States), which includes, in addition to the countries mentioned above, the Great Lakes countries (Democratic Republic of Congo, Rwanda and Burundi). Regional integration within the CEMAC has its origins in the colonial period when France created French Equatorial Africa to establish regional services such as the coordination of economic affairs, transport or geological and mining research services. This regional integration, launched during the post-independence years, was based on a double challenge to overcome artificial boundaries set by colonization and to build a common market through the removal of trade barriers. This process was consolidated in 1994 by the establishment of CEMAC, which is one of the most significant results of the countries' strong commitment to develop economic and customs cooperation in Central Africa.

The recent economic and financial crisis and the food crisis of 2008 did not spare the CEMAC countries. This revealed the fragility of their national policies that are meant to support and promote food agriculture. Hunger riots took place in Cameroon, the food basket of this sub-region and, once again, confirmed the prime position that food agriculture must occupy in these countries.

In general, the agricultural sector remains fragile and vulnerable to economic liberalization and globalization, which fosters more pressure from agricultural products originating from other countries in general, and from Europe in particular. In addition, with rapid population growth and mining and logging, natural resources are facing increased degradation. Moreover, fewer and fewer people are living in rural areas and choosing to migrate to the cities, which results in a decrease in the number of farmers, with competitiveness and productivity challenges and the need for intensification. The current situation exposes CEMAC countries to food insecurity and recurrent poverty phenomena.

2.3 CEMAC's Common Agricultural Policy

In the last twenty years, sub-Saharan Africa countries' agricultural policies have been subject to strong macroeconomic constraints where structural adjustment measures and the globalization process have played a key role in influencing economic policies. In this context, regional integration, through the creation and re-launching of "free trade" or economic integration areas, has increasingly emerged as a survival mechanism. Thus, CEMAC's common agricultural policy aims to coordinate and harmonize agricultural policies of its Member States. It places the issue of food security at the center of its concerns and has dedicated a specific program to this theme, the Regional Program for Food Security. Studies for the implementation of this program were due for completion in 2011 with the assistance of AfDB and FAO.

CEMAC's common agricultural policy is therefore part of a broader process of a common economic policy that is to "promote the establishment of a Community market of Member States, with the coordination of sectoral policies and harmonization of regulations to achieve gradual economic integration of the region's economies". Similarly, this strategy takes into account the NEPAD Program that reflects the continent's main thrusts requirements (Comprehensive African Agriculture Development - CAADP) and multilateral obligations (WTO and EPA). The common agricultural strategy focuses on strengthening the agricultural sector's competitiveness and productivity, comprising increased sustainable food production. Generally, this strategy gives priority to infrastructure components to facilitate trade and movement of products, people and information as well as structural ones such as access to training, new technology, support services (extension and advisory, input supply, credit - savings, veterinary services, quality control, etc.). Specifically, the CEMAC common agricultural policy responds to the following challenges:

- ***Strengthen and harmonize macroeconomic frameworks*** to promote policies that support the agricultural and rural sector. Indeed, structural reforms that were put in place to deal with the late 1980s crisis (liberalization of economic activities, stabilization of public finances, devaluing the XAF, state withdrawal from some productive sectors, privatization of public and para-public enterprises that supported rural development, etc.) impacted heavily on measures and policies, by reducing their scale.
- ***Improve producers' living conditions by increasing their income.*** This call for diversifying economic activities, developing financing tools and mechanisms suitable for agriculture, improving access to technology and strengthening the capacity of poor producers and their organizations in rural settings.
- ***Increase agricultural productivity*** to cope with rapid urbanization and create new jobs. According to FAO, in 2010 agricultural production needed to increase by 75 percent to meet global needs and reduce chronic undernutrition. Regarding the CEMAC zone, the rate will need to increase by 290 percent. Therefore, this will entail developing agricultural research, promoting the transfer and adoption of appropriate technologies and knowledge sharing between researchers, promoting the development of technologies for water management that will allow steady production while respecting the environment.
- ***Develop collection, transport, storage of crops and marketing infrastructure*** in order to improve the competitiveness of production (reduction of transport costs and post-harvest losses) on the local and international markets.
- ***Negotiate and implement regional (CEMAC) and international (WTO EPAs) trade agreements,*** beneficial to the agricultural and rural sectors. CEMAC countries will need to organize themselves to speak with one voice in negotiations and be able to get support measures and compensation benefits for the region.

- *Adopt and implement proactive national policies through increased national budgets allocated to the agricultural sector, in accordance with the Maputo Agreement of 2003 and the CAADP.* Cuts in public funding for agriculture over the past two decades have resulted in a significant decrease in agricultural performance in the CEMAC zone. However, it should be noted that the agricultural sector presents the best prospects for Africa to initiate capital accumulation, productivity gain, growth and multiplier effect throughout the economy.
- *Reforming land tenure* to allow access to land, especially in rural areas and for women and young people.

The following table summarizes current policies in some countries of CEMAC.

Table 2. Overview of agricultural policies in some countries of the CEMAC zone

Country	Issues and Challenges / Policy Framework	Areas of intervention	Action Plan
Chad	<p>Issues and Challenges: Sustainable development of rural production: growth of competitive value chains by developing marketing and competitiveness of agro-silvo-pastoral products.</p> <p>Strategic Framework: National strategy for rural development with the aim to increase the production of the rural economy in a sustainable way while protecting the environment and strengthening human and institutional capacities.</p>	<ol style="list-style-type: none"> 1. Create and maintain a sustainable growth in agricultural production 2. Support rural organizations 3. Develop emerging sectors 4. Improve natural resource management 5. Decentralize provision of agricultural services 6. Improve the public sector's efficiency 7. Improve access to basic services for the population and the rural economy 	<ul style="list-style-type: none"> • Increased investment in hydro-agricultural and pastoral infrastructure • Expansion of access to quality agricultural inputs and equipment • Extension of access to quality support services for crop and livestock farmers • Extension of access to credit and suitable financial services • Diversification of agricultural production, • Improving the functioning of distribution channels and markets for products, • Development of emerging sectors • Crop protection
Central African Republic	<p>Issues and Challenges: The rural sector is the country's backbone for economic development that will strengthen poverty reduction, the fight against food insecurity and vulnerability, economic growth and national reconstruction.</p> <p>Strategic Framework: Rural sector strategy oriented toward agricultural development</p>	<ol style="list-style-type: none"> 1. Intensification and diversification of agricultural production 2. Development of professional agricultural organizations and sectors 3. Promoting coordinated development of local communities and implementation of development infrastructure 4. Implementation of institutional reforms in the agricultural and rural sector 	<ul style="list-style-type: none"> • Improve the productivity of farms, through livestock, fisheries and forestry rational intensification • Improve the performance of farms through efficient production systems • Develop agricultural research • Restructure and reorganize rural stakeholders and farmer organizations • Strengthen the human, financial and material capacities of farmer organizations • Support increased stakeholders' participation to the Chamber of Agriculture • Open up rural areas • Establish the infrastructure to support production, distribution and marketing and reduce vulnerability factors linked to agricultural activities • Strengthen capacities for planning, research, advisory support, training and communication institutions

Table 2. Overview of agricultural policies in some countries of the CEMAC zone (Cont.)

Country	Issues and Challenges / Policy Framework	Areas of intervention	Action Plan
Gabon	<p>Issues and Challenges: Enable agriculture to contribute more significantly to the improvement of living conditions in rural areas and render the country less dependent on external supply.</p> <p>Strategic Framework: National Commission for Food Security and Rural Development in Gabon</p>	<ol style="list-style-type: none"> 1. Increase local food production to ensure better availability of food at low cost 2. Improve household food security through improved protein-energy ration (2400 Kcal / capita per day) 3. Reduce rural poverty by improving stakeholders' agricultural income 	<ul style="list-style-type: none"> • Improve the technical capacity of stakeholders and their organizations to participate in the management of the agricultural sector • Improve the conditions of production and marketing of different crops • Develop appropriate and consistent financing instruments that will support the development of investment in the sector • Establish a legislative and regulatory framework, and more broadly, a more attractive institutional and infrastructural environment
Cameroon	<p>Issues and Challenges: Strengthen the agricultural sector as the engine for the country's economic and social development; Promote professional and inter-professional organizing of the various economic operators who are to be the main actors in the development of agriculture; Improve the food security of populations by increasing production and all revenues.</p> <p>Strategic Framework: Strategy Paper on the development of the rural sector.</p>	<ol style="list-style-type: none"> 1. Develop sustainable production and supply of agricultural products 2. Sustainable natural resources management 3. Promote local and community development 4. Develop appropriate financing mechanisms 5. Develop employment and vocational training in agriculture 6. Manage risks linked to food insecurity 7. Develop the institutional framework 	<ul style="list-style-type: none"> • Modernize farms (access to inputs, land, more efficient techniques and funding) • Increase farm incomes (improving productivity and competitiveness) • Enhance food security in high population density and fragile ecology areas in the context of integrated development programs • Promote rational and sustainable use of natural resources • Establish an incentive framework specifically for small and medium agricultural production and processing enterprises • Strengthen the organization and development of export-oriented production sectors and industrial processing • Develop regional and sub-regional market access • Strengthen professional and inter-professional organizations (partnership in the management sector) • Consolidate the rule of law in the commercial and financial environment (create a more favorable environment for the development of domestic and foreign investment in the agricultural sector) • Develop micro-finance systems, rehabilitate rural dirt roads and strengthen participatory management of grassroots socio-economic infrastructure

3. Agricultural Policy implementation in Cameroon

Four major periods characterize the history of agricultural policies in Cameroon:

- ✓ The five-year development plans period (1960-1986)
- ✓ The beginning of the economic crisis period (1986 - 1990)
- ✓ The New Agricultural Policy (1990-1998)
- ✓ Agricultural Policy - New Challenges (1999)

3.1 Historical overview

A. The five-year development plans period (1960-1986)

The five-year development plans period began at the country's independence in 1960 and was characterized by the promotion of export and industrial crops as they brought in foreign currency for the state and were meant to contribute to improving living conditions in rural areas. In this system, smallholders were considered as tools to guarantee mass production in a way that was at times forced upon them. The state, for its part, guaranteed prices and strictly controlled purchase operations of inputs and sale of agricultural export commodities such as cocoa and coffee (price stabilization mechanisms).

Other instruments of this policy were the creation of large development projects and the implementation of development companies that allowed the state to be present among farmers, provide them with the required technical advice and develop the necessary infrastructure to improve their lives.

Along with traditional agricultural exports, rice and wheat were promoted by the state as a substitute for imports. However, basic food crops (cassava, taro, yam, potato, maize, sorghum, groundnuts, beans, plantain, etc.) were traditionally produced without any support except specific technical advice given within the purpose of maintaining and consolidating food self-sufficiency.

The results of this policy were generally described as mixed. Indeed, yields remained low despite efforts to promote agricultural research and technical supervision of producers (Bokagne, 2006).

The non-achievement of targets set by the state was partially due to: (i) farmers' inadequate access to inputs and other factors of production, (ii) an inefficient management system, (iii) stagnant farm productivity, (iv) aging farms and producers and (v) the backlog of agricultural research on food crops.

During the fifth plan (1981-1985), the government revised its intervention strategy by creating a development structure with a financial and administrative autonomy in each agricultural zone, with the intention of establishing a "new type" of relations between the government and farmers. Aspects related to producers' incomes (and no longer only urban consumers' interests) were taken into account when setting agricultural prices. Similarly, intensified training for rural extension workers and the management (by state services) of production and processing were promoted.

Towards the end of this period, Cameroon started oil production, which resulted in a slowdown of investment in the agricultural sector. Development priorities were given to major infrastructure projects and strengthening public and parastatal agencies. The sixth five-year plan was discontinued in 1986 due to the economic crisis.

Box 1. Management of cocoa and coffee sectors between 1960 and 1986

The development of cocoa and coffee production in Cameroon dates from the colonial period. The colonizer, considering the colony as an area of operations, develops export crops through large plantations (banana, rubber, palm oil) and small peasant farms (cocoa, coffee), for their needs.

In general, during the period mentioned above, cocoa and coffee sector management was entirely administered by the state. However, production management at the farm level was different depending on the approach of the colonial rulers:

- ✓ Western Cameroon, under British occupation, had a more liberal cooperative model, in which the state remained in the background, with actions such as “community development”. In the wake of this, multiple collection and marketing cooperatives were created and eventually gave birth to the North West Cooperative Association (NWCA) in 1953, which is still very active in the Arabica coffee sector.
- ✓ In the eastern part of the country, the French developed a model characterized by strong state intervention. Around 1937, Sociétés Indigènes de Prévoyance came about, and later became Sociétés Africaines de Prévoyance as a result of the application of the 10 September 1947 French law that redefined cooperation. Sociétés Africaines de Prévoyance were thus implemented and represented at each administrative subdivision with the primary function of collecting and selling export and consumption products. In 1958, the Union of Western Cooperatives of Arabica Coffee (UCCAO) was created out of the Sociétés Africaines de Prévoyance.

With independence in 1960, the government of Cameroon became more closely involved in managing the coffee and cocoa sectors. Thus the overall operation of the supply chain, from sourcing and “supervising”⁴ of producers to exporting was controlled by the state through various agencies such as the National Office of Commodities Marketing (ONCPB) and state corporations such as the Cocoa Development Company (SODECAO).

In this management system, producers were required to take their products to their cooperative collection center, which was part of a network of cooperatives represented at departmental or provincial level and managed at national level by the National Center of Business Cooperatives (CENADEC). In these cooperatives, directors were appointed by the state. In this system, the farmer had an executive role. Payments to farmers were made through cooperatives on the basis of prices set by the ONCPB on a scale of quality (grade 1, grade 2, non standard). Cooperative funding came from loan funds obtained from banks and guaranteed by the Central Bank (BEAC). The ONCPB entrusted transportation of purchased products to the port of Douala to private licensed carriers by purchase zone. Private carriers were remunerated for their services by the ONCPB who drew its resources from stabilization operations.

⁴ The very word “supervising” shows a hierarchical relationship, and clearly reveals where producers stood.

Box 1. Management of cocoa and coffee sectors between 1960 and 1986 (Cont.)

For this, the government freely provided support to farmers in terms of production, funding for crop treatment and marketing. Officials of the Ministry of Agriculture and development companies such as SODECAO brought the necessary technical assistance to ensure production in terms of quality and quantity. In general, at the institutional, legislative and regulatory level, cocoa and coffee supply chains were developed and organized through these steps:

- ✓ Implementation of law 73/15 of 7 December 1973 whose aim was to standardize provisions applicable to cooperatives throughout the country.
- ✓ Creating the Cooperation and Mutuality Department within the Ministry of Agriculture (MINAGRI) and assign it with the main task of monitoring and managing cooperatives;
- ✓ Creating cooperative schools for training officers responsible for boosting the cooperative movement;
- ✓ Creating the National Fund for Rural Development (FONADER) to provide credit to farmers. This structure will disappear in the 80s, with results described as "mixed".
- ✓ The establishment, by Decree No. 74/874 of 29 October 1974, of integrated projects such as Integrated Priority Action Zones in the east and central parts of the country to improve the marketing of agricultural products (coffee in particular) and boost the region's economic development;
- ✓ The establishment of the National Cocoa Development Company (SODECAO) by Decree No. 74/83 of 2 February 1974, with the main objective to promote cocoa cultivation in central and southern parts of the country.
- ✓ Creating in September 1976 the National Marketing Commodities Agency (ONCPC). This new structure supported activities of the various stabilization funds by product and the "Produce Marketing Board". ONCPB was then responsible for regulating the purchase price of commodities from farmers, ensuring compensation between the guaranteed producer prices and export sales prices, organizing and monitoring domestic and international marketing, representing producers and defending the image of the product internationally. ONCPB had a virtual monopoly on cocoa and coffee exports and provided funding for all research, extension, production, information, etc., through development companies, projects, media and cooperatives.

B. The beginning of the economic crisis period (1986-1990)

Starting in 1985, Cameroon's economy went into recession, following the sharp decline in export earnings (falling prices of major commodities namely cocoa and coffee and falling oil revenues). Between 1985 and 1995, GDP reduced drastically by 6.3 percent per year. This resulted in an imbalance of macroeconomic accounts and, more importantly, a deficit in public finances. During 1987-1988, the state's main instrument for managing export sectors, ONCPB, recorded a deficit of nearly 30 billion XAF. The assessment conducted in 1988 on two decades of state intervention highlighted the following weaknesses:

- The gap between agricultural research outcomes and farmers' concerns. Results remained inaccessible to users because there was little or no connection between research and extension services; moreover research topics were inadequate to meet farmers' real needs.
- Inefficient production management and monitoring and food products seeds distribution was due to MIDEVIV's poor performance; this public institution had the monopoly on this activity (excessively high operating costs).
- Fertilizer subsidies for small producers that represented around 60 percent of domestic consumption had excessively high costs (7.5 billion XAF per year), and were coupled with a cumbersome distribution system (delivery delays to producers); pesticides (insecticides and fungicides) for cocoa, coffee and cereals costs were on the same line (8 billion XAF per year).
- The Agricultural Credit Policy failed. The main credit instrument, FONADER, found itself deprived of financial resources due to inadequate guarantee systems and approximately 70 percent outstanding payments.
- Training and monitoring of producers through development companies were inefficient and excessively costly.
- Aging farmers, caused by rural exodus and the rapid growth of the urban population.
- The administrative management of agricultural cooperatives by state agents failed (lack of contact with people on the ground, producers did not take ownership of their tools, financial mismanagement and very strong government interventionism).

To cope with this situation, the Cameroon government decided to implement measures that reflected Structural Adjustment Programs (SAPs) agreed with the Bretton Woods Institutions. The economic policy process focused on redefining the development strategy, especially the role of the state in the economic sphere. This gave rise to a liberalized environment, characterized by non-tariff barriers being gradually reduced, restructuring or privatizing / liquidating most production and commercialization enterprises, deregulating prices, and making actors, including professional and interprofessional organizations, accountable. In this particular context, a national seminar on cooperatives was held in Yaoundé in 1988 during which the crisis of the system was acknowledged and the groundwork for cooperative reform was laid out. This brought about in the enactment of the Law on Freedom of Association in 1990. This law was then supplemented in 1992 by the law on common initiative groups and cooperatives.

Overall, state measures showed a strong political will to strengthen agriculture as the key driver of economic and social development, given its significant contribution to the economy (export crops alone account for 50 percent of foreign exchange earnings) and the need to maintain food self-sufficiency. Nevertheless, production potential remained underutilized and food crop shares on the exports market remained insignificant. It was therefore necessary for the government to move towards an agricultural policy adapted to the requirements of competitiveness and to adapt to external shocks on commodities. This is what justified the development and implementation of the New Agricultural Policy (NAP).

Box 2. Promoting diversification of farmer organizations and food crops

Starting in 1985, Cameroon's economy went into recession following the sharp decline in export earnings (falling prices of major commodities, namely cocoa and coffee and falling oil revenues). Between 1985 and 1995, GDP fell by 6.3 percent a year, which resulted in macroeconomic accounts being unbalanced and, in particular, a fiscal deficit. During the 1987-1988, ONCPB had a deficit of nearly 30 billion XAF.

To cope with this situation, the Cameroon government requested the support of Bretton Woods international financial institutions and finalized SAPs. These adjustment plans allowed a redefinition of the development strategy, particularly the role of the state in the economic sphere. This gave rise to a liberalized environment, characterized by non-tariff barriers being gradually reduced, privatizing most production and commercial enterprises and deregulating prices.

Concerning the management of commodity sectors, the SAP indicated that from 1991, "ONCPB's role will be redefined to allow the private sector to gradually take over the internal and external marketing of export crops."

Regarding other food sectors, falling prices of coffee and cocoa helped to reconsider their place in the household economy. The development of short-cycle crops (such as maize and vegetable products) gained importance. Some young high school and university graduates migrated back to certain production areas (Foumbot, Lékié, etc.).

In addition, liberalization options highlighted the place and role that farmer organizations and the private sector were to play in managing agricultural sectors. Thus, in 1988, a national seminar on cooperatives was held in Yaoundé during which the crisis of the system was acknowledged and the groundwork for cooperative reform was laid out. This brought about the enactment of the 1990 and 1992 laws on freedom of association, cooperatives and Common Initiative Groups.

C. The New Agricultural Policy (1990-1998)

The guidelines of this policy focused on implementing deregulation and privatization measures to streamline resources, finding more efficient management practices and privatizing the capital management of parastatal enterprises. The operating mode was to empower more farmers to diversify agricultural production, enhance production potential and existing market opportunities and protect domestic production. Five priorities were identified:

1. Modernize the production apparatus;
2. Food safety management;
3. Promote and diversify exports;
4. Develop agricultural products processing;
5. Balance supply chains.

For this policy, the following main results may be identified:

- ✓ Implementation of the new laws of 1992 and 93 of the associative movement which allowed the revitalization of grassroots associations in the agricultural sector
- ✓ Promoting interprofessional organizations such as Rhorticam (horticultural sectors) and the CICC

- (cocoa and coffee sectors) that have become important partners in developing these sectors
- ✓ Implementation of a new approach to agricultural extension that combines research, extension and other stakeholders from the agricultural sector
 - ✓ Various reforms in trade liberalization of agricultural products and inputs allowing for greater transparency in transactions and better income distribution to producers
 - ✓ Various projects supporting the strengthening of farmer organizations and improving food security, particularly in the most affected areas of northern regions
 - ✓ Successful restructuring of certain public enterprises, which helped initiate a recovery of investment in certain sectors (banana, cotton, rubber and oil palm)
 - ✓ Developing decentralized micro financing systems, which initiated a new approach to funding social and economic needs in rural areas.

All these measures, coupled with the devaluation of the XAF in 1994, led to the improved competitiveness of domestic products and to a significant growth recovery in certain sectors such as cotton, cocoa, banana, rubber, maize, fruits and vegetables. However, the results were below expectations for most food products because of the malfunction of internal markets, which affected domestic products' competitiveness. Other constraints identified were:

- ✓ Weak domestic and foreign private investment in the agricultural sector due to the lack of a financial market suitable for the sector, the liquidation of the Agricultural Credit Bank and the closing of its branches (and interest-subsidy funds for example).
- ✓ The lack of an institutional framework adapted to the new sector development policy context (public service reform, promoting private and associative services capable of more effectively undertaking interventions previously run by the state, weak operational capacity of producer organizations).
- ✓ The backlog in restructuring certain parastatals, which affected the mobilization of investment and growth prospects in the short term of some key production chains such as palm oil, rice and sugar.
- ✓ Small traditional farms' insufficient productivity, compounded in some areas by structural aging: no renewal of plantations, youth emigration, fertility decrease, etc.

This has highlighted farmers' precarious living conditions and the uncertainty of their farming systems, resulting in government tackling the "new challenges" that the agricultural sector should now strive to meet.

Box 3. Promotion of the cassava sector

The new Agricultural Policy provides specific guidance for the roots and tubers sector in the general framework of the starches development policy. This policy is to strengthen the position of carbohydrates in the population's diet as part of fresh and processed products in order to reduce the share of food imports and improve food security. The intervention strategy on the sector focuses on:

- ✓ Providing support for production and field quality improvement (outreach of improved planting material and crop management sequences);
- ✓ Promoting small-scale processing (food hygiene and productivity), as well as Micro, Small and Medium Enterprises (SMEs) for processing or export;
- ✓ Providing support to marketing to ensure cities have a steady food supply and stabilize prices.

In this context, government decided to set up a specific program on the sector because of its social and economic importance and the fact that the many initiatives already underway were struggling to provide meaningful results as they failed to take into account the sector's functions (Pouma cassava processing plant in the Central Region, Cassava chips production in Obala and Cassava Transformation Experimentation Centre in Yoke to the southwest). Thus the National Program for the Development of Roots and Tubers (PNDRT) was established and mobilized financing from IFAD in 2004.

Since its inception in 2005 to date, this program has brought about a significant overall increase in roots and tubers production with 214 percent for cassava (from 15 tonnes / hectare to 25 tonnes), 187 percent for yam and 325 percent for potato (PNDRT Report, 2010). However, issues related to organizing stakeholders and markets and the low level of processing still need to be addressed to enable an impact at household level through better sharing of the added value generated and reducing transaction costs.

D. Agricultural Policy and the Rural Sector Development Strategy since 1999

The new challenges are:

- ✓ Consolidating the agricultural sector as an engine of economic and social development of the country;
- ✓ Promoting professional and inter-professional organizations for the various economic operators, as they should be the main actors in agricultural development;
- ✓ Improving the population's food security through increased production and total income.

On a practical level, the strategic options are:

- Modernizing farms to improve access to inputs, land, more efficient techniques and financing;
- Increasing farm income by improving productivity and developing business opportunities to ensure that domestic agricultural products competitive to keep inflation of consumer food products prices down;
- Strengthening food security in areas of high population density and fragile ecology through integrated development programs;
- Promoting the rational and sustainable use of natural resources, while ensuring compatibility between the various social, economic, technical and environmental constraints;
- Defining and implementing an incentive framework specifically for small and medium agricultural production and processing enterprises to increase the mobilization of domestic private investment in a competitive modern production sector, that creates jobs;

- Consolidating the organization and development of production sectors focused on exports and industrial processing because of their social and economic development importance in various regions of the country, and in particular quickly completing recapitalization of agro-industrial companies under rehabilitation;
- Developing regional and sub-regional market access that presents significant prospects and opportunities for a wide range of domestic products;
- Consolidating professional and inter-professional organizations to develop new partnerships in managing the sector;
- Completing the withdrawal of public services from activities that fall within the competitive field. Adapting these activities to the agricultural policy's new objectives and to their core tasks;
- Consolidating the rule of law in commercial and financial fields, pursuing ongoing reforms, strengthening their application and providing flexible and effective management of procedures to create a more favorable environment for the development of national and foreign investment in the agricultural sector;
- Directing public investment to support existing autonomous production dynamics to increase their efficiency and their induced effects, and for structural actions such as strengthening farmer organizations, developing micro-finance systems, rehabilitating rural roads and participatory management of grassroots socio-economic infrastructure.

Surveys conducted in 2000 with farmers on developing the rural sector development strategy classified sector liberalization as the main cause of their difficulties. Adverse effects reported are:

- ✓ Lack of support for producers,
- ✓ Rising input prices,
- ✓ The fall of the purchase price paid to producers and
- ✓ Lack of funding.

In 2003, the government of Cameroon developed a rural sector development strategy document. Thus, current agricultural policies mainly aim to reach production goals as defined in this strategy document and presented in the table below:

Table 3. Agricultural Production Objectives in Cameroon in 2015

	Production (thousands of t)				Annual Growth (%)		
	2001	Est. 2005	Est. 2010	Et. 2015	2001/2005	2005/2010	2010/2015
Cereals	1 341	1 686	2 345	3 294	5.9	6.8	7.0
R & T	3 517	3 836	4 916	6 319	2.2	5.1	5.2
Pulses	263	300	402	538	3.4	6.0	6.0
Oil seeds	209	239	321	430	3.4	6.1	6.0
Vegetables	1 278	1 405	1 837	2 400	2.4	5.5	5.5
Fruits	2 019	2 282	3 067	4 076	3.1	6.1	5.9
Palm oil	140	177	248	350	6.1	7.0	7.1
Cocoa	123	140	188	280	3.3	6.1	8.3
Arabica coffee	10	10	13	15	0.0	5.4	2.9
Robusta coffee	50	50	72	93	0.0	7.6	5.3
Cotton	220	270	330	400	5.3	4.1	4.0

Source: SDR

The official intervention of the state is organized around seven strategic pillars:

- ✓ Sustainably develop production and supply of agricultural products;
- ✓ Sustainably manage natural resources;
- ✓ Promote local and community development;
- ✓ Develop appropriate funding mechanisms;
- ✓ Develop employment and vocational training in agriculture;
- ✓ Manage food insecurity risks;
- ✓ Develop the institutional framework.

This strategy document is currently being revised to be consistent with the Strategy Document for Growth and Jobs, which is the national framework for economic and social development. It remains the most relevant basis of analysis to assess the government's actions and how they contribute allievating the greatest constraints in the agricultural sector such as capitalization, access to means of production and marketing products at profitable prices.

3.2 Support measures for agricultural commodities in Cameroon

A. The gap between food crop production and the population growth rate

After reaching a peak of 5.9 percent in 2007, the primary sector growth rate fell to 2.7 percent in 2009. The population growth rate (3.4 percent) is higher than the food production growth rate (2.8 percent). Following the food crisis that was the cause of the February 2008 riots, the government proposed an emergency plan to boost agricultural production in consumer products: maize, rice, cassava, potato, oil palm and plantain. Accompanying measures focused on making seeds and seedlings available to farmers, supporting product marketing and warehouse and storage construction.

In 2009, the agricultural sub-sector accounted for approximately 75.6 percent of the primary sector with food crops making up 68.8 percent and export products 6.8. The food products market, however, continues to show pressure on prices. The food price index rose by 13.6 percent in 2009 as opposed to 6.3 percent in 2008. This is due to the high cost of transport (bad roads) and the demand pressure from neighboring countries (Gabon, Central African Republic, Equatorial Guinea).

Cameroon still remains dependent on maize imports with 427 288 tonnes in 2009 against 470 947 tonnes in 2007 and 429 864 tons in 2006, representing a total budget of 87 billion XAF. Cassava, plantain and maize production has increased significantly since 2005, following the implementation of specific support programs; however the quantity of main food products remained almost stagnant while the 19 million-strong current population continues to grow rapidly.⁵

⁵ The growth rate in 2010 was 2.6 percent.

Table 4. Evolution of main staple foods production (tonnes)

Years	Dessert Banana	Plantain	Cassava	Cocoyam /Taro	Yam	Groundnut	Rice	Sorghum	Maize	Potato
1991/1992	622.235	958.641	1.611.911	747.228	120.417	121.117	16.972	350.000	516.224	37.416
1992/1993	634.520	1.035.427	1.675.223	547.642	116.000	102.070	16.786	408.681	507.687	44.502
1993/1994	642.330	1.120.351	1.648.338	431.315	108.315	99.346	24.516	281.337	618.000	38.114
1994/1995	651.285	1.211.158	1.760.800	735.228	120.230	117.613	24.508	325.350	750.000	41.327
1995/1996	651.285	1.250.200	1.780.500	760.000	120.230	117.613	24.500	350.000	750.000	35.000
1996/1997	640.331	1.115.155	1.689.354	642.283	117.038		21.456	343.074	628.382	39271.8
1997/1998	512.265	892.124	1.773.822	513.826	122.890		22.643	240.152	502.706	49089.8
1998/1999	729.514	1.331.813	2.814.661	540.888	393.567	210.503	73.288	270.253	854.577	220.542
1999/2000		1.780.783	1.894.132	1.038.673	261.650	184.361	67.470	331.574	584.999	126.090
2000/2001	645746	1.199.820	1.960.503	1.056.294	268.387	203.587	42.065	511.780	813.461	133.407
2001/2002	692886	1.237.014	2.003.634	1.079.533	274.292	210.712	44.546	541.975	861.456	136.342
2002/2003	743466	1.275.362	2.047.714	1.103.282	280.326	218.087	47.175	573.951	912.281	139.341
2003/2004	797739	1.314.898	2.092.763	1.127.555	286.494	225.720	49.958	607.814	966.106	142.407
2004/2005	929950	2.012.548	2.393.801	1.352.693	343.270	346.448	58.369	828.832	1.050.396	133.811
2005/2006	969967	2.175.434	2.652.176	1.375.386	366.808	414.046	64.525	917.107	1.249.489	142.118
2006/2007	1024004	2.338.036	2.767.455	1.428.568	383.212	449.123	68.267	976.222	1.322.160	143.568
2007/2008	1078041	2.500.639	2.882.734	1.481.750	399.615	484.199	72.009	1.006.478	1.394.832	145.018

Source: SDSR

In Cameroon, support policies mainly concern the measures in the WTO green box, namely:

- ✓ Subsidies for the purchase of inputs or investment for small farmers with low incomes
- ✓ Credit subsidies to agriculture (loan guarantees)
- ✓ Funding for community infrastructure (irrigation, drainage, storage)
- ✓ Extension and agricultural education funding
- ✓ Funding for research
- ✓ Funding for plant protection services
- ✓ Defining standards and regulations
- ✓ Establish food security stocks (Cereals Office, etc.)
- ✓ Address non-tariff barriers and conquer new markets

B. Dealing with non-tariff barriers

Regarding cereal imports, Cameroon is still very dependent on wheat flour that benefits from preferential tariffs and pressure from powerful flour mill lobbies. Maize imports receive the same treatment, which undoubtedly affects the competitiveness of locally produced maize. Studies have recently been conducted on the possibility of establishing a policy to incorporate potato or cassava flour (5-10 percent) in bread manufacturing. Preliminary results show that mills are opposing this and argue that (i) regular supply cannot be assured and (ii) the need to subsidize new investment in equipment that would have to be put in place.

Some vegetable crops such as tomatoes and substitute products such as soy oil versus palm oil also face competition from imports.

In general, despite the implementation of policies aimed at reducing tariffs on raw materials and inputs, certain transaction costs (transport and distribution in particular) do not allow farmers to earn sufficient income from their products.

C. A production environment still offering too few incentives

A quick analysis of the new agricultural policy's implementation in Cameroon shows that the agricultural commodities sector remains very fragile and has few incentives. The hunger riots that took place in 2008 are quite revealing of the situation. Some constraints are recurrent and include:

1. Agriculture development is based on factors of production that have low productivity (especially labor and capital). Food crop production outside of vegetable products is characterized by traditional extensive or semi-intensive systems using little or no input coupled to an aging workforce that invests little in factors of production;
2. The absence of a specialized financing structure for investment in agricultural activities (agricultural bank) and the lack of support from the state to the agricultural private sector to take over agricultural development. The private sector generally considers that agriculture can provide business opportunities. However, interested developers are faced with no existing credible expertise structure, capable of advising and assisting them in developing their projects and implementing their business plans (technical consulting, land tenure security, fundraising and risk management, etc.). Under the new organizational structure of the Ministry of Agriculture and Rural Development in place since 2005, two sub-directorates have been created, one in charge of small and medium-sized farms and the other to promote private enterprises. The conventional and administrative operation of these structures, coupled with the lack of financial resources and specialized and qualified staff, precludes them from providing the advice and support needed by the private sector. Moreover, capital is a major constraint for the development of agricultural production. Weakly capitalized small farms provide most of the food production (about 90 percent). Credit access conditions for these producers are almost impossible to meet. Microfinance institutions, which are at times presented as the solution to local credit, impose conditions beyond the reach of small producers.
3. The almost total absence of infrastructure for transport, storage, processing and marketing has resulted in an imbalance in distribution of the added value generated at the expense of producers.
4. Development of producer organizations poorly integrated into value chains despite the state's willingness to promote relations of a "new type" between the government and the peasants by "empowering" farmers through strengthening the cooperative movement.
5. The existence of a multitude of projects and programs whose activities are at times poorly coordinated. Beyond references made in public policy documents (the Growth and Employment Strategy Paper and the Rural Sector Development Strategy Paper) there is little steering of development partners for concerted action. Interventions are dispersed (sprinkling), and duplicated as a result of insufficient consultation between administrations involved in implementing programs and projects, the inability of policymakers to contain political pressures (territorial coverage management) and the willingness of development partners to project their own image. Thus, in most cases, the measures put in place regarding subsidy strategies for certain inputs (fertilizer, seed, pesticides) do not comprise a sustainable development dimension. This raises the problem of monitoring development outcomes of interventions and their sustainability (ownership by the beneficiaries).

6. The lack of a comprehensive framework to manage all operations in order to capitalize on achievements and to report on the sector's progress. Work is underway to establish a sectoral program⁶ that aims to be the sectorial strategy's framework for programming and monitoring and evaluation.

Table 5. MINADER Programs and projects involved in supporting food chains

Project / program name	Focus of intervention	Areas of intervention	Other observations
<p>1. National Agricultural Extension and Agricultural Research Program (PNVRA).</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Grassroots Producer Organizations Socio-professional Associations of Producers 	<ul style="list-style-type: none"> Improved technical assistance scheme to producers Developing farms' potential and production Conservation management of natural resources and protection of the environment 	Country wide	Initially funded by the World Bank and IFAD, the program is currently funded from internal resources (BIP HIPC)
<p>2. Competitiveness of Agricultural Operations Improvement Program (ACEFA).</p> <p>Target / beneficiaries:</p> <p>The EFA members of producer groups, producer groups and professional agricultural organizations of the second and third levels (CIG unions, Cooperatives and Cooperative Unions)</p>	<ul style="list-style-type: none"> Capacity building of secondary and tertiary level professional organizations to improve the services provided to EFA Financing of producers' productive projects and their organizations to increase the capacity of family farms Establishing an advisory support mechanism co-managed by the state and the profession 	Northern, Adamawa, South, Southwest and West Regions	Ongoing program financed by AFD / C2D resources
<p>3. Grassfield Participatory and Decentralized Development Project (GP-DERUDEP).</p> <p>Target / beneficiaries:</p> <p>Smallholders</p>	<ul style="list-style-type: none"> Agricultural Development Capacity building for decentralized MINADER services, municipalities and agricultural socio-professional organizations in community development Support for the rehabilitation of rural roads 	North-West Region	Ongoing project funded by the AfDB
<p>4. Rural Development Project in the Region of Mount Mbappit.</p> <p>Target / beneficiaries:</p> <p>Rural people / farmers</p>	<ul style="list-style-type: none"> Agricultural and rural infrastructure Animation / Awareness, training and support to beneficiaries of agricultural extension Acquisition of agricultural inputs and equipment; Management and monitoring / evaluation of the project 	Department of Noun, Western Region	Financed by the Islamic Development Bank
<p>5. Rumpi Area Participatory Development Project.</p> <p>Target / beneficiaries:</p> <p>Rural populations in the South West</p>	<ul style="list-style-type: none"> Capacity building of stakeholders Improved agricultural production and productivity Improved market access and support to local development initiatives. 	South West regions	Project funded by the AfDB

⁶ Livestock Agriculture Sectoral Program (LASP).

Table 5. MINADER Programs and projects involved in supporting food chains (Cont.)

Project / program name	Focus of intervention	Areas of intervention	Other observations
<p>6. Plantain Sector Re-launch Program (CSR)</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Individual or organized (CIG) producers of plantains Individual or organized (CIG) nurseries specializing in of plantain plant production Small-scale plantain processors Small plantain traders 	<ul style="list-style-type: none"> Cover the plantain shortfall at national and sub-regional level Establish a network of professional nurseries Support for farmers interested in establishing a plantation of 0.5 to 1 ha. 	Adamawa and 7 southern regions of Cameroon	Ongoing HIPC funding
<p>7. National Program for Food Security (NPF)</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Small farmers and their organizations Local decentralized authorities NGO partners 	<ul style="list-style-type: none"> Optimum use of natural resource base Crop Intensification Diversification of production systems Processing and marketing of products Nutrition Monitoring, warning and crisis response mechanism 	Countrywide	Initial funding FAO and BIP MINADER
<p>8. Grassroots Poverty Reduction Sub-Program (SPRP)</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Small farmers and their organizations 	<ul style="list-style-type: none"> Training in the development of projects Financial support for the implementation of beneficiaries' eligible micro-projects Training of producer organizations in project management 	Countrywide	UNDP
<p>9. Maize Sector National Support Program (PNAFM)</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Small maize producers and their organizations Multipliers of improved maize seed varieties Medium and large maize farms but only in terms of equipment (support for mechanization) 	<ul style="list-style-type: none"> Training of multipliers of improved maize seed varieties Support producers' micro projects Strengthening producers' capacity Structuring and organizing value chain stakeholders (researchers, seed multipliers, seed conditioners maize producers, input suppliers, traders, transport operators, etc.) 	Countrywide	Ongoing HIPC funding
<p>10. Roots and Tubers Development Program</p> <p>Target / beneficiaries:</p> <ul style="list-style-type: none"> Farmers Farmer organizations 	<ul style="list-style-type: none"> Strengthening the capacity of roots and tubers producers Improved access for producer organizations to local, sub-regional and national marketing circuits for roots and tubers Sustainable improvement of processors' access to appropriate post-harvest and processing technology Contribution to the sustainable intensification of roots and tubers production through the use of improved technologies 	Far North, Adamawa, and 7 southern regions	Ongoing project financed by IFAD

Table 5. MINADER Programs and projects involved in supporting food chains (Cont.)

Project / program name	Focus of intervention	Areas of intervention	Other observations
11. Relaunching rice production in the Logone Valley.	<ul style="list-style-type: none"> Structuring rice producers Establish a fertilizer revolving fund 	SEMRY Area / Far North	HIPC funding
12. Project against the major scourges of food production Target / beneficiaries:	<ul style="list-style-type: none"> Strengthening producers' organizational capacities (intervention village brigades: phytosanitary advisers, support for equipment and treatment products, training) Strengthening the operational capacity of the air way treatment unit 	Countrywide	HIPC funding
<ul style="list-style-type: none"> Food producers Producer organizations MINADER plant bases 			
13. Lowland development program Target / beneficiaries:	<ul style="list-style-type: none"> Grant, first to acquire pumps and piping and secondly for site development 	Countrywide	HIPC funding
<ul style="list-style-type: none"> Producer organizations 			
14. Project to support the integration of young farmers Target / beneficiaries:	<ul style="list-style-type: none"> Support projects for young farmers on their own estates Setting up young farmers in agricultural development centers (sites developed by the state) Support implementing young farmers agricultural project 	Countrywide	HIPC funding
<ul style="list-style-type: none"> Young farmers (18-40 years) 			
15. Revitalizing the potato sector project Target / beneficiaries:	<ul style="list-style-type: none"> Production support; Support for processing and marketing 	Potato ecological zone (West and North Wes	HIPC funding
<ul style="list-style-type: none"> Young farmers (18-40 years) 			
16. Agricultural Value Chain Development Support Program (PADFA) Target / beneficiaries:	<ul style="list-style-type: none"> Increase rice and onion production Improve the storage, processing and marketing of targeted products Strengthen the technical and organizational capacity of rice and onion farmers 	Far North, North, West and North West	With funding from IFAD this project was scheduled to start in August 2011
<ul style="list-style-type: none"> Producer Organizations 			

Source: Survey data compiled by the author.

3.3 Specific government actions in support of food chains in Cameroon

A. Developing production and supply of agricultural products

The main actions of the state consisted in:

- (i) Establishing and continuing projects and programs to support strategic sectors;
- (ii) Signing agreements with domestic and foreign operators for strategic crop intensification;
- (iii) Improving product promotion and implementing incentives through the organization of small knowledge exchange groups and agricultural fairs at regional and national levels;
- (iv) Support to modernize production through the development of mechanization;
- (v) Rehabilitate national seed farms;
- (vi) Following instructions by the Head of State, commit to enact a land reform that ensures land availability to develop a second generation agriculture.

Support programs to strategic sectors began with the National Program for the Development of Roots and Tubers funded by IFAD, to which were added the projects financed by HIPC resources. All these instruments that addressed the sector in an integrated manner have mostly had results in terms of production. Cross-cutting and / or participatory regional programs complemented the activities of these programs. However, the assessment at the national meeting organized in Ebolowa from 17 to 22 January 2011 remained mixed.

Rehabilitation of seed farms was undertaken in the framework of the "emergency aid" program, implemented from 2008 on, following riots. It firstly ensures the production of sensitive crops (rice, maize, plantain and cassava). A budget of 5 billion XAF was granted for this purpose. This program helped equip producers of these sectors in agricultural inputs (seeds and seedlings, fertilizers and pesticides) and agricultural equipment. The program also organized regional fairs with the state subsidized the transport of producers and their products to supply large cities during the holiday season with food, promote consumption and rehabilitate farms. The rehabilitation program included the renovation of buildings and production equipment, securing land and boosting seed production in specialized farms. Currently, 38 farms have been identified and 10 of them have been rehabilitated and are productive again.

Some sectors show deficits that are so large that the country has to rely on imports. This is the case for the rice and maize sectors for which the state has opted to sign framework agreements making it easier for domestic or foreign private investors to ensure intensive production of these crops to reduce their deficits. An agreement was signed with Chinese investors for rice production on nearly 6 000 ha in Nanga Eboko, a similar agreement was signed with Italy for a concession on 2 000 ha in the northern region. Two domestic investors have been set up in the Adamawa region to each cultivate 1 000 ha of maize.

The government is currently undertaking a major land reform, with the aim of ensuring land availability for large farms (second generation agriculture), which was selected as an option in the GESP. This option implies a necessary modernization of the means of production and therefore increased mechanization. In terms of mechanization, the state is intervening by restructuring the National Centre for Agricultural Machinery, and having the Ebolowa tractor assembly plant start production was due to start around this time.

Organizing the Ebolowa agropastoral association has relaunched the promotion of agriculture and this foreshadows the return of associations as perennial frameworks that promote, develop and evaluate agricultural activities.

B. Local and Community Development

The state now intervenes in the context of decentralization. To take this inevitable option into account, the State has sought to:

- (i) implement regional and participatory programs;
- (ii) build basic infrastructure;
- (iii) support self-management initiatives in rural communities.

Programs which support decentralization (GRASSFIELD, RUMPI, PARFAR, PADC projects), plus the rural development projects financed by the EU especially in the East, the Far North and in the Northwest, mainly contribute to building basic rural infrastructure namely: warehouses, water points, community houses, playgrounds, irrigation schemes, water crossings, critical points, feeder roads and education and health facilities.

These programs also support self-management initiatives in rural communities, including developing local development plans, establishing local governance structures and the promoting income generating activities for the benefit of vulnerable groups, particularly women and youth.

C. Developing appropriate financing mechanisms

The state's actions in this area have entailed:

- (i) Improving budgetary resources for rural production administrations;
- (ii) Establishing the Cocoa and Coffee Development Fund (FODECC) to finance the coffee and cocoa sectors;
- (iii) Following instructions by the Head of State, immediately creating an agricultural bank and a SME bank with public funding;
- (iv) Taking into account financial constraints in implementing activities of various projects and programs;
- (v) Setting up a new project to support rural microfinance financed by IFAD.

In terms of funding, the renewed interest by government in agriculture is to be noted. Since 2007, there has been a significant increase in the budget of the Ministry of Agriculture, as shown in the following table:

Table 6. Evolution of the MINADER budget from 2007 to 2011

Year	Amount in XAF million
2007	40 129
2008	45 930
2009	55 251
2010	60 342
2011	72 000

Source: DRFP-MINADER

These additional financial resources allocated to rural public services have made it possible to subsidize the main sectors. In this context, aid was granted to organizations such as SEMRY, UNVDA, SODECOTON, SODECAO, MIDENO, SOWEDA, UCCAO and NWCA to support production in their respective territories and areas. The state also grants subsidies to small producers organized in CIGs to ensure the development of their activities.

The renewed interest in agriculture can also be confirmed by the return of key donors including: the World Bank (PACA funding of nearly 30 billion XAF), the European Union, AFD through the Contracts for Debt Relief and Development Agreement (C2D), where agriculture is chosen as the focal sector of the second C2D. IFAD, AfDB and many other donors are also contributing significantly.

As funding is considered a major constraint, most projects take this into account and offer financial support in the form of equipment, inputs, small equipment and / or direct financing micro-projects.

D. Developing employment and vocational training

The state has taken into account human capital in the development of agricultural production. If staff training is the responsibility of universities, the emergence of rural professions necessary to create jobs could not be accomplished without renovating agricultural training. For this, the state has:

- (i) set up the AFOP Program, whose purpose is to renovate the agricultural and professional training framework, under the C2D;
- (ii) taken initiatives to help young farmers start their farming activities.

Renovating the agricultural and professional training framework consists firstly in training and / or retraining of trainers, establishing training programs and professional standard references, and secondly in rehabilitating and building agricultural training and professional infrastructure and providing support for students and graduates to enter the workforce.

Initiatives to help young farmers start their farming activities are primarily under the Support Program for Young Farmers' Installation (PAIJA). Some youth are installed in areas managed by the state while others have set up their activities on their own land. Today the project has 6 sites comprising 450 ha with 160 young farmers.

E. Sustainable management of natural resources

The main state's actions have entailed:

- (i) Setting up a program of soil conservation in cotton growing areas;
- (ii) Taking into account the environment in production development;
- (iii) Strengthening registration of agricultural pesticides and pest control;
- (iv) Establishing in the near future a testing and diagnosis laboratory.

The ESA project (Water-Ground-Tree) funded by the C2D is located in the cotton area where land degradation has become acute. Generally, the State encourages abandoning slash-and-burn farming (with a three-year rotation) where the soil conservation period is three years in favor of intensive cultivation with a conservation horizon of ten years. Some agro-industries (SOSUCAM), faced with declining yields, are already thinking about sustainable farming techniques that could ensure soil conservation for 25 years.

Legislation now requires that an environmental impact study precede implementing major projects. Pesticide registration avoids the use of pesticides with strong residues, which is favorable in view of the advent of the EPA where quality control is of great interest.

F. Action on food insecurity risks

The state's intervention on managing food insecurity risks has focused on the following actions:

- (i) Extend the Grain Office to the whole country;
- (ii) Establish a structure to ensure consumer goods supply (MIRAP);
- (iii) Relaunch the National Food Security Program (NFSP);
- (iv) Intensify the fight against the major food scourges.

The Grain Office was initially limited to northern parts of the country and built warehouses to store products which supply people in lean periods. Subsequently, activities have evolved to now take into

account the construction of village granaries to help the villagers to manage their own stocks and be less dependent on food aid. This initiative, with positive results in the northern part of the country, will now extend to the south.

Food insecurity and, more generally, the issue of supply, especially in large urban centers, can now threaten civil peace. This is taken taken seriously since the 2008 riots during which human and material damage were extensive. This is why the President has created MIRAP to ensure the supply of consumer goods. The purpose of this structure is to provide opportunities for domestic production, especially for agricultural production by purchasing products, or in case of production shortfall, resort to imports. This structure could bring about an improvement in the imbalance between domestic production and consumption.

Relaunching the NFSP is a major state initiative that contributes to managing food insecurity risks. This program first had a pilot phase in four regions and should now extend over the entire territory with a significant state financial contribution (50 percent of the program budget). The aim of the program is to cover areas at risk of food insecurity.

G. Action for the development of the institutional framework

The state has intervened through:

- (i) the implementation of the AMO program (support to public work supervision)
- (ii) giving support to public-private dialogue by establishing consultative frameworks and restructuring the Chamber of Agriculture, Fisheries, Livestock and Forestry (CAPEF);
- (iii) promoting good governance by introducing transparency and cultivating results.

The AMO program has strengthened the administration services involved in the PPBS (Planning-Programming-Budgeting-Monitoring) chain. This support was made through an instrument known as a technical contractualised sheet where the relevant administration established an annual program with specific objectives and results, indicating intervention methods, beneficiaries, the implementation of a timetable, costs and delivery schedules. Thus, rural sector services have been strongly equipped with transport, computer hardware and office equipment and other equipment, combined with significant support to develop their activities.

The support program also focused on renovating the statistics system so that statistical information can be collected regularly to have reliable data for forecasts on the agricultural sector. Another aspect of the program focuses on helping decentralized services (regional offices through a program of improving services that is developed, submitted and approved prior to funding through the AMO program).

The government has also encouraged public-private dialogue by establishing consultative frameworks between the state and farmer organizations. The restructuring of CAPEF has been finalized with running offices. The dialogue instruments with the state seem to be ready to operate.

4. Conclusion

What can be observed today is that the government has clearly expressed its commitment to support sectors by implementing a number of initiatives intended to boost production, which is commendable. However, the targeting of interventions by sector and by regional area is not truly respected and there usually is more of a sprinkle to keep political actors satisfied.

Implemented approaches do not holistically take into account all of the sectors' functions in the value chain logic when it would provide solutions and practical support to stakeholders in the context of the different specific professions, organization and professionalization of the sector.

The processing and marketing chain in this framework is the one that remains the most unsuccessful and the majority of intervention projects and programs have failed to develop an expertise in this area to provide the support desired by stakeholders.

Access to financing remains a major constraint to implementing productive investments. The current practice is simply to encourage microfinance institutions to engage in agricultural financing without giving them the necessary means of action and adequate training to assess and monitor their clients' projects.

Given this situation, it is normal to expect that there still is a long way to go to transform staple food sectors into real economic development, social stability and poverty alleviation instruments.

4.1 Promoting food crops, a necessity for the population's well-being

Current policies in Central Africa seem to move more towards developing food products as a result of many factors among which we can mention:

- ✓ urbanization, which involves feeding a growing population that can have considerable power to make demands (riots);
- ✓ the situation in many countries where the primary sector, especially agriculture, due to endowments in factors of production, is the only competitive sector vis-à-vis the outside world in a globalized world;
- ✓ international trade stagnation of certain strategic sectors implying the development of new sectors;
- ✓ economic difficulties in countries characterized by low growth, rising unemployment and poverty, a phenomenon that mainly affects rural areas;
- ✓ consideration of environmental risks and the need to ensure better conservation of natural resources.

Policy makers, aware of this situation seem to have developed a new attitude toward agriculture in general, and especially vis-à-vis food production, taking into account demographic, ecological, economic and political effects that are linked to it.

This new perspective, favorable to agriculture can be observed from:

- a renewed interest to finance agriculture;
- how crop diversification is considered a strategic option in most countries and / or the need to promote the development of food crops;
- competitiveness development of sectors including the removal of endogenous and exogenous constraints to production and marketing;
- the development of downstream activities for the sectors (storage, processing, facilitating access to markets);

- improving targeting by considering value chain sectors that can protect the most vulnerable;
- improving the integration of promising sectors in both domestic and regional and international markets.

4.2 Renewed interest in financing agriculture

Agricultural policies have long been funded by development aid. According to the OECD, between 1973 and 2004, multilateral aid received by Cameroon over thirty years amounted to about 600 billion XAF. However, aid volatility did not favor the development of structural promising actions. Two periods should be considered: (i) a first period characterized by interventionist donations or bilateral and multilateral loans directly conditioning the success or failure of projects in a context where local expertise was relatively low, and (ii) a second period which began in the 80s before the end of five-year plans, with the project approach as the government was facing a crisis.

It must be recalled that it is in this context that Development Assistance Organizations introduced consultants who developed most of the old "all-purpose" policies that were recommended to African states including those of Central Africa (PASA, SRP, PSSA, etc.).

The evaluation of these policies, which were conceived with the MDGs in mind in the structural adjustment framework, has not been satisfactory. Ultimately, the results, while important in a few places, proved generally disappointing. Funding was then identified as a major constraint to develop agriculture in Africa. This is what brought African leaders to adopt the Maputo declaration allocating at least 10 percent of national budgetary resources to agriculture development.

In the case of Cameroon, there has been a significant improvement of budgetary resources allocated to agriculture and rural development. More generally, the GESP medium-term expenditure framework (MTEF) allocates nearly 7 percent of the resources to the development of agriculture as opposed to the PRSP with only nearly 4 percent.

4.3 Taking into account crop diversification and development

Interest in food crops has increased for economic, social and political reasons. The OECD noted that in 2006 the contribution of agriculture to GDP was around 20 percent in Cameroon. This structural data are still current and the study shows that the contribution of subsistence farming is higher than export crops. This is illustrated in the tables and graphs below:

The contribution to growth analysis confirms the privileged position of food crops as shown in the following table:

Table 7: GDP Evolution by sector in Cameroon

	Historical			Estimated		
	2001	2002	2003	2004	2005	2006
GDP at constant price	4.5	4.0	4.0	3.7	2.7	3.9
Oil	-4.0	-4.4	-5.0	-9.3	-9.7	6.2
Non oil	5.5	4.9	4.9	4.9	3.6	3.7
Primary sector	3.7	3.7	3.5	4.4	2.9	3.3
Agricultural	3.7	4.7	3.4	4.3	3.4	4.1
Food Crops	4.6	5.0	3.5	3.4	3.9	4.2
Export Products	-2.0	2.8	2.4	10.8	-0.2	3.0
Secondary sector	1.0	0.8	0.5	-0.2	-1.9	3.1
Tertiary sector	8.5	7.3	7.4	6.6	5.2	5.2

Source: MINEFI/Economic Affairs Directorate

Table 8: Sectoral contribution to GDP growth, 2001-2006

	Historical			Estimated		
	2001	2002	2003	2004	2005	2006
Primary Sector	0.8	0.7	0.7	0.9	0.6	0.7
Agricultural	0.6	0.7	0.5	0.7	0.5	0.6
Food crops	0.6	0.7	0.5	0.5	0.5	0.6
Export Products	0.0	0.1	0.0	0.2	0.0	0.1
Secondary Sector	0.3	0.2	0.2	-0.1	-0.6	0.9
Tertiary Sector	3.3	2.9	3.1	2.8	2.3	2.3
GDP	4.5	4.0	4.0	3.7	2.7	3.9

Source: MINEFI/Economic Affairs Directorate

This shift in focus, henceforth incorporating food crops is reflected in:

- (i) more attention paid to food crops in national economic policies and sectoral policies documents;
- (ii) implementing sector support projects and programs that provide multifaceted support to producers to strengthen their capacities and improve their performance;
- (iii) strengthening sector competitiveness by removing external constraints to production. This involves creating basic productive and marketing infrastructure, and strengthening producers' equipment, organization and structure;
- (iv) the geographic opening of production areas through the implementation of maintenance programs of dirt and rural roads, developing critical points to facilitate the flow of goods to consumption centers. At the level of CEMAC, the road construction network will link countries together;

- (v) in some countries, like Cameroon, reforms aimed at facilitating access to land are ongoing;
- (vi) agricultural research development now includes topics related to food crop development and the state invests heavily to support national agricultural extension and advisory services.

4.4 Considering the value chain and support to small producers

The value chain concept increasingly has a central position in agricultural considerations. This approach guides intervention programs and helps to focus not only on production, but also on the market: before producing you need to sell. Thus, policy concerns are moving more and more towards sharing the added value. It is essential to understand price formation, how to improve the efficiency of marketing channels, how to improve product quality, and the problems of market regulation, etc.

Specific interest is thus given to understanding the behavior of the operators involved in the value chain by analyzing all of their activities. This leads to a definition of stakeholders' scope of intervention to understand their behaviors and strategies. This is a systemic approach as analyzing interactions between economic agents within the sector and their various functions helps to understand how the system works. Generally, each economic agent pursues their own goals and develops strategies to meet their own needs. The behavior of one agent can then slow down the objectives of others. Only when the system works perfectly can each stakeholder achieve their objectives.

For small producers involved in food sectors, support must incorporate three functions: production, processing and marketing. Agricultural policies should aim to: (i) remove obstacles faced by stakeholders, (ii) create an enabling environment conducive to developing private initiatives, (iii) allow a healthy competition between players (iv) remove obstacles to the proper functioning of the market, and (v) promote a fair share of the added value generated. In short, in this context the state plays a regulatory role in the economic environment and anticipates trends that could be detrimental to the performance of the sector.

In the absence of state regulation, small producers will remain in poverty's vicious circle. Thus, support for professional and inter-professional organization and strengthening their capacity for action and negotiation has emerged as a major public intervention priority.

4.5 Improved marketing and integration into regional and international markets

The state shows a strong interest in trade development. In addition to facilitating the flow of products from production areas to consumption centers made up by urban areas, the state builds markets, especially in border areas.

African, Caribbean and Pacific (ACP) countries in general, and those of Central Africa in particular, are engaged in two parallel negotiating processes that are crucial to agricultural policies and trading: First, multilateral negotiations under the auspices of the WTO and second, bilateral negotiations with the European Union Economic Partnership Agreements (EPAs). Both negotiating frameworks are particularly important, as agriculture is an essential part of ACP economies. However, countries do not have a homogeneous position due to the relative importance of the agricultural sector in each economy, and national specificities.

Agricultural multilateral negotiation stakes nevertheless affect in particular the three pillars of the Agreement on Agriculture: (i) improving market access by reducing tariff and non-tariff barriers (ii) discipline on the use of domestic support so that the aid granted to farmers does not lead to distorting effects on markets and (iii) discipline on export subsidies. Regarding EPA negotiations stakes, they focus on products that can be excluded from EPA, the implementation timetable, but also on the development side which is supposed to distinguish an EPA from a free trade agreement (ALE).

The major constraint for countries is that these two processes are not easy to follow because, firstly, they require significant human capacity, and secondly, the two negotiation processes occur in a context marked by important changes in the EU's agricultural and trade policies (reform of the Common Agricultural Policy - CAP) and also by other bilateral or regional negotiation process involving ACP countries.

The state will have to deal with two major issues: (i) access to markets in the North and the EU in particular, and (ii) competition from imports from the North on national markets as well as on the dynamics of regional trade. To this end, the issue of quantitative and qualitative production development becomes important, given the persistence of non-tariff barriers imposed by the different legally binding standards in targeted markets. States are now forced to invest in setting up sample and diagnosis laboratories to ensure quality control of products and adopt stricter pesticide registration and use, given the maximum residue limit tolerated.

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Chapter 5

Impact of Mali's food and agricultural policies: an assessment of public expenditure and incentives to production from 2005 to 2010

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1. Introduction

During the past decade, economic growth in Africa has been relatively strong overall, with per capita income growing, on average, by almost 5 percent per year (MAFAP, 2010). Yet the agricultural sector has not fared as well. Africa has been a net food-importing region; net imports of cereals, in particular, grew by over 50 percent between 1995 and 2007, from 30 million tonnes to 46 million tonnes (MAFAP, 2010). Unless fundamental policy changes are made and resources used more effectively, cereal imports could grow to over 60 million tonnes in the next decade (MAFAP, 2010).

To attain specific development objectives, governments use policies to change the rules governing the economy as a whole (macro-economic policies), or those governing a particular economic sector (sector policies), in order to guide and modify the behaviour and decisions of agents operating in the economy. One way this can be done is by establishing a legal framework (e.g. food quality or safety norms, or property rights) by which economic agents must abide or run the risk of legal prosecution or fines. Another approach is institutional reform or providing incentives or disincentives to certain types of behaviour via price and trade policies, input and output marketing policies, social policies (income transfers, safety nets, social security schemes) and finance policies.

Public expenditure can be used to make goods and services available to the food and agriculture sector, to support the implementation of government policies and to facilitate the achievement of development objectives. This expenditure may include the provision of public goods through public investment in infrastructure or provide private benefits, such as subsidies or income transfers. The Heads of State of the African Union have committed to the Maputo Declaration of 2003, stating that they would commit to the allocate at least 10 percent of their resources to agriculture and rural development policy implementation within five years. However, this has put the emphasis on the amount of public expenditure going to agricultural and rural development rather than on its appropriate composition, which is crucial for attaining policy consistency and efficiency.

To ensure that government actions are consistent and contribute suitably to development objectives, it is therefore essential that the authorities be fully informed regarding the incentives or disincentives that any packages of policies they implement may provide to the economy, and regarding the consistency, efficacy and adequacy of the way in which they spend their public resources.

Some of the key questions that governments need to consider include the following:

- Do the policies in place provide incentives for production, processing and marketing in key food and agricultural value chains?
- Who, in the most strategic value chains, benefits from the policies in place? (Producers, processors, traders or consumers?)
- Which policies should be changed so that the incentive structure in the food and agriculture sector is more closely aligned with government objectives?
- Is public expenditure used in a way that addresses the key issues faced by the food and agriculture sector? (e.g. which is the most efficient way to improve farmer incomes: an input subsidy or investment in a road?) Is public investment focusing on key investment needs?
- Are policy incentives and public expenditure consistent or do they, in some cases, provide contradictory signals to the economy, resulting in wastage of precious public resources?
- Are public resources spent efficiently, or is an excessive share used to cover administrative costs?

Having insights to answer these questions is all the more important as governments are establishing multiple short-term agricultural and rural policies in many countries of the world as a reaction to the food crisis of 2008 and the present price surge (see Maetz et al., 2011).

This chapter seeks to provide some answers about the coherence and effects of agricultural policies, taking the example of Mali and building on the first results of the Monitoring African Food and Agriculture Policies (MAFAP) project of the United Nations Food and Agriculture Organization (FAO). The MAFAP project is currently being implemented in ten African countries, working with national institutions to undertake work based on an innovative methodology that measures the effects of food and agricultural policies through a two-pronged approach.

First, public expenditures are being examined, including the very nature of activities being implemented and funded partially or totally through the public budget. This enables a better understanding of the composition of public expenditure: commodities being supported, type of activities, beneficiaries and so on.

Second, the MAFAP analysis considers the way the government provides incentives and disincentives through price policies to different agents in the main value chains. To do this, the MAFAP methodology entails a comparison of reference prices (usually international prices) with observed wholesale and producer prices to determine whether the value chain actors get the prices they should get, that is whether observed prices are distorted by agricultural and rural policies.

These two approaches, when combined, offer a rich understanding of the actual effects of agricultural and rural policies implemented by African governments. This allows decision-makers and development stakeholders to assess the coherence of these policies and to conclude whether the various policy measures are consistently implemented and whether they actually reach the stated and/or desired government objectives.

This chapter will present preliminary results from the MAFAP analysis in Mali for the period 2005-2010. After a brief review of the food and agricultural context of Mali (Part 1), the paper will provide a full set of results from the MAFAP public expenditure analysis in the country (Part 2). The methodology for the incentives/disincentives analysis will then be briefly summarized, followed by aggregated results of incentives and disincentives received by producers and wholesalers for eight key value chains (millet, sorghum, maize, rice, cotton, livestock, cow milk and groundnuts), as well as market development gaps (Part 3). The final part will combine the two approaches to examine Mali's agricultural and rural policy coherence, taking four products as examples: rice, livestock, sorghum and millet.

2. Context of food security and agriculture in Mali

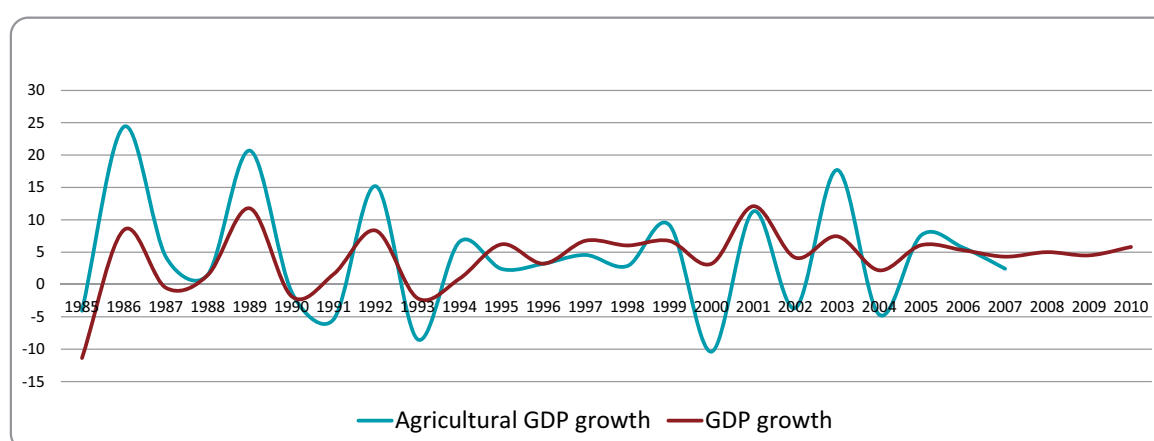
The Malian agricultural sector is dominated by small family farms (68 percent). The sector grew by 4.9 percent in 2010 (World Bank, 2012), and contributed 37 percent to gross domestic product (GDP) in 2008. However, growth of the agricultural sector is subject to high annual variations and even negative years, with disparities between different sub-sectors (see Figure 1 and Table 1).

The agricultural trade balance of Mali has been in deficit since 1976 and this period was marked by continual growth in the value of agricultural imports (except in 2003-2004 and 2006-2007). Grains,

including rice and wheat, account for 80 to 95 percent of the value of total agricultural imports. Cotton accounts for 92 to 97 percent of the total agricultural exports, but its value has declined steadily since 2003. The cotton sub-sector has long been characterized by the fact that the value added has been largely distributed among the various actors of the value chain resulting in interesting spill over effects in terms of income generation. However, it has been facing a prolonged crisis.

Other sub-sectors show significant potential, including livestock, which could be better structured to become a huge economic driver in the country. In the vegetable and fruit sub-sectors, crops such as onions/shallots and mango also offer opportunities for diversification of production. In addition, good water availability, thanks to the Niger and Senegal rivers, offers the prospect of more intensive agricultural production. Encouraging progress is already registered for rice and maize, which have shown yield increases in recent years. These are positive advances towards diversification of agricultural income which has been heavily based on the cotton sector up to now.

Figure 1. Annual growth in agricultural and total GDP in Mali, in %, 1985-2010



Source: World Bank, 2012

Table 1. GDP of the primary subsectors in Mali, in % of total primary sector GDP, 2005-2010

	2005	2006	2007	2008	2009	2010
Agricultural GDP	58	60	59	64	64	66
Livestock GDP	26	25	26	23	23	22
Forestry GDP	14	13	13	11	11	11
Fishery GDP	2	2	2	2	2	2
Primary sector GDP	100	100	100	100	100	100

Source: INSTAT, 2011

Most agricultural value chains, however, encounter significant obstacles to investment, production, processing and marketing. The state has an important role to play, especially in relation to access to inputs that are seldom used – e.g. 3.04 kg fertilizer/ha cultivated (World Bank, 2012) – and often difficult to obtain. The government has been investing heavily in this area through input subsidies, which have increased steadily since 2008, reaching 36 billion FCFA in 2012 (MAFAP, 2012).

Transport infrastructure – for example, only 24.5 percent of roads over the country are paved (World Bank, 2012) – still appears insufficient to enable most small producers to increase their income. Improved performance of the agricultural sector also requires more capacity building and strengthening of producer organizations, which still lack resources and skills to support the farmers and develop the sector sufficiently.

The agricultural GDP has been growing mainly through the expansion of cultivated areas, which results in increased environmental risk, including land degradation, deforestation (6.2 percent between 2005 and 2010), and low resilience to natural disasters (FAO GFRA, 2010).

The dynamic economic growth (approximately 5 percent per year) of the country over the past ten years is probably related to the high rate of population growth, a staggering 3.6 percent per year between 1998 and 2009 (World Bank, 2012). The average income per capita in purchasing power parity (PPP) stood at USD1 030 in 2010 (World Bank, 2012). Although the average per capita income almost doubled and poverty has decreased by 12 percent since 2000, Mali remains one of the world's poorest countries, with 43.6 percent of the population living on less than a dollar a day in 2010 (See Table 2).

Table 2. Population living below the national poverty line (USD 0.95) and below USD 1.25/day in Mali, in %, 2001-2010

	2001	2006	2010
Share of population living with less than USD 0.95/day (INSTAT)	55.6	47.4	43.6
Share of population living with less than USD 1.25/day (World Bank)	25.8	18.8	16.4

Source: INSTAT, 2011, cited by Bourdet, Dabitaou and Dembele, (2011) and World Bank (2012).

Faced with the reality of a population in precarious living conditions and largely dependent on the growth of the rural economy, it appears essential for the government to have a solid information base for its policy choices and directions for the socio-economic development of rural areas and agriculture in particular.

3. An analysis of Mali's public expenditure: composition and volume

3.1 General trends in public expenditure in support of agriculture in Mali

The total approved budget for the sector increased by 72 percent, in nominal terms, from 2004 to 2010, reaching 198 billion FCFA (Table 3).

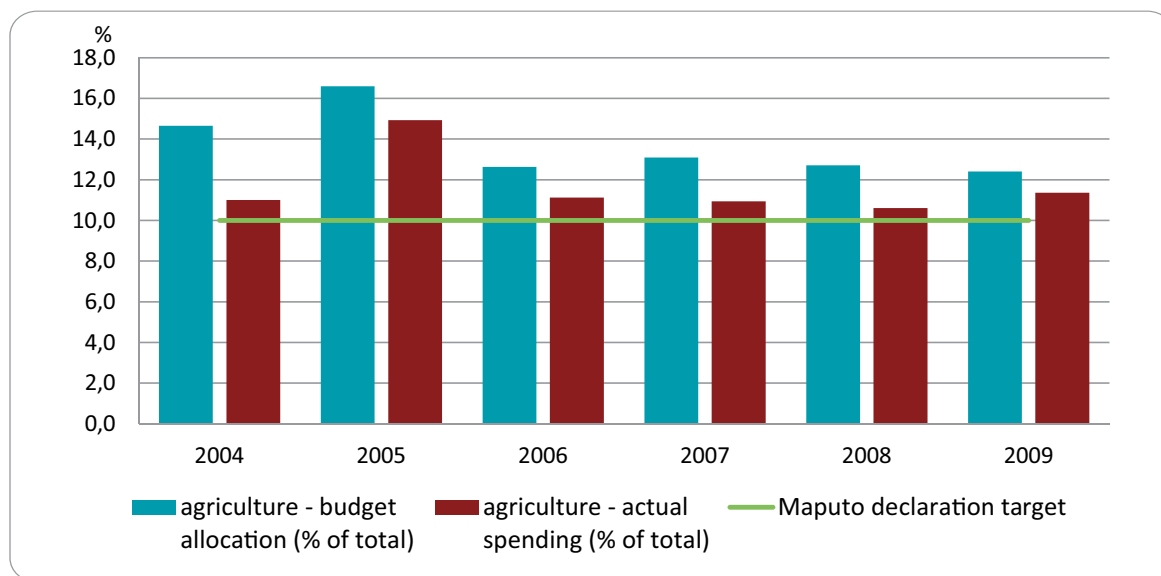
Table 3. Total and agricultural expenditure in Mali: budget allocations and actual spending, in %, 2004-2010

	2004	2005	2006	2007	2008	2009	2010	
	billion FCFA							
Budget allocation	115.3	141.2	118.2	130.2	134.2	143.2	198.0	72%
Actual spending	72.6	117.1	95.3	96.9	94.8	117.1	132.3	82%

Source: Authors, based on CPS and MEF (2011).

Total actual spending has grown even more: it increased by 82 percent from 2004 to 2010, reaching 132.3 billion FCFA. In relative terms, however, the agricultural budget allocations have declined from almost 15 percent of total government spending in 2004 to about 12 percent in 2009, while actual spending was at a similar level of 11 percent in 2004 and 2009 (Figure 2)¹.

Figure 2. Agriculture in total government expenditure in Mali: planned and actual spending, 2004-2009 %



Source: Authors, based on CPS and MEF (2011).

Although, in relative terms, the trends show the importance of agriculture in the total government budget declining slightly, the current level of spending meets the Comprehensive Africa Agriculture Development Program (CAADP) recommendation of allocating 10 percent of the overall budget to agriculture and rural development (including national resources and aid), as expressed in the 2003 Maputo Declaration.

3.2 Composition of public expenditure in support of agricultural and food sector in Mali

Data collected at country level allow for a good disaggregation of expenditure, funded from national resources and foreign aid, which is allocated to the agricultural sector. About 100 projects and programs were identified and grouped according to the MAFAP classification, as outlined in the project methodology (MAFAP, 2010). Collected data covered the 2006 to 2010 period. However, for some of the expenditure, data on policy measures were missing for the most recent year. In such cases, estimation methods were provisionally applied, until the most recent data can be obtained from the country. The results are shown in Table 4.

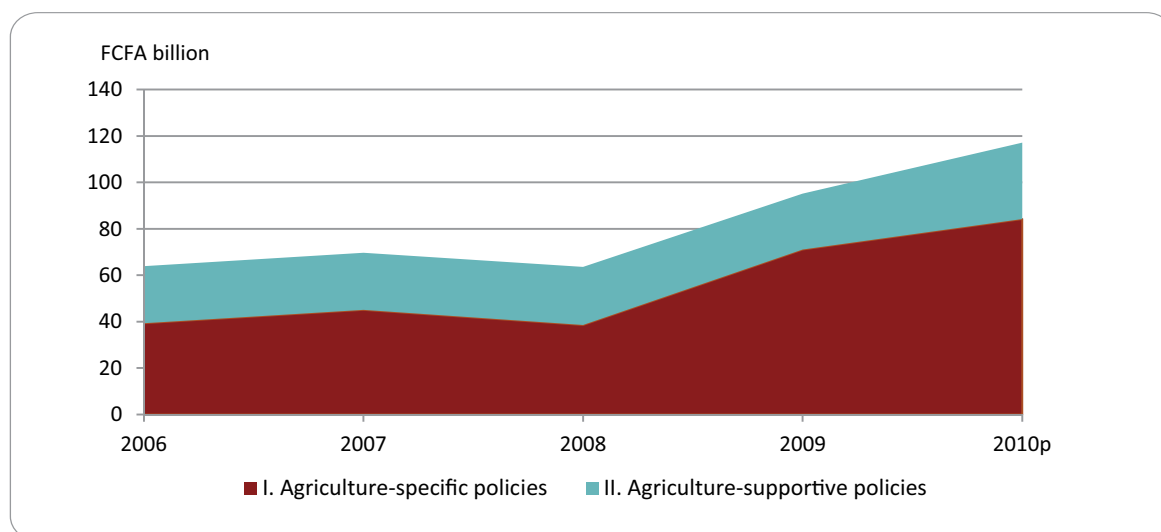
Agriculture-specific expenditure accounts, on average, for almost 70 percent of expenditure in support of food and agriculture development. The level of this expenditure in overall agricultural support increased from about 60 percent in 2006 to 80 percent in 2010. In terms of the level of spending, the agriculture-specific expenditure almost doubled over the analysed period, while agriculture-supportive expenditures increased only slightly (Figure 3).

¹At the time this paper was drafted, data on the total government budget were not available for 2010.

Table 4. Public expenditure in support of food and agriculture in Mali (actual spending) in billion FCFA, 2006-2010

	FCFA billion				
	2006	2007	2008	2009	2010
I. Agriculture-specific policies	39.3	45.1	38.6	71.1	84.2
I.1. Payments to agents in the agri-food sector	17.8	19.4	17.2	26.3	30.0
I.1.1. Payments to producers	16.6	17.4	15.6	23.9	27.1
A. Payments based on output	0.0	0.0	0.0	0.0	0.0
B. Input subsidies	16.3	17.0	15.2	23.5	26.7
<i>B1. variable inputs</i>	0.9	2.4	1.7	4.5	5.2
<i>B2. capital</i>	15.0	14.5	13.4	19.0	21.2
<i>B3. on-farm services</i>	0.4	0.1	0.1	0.1	0.3
C. Income support	0.3	0.4	0.4	0.4	0.4
D. Other	0.0	0.0	0.0	0.0	0.0
I.1.2. Payments to consumers	0.6	0.9	0.5	0.8	0.7
E. Food aid	0.5	0.7	0.4	0.6	0.6
F. Cash transfers	0.1	0.2	0.1	0.2	0.2
G. School feeding programs	0.0	0.0	0.0	0.0	0.0
H. Other	0.0	0.0	0.0	0.0	0.0
I.1.3. Payments to input suppliers	0.0	0.0	0.0	0.0	0.0
I.1.4. Payments to processors	0.6	1.0	1.1	1.6	2.2
I.1.5. Payments to traders	0.0	0.0	0.0	0.0	0.0
I.1.6. Payments to transporters	0.0	0.0	0.0	0.0	0.0
I.2. General sector support	21.6	25.7	21.4	44.8	54.2
I. Agricultural research	0.2	0.5	0.6	3.0	3.2
J. Technical assistance	0.1	0.7	0.6	3.2	3.9
K. Training	3.0	4.2	2.5	7.3	9.7
L. Extension	0.1	0.7	0.5	1.1	1.4
M. Inspection (veterinary/plant)	1.7	2.6	2.7	5.2	6.1
N. Infrastructure	11.4	10.6	9.3	14.0	13.2
<i>N1. roads</i>	1.0	2.2	2.2	3.5	3.0
<i>N2. irrigation water</i>	7.7	5.9	5.1	7.7	9.1
<i>N3. other</i>	2.7	2.5	1.9	2.8	1.2
O. Storage/public stockholding	2.8	2.8	2.3	2.4	2.6
P. Marketing	1.3	3.3	2.6	7.6	13.1
R. Other	0.9	0.3	0.4	0.9	1.0
II. Agriculture-supportive policies	24.6	24.6	25.0	24.1	32.9
S. Rural education	3.2	3.0	2.4	1.8	2.2
T. Rural health	4.8	2.8	2.6	2.5	2.6
U. Rural infrastructure	11.1	9.7	9.0	10.7	15.2
<i>U1. roads</i>	9.4	8.6	8.5	10.4	13.6
<i>U2. water and sanitation</i>	0.7	0.4	0.3	0.2	1.6
<i>U3. energy</i>	0.7	0.6	0.3	0.1	0.1
<i>U4. other</i>	0.3	0.1	0.0	0.0	0.0
V. Other	5.4	9.1	11.0	9.1	12.9
III. Total expenditure in support of the food and agriculture sector	63.9	69.7	63.6	95.2	117.1

Source: Authors, based on budgetary data collected by Institut d'Economie Rurale in Mali for the MAFAP project. ^p - provisional estimate.

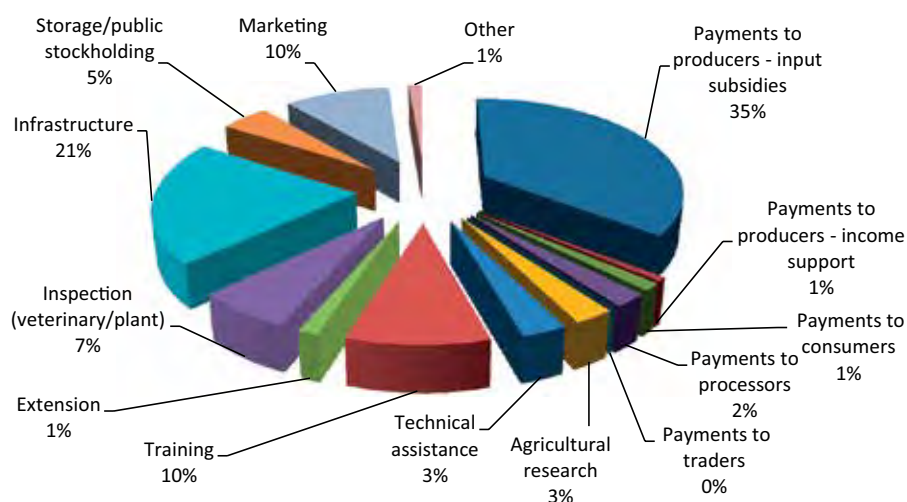
Figure 3. Composition of public expenditure in support of agriculture in Mali, in billion FCFA, 2006-2010

Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project.

Among agriculture-specific expenditure measures, about 60 percent are in the category of general sector support (Figure 4). Most of this expenditure falls into the infrastructure category, with the largest investments in irrigation/water and feeder roads. Other significant expenditure supports training, inspection, storage (including investments in related infrastructure) and marketing (including investments in construction of markets). These expenditure shares did not change significantly throughout the analysed period. Agricultural research, technical assistance and extension services account for only a small proportion of agriculture-specific spending; however, their shares of this expenditure increased in the second half of the period analysed.

Payments to agents in the agri-food sector account for the remaining 40 percent of agriculture-specific expenditure. Within this category, the majority of expenditure consists of payments to producers in the form of input subsidies, particularly subsidies for capital formation (including support for purchasing machinery and equipment, investments in irrigation and access to credit), as well as for variable inputs and on-farm services. There is also some expenditure for income support to producers, but this accounts for a very small proportion of agriculture-specific spending. Other payments to agents in the agri-food sector include payments to consumers (mostly in the form of food aid and cash transfers), payments to processors and payments to traders, but those also account for a very small proportion of agriculture-specific spending. There are no payments to transporters or suppliers of inputs.

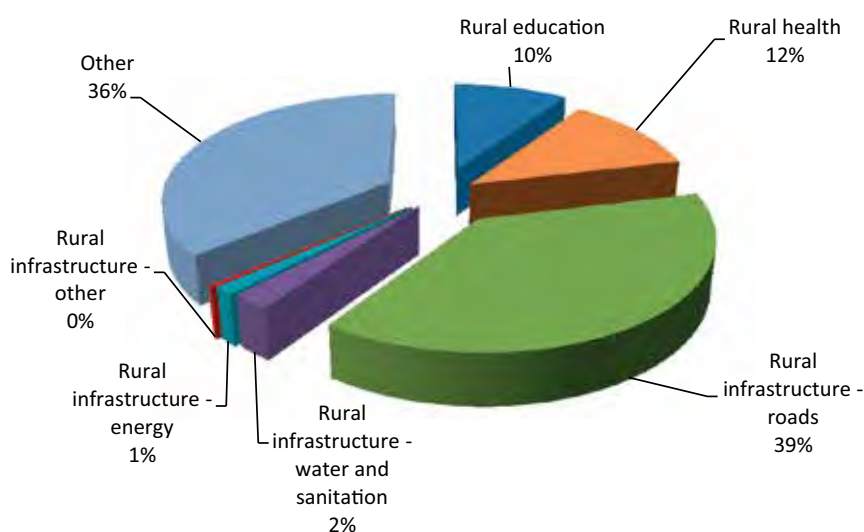
Figure 4. Composition of agriculture-specific spending in Mali, in %, average 2006-2010



Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project.

The agriculture-specific expenditure is complemented by agriculture-supportive expenditure which accounts, on average, for about 30 percent of overall support to the food and agriculture sector in Mali. Among agriculture-supportive measures, by far the largest expenditure is on rural infrastructure, and most of that constitutes investments in rural roads (Figure 5). There is relatively little investment in rural water and sanitation or rural energy; however, there is significant expenditure on rural health and education. These proportions remained almost constant throughout the period analysed. It is important to note, however, that about a third of agriculture-supportive spending falls into the "other" category. This latter category combines all the agriculture-supportive measures for which there was not enough information to be classified into the aforementioned categories. Ideally, additional information should be collected to identify the appropriate spending categories for those measures. This could potentially show a significant change in the relative importance of the categories within the agriculture-supportive measures.

Figure 5. Composition of agriculture-supportive spending in Mali, in %, average 2006-2010

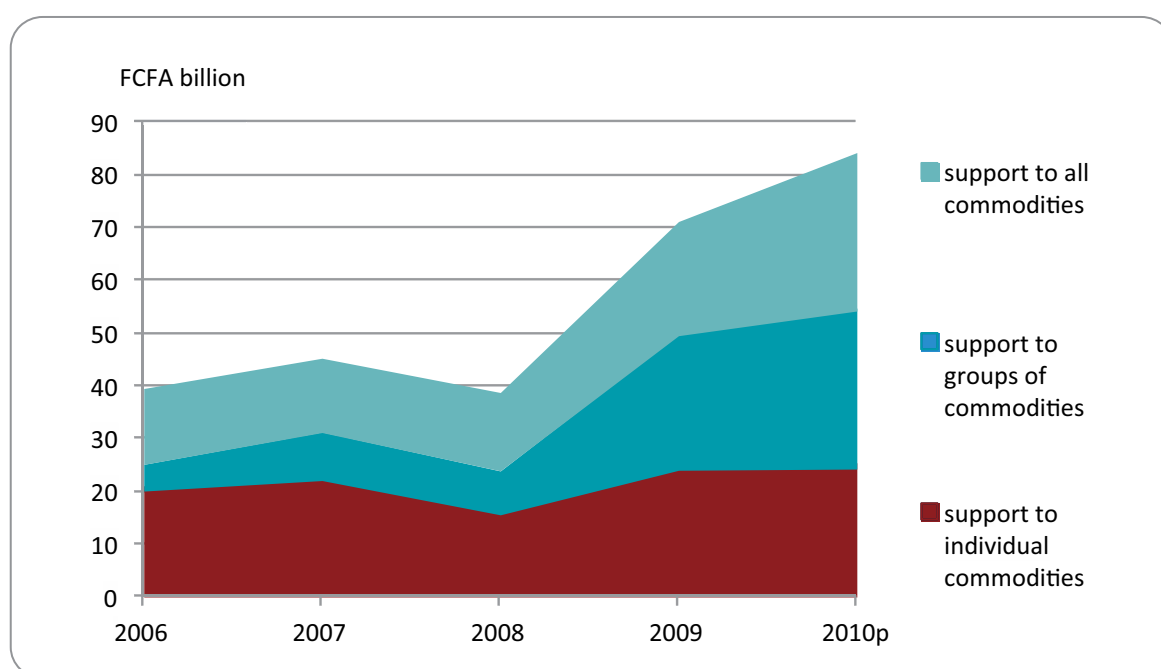


Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project.

Agriculture-specific expenditures can also be broken down according to the commodities which they intend to support.² Each expenditure measure within that category has been attributed an appropriate commodity, depending on whether it supports an individual commodity (e.g. rice for *l'Initiative Riz* in its initial stage – which was then extended to other cereals, including wheat and maize), a group of commodities (e.g. fruit and vegetables, fish and livestock for Program de Compétitivité et de Diversification Agricole (PCDA) or all commodities (e.g. construction of non-specialized markets).

Generally a large number of commodities are supported through these expenditures, including rice, maize, cotton, millet, sorghum, onions/shallots, sesame, shea, fruit and vegetables, livestock and livestock products. In 2006, most of these expenditures were in support of production of all commodities, followed by almost equally high expenditures in support of individual commodities, while very little was spent on groups of commodities (Figure 6). The latter category of support has increased significantly over the period analysed, however, and currently support to groups of commodities accounts for about one-third of all agriculture-specific spending. The remaining two-thirds are distributed almost equally between support to individual commodities and groups of commodities.

Figure 6. Agriculture-specific spending in Mali: support to commodities, in billion FCFA, 2006-2010



Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project. ^p - provisional estimate.

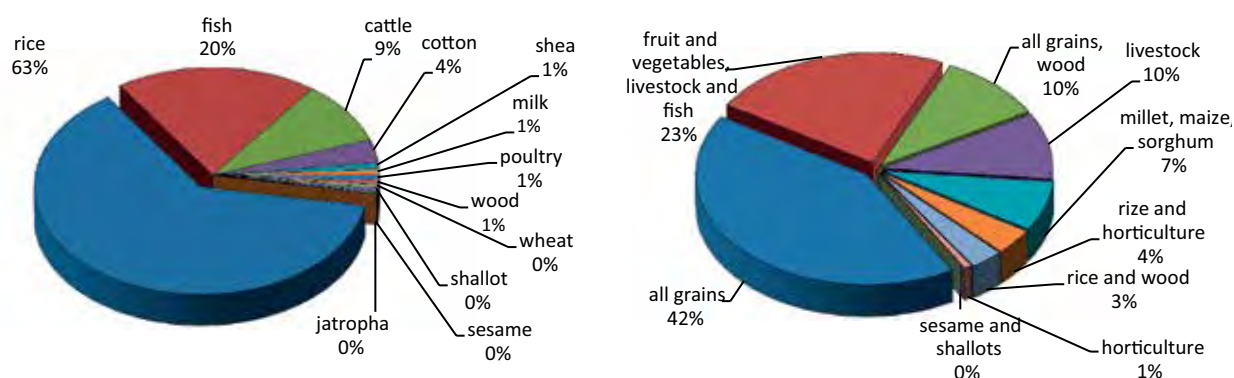
By far the largest share of expenditure in support of individual commodities goes to rice, followed by fish, cattle and cotton (Figure 7, left panel). Support to both rice and fish is provided principally through on-farm capital investments in irrigation and equipment, and through infrastructure development, but also through training, storage and marketing (particularly in the case of fish). Among expenditures made in support of groups of commodities, the biggest share goes to all grains, followed by fruit and vegetables, the livestock and fish group, the all grains and wood group, the livestock group and the millet, maize and sorghum group (Figure 7, right panel). As with individual commodity support, support

²Agriculture-supportive expenditures, by definition, are not intended to support production of any particular commodity and hence are considered not specific to production of agricultural commodities.

to the groups of commodities is provided principally via investments in on-farm capital, infrastructure, marketing and training (and extension in the case of livestock products).

Overall, most public expenditure is aimed at the provision of public services and investment, with a strong focus on infrastructure, both agriculture-specific and agriculture-supportive. These expenditures primarily support grains – particularly rice – but also livestock and livestock products.

Figure 7. Support to individual and groups of commodities in Mali, in %, average 2006-2010



Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project.

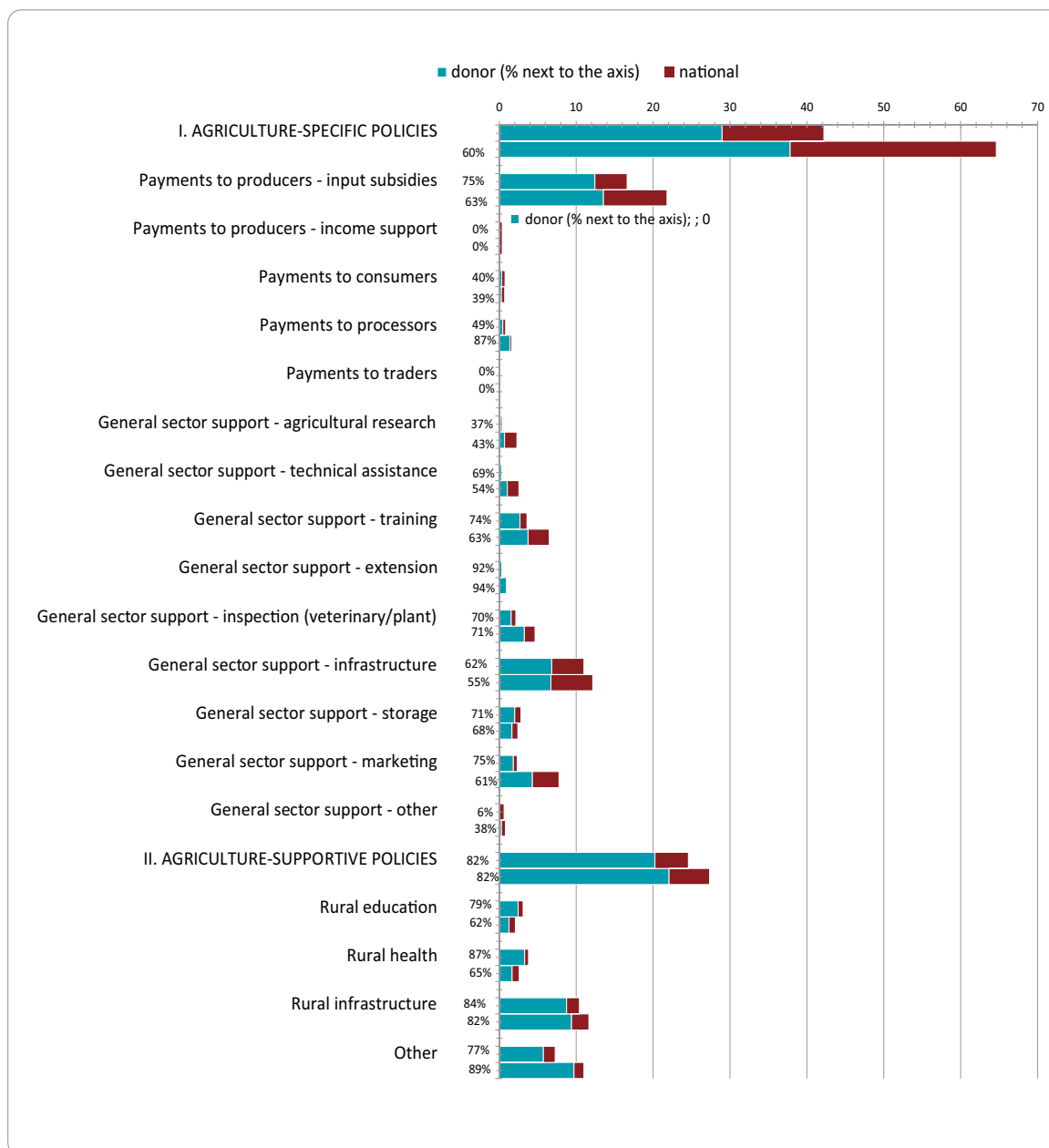
3.3 Role of aid in public expenditure on agriculture in Mali

Aid from donors to the government of Mali seems to be consistent with the government's overall objectives, although there are some minor differences in priorities. On average, donor spending accounts for as much as 70 percent of overall public expenditure in support of the food and agriculture sector in Mali. External aid contributes to 64 percent of agriculture-specific measures and 82 percent of agriculture-supportive measures (Figure 8).

Within each of the main categories, the contribution of aid differs. For agriculture-specific expenditure, in terms of proportion of total spending, donors contribute the most to extension, payments to processors, inspection, storage, input subsidies, training, marketing and infrastructure. In terms of the level of spending, input subsidies and infrastructure receive the highest support.

Among agriculture-supportive measures, all categories receive almost equally high levels of aid, while the highest amount of donor support goes to rural infrastructure. The most supported expenditure category is input subsidies. However, if all infrastructure expenditure (agriculture-specific and agriculture-supportive) were combined, there would be a much higher share of aid directed towards rural infrastructure. Among all spending categories, income support and payments to traders are the only two categories that do not receive any external support.

Figure 8. Average shares of total aid in spending in Mali, in billion FCFA, 2006-10



Source: Authors, based on budgetary data collected by Institute of Rural Economy in Mali for the MAFAP project.

3.4 Main messages on public expenditure

Although the level of public expenditure to support food and agriculture development in Mali is above the level of the Maputo Declaration target, it does not translate into a stable agriculture growth objective as set by CAADP.³ Similarly, the study of the Economic Community of West African States (ECOWAS), the Republic of Mali and the African Union (ECOWAS, *République du Mali and African Union*, 2006) concluded that the elasticity of agricultural growth with respect to public expenditure in support of Mali's food and agriculture is low, falling below the average for sub-Saharan Africa. This may be the case for a number of reasons.

Firstly, there is still scope for improvement in the composition of public expenditure in support of agriculture. The composition of public expenditure is just as, if not more, important than its total level. There may be trade-offs between spending in different categories (for example, spending on rural infrastructure versus subsidies for seed and fertilizer), and there may be complementarities (for example, between spending on extension services and the development of infrastructure that would enable farmers to transport their output to market). The overall observed pattern of spending is consistent with government objectives regarding most public expenditure aimed at the provision of public services and investment. However, there seems to be an imbalance between particular categories of spending. High levels of investment in infrastructure can bring benefits via lower transaction costs and improved farmer access to markets. High levels of support to rural development can provide off-farm employment opportunities, while training services can help farmers to improve productivity. There is also an important share of support for on-farm capital formation, particularly credit and production equipment. However, a large amount of spending is dedicated to variable input subsidies, while much less is being spent on research and extension services.⁴ Fan and Zhang (2008) have estimated that, of all the public expenditure measures they analysed, agricultural extension and research produce the highest returns in terms of agricultural productivity and poverty reduction. Similarly, several other recent studies concluded that investments in agricultural research and development produce much better outcomes in terms of agricultural growth and poverty reduction (SOFA, 2012⁵). Allocating more resources to those two spending categories may produce better outcomes than the ones currently achieved, particularly when accompanied by high investment in infrastructure.

Secondly, a large share of funds is allocated to policy administration costs (Table 5), and there seems to be an imbalance in total expenditure between the share of these costs and the share of policy transfers.⁶ Further, an important share of administration costs is dedicated to wages, while only a small proportion is given over to operational costs. This may exert significant constraints on the effectiveness of certain expenditures. For example, extension services or training can only be provided in an effective manner if extension or training officers have sufficient resources for travelling to communities where services are needed.

³ The 10 percent of budget allocation to agriculture and rural development agreed under the Maputo Declaration was established as a means to achieve the 6 percent of growth in the agricultural sector. Although over the last five years the average agricultural growth in Mali has exceeded 6 percent, the annual growth rates varied substantially over that time, often falling far below the 6 percent target.

⁴ Although inputs subsidies may be an important policy instrument to stabilize incomes of producers in developing countries over the short term, allocation of public resources should be adjusted to include those categories of spending that will improve the incomes over the long term (for an in-depth discussion, see OECD, 2012, and Brooks and Wiggins, 2010).

⁵ See State of Food and Agriculture (SOFA, 2012) for an overview of studies comparing the impacts of different types of agricultural expenditures and investments.

⁶ Total policy administration costs may be slightly overestimated as they are calculated as a difference between the total budget to Rural Development Sector minus policy transfers and hence may include elements which would not be included if detailed data were available – for example, some of expenditures related to policies supporting protection of biodiversity, such as wild animal protection in natural parks. This overestimation is believed to be insignificant for the results.

Table 5. Share of policy transfers and administration costs in total public expenditure, in %, 2004- 2010

	2004	2005	2006	2007	2008	2009	2010
Administration costs	n.a.	n.a.	26	26	26	21	20
Policy transfers	n.a.	n.a.	74	74	74	79	80
Total agricultural budget	n.a.	n.a.	100	100	100	100	100

Source: Authors, based on budgetary data collected by Institut d'Economie Rurale in Mali for the MAFAP project and CPS (2011).

Thirdly, actual spending deviates significantly from allocated funds. Although the rate of disbursement of allocated funds has improved in the period analysed, it is still at a somewhat low level (Table 6). Further, the rate of disbursement of funds allocated to policy administration costs was generally much higher than that of policy transfers to the sector (except in 2009 and 2010).

Only two-thirds of the funds allocated to projects and programs in support of the sector were actually spent; this was mainly because of delays in the release of funds allocated to relevant ministries.

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Table 6. Budget allocations versus actual spending in Mali, in billion FCFA and %, 2004-2010

	2004	2005	2006	2007	2008	2009	2010 ^p
Total agricultural budget*							
budgeted amount (billion FCFA)	115	141	118	130	134	143	198
actual spending (billion FCFA)	73	117	96	97	95	118	132
<i>actual spending as a share of budget (%)</i>	63	83	81	75	71	82	83
Policy transfers							
budgeted amount (billion FCFA)	n.a.	n.a.	87	96	100	114	158
actual spending (billion FCFA)	n.a.	n.a.	64	70	64	95	117
<i>actual spending as a share of budget (%)</i>	n.a.	n.a.	73	72	64	84	74
Administration costs							
budgeted amount (billion FCFA)	n.a.	n.a.	31	34	34	29	40
actual spending (billion FCFA)	n.a.	n.a.	32	28	31	23	15
<i>actual spending as a share of budget (%)</i>	n.a.	n.a.	104	82	91	76	38

*Total agricultural budget includes policy transfers in support of agriculture and policy administration costs.

p - provisional estimate

Source: Authors, based on budgetary data collected by Institut d'Economie Rurale in Mali for the MAFAP project and CPS (2011).

Fourthly, aid accounts for more than two-thirds of public expenditure in support of food and agriculture development. Although donor priorities seem to be generally aligned with those of the government, the question remains whether such large amounts of funding from external resources can be maintained, which raises doubts about the sustainability of programs and projects currently in place. The future adoption of a sector-wide approach to budget planning that integrates all stakeholders, including the donor community, coupled with implementation of the medium-term expenditure framework, should help to address those issues and also improve overall budget planning and resource allocation.

Finally, whether or not addressing these problems will be reflected in improved agricultural growth will also depend on other growth factors, which are not fully dependent on public expenditure.

4. Price policy analysis: incentives and market development gaps along Mali's main value chains

4.1 MAFAP methodology overview

The MAFAP methodology sheds light on incentives and disincentives to production received by various actors within the country's main value chains. This section gives a brief account of the methodology used to calculate the indicators for measuring incentives and disincentives at farmgate and wholesale levels. A detailed explanation of the methodology is available from the MAFAP project site at www.fao.org/mafap-documents.

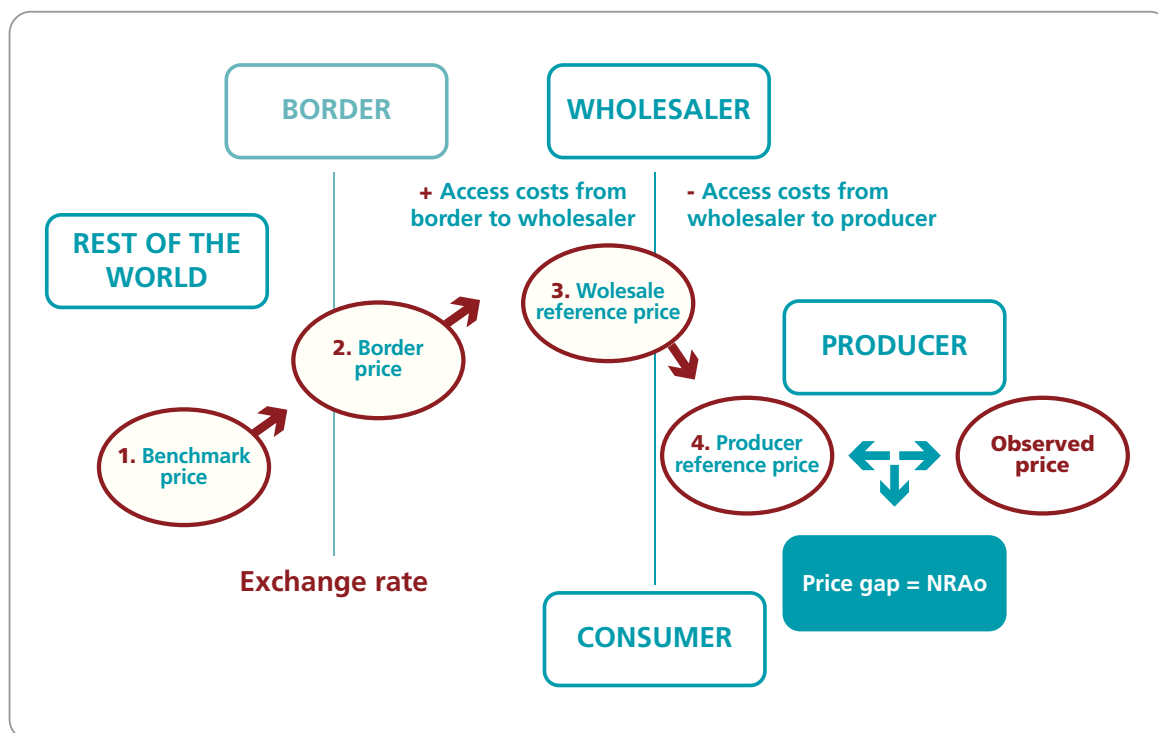
The core of the MAFAP analysis lies in the comparison between domestic market prices (observed prices) and reference prices free from domestic policy interventions. Reference prices are calculated from a benchmark price, which is the international or regional price of the product. This price is then converted into a border price, using the exchange rate if needed, and then brought to the wholesale and farm levels by adjusting for quality, shrinkage, loss, and market access costs. Figure 9 provides a simplified visualization of how incentives are determined with the MAFAP methodology, using the example of an import product. Note that incentives for wholesalers are also calculated.

If observed prices are higher than reference prices, the political environment generates support to producers (incentives) and if observed prices are lower than the reference prices, the political environment does not support those actors (disincentives).

The Nominal Rates of Protection - observed (NRPo) are the ratios expressing the price gap between the domestic market price (observed price) and the reference price. There are two NRPos: at the wholesale and producer (farmgate) level. NRPOfg capture all trade and domestic policies, inefficiencies along the product's value chain and other factors affecting incentives or disincentives for the farmer. NRPOwh help identify where incentives and disincentives may be distributed along the commodity market chain.

The Nominal Rates of Protection - adjusted (NRPa) – one at the wholesale level and one at the farm level – are the same as NRPo except the reference prices are adjusted to eliminate any distortions found in the market supply chain (e.g. extraordinarily high transport costs, taxes/levies or excessive profit margins of economic agents).

Figure 9. Simplified presentation of the MAFAP methodology for incentives calculation, for an import product



Source: Authors

The Market Development Gaps (MDGs) are also calculated: these are caused by market power, exchange rate misalignments, and excessive market access costs which, when quantified and used to adjust the NRPo, generate the NRPa indicators. For the moment, MDGs are calculated as the difference between NRPo and NRPa. The concept of the MDG, as defined in the context of the MAFAP project, takes the analysis a little deeper in assessing the extent of access costs. The measurement of MDGs makes it possible to estimate the share that can be considered “excessive” in access costs and transactions within a given value chain. These excessive costs may result from factors such as poor infrastructure or high processing costs due to obsolete technology, or from high costs due to post-harvest losses. Excessive costs can be considered implicit disincentives insofar as they could, for example, be reduced by appropriate investments and better governance. One major methodological question that remains is the extent to which these costs can be accurately singled out and identified.

4.2 Defining pathways, collecting and estimating access costs and prices

- Pathways

Pathways for all products analysed with the MAFAP methodology were determined using the most representative production, wholesale and competition area for each product, based on volume produced/traded and on the existence of an actual trade corridor.

- Prices

Producer prices were determined from statistics of the Observatory of Agricultural Markets (OMA), except in the case of milk, where prices were determined from a MAFAP survey, since OMA does not collect milk prices.

Prices at the wholesale level were determined from statistics obtained from either the OMA or the West-African Market Information Systems Network (RESIMAO).

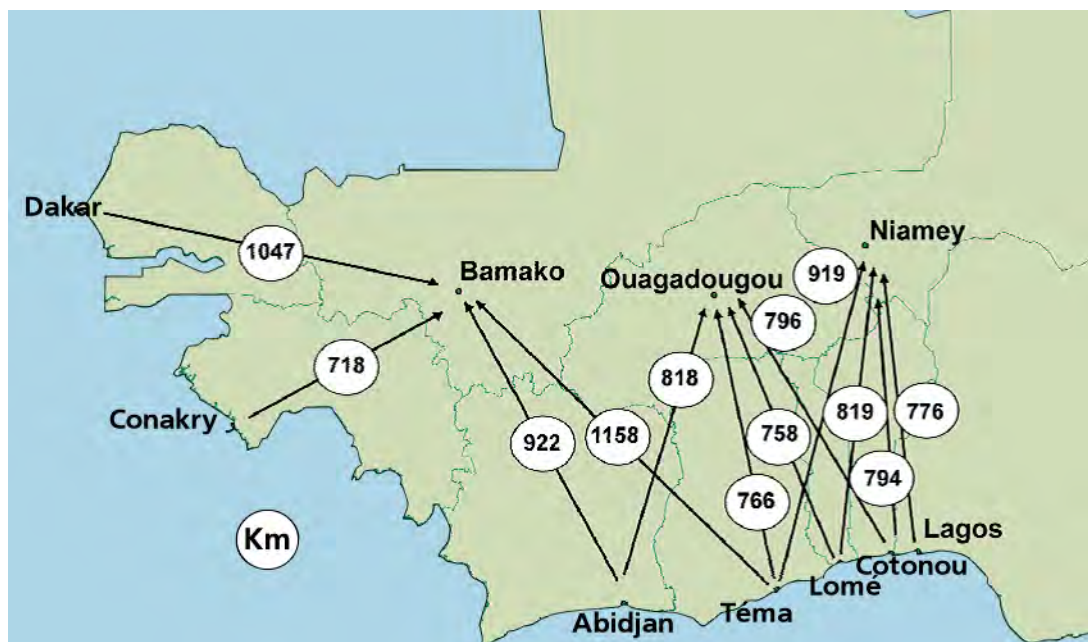
Prices on international markets, whether cost insurance and freight (CIF) or freight on board (FOB) were obtained from various sources depending on the product.

- Observed access costs

Observed access costs were collected by MAFAP project's local technical team.

Wholesale - farmgate access costs: In principle, observed access costs between the farm and the wholesale market are calculated as the sum of all the access costs incurred to move the products from one place to another (transportation costs, various fees for services such as handling charges, the gross margin, transaction costs, expenses and illegal passage along existing corridors, etc.). However, in case data are insufficient or of poor quality, these access costs can be estimated as the difference between wholesale prices and producer prices. In the latter case, the gap between the two prices is considered to reflect the real functioning of the value chain when all explicit taxes are excluded. In other words, this value is the expression of the level of infrastructure development, the competitiveness of actors and the conditions of market power.

Figure 10. Trading corridors serving landlocked Mali, Burkina Faso, Niger



Source: Diallo and Steeve, 2009

Wholesale - border access costs: For this segment wholesale-border, observed access costs are always calculated as the sum of various costs incurred to move a product from the wholesale market to the border and vice versa. In the case of a landlocked country such as Mali, the port which is the origin of imports and the shipping point for exports represents the border. The ports that have been considered here are Abidjan (Ivory Coast) and Dakar (Senegal) because they are the closest. Figure 10 shows the main commercial corridors. For the specific case of thinly traded products, access costs were calculated from/to areas located near the Mali border, to reflect that trade flows largely correspond to cross-border trade.

- Adjusted access costs

For some products, adjusted data to calculate access costs were also considered to reflect efficient value chains. The following adjustments have been performed:

- Providing estimates of efficient transportation costs and reasonable profit margins by systematically choosing the lowest cost for each section (farm gate - wholesale and wholesale - border);
- Deducting illegal taxes on roads for each segment of the highway.

Because reliable data were not always available, certain access cost dimensions, such as efficiency resulting from a better functioning of the sector, increased competition and reduced waiting times for crossing boundaries have not been adjusted. As a result, adjusted costs tend to be higher than they should be in a perfectly efficient market situation. It follows that adjusted reference prices do not totally reflect those of a perfectly competitive market.

4.3 Caveats and limitations about the methodology

Firstly, every effort has been made to check the quality of data collected with local experts. Additional efforts have been made to encourage partners to invest in reliable national and regional statistical systems for better informed policy decisions. Frequent updates of the RESIMAO database, especially for regional wholesale prices, would greatly benefit MAFAP-like analytical work. In addition, importers and exporters in Mali systematically underestimate volumes in order to pay less tax on heavily traded products. The lack of customs data reliability brings uncertainty to the analysis because it directly affects the accuracy of results based on domestic and international price comparisons.

Secondly, our data come from localized areas of production. For example, we considered the area of Loulouni, in the Sikasso region, for maize and the area of the *Office du Niger*, in the Segou region, for rice. These represent the main production areas in Mali for those products but other production areas may face different situations in terms of access costs or prices, which would yield different results.

Thirdly, our methodology uses annual averages which do not allow us to analyse variations in prices due to seasonality or even variations in quality during the production season.

Finally, in order to have a complete picture of policy impacts on farmers, it would be necessary to undertake a deeper analysis of production costs, margins and the structure of producers' incomes.

4.4 MAFAP's aggregated indicators on incentives, disincentives and market development gaps in Mali

Before presenting the indicators, it is important to emphasize that a significant part of the period analysed (2005-2010) was particularly turbulent, when market fundamentals were challenged and price trends experienced drastic changes. As a consequence, determining the causes for incentives and disincentives was more difficult.

Moreover, the interpretations referring to the agricultural sector as a whole actually refer to the group of products that were included in the MAFAP analysis. These products account for 65 percent of the value of the average production (2005-2009)⁷ and include : rice (13.5 percent), beef (12.5 percent), millet (10.3 percent), cotton fiber (7.5 percent), groundnuts (7.1 percent), sorghum (5.6 percent), maize (4.7 percent), and cow's milk (3.4 percent).

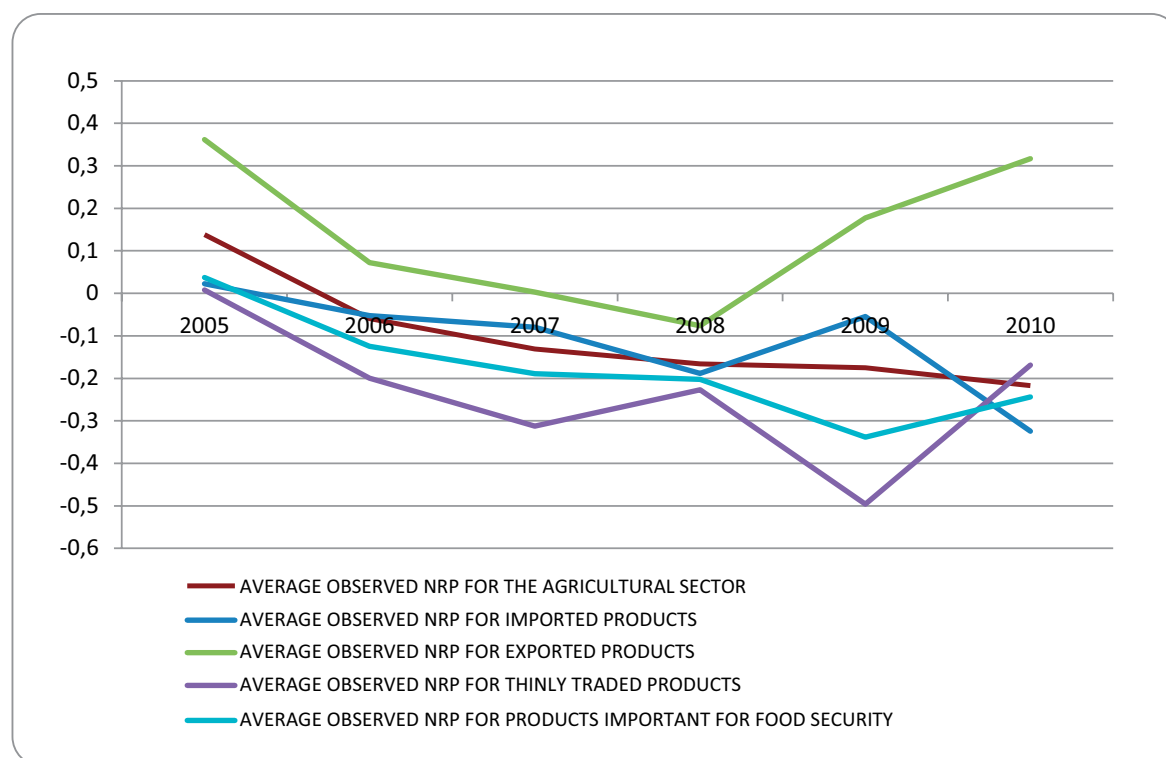
⁷ Average production value in 1000 constant US dollars, 2005-2009 and 1999-2001.

These indicators are aggregated by sector and product group. The aggregation is weighted to reflect the weight of each product relative to total production value.

The headline indicators selected are:

- the nominal rate of protection for imported products (NRP_{imp})
- the nominal rate of protection for exported products (NRP_{exp})
- the nominal rate of protection for non- or thinly traded products (NRP_{not})
- the nominal rate of protection for products essential to food security (NR Pfs) as defined in the selection of products
- market development gaps for all three product categories and for the agricultural sector as a whole (MDG_{imp} , MDG_{exp} , MDG_{not} , and MDG_{sag}), although in fact this only refers to the eight products analysed.

Figure 11. Observed nominal rate of protection (NRPo) by product group and for the sector, in %, 2005-2010



Source: Authors

Figure 11 reveals that policies in place have various impacts depending on the product categories that were analysed:

- category of exported products: cotton, beef and groundnuts
- category of imported products: rice, milk
- category of thinly traded products: maize, sorghum, millet
- category of key products for food security: maize, sorghum, millet, rice, groundnuts

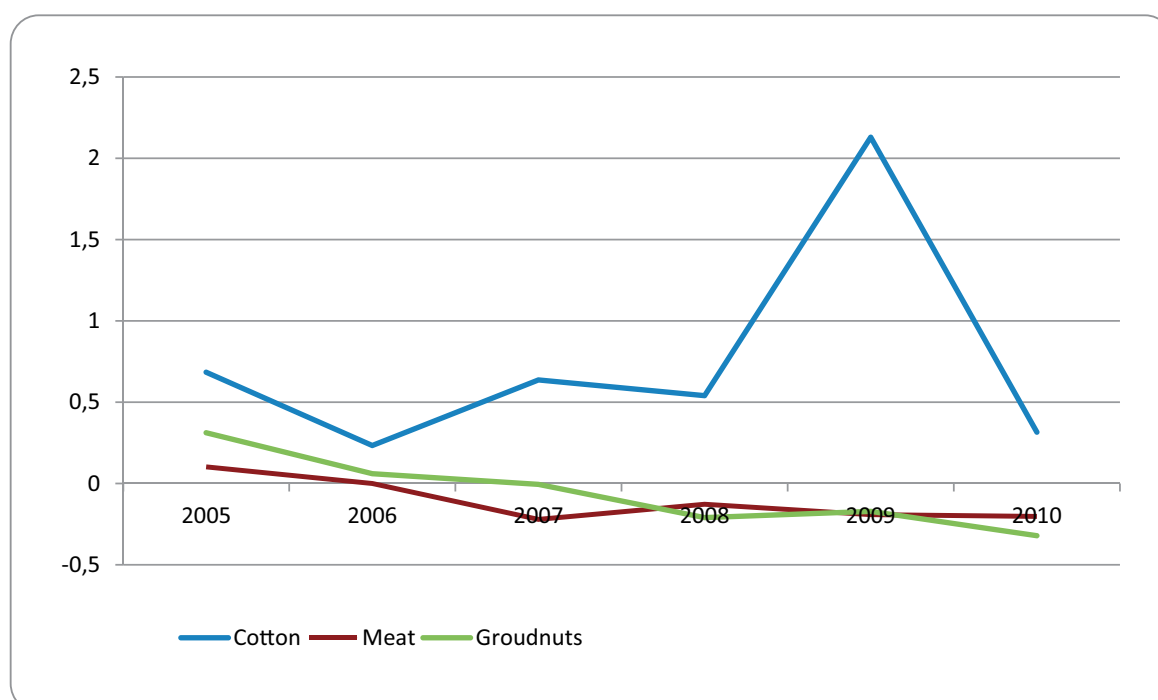
It is important to note that the category of key products for food security cuts across the other three categories. It thus enables a more horizontal reading of policy effects.

In terms of incentives and disincentives, there are two main product groups. On the one hand, export commodities benefit from strong overall incentives, with an average of 19 percent over the study

period. On the other hand, imports, thinly traded products and products related to food security have generally received disincentives at average levels of -16 percent, -24 percent and -21 percent, respectively. The group of exported products shown in Figure 11 is not homogeneous. Cotton has more importance among these products and this commodity alone has a large impact on the group's incentives. In fact, groundnut and beef production were generally at a disadvantage during the study period, with averages of -5 percent and 9 percent, respectively.

Moreover, results from group analysis should not mislead the reader into thinking there is a coherent policy for exports, which is far from the case in Mali. The government has not adopted specific policy measures supporting groundnuts or beef, and this is reflected in the negative NRPs for producers of both products (see Figure 12 below).

Figure 12. Comparison of nominal rates of protection (NRPs) at producer level for exported products, in %, 2005-2010.



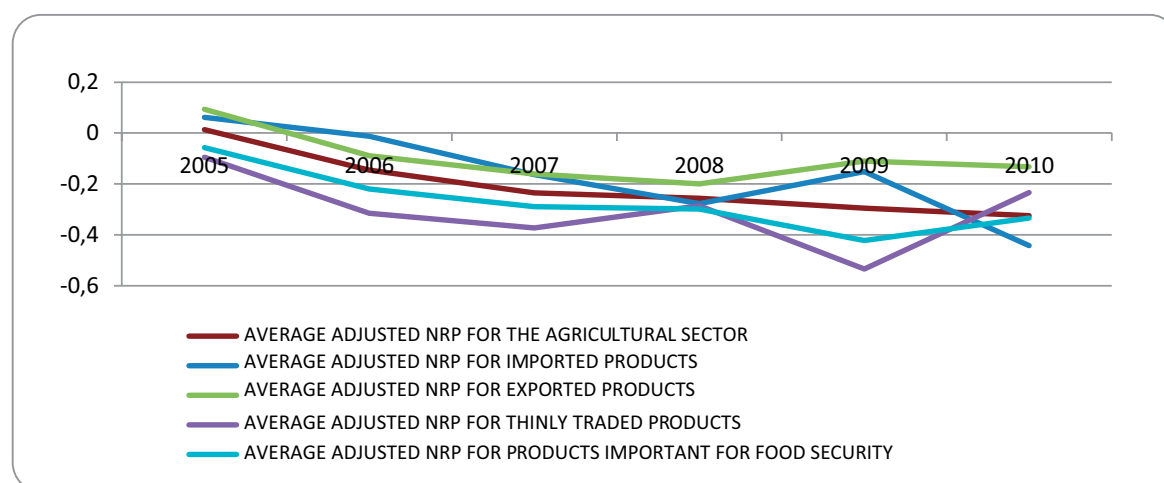
Source: Authors

Levels of incentives and disincentives have remained relatively stable over the study period, with the exception of changes in levels of incentives linked to very significant price movements during the food price crisis of 2008-2009.

During the 2008-2009 food price crisis, incentives became stronger in the category of exported products while disincentives came close to zero for imports. However, disincentives have worsened for thinly traded products and products related to food security. This can be explained by the implementation of government policies favorable to certain import products, such as rice for urban consumers, an approach that clearly did not encourage producers. Similarly, the rise in international cotton prices, concomitant with a price increase for most agricultural products, particularly staples, has benefited exporters. However, export restrictions on commodities, particularly through non-tariff measures or even export bans, have negatively affected those who sought to profit from higher prices in neighbouring countries for groundnuts, maize, millet and sorghum.

The year 2010 saw a return to levels of incentives and disincentives that had prevailed before the crisis, although overall imports recorded lower levels of disincentives and exports experienced significantly higher levels of incentives. This again suggests that the government of Mali has an interventionist agricultural policy that is focused primarily on imports, mainly of rice, on the one hand, and on exports, principally cotton, on the other.

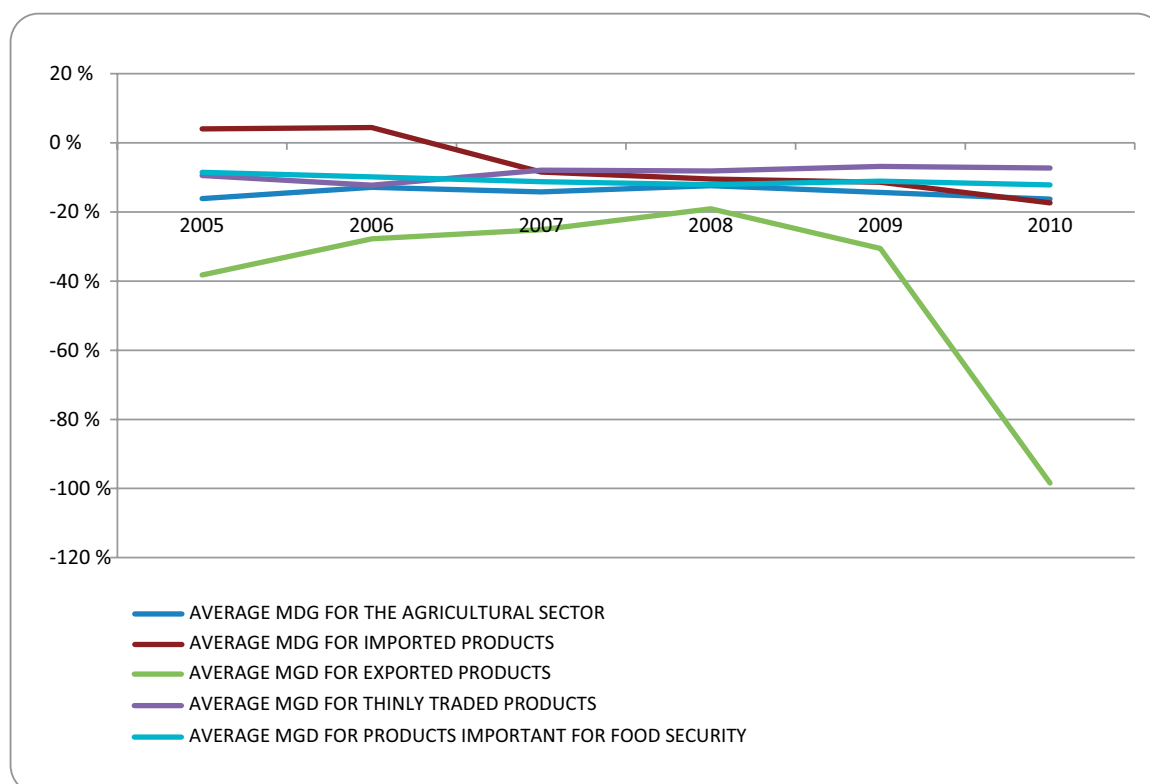
Figure 13. Adjusted nominal rate of protection (NRPa) by product group and for the sector, in %, 2005-2010



Source: Authors

Figure 13, reporting changes in the NRPa, shows several interesting facts when compared to Figure 12.

- The agricultural sector received stronger disincentives. The evolution of the curve indicates an increasing rate of disincentives, which plummeted from 1 percent in 2005 to -32 percent in 2010. In fact, the NRPa for the sector is negative for the entire period, with an average rate of 25 percent, while the NRPo was only -14 percent. This highlights the effect of additional disincentives related to market inefficiencies, such as excessive access costs for all products.
- The gap narrowed between NRPs of the different categories of products. The highest NRPa, for exported products, rose to 9 percent in 2005, due to the heavy impact of cotton's strong incentives. The maximum NRPo was 36 percent, also in 2005 for exported products. The minimum NRPa was for thinly traded products in 2009, and stood at -53 percent in that year. The minimum NRPo stood at -50 percent for the same product category and the same year. This tightening makes sense given that the adjusted data correspond to more efficient markets, which tends to mitigate excessive or unjustified cost differences between value chains.
- Disincentives increased for thinly traded products and products related to food security. This seems consistent with the national context, because these products are subject to hardly any form of specific policy support while absorbing the brunt of inefficiencies due to excessive market access costs, as the government seeks to restrict their export.

Figure 14. Market development gaps (MDG) by product, in %, 2005-2010

Source: Authors

Figure 14 shows the evolution of MDGs, which constitute another flagship group of indicators for the MAFAP project (see definition and modes of interpretation described above). There are three major product groups in terms of MDGs: imports, exports and a group composed of thinly traded products and products related to food security.

Exports reveal important negative market development gaps, on average more than two times those of imported products. This is due to the importance of cotton, with an average MDG of -33 percent over the period. Livestock and groundnut have respective average MDGs of -7 percent and -11 percent. Cotton's important MDG, despite it receiving strong incentives, shows that incentives do not necessarily mean there are no market inefficiencies. In the case of cotton, it is clear that governmental policies give incentives to producers even though the value chain itself is inefficient.

Globally, it is clear that MDGs reduce the level of incentives and increase that of disincentives. It should also be noted that cotton and cattle both experience negative in MDGs, despite having opposite situations in terms of incentives and disincentives. This means that MDGs are not, as might be expected, correlated to the effects of explicit policies and affect all categories of products regardless of their status in terms of incentives and disincentives.

Such findings suggest that these differences are primarily explained by the combination of market structure and the conditions of competition, processing technologies and market power wielded by certain actors.

The import substitution products (milk and rice) are the only category of products with positive MDGs for about a third of the study period (2005-2006). These MDGs then become negative, as for other

products. This is due to the fact that MDGs take into account the overvalued domestic currency from 2007 which makes imports more competitive. It can also be noted that there is a natural protection due to the structure of access costs, which makes imports very costly and thus allows producers to benefit from higher prices.

Thinly traded products and key products for food security have higher MDGs, with an average of -8 percent, a figure that is stable over the period studied and that corresponds to limited competitiveness, which is understandable for products that are generally thinly traded.

MDG indicators can be used by the government and other development actors to spot sectors plagued by structural weaknesses, such as "excessive" access costs. These sectors may need adequate investment to reduce transport costs, for example, or require stronger governance because of illicit taxes and bribes levied on trade corridors. MDG indicators offer a quantitative assessment of constraints stemming from the underdevelopment of markets; the MDG relates to the farmgate reference price and thus allows estimation of the share of that price that would be captured by the producer if these constraints were lifted.

5. Assessing agricultural policy coherence in Mali from 2005 to 2010: three case studies

5.1 Policy coherence in the MAFAP analysis

The results of the MAFAP analysis have been used to assess the level of policy coherence in the food and agricultural sector. In Mali, policy objectives are set within large policy frameworks. In this analysis, agricultural policies are considered as an array of decisions and measures aimed at achieving the overall objectives. Programs and projects are usually used to implement policies and are found at the end of the policy process continuum (Figure 15).

Figure 15. Simplified representation of the policy process



Source: Authors

A study on agricultural policy coherence of the Global Donors Platform for Agricultural and Rural Development (Wiggins *et al.*, 2011) showed that the main risk of inconsistency lies in the proliferation of policies, projects and programs that are subsequently cancelled and not prioritized. Indeed, in Mali, as in other countries, it can be observed that, despite progress towards a coherent and coordinated

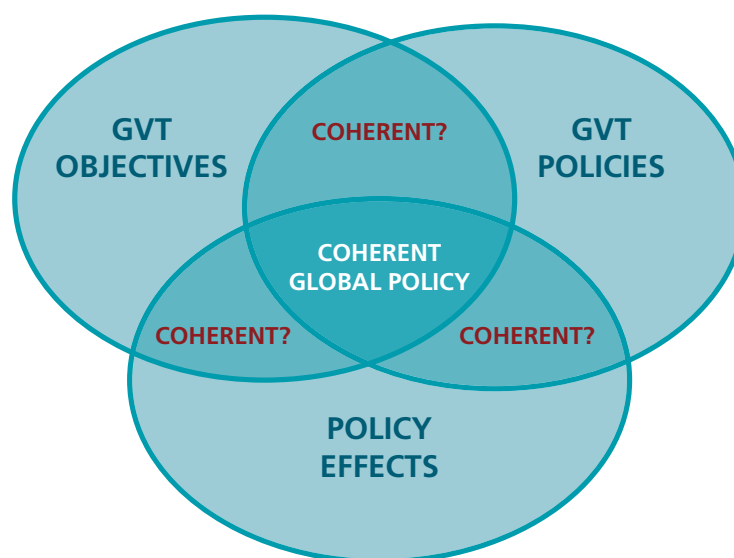
sectoral approach, agricultural policy consists of a maze of programs and projects. Included in this category are government decisions on trade, especially those relating to tariffs, and government budgetary decisions, i.e. public expenditure.

It should also be remembered that agricultural policy is not the exclusive domain of the government. Donors and other development partners also have an influence on policy decisions, dictated by their own agendas and interests. In Mali, 70 percent of expenditure for agriculture comes from foreign aid.

Therefore, the main questions in addressing the issue of policy coherence are:

- What are the main government objectives?
- What are the main policy decisions and measures (e.g. tax exemptions, bans, tariffs)? Are these decisions consistent with the stated objectives?
- Have these measures had an impact, have they achieved their expected effects, and have they met the government's objectives?

Figure 16. Logical framework for MAFAP's policy coherence analysis



Source: Authors

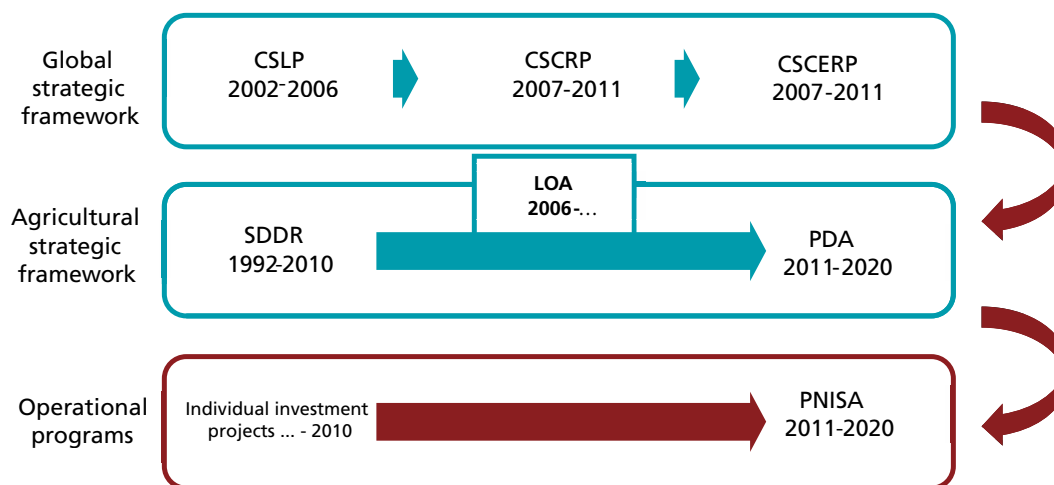
The following section will provide some answers to these questions, taking three products (rice, livestock and millet/sorghum) as examples.

It is important to note that there is not a single reference document in Mali that presents a clear and simple outline of the government's objectives and priorities regarding agricultural and food policies. Four strategic frameworks relating to the agricultural and rural sector over the period 2005-2010 were reviewed to determine the government's stated global objectives. These frameworks are as follows:

- The Agricultural and Rural Sector (SRA) part of the Strategic Framework for Growth and Poverty Reduction (CSCR)
- The Agricultural Orientation Law (LOA)
- The Master Plan for Rural Development (SDDR)
- The draft Agricultural Development Policy (PDA)

The way these frameworks are related can be summed up in a visual representation (see Figure 17).

Figure 17. Visual representation of Mali's main policy and operational frameworks



Source: Authors

All relevant policy measures were also analysed for each commodity, to explain the incentives and disincentives to production. Project and programs related to the agricultural and rural sector and included in the state budget were all examined in the public expenditure analysis (see part 2 : An analysis of Mali's public expenditure: composition and volume).

5.2 The case of rice: contradictory objectives result in apparent incoherence

Rice is considered a strategic food product in Mali; it is therefore the object of special attention in terms of both public policy (policies) and policy issues (politics). Rice is seen as the main staple, with potential for achieving food security, improving farmers' incomes and meeting growing urban demand at a reasonable cost. The recent food price crises have revived the colonial era project to make Mali not only a country durably self-sufficient in rice but also a rice exporter, at least in West Africa (Roy, 2010). In this context, policy objectives relating to rice are numerous and sometimes contradictory.

Rice has received enormous attention from the Mali government and donors alike over the period studied. A profusion of projects and programs focusing on rice exist in the country, with this commodity receiving a staggering 63 percent of total public expenditure allocated to specific agricultural products, making it the leading product in terms of public expenditure. A large share of public expenditure in support of rice comes from the Rice Initiative. This policy was implemented in 2008 as a response to the food crisis and is still ongoing. The Rice Initiative provides rice farmers with seeds and fertilizer at about 50 percent of their market price. The state also provides credit facilities (for power tillers, threshers, pumps) and support and advice to producers. The initiative was extended to other cereals after 2009. The government spent more than 7.3 billion FCFA to support fertilizers in 2008/2009, allocated overwhelmingly to rice (Ministère de l'Agriculture, 2009). The government had a budgeted expenditure of 6.4 billion FCFA in 2009/2010 to subsidize fertilizers with the Rice Initiative (Ministère de l'Agriculture, 2010). Moreover, the government has been heavily investing in irrigation and roads, much of this spending being linked to the development of the rice crop. In total, 21 percent of agriculture-specific state spending was spent on agricultural infrastructure.

Despite taking important steps to boost production from 2005 to 2010, the government also adopted contradictory price policies over the same period. These short-term policies were established in reaction

to the 2008 food crisis. In order to satisfy consumers, especially urban consumers, the government waived taxes and duties on imports of rice from March 2008 to December 2009, on condition that importers agreed to sell their rice at or below a ceiling price (Table 7). Rice sales from domestic stocks in food-insecure areas have been another measure to improve food security.

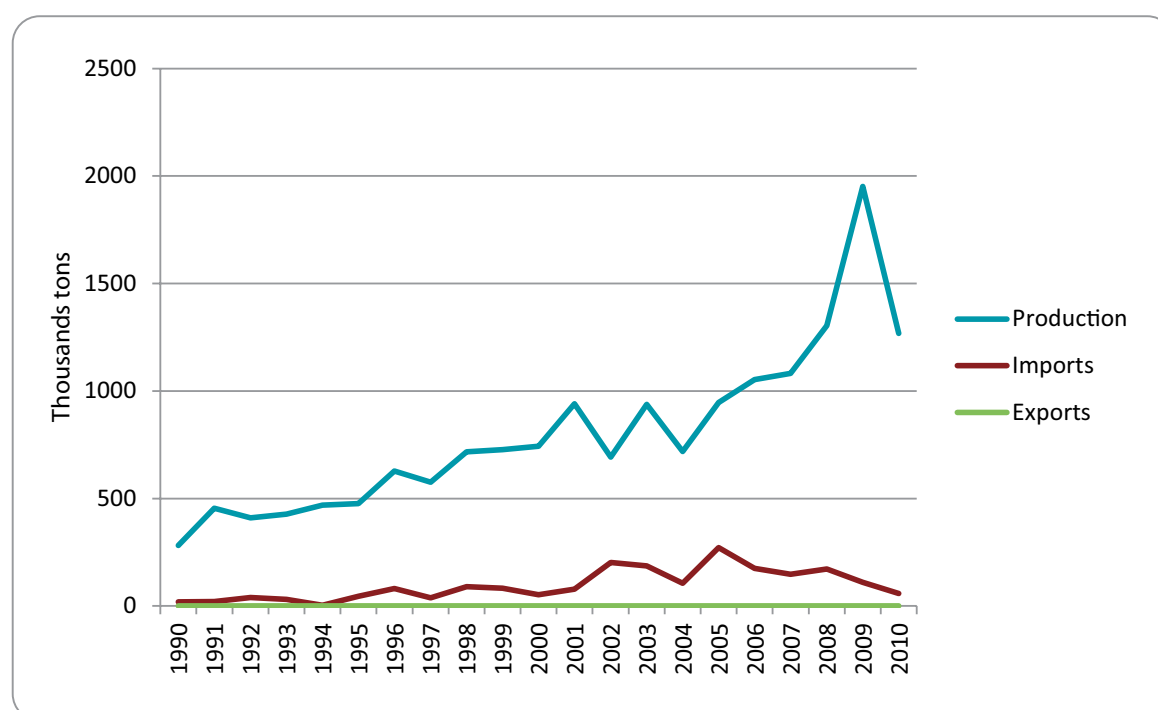
Table 7. Wholesale and retail ceiling prices for rice in Mali, FCFA/tonne and FCFA/kg, 2008-2009

Price	2008	2009
Wholesale (FCFA/tonne)	300,000	280,000
Retail (FCFA/kg)	310	300

Source: INSTAT, 2011, cited by Bourdet, Dabitaou and Dembele, (2011) and World Bank (2012).

Overall, the policy environment has allowed Mali to increase its rice production over the period studied. Production more than doubled between 2005 and 2009, although it did drop sharply in 2010. However, the increase in production began in 2005, well before the adoption of the Rice Initiative (see Figure 18).

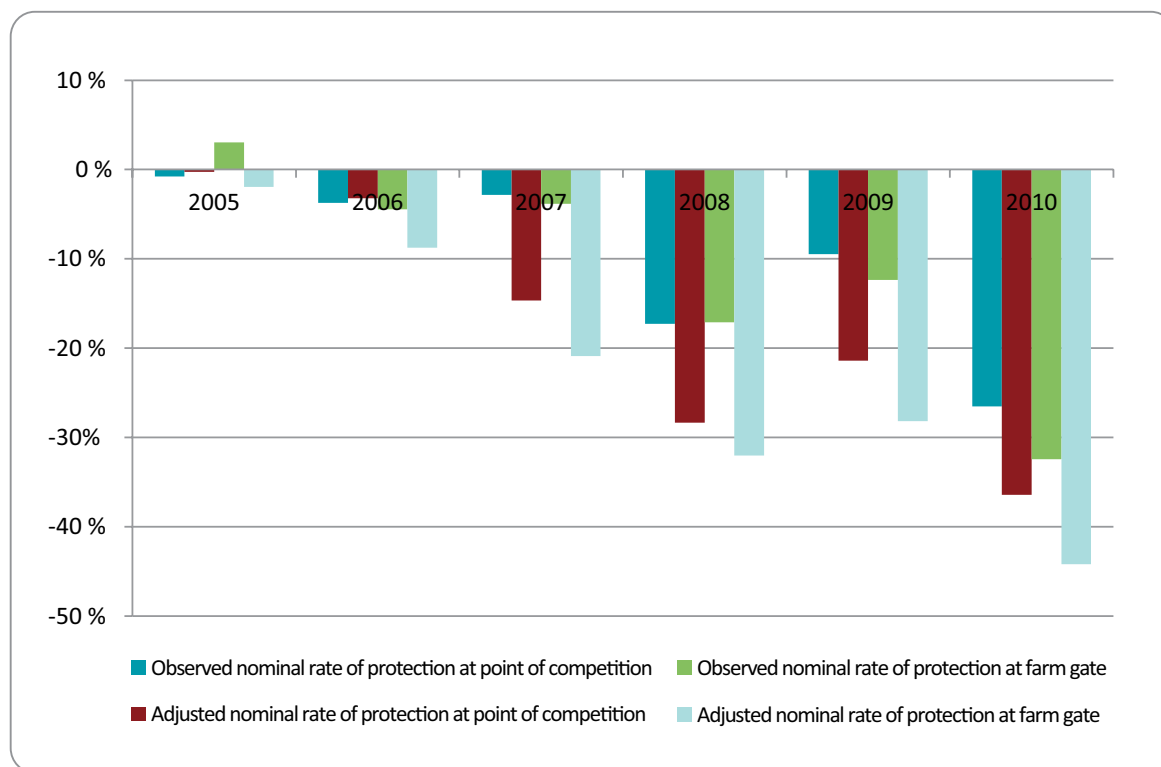
Figure 18. Rice production, imports and exports in Mali from 1980 to 2010



Source: Authors, from FAOSTAT and CPS, 2010

Despite the increase in production, the incentives and disincentives to production received by producers over the period lead to questions about sustainability of the Rice Initiative. Both producers and wholesalers received strong disincentives over the period studied, which means they did not benefit from the opportunities arising from the international price spike during those years (Figure 19). These disincentives can partially be explained by the government's price policies (tax exemption and price ceilings), although these measures mostly benefited a handful of large rice importers in the country (Diakite and Kone, 2010) who have prevented fluid transmission of high international prices up to the farmer level. Further explanations include the government's decision to set low prices for rice and to distribute free food.

Figure 19. Observed and adjusted NRP to rice wholesalers and producers in Mali, 2005-2010



Source: Authors

Furthermore, the amounts credited to the Rice Initiative – for example 25 398 billion FCFA for the year 2009/10 (compared with 117 billion FCFA spent in total in Mali for the rural and agriculture sector) – lead one to question the program's sustainability, especially when it comes to inputs (fertilizer, seeds) and loans for equipment.

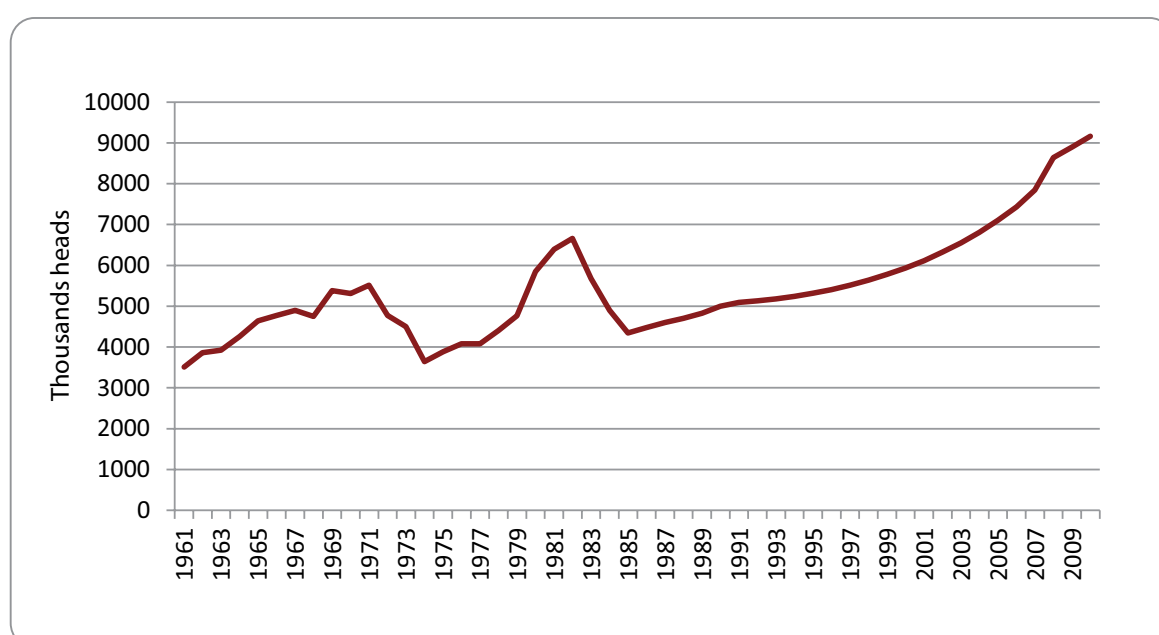
The Malian government has made considerable efforts to support rice production through public expenditures, with an encouraging increase in production volume. However, it appears that consumer oriented policies adopted from 2008 onwards have penalized producers and wholesalers who did not get the prices they should have received. More transparency may be needed in order to allow different actors along the value chain to adjust to the government's priorities. In addition, there are risks that the heavy investment in input subsidies will not result in long term benefits for rice production.

5.3 The case of livestock: lack of support despite a strong potential in the value chain

Livestock, and meat in particular, are included in the explicit objectives of the SDDR. However, other decisions for the sector have also been taken, such as the adoption of the new national policy on live stock in 2004. Moreover, the creation of the *Direction Nationale des Productions et Industries Animales* (DNPIA) to replace the *Office Malien du Bétail et de la Viande* (OMBEVI) reflects the government's desire to boost the livestock sector and to build capacity, while diversifying the approach to livestock production. In addition to these institutional approaches, breeding has benefited from an array of projects and programs focusing particularly on animal health, breeding, marketing and slaughter, such as *Programme d'Appui au Développement de l'Élevage dans le Sahel Occidental* (PADES0).

The study results show that government efforts to boost livestock are real, though they are insufficient given the potential of the sector. Livestock indeed received 9 percent of public expenditure allocated to specific products in Mali from 2005 to 2010. The objectives of the SDDR have been taken into account; several projects included activities related to animal health, infrastructure development and genetic improvement of herds. Although various policy documents describe animal feed as critical to increase livestock quality, this element has been neglected, with the exception of bourgou pasture production. More importantly, the state does not appear to have sought to stimulate better structuring of the sector in order to harness the significant potential represented by livestock exports. Livestock is the third most important export commodity for Mali, which is one of the biggest cattle producers in West Africa with more than nine million heads. Yet only live animals are exported because the lack of infrastructure (especially slaughterhouses and freezing facilities) makes it impossible to develop a meat value chain.

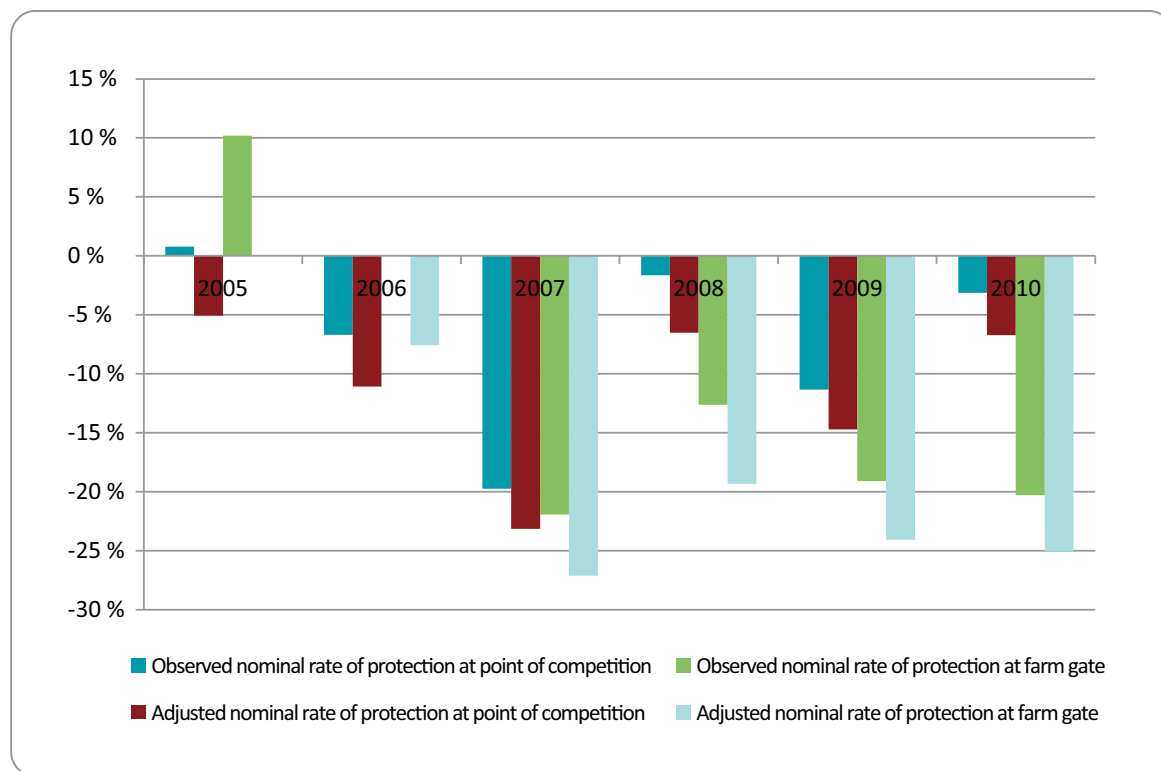
Figure 20. Cattle production in Mali, thousands of heads, 1961-2010



Source: FAOSTAT, 2012

The global lack of structure in the livestock value chain has not allowed either producers or wholesalers to receive the best prices, and they were therefore effectively penalized during the period 2005-2010. Producers received average disincentives of -9 percent and wholesalers received around -8 percent: the prices they received were far lower than livestock prices in the neighboring Ivory Coast. The poor structuring of the livestock value chain is primarily demonstrated in excessive access costs, i.e. high numbers of intermediaries, illicit taxes, and insufficient animal feed resulting in animal weight loss. There is a need for more policy support to improve infrastructure (roads, markets) and to improve the value chain's efficiency beyond production, i.e. to have fewer intermediaries and illicit taxes, and more support to cattle traders and processors.

Figure 21. Observed and adjusted NRP to cattle wholesalers and producers in Mali, 2005-2010



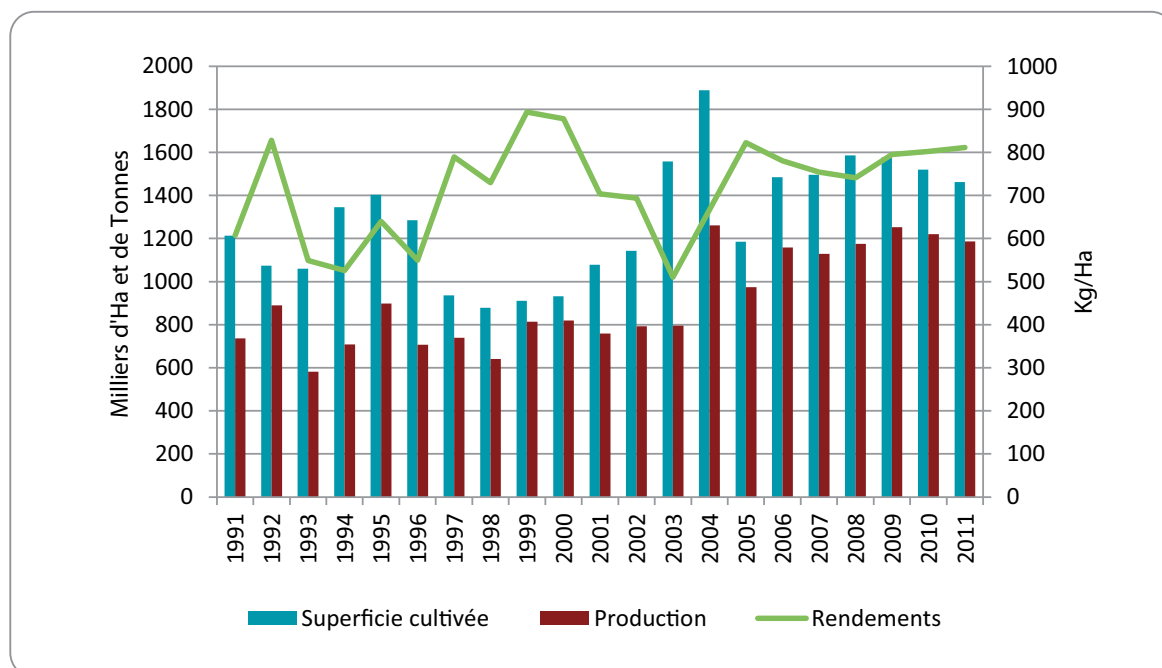
Source: Authors

5.4 The case of millet and sorghum: short-term coherence but uncertainty in the long run

In Mali as in many other countries, millet and sorghum are consumers' substitutes. These products are thinly traded, while the methodology in this study is better suited to analyse products traded on competitive international markets. Therefore, this analysis provides only partial insights into the market situations of millet and sorghum, and into incentives or disincentives faced by the agents in these two value chains.

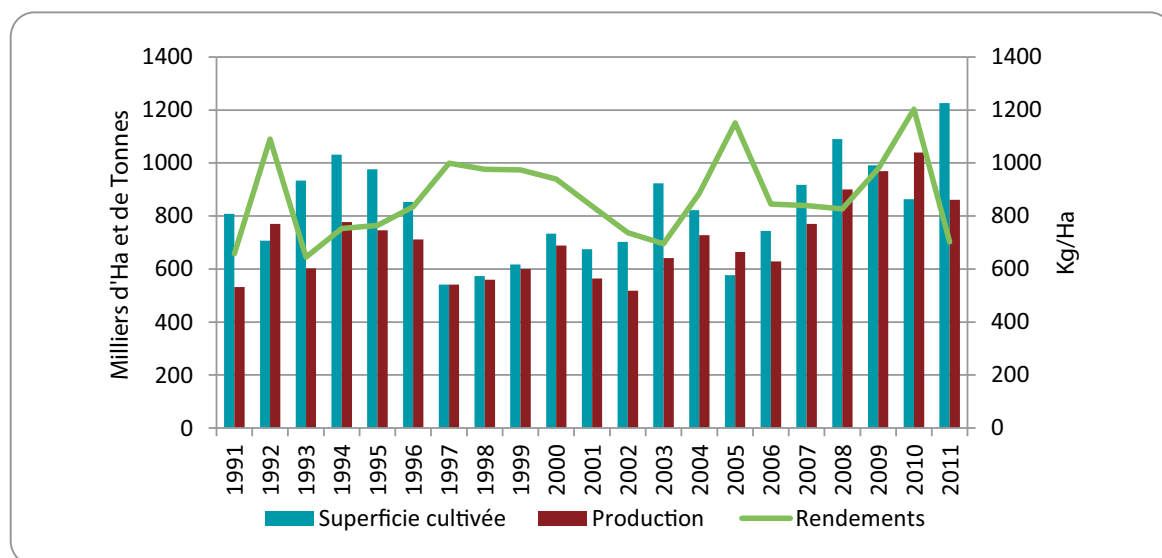
In Mali, government support to produce millet and sorghum is primarily intended to increase production for food security, or even food sovereignty, as included in the LOA. Millet and sorghum benefited from light input subsidies during the 2009/2010 crop year, after they were included in the Rice Initiative. However, this insufficient support did not result in incentives to producers and wholesalers in 2010, and producers and wholesalers were penalized during the whole period studied. Globally, the government does little to encourage the intensification of sorghum and millet production – despite the fact that some research activities to improve sorghum and millet varieties exist. As a consequence of the lack of policy support for intensification, yields remain low and the production volume increase mostly comes from cultivated area extension (see Figure 22 and Figure 23). Indeed, the public expenditure analysis revealed no sorghum or millet-specific project but rather research activities that appear in different budget lines, although programs targeting coarse grains (including maize) represented 7 percent of agricultural-specific public expenditure for groups of products. Furthermore, the state spent only 5 percent of agricultural-specific public expenditure for storage and public stockholding, which is very low considering the importance of such infrastructure for millet and sorghum marketing.

Figure 22. Millet cultivated area, production and yields in Mali, 1991-2011



Source: Authors, from CPS, 2010

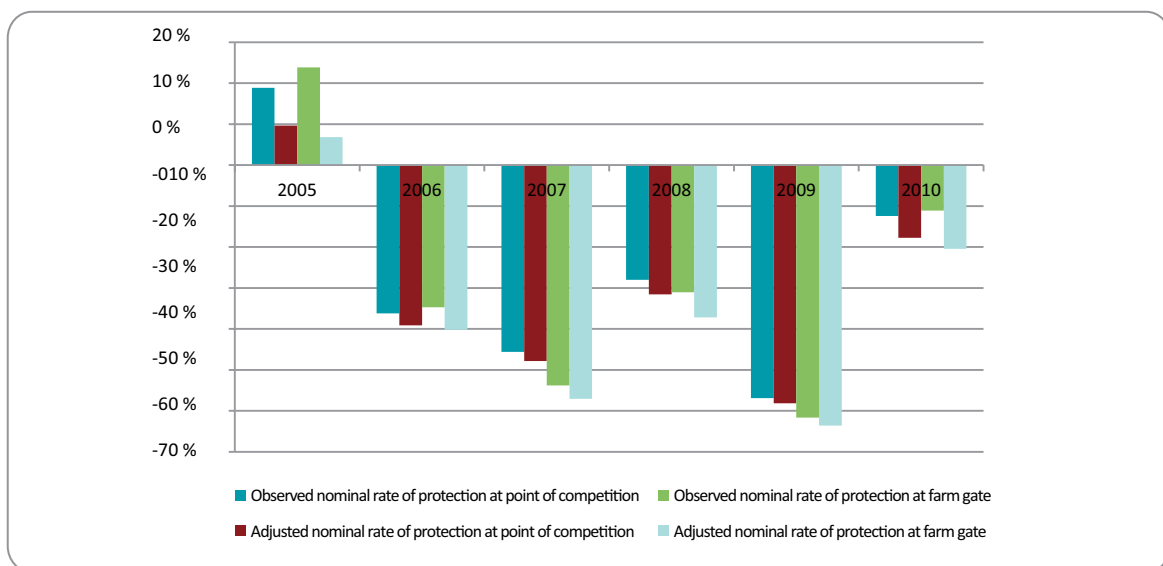
Figure 23. Sorghum cultivated area, production and yields in Mali, 1991-2011



Source: Authors, from CPS, 2010

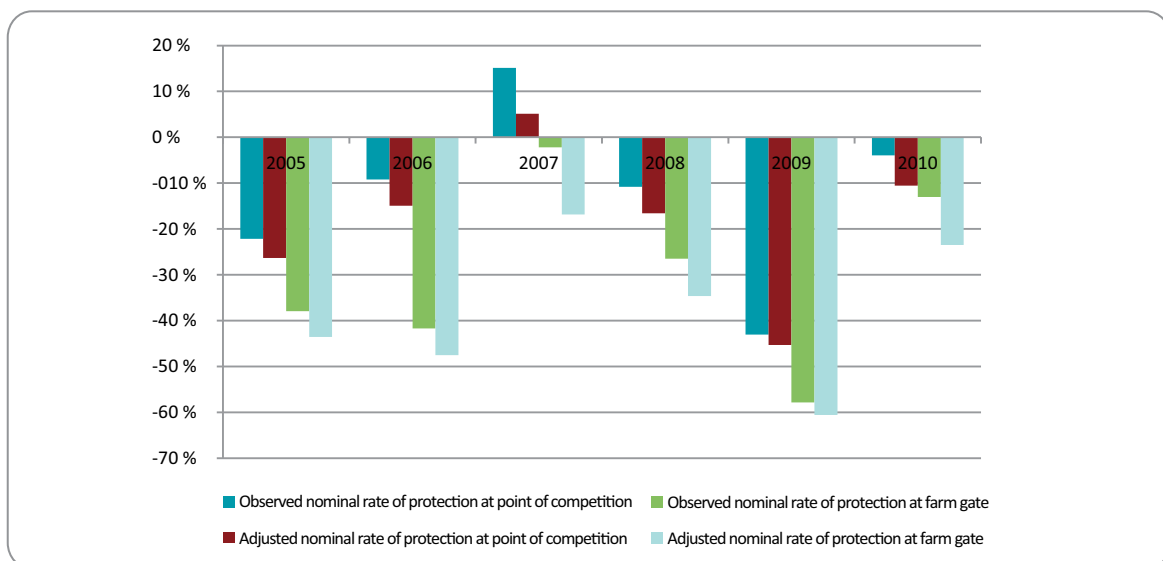
The government has not shown strong interest in supporting trading of these commodities on the domestic market. Moreover, authorities have discouraged formal exports of staple products to neighbouring countries through a variety of non-tariff barriers (NTB) as a way to ensure food security in the country. The cost of these NTBs is estimated at 10 FCFA/sack of grain (Dembele and Boughton, 2010). These measures have generated disincentives to producers and wholesalers, but have enabled the government to achieve its implicit objective of limiting foreign trade in millet and sorghum. It is doubtful, however, that this policy will help to achieve long-term food sovereignty in Mali, staple consumption being highly related to incentives for production. With producers receiving, on average, -32 percent disincentives for sorghum and -27 percent for millet for the period 2005-2010, prospects are not encouraging for the intensification of production that would be required to meet the ever-growing demand in the country.

Figure 24. Observed and adjusted NRP to millet wholesalers and producers in Mali, 2005-2010



Source: Authors

Figure 25. Observed and adjusted NRP to sorghum wholesalers and producers in Mali, 2005-2010



Source: Authors

6. Conclusion

Despite the fact that African governments committed to increase their spending for agricultural and rural development in 2003, and adopted various agricultural policies in reaction to the 2008 food crisis, they generally recognize that they have insufficient data about the effects of these policy decisions.

This chapter presents results obtained in Mali that allow policy analysts to assess quantitatively the effects of policies influencing both price levels and public expenditure in terms of incentives or disincentives to production.

The results shed light on whether the government succeeded in addressing the development gaps in the most important value chains in the country from 2005 to 2010, and whether the policy environment has generated incentives to production within those value chains. Most importantly, the MAFAP analysis reveals whether the government has achieved coherence in its agricultural and rural policies.

Taking four commodities as examples (rice, livestock, millet and sorghum), this chapter shows that there has been a certain degree of incoherence between official policy objectives, measures that have been implemented and their effects. The rice value chain illustrates this lack of policy coherence. Public expenditure overwhelmingly supported rice, which received 63 percent of the product-based agricultural-specific spending from 2005 to 2010. The bulk of this expenditure consisted of input subsidies through the Rice Initiative, as well as heavy spending in irrigation infrastructure. However, because of policy measures influencing price levels, such as import tax exemptions and price ceilings, the Malian government actually penalized producers and wholesalers, who did not benefit as they should have from high international prices. On the contrary, to a large extent it is the consumer category that has benefited from the recent measures adopted by the government.

This analysis thus highlights the need for decision-makers and development partners to better understand the effects and impacts of agricultural and food policies, through adequate policy monitoring and analysis. The type of analysis provided by MAFAP should be institutionalized and internalized at country level, with appropriate capacity-building, so as to ensure its continuity and sustainability. This in turn will lead to more transparent and evidence based decision making for food and agricultural policies in African countries.

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Chapter 6

The role of the private sector and the engagement of smallholder farmers in food value chains: initiatives and successful cases from Nigeria, Senegal, and Ghana

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1. Introduction

By the very nature of agriculture, most small farmers are entrepreneurs who make economic or business choices, manage risk, allocate resources, and combine farm and off farm activities to improve their livelihoods. Markets are essential for the economic growth of farmers and 60-80 percent of small scale farmers operate in traditional markets, while a smaller proportion participate in more modern markets and developed value chains.

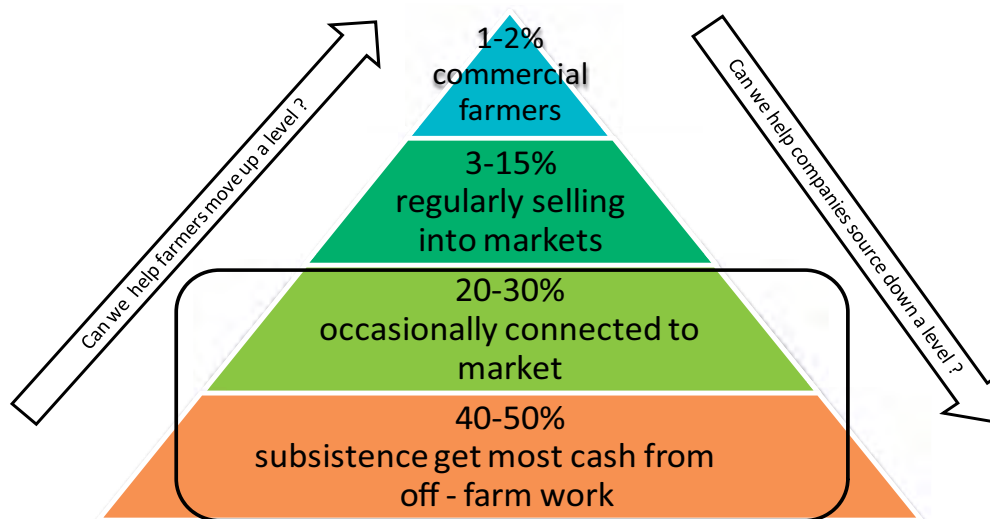
Agribusiness needs farmers. Growing demand in food in domestic and international markets means more food needs to be produced and supplied and hence there are new business opportunities. Having a market creates a business opportunity and hence the necessity of investing in farmers as suppliers of raw materials. Depending on context agro-business companies can engage trading or commercial relationships with farmers either as individuals or as groups, cooperatives or associations.

In addressing smallholder market integration and in analyzing the rationale for inclusive value chain development, two central questions need to be posed:

- (1). How can we help small scale producers move up the commercial and market integration ladder?
- (2). How can we ensure more agro-businesses source their raw agricultural products from small scale producers?

The issue is illustrated in Figure 1 below.

Figure 1. Smallholder market engagement



Source : Del-Pozo Vergnes, 2011; quoted from Ferris and Seville, 2010.

Answering the first question implies huge expectations of smallholders to be organised and build capacity to engage in trade and inclusive business operating in modern/high value markets supported by the right policies and market institutions. Emphasis on linking small-scale farmers to markets and business assumes that producer organisations will succeed by aggregating and upgrading their production.

Within the West African context, there is a clear need for producers' organisations to develop capacity and credibility in the market and become active players in value chain development. This assumes among

other things sustainable strategies to build internal capacity and acquire a strong leadership capable of meeting the economic and business needs of the members. The goal for a producer organisation goes beyond organizing, the ultimate aim is the capacity to leverage market opportunities for smallholders, by acquiring the knowledge needed to engage and design projects and negotiate contracts. The key prerequisite for success is the identification of the business or market opportunities for the group. This points to the need to develop great managerial, business and financial literacy, which are required to level the playing field and to create a more conducive environment for transparent and win-win negotiations between producers, buyers, processors and intermediaries.

For question (2) above, there is a business case for working with small farmers who benefit from their comparative advantage in terms of quality, in securing the supplies, in having better access to subsidized inputs and guaranteed corporate responsibility. However, they present some costs and risks such as the difficulty of complying with standards and traceability, some hazards linked to loyalty and fulfillment of commitments and issues of communication/coordination.

Among the factors that would induce agro-business firms to source locally from small scale producers is uncertainty in the global economic landscape resulting in firms sourcing internally for their agricultural inputs, population and economic growth, support from intermediary organisations, government incentives and favourable support and increasing pressures on companies to develop sustainable engagement strategies. There are opportunities for private sector organisations to engage across the agricultural value chain, from the provision of inputs, to financing, agroprocessing, packaging and even technology.

However, successful partnerships between agro-business and small producers hinges on many factors. The partnerships must be market-based, and the selection of partnering farmers must be based on merit, trust and ability to deliver on contractual agreements. This requires also pilot schemes for training farmers, the buy-in and alignment of all key stakeholders, clear standards and incentives and a conducive and supportive environment. From the private sector perspective, lessons for value chain development require a market-driven approach and there has to be clear benefit for everyone involved. An important measure in building trust between the producers (or outgrowers) and the private sector is to engage in transparent price-fixing mechanism inclusive of all the stakeholders.

Agro-business and small farmer partnerships bring their own risks that need to be understood and managed properly. There are also risks dealing with small scale suppliers. Some of the risks arise from a very unfavorable environment for local agro-business operating locally.

Inadequate physical and financial infrastructures and the reluctance of some government officials to support the activities of the private sector constituted a drawback to engagement with smallholder farmers. Other limiting factors included human resources, production equipment and marketing. Impediments include limited mind set focused on short-term gains, inability to meet the economic needs of all stakeholders, contract failures, limited access to affordable finance, poor enabling environment and interference from the public sector.

Side-selling illustrates the type of arising when agro-business and small scale producers contract to supply raw products under outgrower schemes. Side-selling poses a serious obstacle to processors financing/pre-financing the production of food staples and commodities. It also poses a challenge to commercial agreements between out-grower farmers and private sector companies providing agricultural input services. To mitigate against the side-selling risk, it is important to establish a transparent and fair mechanism at the contracting and price fixing phase that ensures a win-win outcome for all the principal stakeholders. This also requires stronger producer organizations with stronger credibility when it comes to negotiating. Investing in strong and credible producers' organizations is also a strong business requirement.

The few success cases of private-public partnerships, all start from actors who were able to self-aggregate and meet demand in order to better access markets. Also processing could be a key success factor when greater product value can be captured in meeting market demand, and if well managed, allow great access to consumers. The significance of leaders at each phase of the value chains, as well as programs and projects ownership cannot be overstressed.

There is more that can be done at the policy level to improve the business environment to foster a more inclusive value chain development. First, investment promotion should take into consideration the opportunity to support local medium and small enterprises and investments. Also critical are incentives for agroprocessing companies that process locally add value and create jobs. This has strong implications for appropriate trade policies that need to be fully harmonized with domestic policies aimed at promoting the development of staple food value chains. There is a strong need to design and implement solutions involving both government and the private sector with complementary roles for each.

The remainder of the chapter will present specific cases and initiatives from 3 West African countries: Ghana, Nigeria and Senegal.

2. Nigeria food processing and the trends towards smallholder inclusive food supply chains*

Agriculture is the most important sector in the Nigerian economy. According to the Federal Ministry of Agriculture and Water Resources, the country has a land area of 92.4 million hectares, with approximately 79 million hectares suitable for agriculture; however, less than half of this available land is being utilized. The sector engages approximately 60 percent of the Nigerian population, including many rural women, and contributes 42 percent of the country's national GDP.

As in many African countries, agriculture in Nigeria is dominated by smallholder farmers, who cultivate an average of one hectare of land, with limited access to fertilizer, irrigation, improved seeds, storage and processing capabilities and markets. They typically experience poor yields, and significant losses.

As a result, Nigeria remains a net importer of food, spending over USD 4.2 billion annually on food imports. In addition, local food prices are prohibitively high for the average Nigerian family and the country continues to experience alarming rates of malnutrition.

Given the context, this chapter will outline key success factors for agroprocessor engagement with smallholder farmers and will use the case study of AACE Food Processing & Distribution, a start-up agroprocessing company. It will also attempt to outline practical actions that can be taken to improve the agriculture sector and enhance the lives of smallholder farmers.

* This section 2 was contributed by Ndidi Nuweli.

2.1 Engagement of agroprocessors in the sector

Historically, private sector investments in Nigeria have been limited to commercial agriculture producing export-focused crops, such as cocoa, rubber and sesame, and protected sectors that serve the local market, such as poultry and palm oil. This pattern of investment has been driven to a large extent by the availability of financing for commercial agriculture given the perceived financial returns associated with cash crops and exports.

There has been minimal private sector investment in sustainable smallholder agriculture and limited collaboration between the private sector and smallholder farmers. Most private sector companies, including agroprocessors and financial institutions, complain about the physical challenges and the costs associated with reaching smallholders, as well as the small scale of their operations. As a result, large agroprocessors and manufacturers in Nigeria have relied on intermediaries, aggregators or third parties to source from the farmers. In addition, given the high costs of local produce relative to imports, large food processing companies have opted to import produce instead of sourcing locally.

However, this context is changing. A growing number of fast-moving consumer goods companies, such as Nestle, Nigerian Breweries, and AACE Foods, are now starting to source raw materials in Nigeria.

2.2 Drivers of a changing landscape

There are at least five critical drivers propelling agroprocessors to engage with smallholder farmers. They include the following:

1. **Increased uncertainty in the global economic landscape:** The global food crises, rapid fluctuations in commodity prices, and increasing exchange rate risks associated with importing commodities have compelled more Nigerian companies to look internally for raw materials. In addition, the challenges associated with importing products and the cumbersome customs clearing process have encouraged more companies to source locally.
2. **Population and economic growth:** Given the growing population and increased economic growth, local and multinational agroprocessing companies operating in Nigeria have greater demand for high-quality, consistent supplies of raw materials for their operations. Engagement with smallholder farmers not only enables them to source raw materials, but direct communications and partnerships with the smallholders can ensure increased yields, lower post-harvest losses and enhance the ability of the farmers to meet the demand specifications of the private sector companies effectively.

In addition, forming direct links allows for more efficient information flow and reduces the delay associated with effecting changes and achieving results. It also reduces the transaction costs associated with interfacing through intermediaries or aggregators.

3. **Government incentives and favorable policies:** The Nigerian government has initiated a range of interventions and policies, such as the Agriculture Transformation Agenda (ATA) spearheaded by the Minister of Agriculture and Rural Development and the Central Bank's Nigerian Incentive-based Risk Sharing system for Agricultural Lending (NIRSAL). Both interventions encourage private sector institutions to engage in agriculture and to actively partner with smallholder farmers.

This trend has also influenced the activities of development partners such as the World Bank, Department for International Development (DFID), United States Agency for International Development (USAID), Alliance for a Green Revolution in Africa (AGRA), Japan International Cooperation Agency, and the German Agency for International Cooperation (GIZ), who are increasingly encouraged by the Nigerian National Planning Commission to invest in agricultural initiatives in the most disadvantaged parts of the country. This in turn has led to the emergence of donor-driven projects focused on priority agricultural value chains including maize, rice, sorghum, cassava, and soybean.

Regional agricultural policy initiatives such as the Comprehensive African Agriculture Development Plan (CAADP)/ Regional Agricultural Policy for West Africa (ECOWAP) of the Economic Community of West African States, (ECOWAS), and initiatives spearheaded by the United Nations Development Program (UNDP), the United Nations Industrial Development Organization (UNIDO) and the African Development Bank (AfDB) have also generated greater awareness about the need for private sector engagement in the agricultural value chain.

4. **Support from intermediary organizations:** Most private companies in Nigeria are reluctant to invest the time and energy required to engage smallholder farmers effectively. As a result, development partners have engaged international and local nonprofits such as Technoserve and the International Fertilizer Development Centre (IFDC) to bridge this gap by constituting farmers into groups, providing access to inputs and credit, as well as providing training and demonstrations, storage and transportation support, and then linking the smallholders to private sector customers.

In addition, credit guarantees from organizations such as AGRA have propelled financial institutions which ordinarily would not lend to smallholder farmers or to farmer-based organizations, based on the perceived risks of interfacing with these groups, to provide loans to them.

Each successful engagement has generated widespread interest and compelled more companies to invest the time, energy and resources required to work with smallholder farmers.

5. **Focus on the triple bottom line – pressure to move beyond corporate social responsibility (CSR):** There is growing pressure on companies of all sizes, operating in all sectors, to support critical stakeholders, especially those who need it most. This is especially relevant in northern Nigeria, which has alarming rates of poverty and is dependent on agriculture. Food processing companies are being increasingly challenged by civil society and public sector organizations to support farmers in these communities by sourcing locally and investing in programs to enhance the welfare of those who live in these communities.

2.3 Case example – AACE food processing and distribution Ltd.

The experience of AACE Foods, a start-up agroprocessing company in Nigeria, illustrates the challenges and benefits of engaging with smallholder farmers. The creation of AACE Foods in 2009 was driven by the urgency to tackle the following unsettling facts:

1. According to the 2008 Demographic and Health Survey, 41 percent of Nigerian children under the age of five are classified as “stunted”, 14 percent are “wasted” and 23 percent are “underweight”. This contributes to Nigeria’s high infant and maternal mortality rates.
2. Researchers at the University of Agriculture Abeokuta estimate that 40-60 percent of the fruits and vegetables grown and harvested by smallholder farmers across the county are wasted annually.
3. Ninety percent of the processed food consumed in Nigeria is imported.

AACE Foods directly addresses the first two challenges and capitalizes on the third opportunity, by processing and packaging nutritious and tasty food made from quality fruits, herbs and vegetables from West Africa. The company's business model is centered around sourcing its raw materials – fruits, herbs and vegetables – from smallholder farmers in northern Nigeria, in partnership with community groups and non-profit associations, especially the International Food Data Conference (IFDC). Using semi-automated manufacturing processes, the company transforms this raw material into spices, spreads, sauces and supplementary toddler food.

AACE has targeted institutional buyers, such as food processing companies, caterers, hotels, and fast food chains. It currently supplies spices (e.g. chili pepper, black pepper, ginger, and garlic) in 25 kg sacks to its commercial customers and in retail pack sizes to supermarkets. Through its innovative packaging, competitive pricing strategy and distribution approach, AACE has gradually displaced imports and improved its share of the domestic spice market.

A. Experience Engaging Smallholder Farmers

From its inception, the management of AACE Foods was committed to sourcing raw materials from smallholder farmers. However, they faced some initial hurdles, which are described below.

- **Identifying the farmer groups:** Data on farmer groups/clusters and their products are not readily available in the context of Nigeria. As a result, agroprocessors essentially have to conduct their own research in order to find the farmer groups. AACE was fortunate to benefit from a DFID-funded Business Innovation Facility grant which enabled it to engage Technoserve to conduct a supply chain study. This allowed the organization to identify clusters of farmers that could support its raw material requirements.
- **Communicating with farmer groups:** Despite the deregulation of the information and communications technologies industry in Nigeria and the proliferation of cellular telephones, connectivity is still relatively poor, especially in rural areas. In addition, given the unreliability of power in Nigeria, even those farmers who have cellular phone connectivity cannot always charge their phones. As a result, it is often difficult to communicate with smallholder farmers. This propelled AACE Foods to cultivate relationships with IFDC field staff that support the key farmer clusters, and can physically meet the farmers or the leadership of the clusters to relay information about orders, pricing and payment terms.
- **Financial literacy:** As in many African countries, the average Nigerian smallholder farmer does not have a bank account and works exclusively with cash. As a result, the farmers typically prefer to sell their produce to intermediary traders who travel to the rural areas and pay cash upon collection.

Working with AACE Foods, which has a policy of paying 50 percent up front and providing the balance upon delivery in Lagos (which typically occurs 3-7 days after the first payment), proved difficult at first, because of the significant distrust that exists between smallholders and agroprocessors. However, with IFDC serving as an intermediary and guarantor to both parties, the smallholder farmers have accepted this arrangement. A farmer cluster can open a bank account, the leader receives the funds on behalf of the cluster, and eventually distributes the funds to the members of the cluster.

- **Determining standards:** There is often a significant lack of agreement between the standards of the agroprocessor and the output of the smallholder farmer. Most farmers sell their produce on a "per bag" basis, with minimal regard for standardizing drying and sorting practices in order to prevent contamination and reduce the microbial load. In addition, there is limited grading of the produce based on size, color, wholeness, cleanliness and other basic criteria.

Over time, through periodic meetings with its cluster groups, AACE Foods has been able to communicate its expectations and standards to the farmers, encouraging them to purchase scales and link prices to standard weights (e.g. per kg). AACE has also been able to train the farmers on cleaning and sorting practices. This, in turn, has enhanced the quality of the produce, reducing the production time at AACE Foods and enhancing the incomes of the smallholder farmers who are able to charge higher prices, because of their higher quality output.

B. Impact on Farmers

With support from IFDC, AACE has been able to establish partnerships with farmer cooperatives. These partnerships are giving farmers better market information, informing their planning and harvesting processes and enhancing the predictability of their sales. In addition, by eliminating intermediate traders, these partnerships are raising the incremental household income of the farmers. To date, AACE has sourced from 5 000 farmers; 60 percent of these farmers are women.

AACE plans to increase the volumes that it purchases from these farmers, enhancing their household incomes by up to USD 400 per farmer household by 2015.

2.4 Key success factors in agroprocessor and smallholder partnerships

A study conducted for Oxfam West Africa as part of the GROW Africa Campaign provided an assessment of the experience of AACE Foods and a review of other examples of successful and unsuccessful agroprocessor engagement with smallholder farmers. The study reveals some key success factors. They include the following:

Table 1. Links between smallholders and agro-industry: key success factors

Key Success Factors	Best Practices - Considerations
<p>Relationship is market-driven, not viewed as CSR but as a mutually beneficial relationship with clear and sustainable value addition – and economic benefits.</p>	<p>From the private companies' perspective:</p> <ul style="list-style-type: none"> Engaging smallholders is in response to an economic need – market demand must exist for the product and the company must have a good understanding of the market needs and dynamics Clear systems and structures exist which ensure that quality produce is delivered on a timely basis Clear, transparent and timely pricing and payment systems are established <p>From the farmers' perspective:</p> <p>There are tangible benefits associated with engaging with the private sector – in terms of access to inputs, credit, extension and a guaranteed market. More specifically, where applicable, there will be:</p> <ul style="list-style-type: none"> Timely delivery of inputs for production Adequate provision of technical and managerial support Credible and transparent payment arrangements
<p>Merit-based farmer selection</p>	<ul style="list-style-type: none"> The best farmers are selected to participate or, if possible, farmers choose to be part of the program There is a transparent process for farmers who are unable or unwilling to meet standards to exit the program

Table 1. Links between smallholders and agro-industry: key success factors (Cont.)

Key Success Factors	Best Practices - Considerations
Merit-based farmer selection	<ul style="list-style-type: none"> • There is support of farmer-based organizations, clusters or cooperatives that enhance farmer commitment and minimize non-performance and defaults on the part of the farmers.
Pilots for learning; nonprofits/development partners play a key role	<p>Pilots are critical because they allow for proof of concept and tweaking of the model before a full roll-out which can prove to be expensive and ineffective.</p> <p>Nonprofits/development partners engage and support pilot programs to demonstrate proof of concept and reduce the barriers to effective partnerships from the perspective of both the farmers and the private sector. More specifically, they:</p> <ul style="list-style-type: none"> • Organize farmers and prepare them to work in groups. • Provide inputs, technical assistance and access to financing for the farmers. • Provide information and support to the private sector companies. • Have clear roles and responsibilities at different growth points of the scheme. • Have a clear exit strategy which guarantees that the relationship between the smallholders and the private sector company will continue even after the exit. (Given that most of the nonprofit/development partner interventions are donor-funded, they are tied to specific deliverables within a predefined time frame, which makes this exit strategy a crucial factor.)
Buy-in and alignment from all key stakeholders including the community leaders, civil society, NGO partners, FBOs and the private sector	<p>It is imperative that there is broad-based buy-in from all the key stakeholders. This can only be achieved through:</p> <p>Private sector:</p> <ul style="list-style-type: none"> • Senior management buy-in and support. • Capable staff employed and fully dedicated to managing the relationship. <p>All stakeholders (private sector, FBOs, farmers, nonprofits, community leaders):</p> <ul style="list-style-type: none"> • Broad-based consultations in the planning and pilot phases. • Transparency in all aspects of engagement. • Regular communication, which is critical for building trust. • Clear systems and structures for conflict resolution and problem-solving.
Incentives available for increased quality, yield and scale	<p>Clear standards must be set and communicated. In order to enhance farmer productivity and encourage greater commitment, successful private sector companies ensure that:</p> <ul style="list-style-type: none"> • Farmers are paid more for better quality and increased production. • Economies of scale allow farmers to make higher margins.
Conducive and supportive environment	<p>Partnerships between smallholder farmers and private sector companies thrive when the LGA/district, region or state in which the partnership is taking place is supportive. A few examples of support that surfaced during the study include the following:</p> <ul style="list-style-type: none"> • Government creates an enabling environment and does not serve as a stumbling block. • Farmers are not penalized for their engagement in groups or in the formal financial systems via levying of multiple taxes. • Extension services and other public sector interventions support program implementation. • Land tenure issues do not limit farmer expansion. • Feeder roads and other infrastructural developments exist, thereby reducing the cost of doing business. • Courts at the district and local government level enforce contracts.

Measuring the Impact of Agroprocessors' Engagement with Smallholder Farmers

There is limited research on the most appropriate criteria for measuring the impact of agroprocessors' engagement with smallholder farmers. Some early ideas for impact measurement include the following:

From the farmers' perspective:

- Quantities of produce purchased
- Increases in household incomes
- Anecdotal evidence of improvements in the lives of the farmers, in terms of their ability to send their children to school or the weight of their children
- Ability of the farmers to withstand shocks
- Value addition and resulting increases in income at the farm/community level
- Sustainability of the partnership after the development partner/nonprofit organization has withdrawn and the public/donor-funded intervention that created the linkage has formally ended

From the agroprocessors' perspective:

- Improved profitability due to reductions in transaction costs, reductions in storage costs, improvements in the quality of the produce and enhanced reliability of produce

Clearly, there is a need to further refine and standardize criteria for measuring agroprocessors' engagement in smallholder agriculture to ensure sustainable improvements in the livelihoods of the smallholder farmers and improvements in profitability of the private sector companies.

2.5 Conclusion

The Nigerian, and indeed the entire African, agribusiness landscape would benefit immensely from more sustainable partnerships between smallholder farmers and agroprocessors. However, key actions have to be taken on the part of both the agroprocessors and the smallholder farmers to ensure that this occurs. More specifically:

- **Agroprocessors** need to:
 - Increase their commitment to engaging smallholder farmers, shifting their perspectives from a CSR lens to one that views smallholder farmers as a critical part of their supply chain, and a key component of their long-term competitive advantage. This will require senior management to be committed to developing and executing comprehensive supply chain strategies which engage smallholder farmers.
 - Engage development partners/nonprofit organizations with expertise in market linkages who can serve as critical partners in the design and piloting of strategic partnerships with smallholder farmers.
 - Partner with research institutions such as the International Institute of Tropical Agriculture to equip farmers with knowledge about improved and high yielding varieties of crops.
 - Develop transparent engagement terms, including product specifications, pricing and payment structures, and share these with key stakeholders to obtain buy-in.

Farmers and Farmer Based Organizations need to:

- Strengthen their clusters, associations or groups to ensure effective governance structures with clear and consistent leadership, empowered to represent the interests of farmers effectively in their engagement with private and public organizations as well as with development partners.

Several factors contributed to the success and growth of the LdB enterprise. These can be separated between:

- Empower and educate themselves through business training, adult literacy classes, mentoring and coaching, to ensure that more farmers are able to engage effectively in the formal economy and deliver on their commitments to private sector companies.
- Work with nonprofits, development partners and key public sector institutions to enhance their capabilities to adopt the industry standards required for success in a particular value chain, increase their yields, minimize their post-harvest losses and engage in more value addition at the farm level.

3. Initiatives to develop local-milk based dairy markets in Senegal*

3.1 Background and context: the milk paradox in Senegal

With more than 12.5 million people in a territory of about 196.722 km², Senegal is strongly dependent on food imports, as only 39 percent of the country's food consumption comes from local production (EDS, 2007). Consumption of dairy products is deeply integrated into local dietary practices, with 90 percent of households consuming yoghurt every week. However, local fresh milk is largely consumed by breeders or occasionally sold on traditional markets. Indeed, 90 percent of the milk being traded is imported, mainly as powdered milk.

The livestock sector in Senegal is sizable – more than 3.25 million cattle and 11.25 million sheep and goats (DIREL, 2010) – but it produces only 40 percent of the national milk consumption. According to the Ministry of Livestock, consumption of milk and dairy products/by-products is estimated at 360 million litres, of which 60 percent are imported and 40 percent of local origin, representing FCFA 60 billion and FCFA 51 billion, respectively.

The livestock sector contains mostly traditional activity and involves 30 percent of the population. Most of the local milk production (98-99 percent) comes from agropastoral and extensive pasture systems; the rest comes from intensive farms.

In 2010, a value chain analysis showed that collection and processing are the weakest links of the value chain, with only two percent of local milk (around 2.5 million litres) processed into higher value products. Clearly, the milk sector in Senegal has huge growth potential.

3.2 Case study: Laiterie du Berger

The **Laiterie du Berger (LdB)** is private company established in 2006 by a few young Senegalese entrepreneurs, including a veterinarian and a food engineer. Its objective is to increase the local production of milk and milk products and to supply urban centres with good quality and competitively priced milk and dairy products. Its main factory is at Richard Toll, a town about 400 kilometres from Dakar, which is where the commercial, marketing and administrative arms of the enterprise are located. There are six milk collection centres and the company employs approximately 100 people.

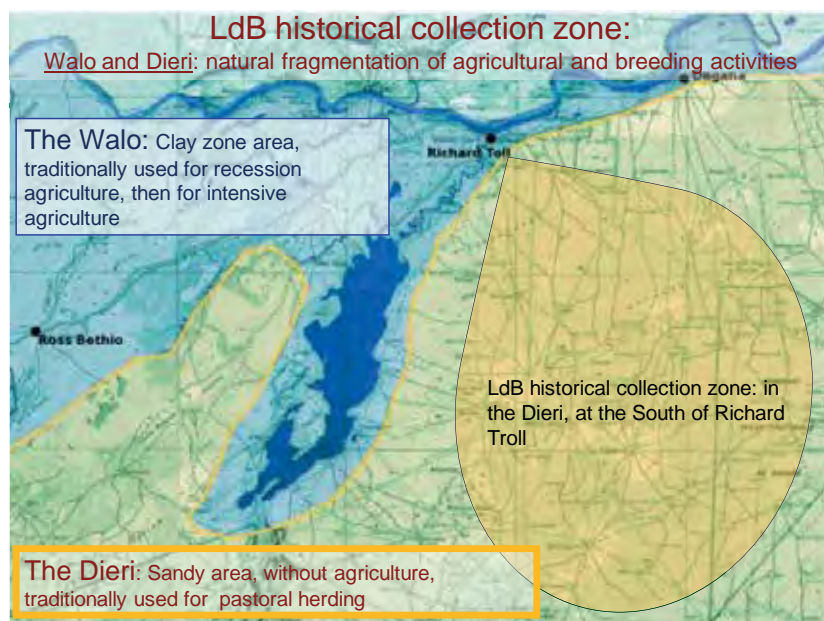
LdB processes milk into yoghurt and fresh cream. In 2009, the company released its own branded dairy product, DOLIMA (yoghurt), which quickly propelled it to third place in Senegal's dairy products market. LdB is currently the only factory/industry in Senegal processing local milk into dairy products.

* This section 3 was written by Arona Diaw.

A. Collection of milk

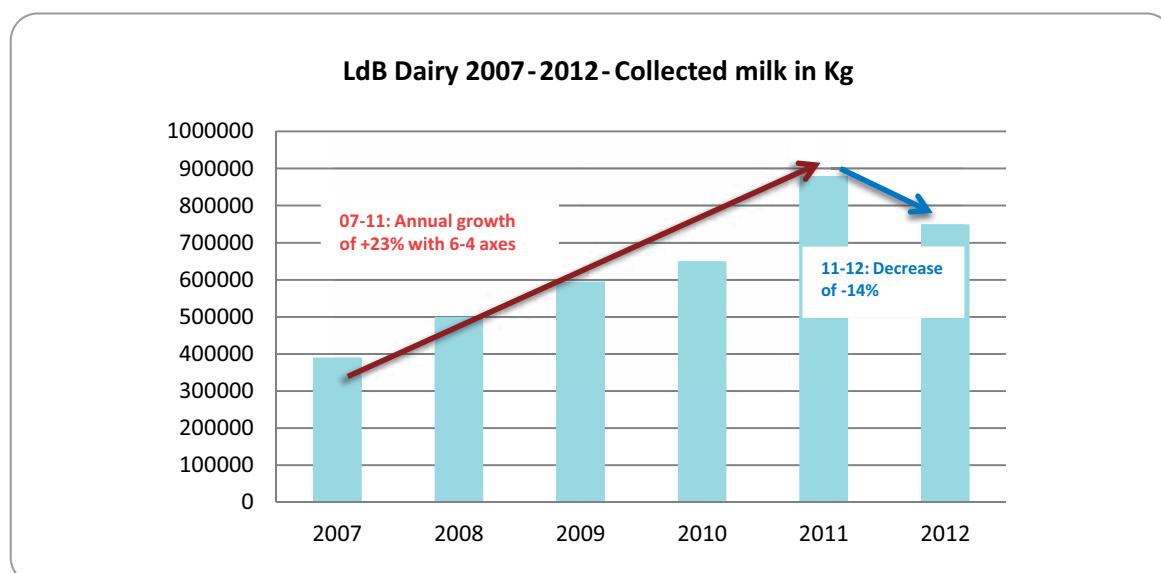
Collection of milk from breeders is organized along two axes, twice a day, collecting average amounts of 2000 and 6000 kg per day in dry season and winter, respectively. There are two collection zones: the 'Dieri' (sandy area) and the 'Walo' (rice producing region) (see map below). Milk collection consists of 3 to 5 axes with collection rounds of about 50 km radius and a collection zone of 600 to 1000 km per day. Each collection axis is serviced by one driver, one collector and one pickup vehicle with a capacity of 1.5 tonnes.

Figure 2. Milk collection centers for LdB



Milk collection has continually grown since the start rising from 100 initially to 600 breeders and providers by 2011. About 2000 persons are involved in the collection. Until 2011, there was 23 percent annual growth of collection levels. However, in 2012, winter deficit combined with lack of pasture led to a 14 percent decrease in spite of efforts in terms of service provision to breeders (see Figure 2)

Figure 3. Evolution of milk collection at LdB center (source: LdB)



- **Internal:** quality staff, adequate logistics, quality service provision (inputs, advice) to breeders.
- **External:** quality and availability of natural pasture, access to water, incentives for breeders to manage and keep dairy cattle.

However, there were also some limiting factors, including:

- Seasonal nature of the collection (winter vs. dry season)
- High dependency on the winter season collection (e.g. 2012 vs. 2011)
- High transportation cost of the milk when it is about a horizontal growth by opening new axes

Looking forward to 2016, collected milk volumes are expected to show an annual deficit of about 30 percent, while the factory's need for milk will grow 15 percent.

B. Service provision to breeders/milk providers

Beyond the external factors cited above, the increase in volume of collected milk is closely linked to the accessibility of basic services (food, water, advice) to targeted breeders. LdB provide a variety of services to the breeders that supply milk. Among these services are:

- Cattle feed – industrial products and local by-products (rice bran): 320 tonnes in 2012
- Transportation of feed with collective purchase
- Fodder (rice straw and sugarcane straw) with delivery to breeders: 600 tonnes in 2012
- Veterinary consultations and basic care (pesticides)
- Advice on feeding and milk-related hygiene

Ancillary services:

- Artificial insemination – in collaboration with the Ministry of Livestock
- Rural hydraulic systems and services provided to breeders – in collaboration with the NGO Groupe de Recherche et d'Échanges Technologiques (GRET).

C. The LdB business model

The business model for linking up with milk producers and suppliers consists of a system for collection of milk from two collection zones with about five collection axes per zone, each axis having one vehicle. Both internal and external factors contribute to the success of the operation. Internally, the company ensures the quality of its personnel, adequate logistics and quality of services offered to the farmers; externally, the company enhances both the quality and availability of pasture and access to water.

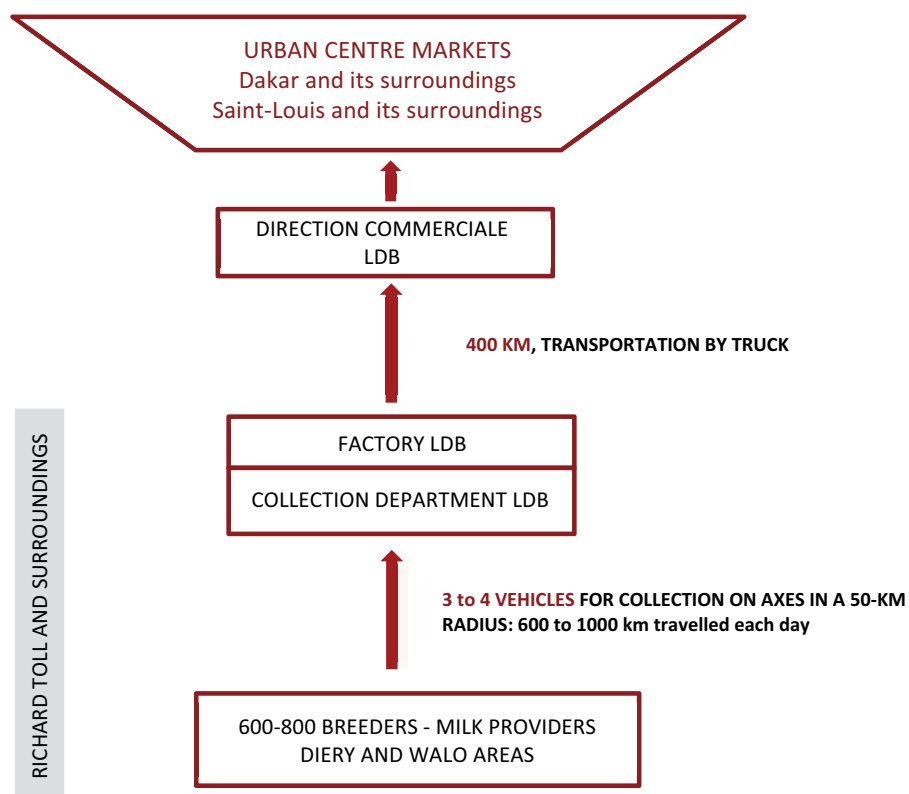
The milk collection system has effectively reduced the amount of spoiled milk received at the factory. The use of harvest residues (of maize, rice, groundnuts, etc.) as animal feed has increased milk yield during the dry season. The curdling of milk collected from the smallholder dairy farms was considered an important element in the operation of LdB because it affects the quality and profitability of its products. An ongoing issue is how to determine criteria for assigning responsibilities between the company and the smallholder dairy farmer. The small farmers' capacities should be enhanced, not only in good agricultural practices but also in management, so that they can improve the financial operations of

their farms. LdB is considering including producers in the governance of the company once they receive adequate training.

The development strategy of LdB is aimed at increasing the market penetration of its products on the basis of their quality and competitiveness and easy access to the market in Dakar. The company has focused primarily on the mass consumption segment and less on improvements in technological development, commercialization and distribution. The company has also developed a partnership with an NGO (GRET), as a vehicle to build relationships with milk producers and suppliers, which number around 600 smallholder farmers. The company ensures that its targeted milk producers have access to basic services in return for supplying milk and for increasing their milk production. Using dedicated, qualified staff, the company has provided the following services to its target dairy farmers: (a) group purchase and distribution of animal feed, including rice and sugar cane harvest residue and concentrates; (b) delivery of animal feed; and (c) veterinary consultations.

These services were supplemented by those offered by GRET, which supplied rural water services to cattle farmers, and by the Ministry of Animal Husbandry, which provided artificial insemination services. The objective of the partnership between the company and GRET was to facilitate improvement in the conditions of life for free range cattle farmers through a synergetic set of interventions in the Dagana district. This successful case demonstrates the potential effectiveness of a privately led multi-stakeholder partnership involving a private company, well organized small scale producers, an NGO and government, all collaborating to improve agricultural value addition and value chain development, as well as income, employment and food security at the local level. However, before such an initiative can be promoted for replication and scaling up elsewhere, its sustainability in the long run has to be fully ensured.

Figure 4. Milk supply chain for LdB



4. Public and private support services to farmer-based organizations: The case of Ghana*

4.1 Introduction

Farmer Based Organizations (FBOs) have been heralded as leading contributors to poverty reduction and food security (FAO, 2010). However, despite their potential, the performance of FBOs in Ghana, especially those in the horticultural sector, has been constrained by poor access to markets, low production volumes and quality of produce, lack of group cohesion, and limited business and entrepreneurial skills for value addition. The FBOs require significant upgrading in all these areas. Agriculture research and development organizations have now recognized that improving market access and enhancing the ability of FBOs to diversify their links with markets are among the most important interventions needed to change the fortunes of the farmers (IFAD, 2001, IFPRI, 2002).

Recently, the Government of Ghana, through the Food and Agriculture Sector Development Policy (FASDEP II) has been promoting the commercialization of agriculture, transforming subsistence agriculture to a market-oriented sector by instilling entrepreneurial culture in smallholder farmers. Farmers are encouraged to produce for markets rather than simply trying to market what they produce.

4.2 Market Oriented Agriculture Program (MOAP) in Ghana

To promote the development of FBOs, given the important roles they play, Ghana's Ministry of Food and Agriculture (MoFA), in collaboration with the German Agency for International Cooperation (GIZ), began implementing the Market Oriented Agriculture Program (MOAP) in July 2004. The goal of MOAP is to increase the competitiveness of Ghanaian agricultural producers, processors and traders in the domestic, regional and international markets by offering support in the following ways:

- a. promoting, strengthening and upgrading selected commodity value chains (pineapple, mango, citrus and chili pepper) to achieve greater value in production, processing and marketing;
- b. improving the effectiveness and efficiency of public service delivery to agriculture and agribusiness; and
- c. strengthening public and private service delivery in agriculture, especially to FBOs.

Over the life of MOAP, the program has supported the achievement of its objectives in diverse ways, through intense development of FBOs and support for the various commodity value chains across the regions. Currently, the program is working with over 200 FBOs – comprising over 8 000 members, 30 percent of whom are women – across the four commodity value chains in four regions of Ghana, namely Central, Brong Ahafo, Northern and Volta Regions.

MOAP's Approach to FBO Development

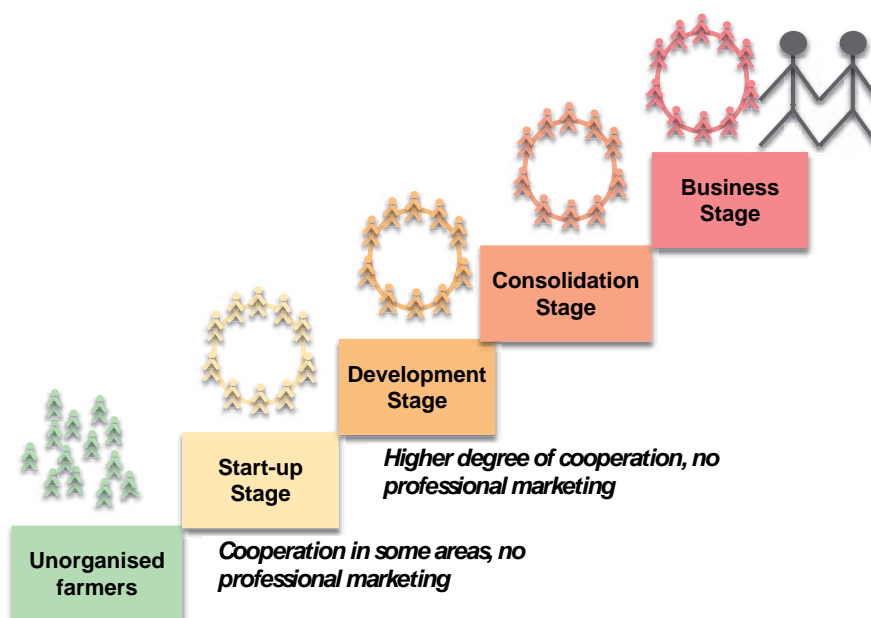
Given the multiplicity of constraints that simultaneously confront FBOs, it is essential to develop appropriate strategies to maximize their effectiveness and deepen their participation in the marketplace and in the agricultural development process. To address this concern, Ghana government (with GIZ

* This section 4 was written by Festus Kwadzokpo.

support) has introduced an initiative for strengthening FBOs in selected value chains. The approach is targeted at developing the capacity of the organizations to understand, develop and effectively link to markets in a business-oriented fashion. The focus is on building the capacity of FBOs, with emphasis on organizational development, technical agronomic training and market orientation. This is done through a four-stage process, designed to ensure that the FBOs develop a business-oriented vision for effective participation in the market. The process is described in Figure 4 below and the rationale behind its development is as follows:

- To tailor support according to the actual needs of the FBOs;
- To systematize incentives for FBOs' development based on performance;
- To provide orientation for grant and credit suppliers to increase their opportunities to reach business-oriented FBOs; and
- To measure progress in the FBO development process.

Figure 5. FBO Development Stages



Each development stage consists of three elements:

- (a). **criteria** indicating when an FBO has reached a specific development stage;
- (b). a **toolbox** of organizational development, business and agricultural technical training measures to promote the FBO to the next development stage; and
- (c). an **incentive system** to propel the FBO to a higher level of organizational development.

Unorganized farmers constitute the target group for starting the FBO development; the associated criteria to identify each development stage are outlined as follows:

An FBO in the **Start-Up Stage** meets the following criteria:

- (a). Has updated membership list
- (b). Has group members who know each other
- (c). Carries out meetings attended by at least 70 percent of group members

An FBO meeting the following criteria is regarded to have reached the **Development Stage**:

- (d). Has a clear vision and mission defined by members
- (e). Has clear objectives, which are understood by members
- (f). Has an acceptable constitution, known by all
- (g). Has a bank account
- (h). Has elected, functional leaders and decision-making procedures that follow the regulation of the constitution
- (i). Has a minimum of 70 percent of members paying dues
- (j). Has business training and skills in planning and record-keeping
- (k). Has external relationships and linkages
- (l). Has good records on income and expenditures, meetings and activities
- (m). Has market for produce

An FBO in the **Consolidating Stage** is defined by the following criteria:

- (n). Is officially registered and has an office
- (o). Has defined services and/or business activities for members
- (p). Has income from services and/or business activities at FBO level
- (q). Has certificates for the produce
- (r). Has strategic and business plans (budgets)
- (s). Has contracts for produce
- (t). Has sufficient knowledge for implementing the development/business plan
- (u). Is networking with similarly-oriented FBOs

The **Business (Mature) Stage** is achieved by an FBO when the following criteria are met:

- (v). Has employed a professional manager to run the business
- (w). Has an ongoing contract and guaranteed market for produce of its members

The prospect of higher income is the driving force for farmers to gradually develop their FBOs to a higher organizational level. So far, the experience of MOAP indicates that the primary incentive for commitment by individual farmers and FBOs is the availability of market for their produce. To motivate farmers to be more committed to the FBOs and encourage the FBOs to become more cohesive, MOAP's advisory support combines advice on good agricultural practices, business training and organizational development support and has found this combination to be very important. Because marketing plays a crucial role for achieving higher income levels and sustaining membership commitment, the link to the market is crucial and starts from the development stage.

To make the approach more meaningful to the FBOs, the development classification system is communicated and explained to the rank and file members, allowing them to track their own development process. This communication creates a concrete perspective for development.

Each of the development stages is provided with the needed support measures to promote the FBO to the next development stage. Basically, three different types of service combinations are involved in these measures:

- **Unorganized farmers** are provided with basic organizational development to mobilize and motivate farmers and their leaders and to link to extension services; this basically corresponds with the participatory rural appraisal (PRA) approach.

- Farmer groups in the **Start-Up, Development, and Consolidation Stages** are provided with a combination of extension services for good agricultural practice leading to certifications such as GlobalGAP, organic and fair trade certificates, as well as farmer business training and organizational development support.
- In the **Business Stage**, extension activities for improving agricultural practices (focused on income generation) continue for the individual FBO members. At this stage, the FBO ensures that individual members strive to meet production volumes and overcome quality problems at the farm level. The organizational development element for the FBO at this stage becomes a specialized business support.

Sustainable FBO development requires systematic, long-term training, advising and coaching. These activities are therefore combined with agricultural extension, business training and organizational development support systems to enable FBOs to develop to the stage where they have quality produce and sustainable market penetration capabilities.

MOAP views the availability of marketing channels as a vital driving force for FBO development, so before an FBO is linked to the market, its readiness is critically examined in advance of any recommendation. Recommendation is contingent on the readiness of the FBO to meet the demands of the market according to its stage of development. It was observed that overly ambitious market linkages for FBOs at lower stages of development can lead to disappointment for both the buyers and FBOs, because they do not have the competence, quality standards and quantities demanded by the buyer. Market linkages are therefore used as an incentive for FBOs to reach the next stage of development.

The combination of agricultural extension support with organizational development training and business advisory modules is offered to FBOs that show promise when the specific criteria for a development stage have been fully met. Specific services are offered to FBOs that have met the criteria for a particular development stage. For example, support in accessing credit is provided to FBOs that have reached the **consolidation** and **business** stages, and access to improved and sustainable markets is provided to FBOs that have reached the **development** stage. The FBOs that have reached the **business** stage are provided with advanced business development services.

4.3 Some successful initiatives with MOAP

A. The case of Mid-Ghana Commercial Mango Growers Association (COMANGA)

COMANGA was formed by a group of business-oriented mango farmers in the Brong Ahafo and Ashanti regions of Ghana. Before the formation of the association in 2008, the farmers were members of seven district mango associations in the Brong Ahafo and Ashanti regions with little knowledge about cultivation of mango. Through the training received and interaction in the regional mango value chain committee, the business-oriented members in the district associations decided to come together to form their own association to promote their common interest. MOAP, using its FBO development approach, supported COMANGA through good agriculture practice training, business and organizational development training. At present, COMANGA has 27 members, including four women, and it has reached the consolidation stage in the FBO development process. COMANGA has hired the services of an agribusiness manager who runs the association and ensures that linkages are established with buyers. In 2011, COMANGA members sold 197 mt of mango to fruit processing companies in Ghana and the association has set a goal of selling fresh fruit to fruit exporting companies in Ghana and outside. The mangoes produced by members are considered some of the best in Ghana because of their colour, taste and quality.

B. The case of Central Region Citrus Farmers Association (CROCFA) – Ghana

CROCFA is the largest organic citrus producers' association in Ghana, with over two thousand members – about 40 percent of them women – from over 60 communities. The association's head office is at Abakrampa, in the Abura Asebu Kwamankese (AAK) district, Central region, Ghana. Before the formation of the association, members had no guaranteed market for their produce. They would sell to market women, and to buyers within Ghana and the neighbouring West African countries such as Côte d'Ivoire and Togo. Often, buyers would collect the fruit on credit with the promise of coming back to pay, but then did not follow through. Because of the unorganized nature of the association, the buyers had difficulty in choosing fruit from the suppliers whose membership of the association was not clear. Through the intervention of MOAP, the association has been reorganized and all the member communities are linked to the parent association. It has a governing body, a constitution and the office at Abakrampa. More importantly, it has a contracted buyer, the Pinora Fresh Juice Processing Company, in the Eastern region of Ghana. As a result of the training provided to CROCFA and the reorganization of the association in all the communities, the association is now in a better position to negotiate prices with the buyer and agree on many issues which are paramount to the development of the association. The association has placed a levy on all sales made by members to Pinora and this has become the main source of income for the association. The financial difficulties of the association are now over. Financial independence has become a major empowering tool for the association.

4.4 Challenges and recommendations for FBO support in Ghana

The attempt to develop FBOs on a sustainable basis is not without challenges:

- In a market-driven economy, FBOs must strive to operate in a business oriented fashion or they will cease to exist.
- Government extension services are limited in scope; thus FBOs will have to assume more of the responsibilities themselves through self-reliance and networking.
- Private extension services come at a high cost and the culture of paying for extension services is still low.
- Market entry demands (e.g. quality and grading standards, credit, transportation, quality control, volume) are still difficult to meet for many under-resourced FBOs.
- The costs of inputs (e.g. farm machinery, tools, fertilizers) are still high for many smallholder farmers.

Strengthening and empowering FBOs in a developing country like Ghana requires significant effort, through a structured, sustained and long-term program of training, advising and coaching. A phased program of technical agronomic training, followed by organizational development and business training support based on trust, transparency and mutually agreed terms of engagement, is recommended for any sustainable FBO development intervention. This is a process of trial and error as there is no foolproof recipe for success. The process requires patience and willingness to learn and relearn from mistakes, successes and failures.

Mechanisms for tracking progress and for documenting lessons and success stories within FBOs and their development partners are necessary, given the dynamic environment, clouded with many uncertainties. MOAP's work on FBO development so far has shown that capacity development of FBOs should be handled with caution, resisting the natural impulse to get impatient and try to force the process. It is important not to forget that the environment is complex and regulated by socio-cultural norms, traditions, sometimes contradictory social behavior and broader policy regimes.

5. Other public-private initiatives for engagement with smallholder farmers in Ghana

5.1 The Outgrower and Value Chain Fund (OVCF) for agricultural financing

Agricultural development in much of Africa is hindered by a lack of accessible finance. The traditional channels for access to capital and finance rarely work in agricultural sectors, especially for staple products, and innovative approaches are sorely needed. A recent initiative in Ghana – the Outgrower and Value Chain Fund (OVCF) – was started with German cooperative support. Its objective was to improve access to medium- and long-term financing of investments by small-scale farmers as part of outgrower schemes, thus facilitating the integration of smallholder farmers into commercial agriculture.

The OVCF facility brought together the outgrower/farmer, the technical operator (processor, exporter or aggregator) and the financial operator/participating bank to collaborate in development of the agricultural value chain. The project was initiated as one method to support implementation of the Government of Ghana's agricultural policy instruments, such as METASIP, FASDEP, and the Ghana Shared Growth and Development Agenda.

Factors contributing to the success of the project include the tripartite contract arrangement, the provision of quality technical and financial services, access to information, and transparent pricing and knowledge of value chain financing by participating banks. Participation in the program is subject to specific eligibility criteria for each of the three main categories of stakeholders. To ensure long-term sustainability of the program, technical assistance, training and organizational development support for the three main categories of stakeholders (outgrower, technical operator and financial operator) are critical. Good governance (through establishment of a steering committee to engage with all stakeholders) is critical, as well. Success also hinges on resolving such challenges as agreeing on appropriate and reasonable interest rates for both the outgrowers and the financial institutions, and implementing innovative approaches to risk management. Implementation of the project required intensive preparation. The OVCF initiative became operational in April 2011 and the disbursement of funds was expected to start in the third quarter of 2012.

5.2 Commodity chain development and facilitating access to finance: Northern Rural Growth Program (NRGP)

The Northern Rural Growth Program (NRGP) is managed by the Ghanaian Ministry of Food and Agriculture with funding from IFAD and the AfDB. NRGF is a private sector-led agricultural development and investment strategy for poverty reduction that seeks to facilitate smallholder farmers' access to finance. The program focuses on northern Ghana, a region facing multiple constraints, including weak market linkages, high transport costs, poorly motivated producer organizations, inadequate infrastructure and weak financial services. The program was designed to address the constraints of agricultural production and the productivity value chain in four commodity groups: (i) industrial crops (soybean, maize, groundnut, sorghum); (ii) export fruits and vegetables (papaya, okra, chili); (iii) crops grown especially by women (shea, sesame, moringa, African brown rice); and (iv) animals (Guinea fowl, small ruminants).

The NRGF business model for facilitating smallholder access to finance can be characterized as a producer-driven value chain model working through associations of nucleus smallholder farmers operating as outgrowers. The nucleus farmer registers a company as a special purpose vehicle (SPV) which can then access commercial bank financing for equipment and working capital for SPV₂, with outgrowers paying for the services offered through the SPV. The nucleus farmer then provides the outgrowers with facilities such as input credit (fertilizers, herbicides, etc.), tractors and other mechanical services, and training in group cohesion. Under this model, market for the outgrowers is assured through the lead firm (SPV) model, with the smallholder farmer selling his/her produce to an aggregator. The services provided by the aggregator include quality assurance and training of farmers on improved agronomic practices and farm management, as well as the provision of cashless credit facilities.

An interesting feature of the program is the governance structure, which brings together the various value chain stakeholders at the district level through the District Value Chain Committee (DVCC). The DVCC includes representatives of agro-input dealers, FBOs, financial institutions, mechanization service providers and marketing companies. The purpose of the DVCC is to encourage the private sector to contribute its assets and know-how towards the public good. The role of the DVCC is considered crucial to the success of the program, highlighting the importance of good governance for the success of any type of multi-stakeholder initiative.

Key prerequisites for successful operation of the DVCC linkage model are the existence of an end market for the commodity, as well as the active participation (which implies self-interested motivation) of the value chain producers, traders and processors, business development service providers and financial service providers. An initial challenge to implementation of the program in northern Ghana was that financial services penetration in the region was low, which had a negative impact on the operation of the program. To remedy this weakness, an effort was made to link up with a sister project and other local government authorities to establish rural banks, as well as to encourage some existing commercial and rural banks to establish agencies in the operational zone. The remaining crucial element for the initiative's long-term prospect is availability of funding on a sustainable basis. One option is to encourage the DVCC to institutionalize revenue mobilization measures, such as commissions on businesses leveraged by it, and creating an incentive package for the DVCC for successful loan leverage. One encouraging sign is that, as a result of business generated by the DVCC, the number of banks involved in the scheme increased from 2 to 24, demonstrating an increase in services offered to smallholder farmers.

5.3 Initiative to enhance market linkages: experiences from cassava processing in Ghana

The Root and Tuber Improvement and Marketing Program (RTIMP) in Ghana focuses on cassava production and processing. Its goals are to improve market linkages, reduce post-harvest losses, facilitate use of the produce to reduce spoilage, promote technologies for the packaging and storage of cassava products and promote marketing. The main shelf-stable forms of cassava byproducts include gari, cassava chips, high quality cassava flour and *Agbelima* (a fermented cassava product). The RTIMP's approach to enhance market linkage supports multiple activities: multiplication and distribution of improved planting material, technology generation and capacity building, establishment of Good Practice Centres, exposure visits, financial analysis of chain activities, access to a Micro Enterprise Fund (MEF) and an Initiative Fund, district stakeholders' meetings, radio discussions and Esoko, a technology platform for information management and improving the transparency of markets.

A network of small plots belonging to participating farmers was dedicated to growing improved varieties giving high yields, suitable for processing and for producing quality products. Continuous supply of these high quality planting materials was necessary to facilitate continuous operation for farmers, processors and traders. The program also set up Good Practice Centres, where selected tuber and root processing enterprises with standardized equipment were located. As part of the program's technology generation and capacity building goals, RTIMP promoted the use of standardized cassava processing equipment and facilities, as well as training the main implementing partners to construct the standardized equipment. RTIMP provides training services to farmers based on their needs. There is no free service and smallholder farmers pay for the services offered.

The MEF was established to enable processors to acquire processing equipment and to market their products. However, its matching fund requirement constituted a barrier to access, as the processors lacked the resources needed to join. The district stakeholders' meetings provided opportunities for all stakeholders in the cassava value chain to exchange ideas and discuss possible avenues to promote and market their cassava commodities. Consequently, they enabled farmers within a specific zone to exchange information about raw materials and transport availability, as well as about idle processing facilities, thereby promoting the effective integration of all the processes.

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Chapter 7

GAIN methodology to enhance producer organizations' capacity for market integration: Applications to West Africa

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1. Introduction

Constraints faced by smallholders – be they women or men – in accessing markets and improving their revenues are well known and easy to enumerate. Finding workable solutions to these constraints remains a challenge. Small farmers face a number of constraints in terms of access to markets such as the lack of means of production (arable land, water, equipment, financial resources), poor access to education, training and modern technology and weak bargaining power. Women face additional challenges, including cultural and legal discrimination giving them or not access to production inputs, financial services, education and technology.

The situation is very similar in many developing countries, particularly in Africa. A major obstacle to achieving agricultural development and inclusive value chains is the lack of effective and self-reliant producer organizations. In West and Central Africa, farm organizations form only a small portion of the farm population, and when they exist, they are often structurally weak, lack good governance and the endogenous capacity to be self-reliant and sustainably deliver the economic services required by their members. In most cases, these organizations remain too dependent on external support that often lacks safeguards to ensure long term sustainability.

Following the food crisis of 2007-08, during the World Summit on Food Security organized by FAO in November 2009, Member States reaffirmed the need to better integrate small farmers – be they women or men – in agricultural markets. This recommendation came out of the bitter fact that, in most cases, despite the soaring food prices starting in 2007, small farmers in poor countries have not been able to respond by increasing their production. The expected production response to price increases did not occur. This showed that agricultural markets do not work - at least not for small farmers.

To correct this huge market failure, policies need a strategic correction and redirection toward staple food value chains and food strategy based on diversification as the surest way towards food security. Such process in fact started in 2000 when the Millennium Development Goals were established followed by the regional agricultural policies such as the African Agricultural Development Program (CAADP); however the crisis of 2007-2008 has given more urgency to this shift.

Developing markets that include small farmers requires a concerted effort involving government, the private sector and agribusiness, as well as producer organizations (POs), Non Governmental Organizations (NGOs), etc. Producer organizations play a key role in ideally helping their members to be less isolated and to increase their social capital and self-confidence (especially for women). In addition, the PO can facilitate producers' access to training, loans and marketing of products on the market, while reducing their transaction costs and increasing their bargaining power. Thus, by organizing themselves, small producers are better able to overcome the constraints they face individually and take advantage of market opportunities. In order to be effective, these policies and programs of action must be based on functional small producer organizations that have clear economic objectives and are self-empowered with sustainable capacities. These will give them the possibility to interact and negotiate with economic, financial and institutional partners.

In West Africa, as elsewhere, during the last 25 years, a wide range of producer organizations, mainly associative institutions and agricultural cooperatives, have emerged and come to fill a void created by the gradual decline of public investment, management and support to the agricultural sector. The performance evaluation of these organizations shows that they are relatively limited. This is due to a number of reasons: the conditions and motivations for which these organizations were set up (often

in response to time-limited projects); unsuitable structures and an internal lack of good governance limiting effectiveness; a lack of individual skills and talents necessary to properly manage themselves and to develop partnerships, often combined with a lack of collective vision that would mobilize members around economic goals and clearly define the services that each organization should offer to its members. In addition, most of these organizations lack autonomy, especially at the financial level, and do not have the capacity to mobilize resources directly from their members. This makes them dependent on external support that comes in sparingly, in a temporary fashion, and is often related to requirements or conditions that have nothing to do with the real and internal needs of these organizations' members.

There are a few effective approaches and diagnostic tools that can be used to diagnose and design a progressive path for producer organizations that leads them to a situation of autonomy and economic efficiency within a framework of institutional sustainability. Within projects, the efforts of development partners to assist and financially support certain organizations very often end up creating situations of dependency in relation to external assistance. Thus, when the external financial support stops, organizations often tend to fall into a passive phase resulting in the inability to continue to operate independently.

A new methodology called GAIN (Governance, Autonomy, Integration, Needs based) by FAO to provide an effective assessment tool for initiating endogenous structural changes within a producer organization (Elbehri *et al.* 2013).² Using a participatory and iterative approach, GAIN combines an internal assessment of the organization with an analysis of its immediate environment in order to initiate a gradual process of economic self-empowerment. This takes the OP on the path of more reliably supporting its members' economic needs and playing a more active role in the local economy.

The GAIN methodology was designed to address three interrelated concerns:

- Finding an effective approach to enable small farmers, be they men or women, to become better integrated in the market and reap the ensuing benefits;
- Formulating within the AII-ACP project in West Africa modalities that can develop staple food value chains through capacity building of inter-professions and member umbrella organizations, including producer organizations;
- Drawing on lessons learned from the exemplary organization SEWA in India as catalytic agent to induce an effective institutional change in African organizations.

This chapter describes the GAIN methodology, review its application in three West African countries, with a detailed description of the Burkina Faso case study (with Tien-Tietetaa Union). The chapter concludes with an assessment of GAIN effectiveness and potential additional fields for its application.

2. Description of the GAIN methodology

The GAIN methodology is based on three main components:

- 1). Internal assessment of the organization and its immediate environment
- 2). Development of a strategic action plan by the members of the organization
- 3). Monitoring and implementation of the action plan by the PO

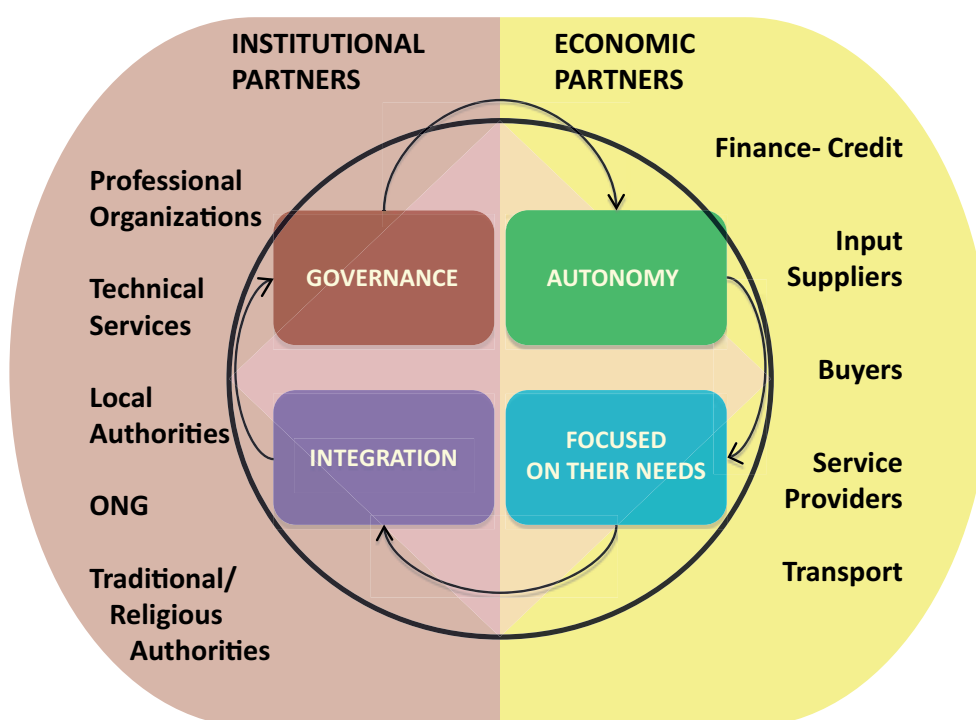
² See FAO report (2013): "GAIN Methodology: Diagnosis and Design of Change Processes within Producer Organizations" by Elbehri Aziz, Maria Lee, Carina Hirsch, and Marwan Benali.

2.1 Principals of the GAIN methodology

The GAIN methodology enables users to evaluate any producer organization at the functional and institutional level. With this assessment, PO members will be able to build a new vision and design a structure that allows their institution to become economically efficient and gradually sustainably autonomous and benefit all its members through democratic governance.

The methodology's conceptual framework distinguishes two levels of analysis: (1) an internal assessment of the PO and (2) the analysis of its economic and institutional environment. This conceptual framework is shown in figure 1 below.

Figure 1. Representation of the PO and its immediate environment by GAIN (source: authors)



This double analysis of the PO follows three main steps:

STEP 1: Endogenous assessment of the PO

STEP 2: Consultations and Validation by economic and institutional partners

STEP 3: Reconciliation between the PO's vision and partner requirements for a strengthened partnership.

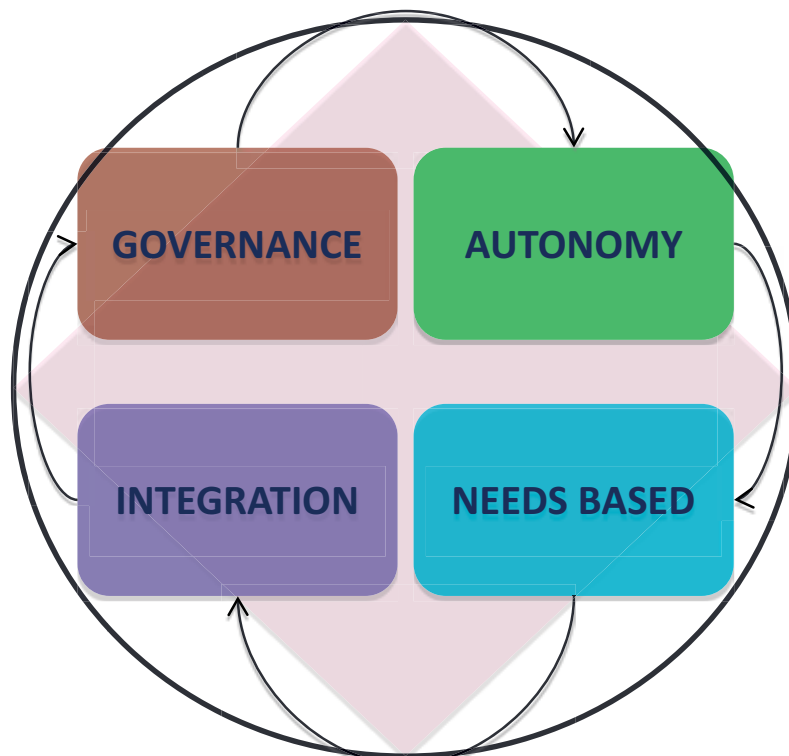
The final product is an action plan or roadmap from and for the PO validated by its major partners.

The GAIN methodology's endogenous assessment of OPs is based on four guiding principles that are considered essential for the sustainable development of an effective organization: good governance, empowerment, an integrated approach and giving priority to the needs of its members. These four principles are actually successfully applied in thriving OPs, such as the Indian organization SEWA and consist in:

- **Effective governance** through expanded sharing of responsibilities between the members of the organization, bringing about an increased commitment of each member to the organization and flow of information from grassroots to the executive management and vice-versa; in other words, governance that is based on its members' accountability and not just on a centralized decision-making system in the hands of one or two people in the organization.

- **Increased empowerment** of the organization and its members. The organization focuses on gradual empowerment in terms of human and financial resources capacity. Strengthening technical skills and members' decisions are established as a priority, giving members the ability to find solutions for themselves and mobilize resources (capital, financial services provided by the organization to its members, setting up savings and loan mechanisms).
- An **integrated approach** taking into account the need to improve living conditions (health, education, housing, etc.) and economic opportunities for members. This approach is judiciously combined with programs and activities that aim to improve access to information, provide targeted training based on needs and facilitate access to means of production. These activities are implemented with a view to empower members and render them more accountable. This principle of integration also implies that the organization build strategic partnerships with local economic opportunities.
- **Priority given to the needs of members.** Priority needs of members guide the organization's activities, be it in terms of choice of training programs, granting of loans or engaging in activities initiated and financed by external institutions. Activities and services are more likely to benefit members in the long term and last over time if they respect the priority needs of members of the organization.

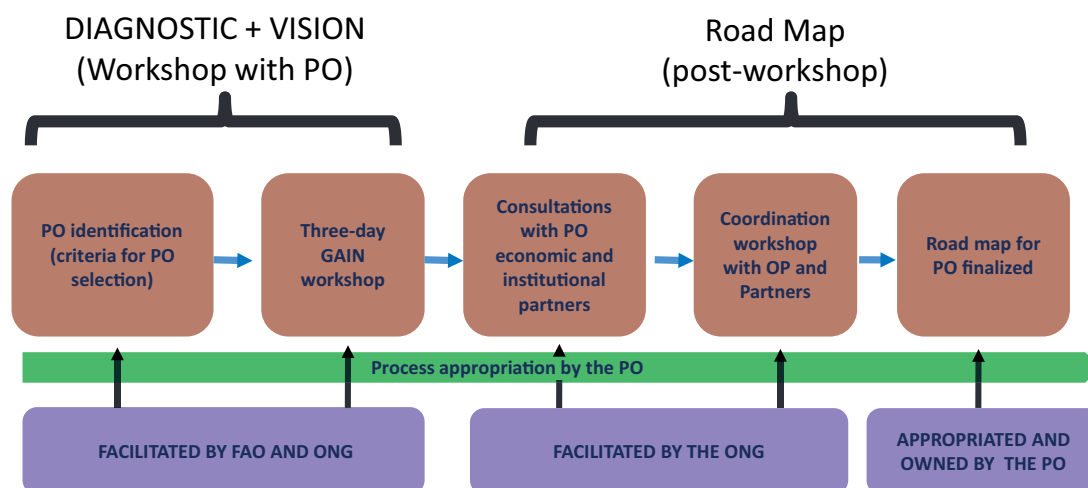
Figure 2. The 4 principles of the GAIN methodology (source: authors)



2.2 Description of the steps of GAIN methodology

The different steps of the GAIN methodology are depicted and explained below:

Figure 3. Main steps of the GAIN methodology (source: authors)



A. Identifying the PO

There are a number of circumstances that allow initiating the GAIN methodology in a given geographic area. Starting this process may follow up on a local initiative, be part of a national development or rural program, or even in response to sudden economic, political or environmental changes, or simply upstream of an investment program that requires the active participation of farmers and their organizations in its implementation. Launching the GAIN methodology can also be very useful when producers have access to new market opportunities in the region requiring first and foremost a functional organization that can facilitate access to loans, information, training, etc. All these circumstances may be a prerequisite to justify the launch of the GAIN methodology for one or more POs. The initiator of GAIN can be the state, an NGO, an umbrella organization or any third party, as long as they have the required human resources and skills for a successful application of this methodology.

The preliminary criteria for choosing a PO that may benefit from a GAIN assessment are that the status and functionality of the PO should be consistent with the program objectives, investment or development activity requiring an upstream GAIN assessment. In addition, members should come together around one or more economic functions of the organization. These economic objectives must also be aligned with the general objectives of the initiating project, program or activity. Lastly, once the organization is identified (with the assistance of a local professional organization, NGO, government agency, etc.), enough members of the chosen organization need to participate in the GAIN assessment workshop to ensure a collective result. The selection of participants must also meet certain criteria such as a balance between leaders and members (preferably the most active), between men and women, and also between representatives of the different groups within the PO.

Once the PO is identified, a workshop is organized with the assistance of a facilitator (FAO; local NGO) in order to assess the internal situation and the organization's current relations with economic and institutional partners. In the case of the three test interventions performed and described in the next chapters, the assessment workshop lasted two and a half days and brought together thirty members of the producer organization and a team of six to eight facilitators, rapporteurs and translators (in local language).

B. GAIN diagnostic workshop

a) Internal analysis of the PO

The main component of the GAIN methodology is to organize a three-day assessment workshop to examine the PO's current situation and its relations with its direct economic and institutional partners. The first part of the workshop aims to have all the participants assess the internal governance of the organization, the capacity for self-management and the ability to mobilize its own resources to respond to the members' economic needs, as well as the organization's ability to develop a joint approach so that its members may better integrate the market.

The PO's internal assessment begins with an evaluation of its strengths and internal constraints in relation to major income-generating activities, the roles and responsibilities of different members (distinguishing men, women and youth), the general productivity level, the current state of production and market surplus, and the types of relationships with the market. This first assessment step lasts one day and is sub-divided into four sub-themes:

The main income-generating activities for members

- Farm income generating activities
- Non-farm income generating activities
- Distribution of tasks / responsibilities (men/women, individual/group, family labor/employee)

Internal resources, capitalization and members' expertise

- Capital: land, animals, water, machinery, storage facilities, etc.
- Skills: Members' experience/expertise, types of training received (technical, economic, management, leadership), training providers and beneficiaries among members;
- Social capital: support groups, degree of group(s)' solidarity and social cohesion, etc.
- Production techniques (inputs, machinery, animals) qualitative assessment of the productivity level of major agricultural activities;
- Loans (who has access; eligible activities; conditions);
- Internal savings (individual and group).

Internal governance, structure and decision-making and information sharing modes

- Formal structure of the PO (governing body, roles and functions);
- Forms of governance and sharing of responsibility among members (decision-making terms, information flow, relations between leaders and members);
- Level of members' participation (membership, frequency of meetings, etc.)

Level of market integration, market surplus, sales and ability vis-à-vis the market

- Importance of surplus for market from crop/agricultural products (crops; consumption/sale ratio);
- Products specific for market (farm and non-farm);
- Access to market information;
- Marketing methods (grouped - individual sales, frequency/sale period, sales points, storage possibilities, etc.)

These four sub-themes are summarized in Table 1 below.

For each of the above topics, the facilitators' role is to formulate the questions, take notes, organize, clarify and sort the answers and ensure a wide participation of participating members.

Table 1. Main components of the internal assessment of the PO (according GAIN)

PO'S ECONOMIC ACTIVITIES	<ul style="list-style-type: none"> • Farm income generating activities (from crop) • Non-farm income generating activities (non-crop) • Distribution of tasks/responsibilities (men/women, individual/group, family labor/employee)
CAPITAL AND PRODUCTION MEANS	<ul style="list-style-type: none"> • Capital: land, animals, water, machinery, storage facilities, etc. • Skills: Members' experience/expertise, types of training received (technical, economic, management, leadership), training providers and beneficiaries among members • Social capital: support groups, etc. • Production techniques (inputs, machinery, animals) • Loans (who has access; eligible activities; conditions) • Internal savings (individual and group, etc.)
PO'S STRUCTURE AND GOVERNANCE	<ul style="list-style-type: none"> • Formal structure of the PO (governing body, roles and functions) • Forms of governance (decision-making terms, information flow, relations between leaders and members) • Level of members' participation (membership, frequency of meetings, etc.)
MARKET INTEGRATION BY PO AND MEMBERS	<ul style="list-style-type: none"> • Importance of crops' market surplus/agricultural products (crops; consumption/sale ratio) • Products specific for market (farm and non-farm) • Access to market information • Marketing methods (grouped - individual sales, frequency/sale period, sales points, storage possibilities, etc.)

This exercise is followed by a SWOT assessment (Strengths, Weaknesses, Opportunities and Threats), inviting participants to identify the strengths and weaknesses of their organization and its members, for each of the topics covered in the session. The answers are listed on a two-column matrix: the relative strengths and weaknesses of the PO vis-à-vis the main topics discussed.

b) Analyzing the PO's partnerships

The second part of the assessment workshop analyzes relationships between the organization and its economic and institutional partners. This exercise can be done with all participants (in plenary) or in groups of 10 participants. The first step is to list all the actors with whom the organization is directly or indirectly linked. Afterwards, participants are invited to comment and give their assessment of the successes and difficulties encountered with each partner.

Subsequently, the facilitators help identify the different types of partners following a number of criteria, including:

- PROXIMITY: locally based partners (area, district) or national
- TYPE of partnership: economic or institutional. An economic partnership involves commercial or contractual transactions with banks, suppliers, buyers, etc. Institutional partners include government departments, local authorities, the municipality/city council, local or national professional organizations, NGOs, religious or traditional authorities, etc.
- TEMPORALITY: current or past relationships (ended)

For each of these cases, the PO members accurately describe the nature of the relationship with the partner organization, and rank partners according to their importance and depending on whether relationships are successful or problematic. Finally, they identify the key partners with whom the PO wishes to continue or strengthen relationships in the future.

When this exercise is conducted in small groups, the facilitators then coordinate the restitution in a plenary session for all participating members. During the session the main points of the organization's internal assessment and the most important economic and institutional partners previously identified are summarized. This restitution and validation for all the PO members is very important as it sets up the discussions for the next and final step of the PO's assessment - namely the development of a shared vision of the organization by the members in a framework defined by the facilitators.

c) Common vision of the PO

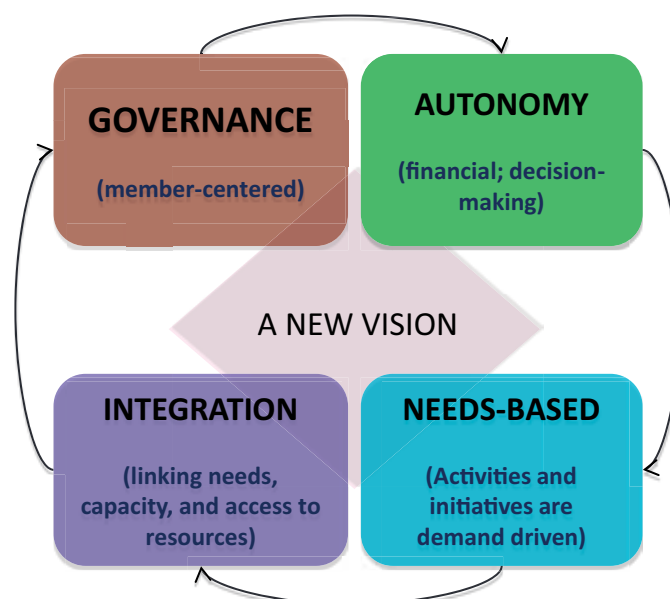
The third part of the assessment workshop is dedicated to developing a new vision for the PO based on the core principles of the GAIN methodology: decentralized governance, economic independence, activities geared to benefit the members, an integrated approach and the PO's capacity and functionality. PO participant members are first invited to propose new suggestions for their organization and then rank these in order of priority during a group working session. On this basis, two or three priority proposals are selected for a profound and detailed analysis using the four principles of the GAIN.

Participants are divided into sub-groups of 10 to 15 members joined by one or two facilitators, a translator and a rapporteur, to analyze one of the selected proposals.

The group analysis for each proposal is conducted by imposing each of the four core principles of the GAIN methodology as a benchmark, one by one. As a result, the winning proposal is considered by the group vis-à-vis the principle through a double lens, namely first the relationship of the proposal with the principle, and then how the principle can modify the proposal's specification. The proposal is submitted to the following specific questions for each of the four principles:

- GOVERNANCE - Is the OP's present type of governance suitable to implement the proposal? What changes in terms of governance are necessary to ensure that the proposal can be carried out?
- PO's AUTONOMY - What internal resources can the members of the organization mobilize to implement this new vision? At the same time, to what extent can the new vision improve the economic autonomy of the PO's members?

Figure 4. The GAIN iterative scheme for the development of the PO's new vision (source: authors)



- INTERNAL NEEDS - What priority needs of the organization and its members can this new proposal meet?
- INTEGRATION - The principle of integration requires to consider how the PO's members intend to link training needs, strengthening members' capacity, access to means of production, and restructuring their governance to implement their new proposal.

This group exercise ends with the development of an action plan or roadmap in the form of a table with two columns (short and medium term) and two lines (PO's internal activities, and activities to be undertaken with external support). The final part of the assessment workshop consists in the members of the group filling out the table with the help of the facilitator, thus laying down the final development stage of the new vision.

Road map to implement the new proposal	SHORT TERM ACTIVITIES (3 MONTHS)	MID TERM ACTIVITIES (6 MONTHS)
EXCLUSIVELY BY THE PO		
WITH EXTERNAL SUPPORT		

The results of the group work on the vision are briefly presented and the next steps of the methodology are explained to PO members in a plenary session that closes the assessment workshop.

A first report is prepared following the workshop and is used as the basis for the consultations that follow with both current and potential partners as identified by PO members during the common vision exercise.

C. Consultations with partners

Key stakeholders who may be consulted have been identified during the assessment workshop. These partners may represent a sample of all the current and potential partners. The outcome of the consultations and monitoring with partners is reconciled with the new vision of the PO, while fully taking into account the partners' possibilities, opportunities and expectations, in order to elaborate the final plan of action for the OP. These consultations will assess partners' points of view and relations with the PO while allowing them to outline their own strategies and requirements that may facilitate collaboration

or develop new economic, financial or other relations; these should meet the PO's expectations for its future development. In regard to consultations with existing partners with whom more successful and stronger relationships are possible, the objectives of these consultations can:

- clarify and identify the points of contention between the PO and the partner;
- identify opportunities for improvement or implementation of more profitable relationships with the partner, while more precisely defining the conditions that the PO must meet to engage in closer partnerships that will enable it to continue existing activities or implement the new action plan.

These post-workshop individual consultations do not follow a rigid framework but should at least aim to:

- gather the partner's point of view on its relationship with the PO (or with similar POs); identify the partner's conditions and requirements to engage in collaboration or a closer partnership with the PO;
- understand the overall strategy of the partner vis-à-vis the OP; clarify how the partner's strategy has commonalities with the PO's and what are the points of disagreement; when the PO has previously identified problems or blockages with the partner, gather the partner's own reading of the causes of these difficulties;
- assess the extent to which the partner may be involved in the implementation of certain elements of the new approach developed by PO members during the assessment workshop and what the PO must do to ensure a commitment from the partner.

The information gathered from these consultations should be analyzed in order to identify which of the partners' strategic elements may be entry points for an effective collaboration between the partners and the PO. This requires identifying the prerequisites to developing successful partnerships. When appropriate, causes of conflicting relationships should be identified to reduce misunderstandings or disagreements and build new and stronger partnerships.

D. Development of a roadmap for the OP

The last step of the GAIN methodology process is to organize a coordination workshop between the PO members who participated in the assessment workshop and the partners that have been consulted. The initiators of the GAIN methodology (e.g., FAO) will facilitate this one-day workshop.

The assessment workshop results and the information from consultations with partners are presented and discussed. This will further clarify each party's position and help the OP to better understand what steps are necessary to implement its action plan developed during the assessment workshop. A final session will be dedicated to a free exchange and sharing between participants (PO and partners) to identify opportunities for collaboration or future partnerships, clarify the preconditions and operational procedures, and establish communication procedures and necessary information exchanges that will ensure success.

Following this coordination workshop, a report constituting a new strategic plan for the PO is finalized and submitted to the PO who becomes its owner, validates it and implements it at its own pace and according to the new partnerships resulting from this process.

3. Application of GAIN to Tien-Tietaa Union in Burkina Faso

3.1 Selection of the producer organization and area of intervention

In Burkina Faso, the Ten-Tietaa Union, representing women and men grain producers in the district of Dissin, was chosen to test the GAIN methodology. The choice was made with the help of a local NGO, SOS Sahel of Burkina Faso. This NGO has been chosen as FAO's local partner to co-facilitate the process. The assessment workshop was attended by 30 members of the Ten-Tietaa Union and was held in Dissin from 3 to 5 November 2011. Union members attending the assessment workshop were chosen amongst the leaders and the most active members exemplifying various grassroots groups along with a strong representation of women members. Other significant criteria were experience, the ability to express ideas, and the trust in the group.

Prior to the GAIN assessment workshop, the management of SOS Sahel had preparatory sessions with Union members where they explained the objectives of the GAIN methodology, namely:

- 1). Assess the organization at a strategic and institutional level by analyzing the current internal situation of the organization, combining the study of governance tools, the Union's means of production and its ability to meet its members' needs;
- 2). An analysis of its partners and of the external environment in which the Union operates to determine the causes of the current problems that it encounters in its interactions with these partners and future opportunities for partnership;
- 3). Having the Union members develop a shared vision;
- 4). Formulating an appropriate plan of action that can be implemented by the PO members.

The Ten-Tietaa Groupings Union (UGTT) was founded in 1992 as a producers' organization and was officially recognized on 9 February 1999. In the local language, Dagara, Ten-Tiétaa means "mutual support among members." There are approximately 4 000 members (men and women) organized in 135 farming and forestry-pastoral groups including 61 men and 74 women groups from 22 villages, mostly located in the district of Dissin with a few in Ouessa. The district (or commune) of Dissin is located in the Loba province in southwestern Burkina Faso, a few kilometres from the border with Ghana. The UGTT is an organization of pre-cooperative groups of farming and forestry-pastoral production whose aim is to create favourable conditions for better self-management of its members.

The stated objectives of the Union are to promote and provide advisory support to the grassroots groups on how to reach sustainable rural development. One of the major challenges faced by the Union is the fight against poverty and the reduction of food insecurity that affects nearly 80% of members.

Former youth groups, named Naam, originally set up to fight against youth unemployment founded the Union. It was officially established in 1999 under the leadership of the German NGO Agro-Action, now called Welt Hunger Hilfe. Initially, the Union's creation was kindled with the food security objective. Indeed, the Dissin region had experienced poor harvest seasons and producers did not always meet their food needs. Producers then decided to organize themselves under the slogan - "Strength through unity" - with the aim of being taken more seriously by public authorities but also to acquire better capacity to overcome the difficulties they faced in terms of food security, access to drinking water and youth unemployment.

Today the main activities of the Union include the implementation of food security, livestock, environment and microcredit for women micro projects, and training on HIV/AIDS.

3.2 GAIN diagnostic workshop

The assessment workshop is the first of the three main components of the GAIN methodology. A comprehensive assessment of the Union divided into three segments: (a) internal analysis of the organization, (b) evaluation of the PO's partners and (c) the PO's vision of the future.

A. Economic activities and PO members' main occupations

First, the Union members' main activities and occupations were identified. These activities were then divided between the farm and non-farm income-generating activities. At the group level, activities are extremely varied even if maize, sorghum and groundnuts prevail; the other cultivated crops are cowpeas, cotton, rice, soybeans and vegetables. Among these activities, peanuts, rice, sorghum, maize and cotton are grown in groups in collective fields, and in individual fields, while groundnuts, rice and maize are only grown individually. Women's groups are very active in these crop activities. The non-crop activities are mainly pork and poultry production, but also a multitude of small businesses such as soap, petrol or basketry. Some male groups also mentioned vehicle repairing. Most of these non-farm activities are carried out both collectively and individually, except for soap and baskets that are produced and sold as a group.

Table 2. Main income generating activities of the UGTT members

Crop farming activities	Non-crop farming activities
Individual: Corn, peanuts, and rice crops	Individual and group: Livestock (pigs and poultry) Small businesses, e.g. soap, oil or basketry
Individual and group: Maize, sorghum and groundnut crops Cowpea, cotton, rice, soybean and vegetable crops	Vehicle repair for some male groups Only done in groups: soap, basketry

In the past, Union members participated in projects to restore land and build water conservation structures in the context of development projects funded by European donors. The Union has also set up a receipt system (warehouse receipt) to better manage the internal storage of cereals and facilitate access to loans. (As a formal structure, the Union has created technical committees: a managing well water committee, a storage warehouse warrantage committee, a hygiene committee, and a vegetable crop production committee). In addition, members have received training on hygiene promotion, nutrition and preventing HIV/AIDS. Following these training programs on HIV/AIDS, the Union has developed the ability to implement a screening program and give advisory support to groups with a better understanding and consequently, strategy to combat HIV/AIDS.

Some Union groups have also received training on erosion control techniques, advice on the use of improved seeds, as well as training on agro-ecology. In the livestock sector, the Union provides support to write applications for obtaining capital loans, as well as technical support to farmers setting up micro-pig farms. The Union also offers microcredit to its members, especially women, for recognized income generating activities. Each year, more than 400 women receive micro loans.

The Tien-Tietaa Union is well organized and has good social cohesion, making it very attractive to donors and projects. Several of its land use and local environment protection programs receive support as well as reforestation, plant care, water and sanitation activities, integrated food security programs at the village level, and the Union participates in a project against child trafficking.

B. Capital, means of production, and PO's internal capacity

a) Capital and Union members' means of production

Access to means of production could be greatly improved. The majority of Union members (nearly 99 percent) are landowners, but women have too little or no access to land ownership. The only exceptions where women can access land are when the Union intervenes on certain plots or when the state inherits plots following inheritance disputes. Soil quality is also very variable and some plots are too degraded to be cultivated. The lack of water is a recurring problem. Producers cannot adequately maintain many crops and obtain low yields due to the lack of irrigation.

The most preoccupying aspect of crop production is the often-mentioned poor quality of inputs. Seeds are purchased from local merchants and SOFITEX or obtained through personal production or barter between different producers, but quality seed is rare or insufficient or not made available in good time to Union members. Finally, its rather excessive prices make them unaffordable for most producers, given their small budget.

For Union members, another disabling aspect at production level is linked to the tools and materials used. These are unanimously considered obsolete or unsuited for the participants' work. They are *dabas*, knives, wheelbarrows, carts, picks, shovels, machetes or even rickshaws. These obsolete tools are unfortunately not sufficient to ensure sustainable and efficient production, and the few tractors hired by the Union cannot compensate for them. Most of the labor is family-based (90 percent) although some of mutual service practices between producer groups have been possible. According to producers, this workforce remains inefficient and unskilled, as it limits itself to manual labor.

In summary, irrigation water access does not seem to be a major problem (except in some rare cases for water linked to production and agricultural activities); if men have guaranteed access to land, access to land for women is problematic and some members still have difficulty accessing quality inputs (often due to lack of funds) or even sufficient quantity given their needs, particularly because of a compatibility issue with long cycle inputs. The equipment used was also strongly criticized for its obsolescence.

b) Access to training

Many courses are offered to Union members, often through NGOs (SOS Sahel), the support of donors and government services. The types of training received include: building stone barriers, the how and why of manure pits and manure management, training in vegetable production, good equipment management, soap making, seed production, literacy, borehole and well management, nutrition, HIV/AIDS, warrantage, hygiene, management of water points, loan management, monitoring and evaluation of activities and/or family farm management. This training covers both farm and non-farm activities. Union members are also satisfied with the way training is allocated. The village community, the Union, the Ten-Tiétáa communities, women or producers decide who attends these sessions, depending on what is offered. Indeed, a strong tendency towards specialization seems to be emerging within the Union. In other words, when one of the Union producers has been trained, he will be given priority for all other similar training so that he/she may specialize in this area and increase his/her capacity to disseminate knowledge within groups and different villages. These courses are widely passed on, beneficiaries

having a “moral obligation” to share the results with other group members through further training or other informal learning processes. However, some training needs expressed by Union members are not met, such as project management, mastering technology, account management, food conservation or livestock production. But overall, the Union can boast it has received a wide range of training courses that have benefitted its members.

c) Access to credit

Union members are quite concerned about accessing loans. Women obtain microcredit with the guarantee of the Union but men have not been able to get access, as the Union will not act as guarantor due to men's reputation for poor creditworthiness. In addition, the credit lines that the Union and women members can access through the Caisse Populaire are only possible thanks to a protocol with a German NGO that deposited a microcredit guarantee fund for the Tien-Tietaa Union women members. This arrangement allows the Caisse Populaire to disburse loans at a much lower risk. To meet the challenge to access loans, Union members are asked to carry out continuous awareness building on this issue and regular monitoring of the management of loans granted to men. The starting point is to generate greater agricultural yields bringing about a merchant surplus coupled with the necessary guarantees (warrantage) to obtain a loan. The use of funds obtained through credit is quite eclectic, combining both agricultural activities and alternative activities that relate more to household management or other aspects of personal life. Thus, credit is often used toward children's education or refurbishing of homes. Credit also widely supports agricultural activities: for example maize, rice, cotton or livestock activities. Opening a storage warehouse is also eligible for a loan. The credit is mainly obtained from the Caisse Populaire that remains the Union's preferred partner (something we will consider in the next section on the Union's partners). Members face other difficulties linked to loans such as procedure delays, outstanding repayments and trust deficiencies in some groups. In general, Union members define poor access to credit - and by the same token dependency on financial institutions - as a major obstacle to the purchase of sufficient production equipment.

Table 3 below summarizes the Union's assessment concerning its capitalization, resources and expertise.

Table 3. Strengths and weaknesses of the Tien-Tietaa Union's capabilities and resources

Land	
Strengths	<ul style="list-style-type: none"> • The majority of members (men) are landowners.
Weaknesses	<ul style="list-style-type: none"> • Women do not have access to land ownership; with some exceptions. • Very degraded soils, lack of water and irrigation systems.
Inputs and production means	
Strengths	<ul style="list-style-type: none"> • Seeds available on the market. • Mostly family labor, self-help and support groups.
Weaknesses	<ul style="list-style-type: none"> • Poor quality; difficult access to costly quality seeds in a timely fashion. • Obsolete equipment and tools, poorly adapted, low productivity. • Lack of skilled labor.
Training	
Strengths	<ul style="list-style-type: none"> • Wide range of training received in the context of development projects. • Technical assistance from NGOs (SOS Sahel) and government services. • Rational and judicious allocation in members' selection for training.
Weaknesses	<ul style="list-style-type: none"> • Several training needs expressed by members have not been met.
Credit	
Strengths	<ul style="list-style-type: none"> • The credit is mainly obtained from the Caisse Populaire, who received financial support from a German NGO. • Most beneficiaries are women, with the Union acting as guarantor. • Credit is used for farming or other income-generating activities and for basic consumption (children's education).
Weaknesses	<ul style="list-style-type: none"> • Men do not have access to loans (lack of creditworthiness, no guarantee from the Union). • Difficulties with procedures; trust issues among some groups.

C. Structure and governance

The Ten-Tietaa Union is well structured and governed by sound entities. The 135 groups (men and women) are "led" by a board of three members: a president, a secretary and a treasurer. The Executive Bureau (EB), at the top of the Union, is composed of 12 members, including 6 women. The Executive Board includes one member in charge of women's affairs, another responsible for economic activities and another in charge of information. All members are elected for a term of three years renewable once. The EB is the Union's executive body, responsible for planning and implementing actions, reports to the General Assembly while also being responsible for the smooth running of the Union. The EB is in charge of reviewing and selecting loan request applications before they are submitted to the Caisse Populaire of Dissin and also fully monitors the granting of loans. In villages, the Ten-Tietaa committees (CTT) assist the EB in building awareness on respecting commitments in relation to maturity dates of the loan as set by each beneficiary. These committees provide a space and transmit information between the EB and grassroots groups. Each village has a CTT and they total 28. CTT are also involved in mobilizing groups in villages, identifying groups' constraints and needs as well as difficulties, which they communicate to the EB. Committees are elected for a term of two years, renewable once. The CTT are responsible for screening loan files or other project ideas and forwarding them to the EB.

The General Assembly (GA) meets annually with 3 delegates per group. The GA defines the yearly main lines of action and mandates the EB to implement actions supported by several specialized committees: 52 water point committees, 7 warrantage warehouse management committees, one hygiene committee, and one vegetable crop committee.

Discussions between Union members on internal communication reveal that it works quite well. The internal communication strategy is mainly based on the publication of circulars sent to committees, on town criers, on word-of-mouth, or on church meetings (Union members are predominantly Catholic). A communication structure has also been set up with stocktaking meetings and relay women in the villages. Phones and local radio stations are also used but to a lesser extent, due to the limited access of Union members to these two technologies.

The SWOT analysis on the Union's governance highlights the strengths and weaknesses of the organization. Strengths show that the Union has a sound structure with bodies operating well. Thus, GAs occur on a regular basis and the role of various management committees is respected. The Union generally demonstrates democratic behaviour. The Union owns a significant amount of land and material goods as well as its headquarters, premises, conference rooms and drying units, perceived by its members as valuable assets to ensure good governance.

In terms of weaknesses, members identified structural and functioning flaws in the organization. At first, the flow of information was sometimes perceived as insufficient to ensure effective governance. In addition, certain technical committees (e.g. water point management) show poorer performance. It was also noted that the EB is not always operational, with challenges in bringing its members together or in contacting them. Some participants also criticized the Union's finance management. It appears, however, that members are very pleased with the Union's institutions and perceive them as solid, especially in terms of internal communication, deemed quite satisfactory. This seems to be the cornerstone of the organization's success with the two monthly meetings of the EB. The CTT also meet regularly and allow regular exchanges of information at group level.

D. PO's level and modalities of market integration

The lack of market integration is one of the Union's major weaknesses. The main reason is the fact that most members produce to meet their consumption needs with a variable surplus, which is therefore not always sold. This situation has not allowed members to develop assertive and regular business relationships. When members do sell the excess on the market, they do so individually and in small quantities without the ability to weigh on prices or without the benefit of group sales.

Warrantage represents a real opportunity for the Ten-Tiétaa Union in terms of marketing procedures and production sales, as it may really profit from better selling prices on the market, given that it is one of the few organizations in Burkina Faso to carry out this practice. Drying vegetable crops is also a process that can be developed to improve its sales force. However, the Union has low storage capacity, which obviously limits warrantage, whose management remains inadequate. Members came back to the lack of reliable price information in the marketing discussion because it greatly hinders the Union from being in a position to sell products at an optimal price. The Union does not know the market situation well and, therefore, cannot seize existing commercial opportunities, wasting the small surplus it produces.

Information on prices and markets is not available to producers. There is no adequate sales information system (SIC) or market information system (SIM) that would be sustainable enough to provide continuous and timely information to producers. The information is not spread fast enough compared to the volatility of market prices or marketing opportunities (e.g. sales and other outlets). This is largely due to the lack of use and access to means of communication and modern media such as radio, internet or mobile phones. A few survey operations on market prices have been mandated by the Union or by the Ministry of Agriculture's local branches but overall, word-of-mouth is what prevails in these particular situations, despite its limitations (slow, low reliability etc.).

The Union seems better organized and holds extraordinary GAs or specific meetings when looking at input prices. Phone and word-of-mouth are also used in this case. However, the necessary information to bring about good marketing remains insufficiently disseminated within the Union and does not allow it to seize existing business opportunities.

Finally, market integration is hampered by a number of constraints upstream and downstream of production: upstream, lack of access to quality inputs at the right time, access to land especially for women, access to loans especially for men, and access to appropriate equipment; downstream, the absence of bundling that would enable it to sell the best price and lowest cost in the surrounding markets.

E. Analyzing the PO's partnerships

During the second stage of the GAIN assessment workshop, participating members of the Union were invited to list all the partners with whom they have relationships. These partners along with the services they provide or the kinds of relations they have with the Union are summarized in Tables 4 and 5; Table 4 for local partners and Table 5 for partners at national level.

Table 4. Local partners of the Tien-Tietaa Union and services provided

PARTNERS		SERVICES	
Type of partner	Partners	Services	Type of services
Institutional Partners	Municipality	Land tenure security Assignment of developed areas Improved seeds	Production support
	Ministry of the Environment	Reforestation	
	Ministry of Livestock	Veterinary Services	
	Technical Support Zone	Technical support, access to inputs	
	Wayel Association	Mutual service	Access to financing and loans
	CIDI Association (coordination of Total Development Initiatives)	Training in livestock production	Capacity building
	Ministry of education	Literacy courses in villages	
	Plan Burkina	Training and other educational aspects	
	FAYENTORAN	Strengthening capacities	
	AJC Association (Conscious Youth Association)	Family planning support	Social Services
	Dissin Health and Social Promotion Centre (CSPS)	Hygiene services	
	Catholic Mission	Information dissemination Centre	Communication and information
SOS SAHEL International	Overall support	Overall support	
Economic Partners	Caisse Populaire Crédit	Credit	Access to financing and loans
	Crédit Sud Crédit	Crédit	
	King Agro	Group purchase of inputs	Upstream of production services
	Tropic Agro (Group purchase of inputs)	Supply of inputs	
	Private processors	Processing	Downstream of production services
	Local and traders from Ouagadougou, Bobo-Dioulasso or Ghana	Sale of production	

Table 5. National partners of the Tien-Tietaa Union and services provided

PARTNERS		SERVICES	
Type of partner	Partners	Services	Type of services
Institutional Partners	Agro-Action	Overall and financial support	Overall and financial support
	National Federation of NAAM Groups	Connects the Union with other institutional and economic actors	
	European Union	Funding	
	ANPE	Youth training	Capacity building
	Diobass	Support to resource conservation	Production support
	Dreyer Foundation	Protecting moringa cultivation	
	PAFER	Lowland reclaiming	
	PIGPE	Irrigation and water point management	
Afrique Verte	Market research Group sales	Marketing support	
Economic Partners	INERA	Supply of improved inputs	Upstream of production services
	SOFITEX	Supply of inputs	

The Union members identified a large number of partners at both local (district) level and beyond. They are: local representatives of Ministries, the city council and the municipality of Dissin, the European Union, NGOs (Association AGC organization Fayenteren, Welt Hunger Hilfe, Wayel Association, CIDI association, Dreyer Foundation). There is also the Caisse Populaire and Crédit Sud King Agro and Agro Tropic, the Catholic Mission and the National Federation of Naam Groups, which acts as the Union's connector with other institutional or economic actors.

Two observations can be drawn from these lists. Firstly, "local" actors are dominant, reflecting the low projection of the Union beyond the district of Dissin, especially as most of the players considered as "external" to the area have tended to come into the municipality in order to deliver their services. Secondly, institutional partners predominate denoting economic, financial and development support relations aimed primarily at strengthening the capacities of Union members. In addition, the relatively limited number of business partners indicates that the Union is not truly able to project itself commercially. Moreover, except for those involving traders, relations with economic partners are often related to upstream production, namely the purchase of seeds (INERA), pesticides (King and Agro Tropic Agro) and loan requests (Caisse Populaire and Crédit South).

The pre-dominance of institutional partners who provide services and support to Union members confirms that the Union is heavily dependent on external actors for its running, if not for its actual existence. This shows that the Union appears to be strongly assisted and supported by institutions and organizations in the vicinity. The strong institutional structure is an attractive factor but could also be the consequence of repeated external requests that require beforehand a formal and functional organization that can fulfil the requirements enabling it to benefit from development project offerings. However, the limited list of business partners reflects the Union's lack of significant economic and financial autonomy.

Following the participants' enumeration of the various economic and institutional partners, be they local or national, a detailed analysis of the Union's main partners was conducted.

a) Institutional Partners

Relations with the Ministries, the city council and the municipality of Dissin are considered positive because they lead to real results for the Union. The Ministry of Agriculture supports Union producers through its departmental service both upstream and downstream of production. Thus, the Ministry provides producers with subsidized fertilizer and seeds as well as training in agricultural techniques. Downstream of the production, department officials provide technical support such as crop monitoring and production and also in terms of pest management. However, the Ministry's human resources and capacities are too scarce at times to ensure optimal support and monitoring of Union members. This causes occasional delays in the delivery of improved seeds and fertilizer, or a lack of mobility for Ministry staff that should provide continuous technical monitoring on the ground.

The municipality of Dissin has been also strongly involved in the development of the township, in the Union's life and daily efforts for the past five years. The city council intervenes heavily in the area of tenure security or in assigning developed areas (especially important for women), on the basis of ad hoc interventions and upon requests. The municipality also provides improved seeds to Union producers.

Among non-governmental organizations, the German NGO, Welt Hunger Hilfe (ex-AgroAction) has provided a lot of support to the Union, including creating a guarantee fund for members to directly obtain loans from the Caisse Populaire. This NGO has continually backed the Union for 12 years, through the following initiatives: soil restoration and the provision of more efficient production equipment. In addition, it provides training and literacy sessions for Union members. The Union's relationship with this organization is extremely positive and has contributed to improving the lives of women and increasing yields through training and provision of equipment.

b) Economic partners

In regard to economic relations, La Caisse Populaire remains one of the most important partners of the Union insofar as it has provided loans to groups for 11 years. Groups must be members of the Union to obtain a loan from the Caisse Populaire. Applications are in fact difficult to make despite the Union's intermediary efforts for its members. Indeed, members highlighted several issues and emphasized that delays in the granting of loans are often related to the cumbersome loan administrative procedures and difficult access to information. Participants also complained about interest rates being too high, making repayments difficult and undermining further the solvency of Union members. These interest rates are non-negotiable, darkening prospects of improving relationships with the Caisse Populaire.

Union cotton farmers have a strained relationship with the Société Burkinabe Fibres Textiles (SOFITEX). This company grants access to inputs (especially seeds and insecticides) on credit in return for being paid back in cotton. According to producers, the problem, is that upstream good quality input prices remain much too high especially as the selling price of cotton is very low and this generates losses for producers. SOFITEX (which has a monopoly on cotton purchase at national level) imposes fixed prices precluding flexibility and producers have little means to discuss or negotiate. SOFITEX applies the same rigidity when imposing certain deadlines which determine sales periods that do not correspond exactly to producers' expectations and cause delays in receipt of payment. However, in some cases, they have the opportunity to engage in early sales, that is to say, sell a small part of their production in advance and receive payment immediately.

There is a large range of traders with a variety of scale (local, regional, national, international) and products] with which Union members constantly interact. However, during the assessment workshop, overall relationships between producers and traders appear to be rather difficult. In fact, traders are in a position of strength and use many tools to enhance their status and maximize their profits vis-à-vis producers. Traders impose very low sale prices that rarely reflect the actual production value and thus contribute to creating a loss of earnings for producers and unpleasantness during transactions. Relationships are also too rigid with merchants with whom the terms of price negotiations are not to the benefit of producers. These difficulties as a whole show the weak marketing capabilities of the Union. This analysis confirms that, in general, relations with business partners mirror the Union's low economic and market power. On the contrary, relationships with institutional partners are generally positive. Union members value these relationships despite a few difficulties inherent in the sometimes limited capacity of these institutional partners. Similarly, the Union's solid structure facilitates the stability of its relationships with institutional partners.

F. Common vision for the PO

The third and final phase of the assessment workshop began with a session in which participant members were invited to propose and develop a new vision through concrete and feasible proposals, subject to a rigorous analysis of the GAIN principles. First in plenary session, each member was invited to write out one or two proposals they wish to see the Union achieve. Then the proposals were listed and catalogued and subject to analysis and classification so as to extract a few flagship proposals approved by a majority of members. At the end of the meeting, four new proposals were selected for more detailed analysis in subgroups. These were:

1. Establishing a federation
2. Creating an internal mutual for the Union
3. Establishing seed production within the Union
4. Better marketing of agricultural products

Subsequently, participants were divided into three groups (10 members each with a facilitator, a translator and a rapporteur), each group dealing with one of the four proposals. The first group (which considered Creating an internal mutual for the Union) briefly discussed the fourth proposal (Establishing a federation). During the sub-groups meetings, the new proposals were scrutinized according to the GAIN scheme and its four principles, namely: decentralized governance, economic independence, activities geared to benefit the members, an integrated approach and the PO's capacity and functionality. The analysis was completed by identifying implementation stages for these proposals and separating what actions are to be developed in the short term (less than three months) and medium term (between three months and one year), depending on the Union's internal capacity and/or the need to use external support. The results of this exercise for each of the four proposals are presented below.

a) Establishing a federation

The sub-group explored how to transform the Union into a federation in order to expand their base beyond the township of Dissin and join or partner with other unions. In addition, it is important that the Union comply with the rule of law, in particular Law 14 that regulates cooperative societies and groups in Burkina Faso.³ The Union would also like to grow by incorporating existing federations or by organising itself around value chains and incorporating new sectors such as fishing.

³ This law was complemented in 2004 with Decree No. 2004-040 that establishes modalities for the establishment, recognition, organization and functioning of Unions, Federations and the Confederation.

The Union already has substantial resources to undertake this transformation, such as its strong organizational structure. Similarly, its effective internal communication channels can be useful to support and convey awareness operations that will persuade Union members of the need to mobilize resources or increase group contributions. This desired governance transformation has important implications for the Union, as it will have to reorganise itself in various value chains and create technical committees by industry and municipality.

b) Creating internal savings and credit for the Union

During the assessment workshop, Union members mentioned that they faced great difficulties in accessing credit and therefore proposed the creation of an internal savings and loans mutual fund. This need was evident because of their strained relationship with the Caisse Populaire. By setting up a mutual and an internal loans system, the Union would take a big step towards greater economic independence.

At first, creating an internal mutual fund requires mobilizing enough money to constitute a large enough fund. In the medium term, it will be essential to mobilize larger annual contributions, without relying on external funds in order to maintain a degree of autonomy.

In terms of activities, the first step is to educate Union members about how to start the mutual, its added value and the importance of developing it with the Union's own funds, that is to say through increased contributions. In the medium term, the Union plans to establish savings and loan accounts that it would self manage. To do this, it will set up specific training to develop the members' capacity to draw up and manage accounts. A study trip with an organization that already has its own mutual fund could also be organized, for example with an organization like SEWA, which has its own bank controlled by women members, who act as custodians and loan beneficiaries.

This course will obviously involve changes in the Union's governance. Participants proposed to set up a management committee of the mutual fund or a mutual savings and loan committee. This committee, under the control of the EB will be organized into several branches, each branch corresponding to a village. A manager will be recruited for each branch while the committee will receive specific financial management training. A monitoring committee could also be set up and would consist of an accountant and a storekeeper (for warrantage).

This proposal is laid out into a plan (or roadmap in Table 6 with timelines. It also identifies internal resources to mobilize.

Table 6. Timeline for savings and credit proposals

	Short term (three months)	Medium term (6 months and more)
Own resources	<ul style="list-style-type: none"> • Sensitize members on creating the mutual fund and why. • Mobilize village committees (communication channel). • Create a savings and loans committee. • Organize an Extraordinary General Assembly (to set the amount of individual contributions). 	<ul style="list-style-type: none"> • Mobilize contributions. • File the request for approval with competent authorities.
External support	<ul style="list-style-type: none"> • Hire an expert to conduct a feasibility study. 	<ul style="list-style-type: none"> • Mobilize external support and seek specialized training for the staff of the Management Committee. • Organize a study tour to visit an organization that already has a mutual fund. • Seek external help to apply for accreditation (legalization). • Contract an expert to audit the accounts.

C) Establishing seed production within the Union

Seed production within the Union addresses the need to increase yields and reduce costs related to the purchase of inputs. Seeds available for Union producers are sometimes insufficient and often of poor quality. Union members will gain more autonomy and be able to produce better if they develop the capacity to produce their own seeds. Members identified maize, rice, cowpea, sorghum and soybeans as priority products for marketing, putting these at the forefront of their own seed production. Participants also identified their own specific needs to implement this. Thus, to produce quality seeds, the Union must equip itself with adequate production equipment (including fertilizer and seed base), processing equipment as well as premises to stock seeds. Training in composting would be most beneficial. Finally, important standards regarding the land are to be observed, as it must be sufficiently far from other agricultural land by being separated by a minimum of five contiguous hectares of land. The Union must therefore find this land before starting any activity.

Some of the resources needed to achieve such an objective may be mobilized internally. Indeed, the Union can use part of its estate for the land and the compost pits. The Union also already has the human capacity and knowledge required to perform the necessary reforestation. However, external resources must be mobilized for technical support such as mentoring by the Ministry of Agriculture's staff (for advice, monitoring, training) or seed certification, which is done by the same Ministry. As illustrated in the results of the stakeholder analysis, good relations with the Ministry of Agriculture should facilitate obtaining these resources.

Once all the resources have been mobilized, Union members will need to implement activities: firstly, the Union should identify potential seed producers within its members and provide training in composting. Secondly, efforts should focus on which agricultural production should be chosen, that is which products should be prioritized in terms of seeds, as well as necessary resources for each (What soil? What inputs? Any storage premises?). Once all of this is done, it will be very important to obtain the seed certification from the Ministry of Agriculture and finally to prepare the marketing of these seeds, in particular by applying the Union logo that will allow seed producers to develop a brand and stand out in the market. In most cases, these activities can be performed with the Union's internal resources, while external resources are within its range (training and certification).

In short, establishing seed production within the Union can be done autonomously even if it entails some governance implications, such as the need to create a management committee for monitoring seed production activities. It will be set up according to procedures already established by the Union and will not only be responsible for monitoring operations but also for marketing any seed production surplus. All the different seed crops should be represented on the management committee, with one member responsible for each crop. The options available to achieve autonomous seed production quality are well within the scope of the Union.

The action plan for this proposal is as follows:

Table 7. Timeline for seed production proposals

	Short term (three months)	Medium term (6 months and more)
Own resources	<ul style="list-style-type: none"> • Identify potential seed producers among members. • Identify target crops for seed production. • Choose of seed varieties. 	<ul style="list-style-type: none"> • Identify quality land, meeting criteria for seed production.
External support	<ul style="list-style-type: none"> • Learn about the techniques of seed production with the National Union of Seed Producers of Burkina Faso. • Solicit support from agricultural services agencies (training and technical support). 	<ul style="list-style-type: none"> • Develop basic seed (sign necessary agreements with the National Seed Union). • Seek INERA's technical support (seed certification). • Set up specifications for the production and marketing of seeds with the help of an expert.

d) Starting collective marketing of agricultural products

The Union could address one of the main weaknesses identified during the assessment workshop by improving the marketing of its agricultural products. Union members show little marketing capacity characterized by highly variable individual sales, often at farm gate and without sufficient knowledge about markets. In particular, participants explained that the Union should focus its efforts on peanuts, rice, soybeans and corn, as their commercialization is still marginal. They also discussed the needs they must meet in order to fully develop this marketing potential that is mainly focused on finding opportunities and securing transportation. Participants also noted that processing units such as drying units are important in this process, as are the related transformation strategies. Finally, Union members need to have sufficient information on applicable prices and those applied in markets and also need to receive additional training in marketing.

The Union identified the crops that can provide production surpluses. In addition, warrantage (which allows producers to preserve and store their production to then sell it at the best price) is an important tool to establish better marketing. However the Union needs to further develop its negotiation capacity vis-à-vis traders.

Union members also identified the main activities they need to develop that will ensure effective and especially sustainable marketing, by starting with finding consumption niches and then sensitizing members of the concerned crops to ensure quality production surpluses. The Union must also reorganize some of its activities by setting up bundled sales and promoting warrantage operations. Finally, in order to better manage resources obtained through these sales, Union members would like to receive training in operating account management. This activity requires mobilizing external support and resources.

Some changes in the Union's governance are essential to support these group marketing activities. Thus, the Union should revitalize its price committee to become the main entity responsible for marketing operations within the Union. In this context, it would be in charge of identifying the products and the quantity to stock and sell, with the notion that only products that are to be sold would be warranted, while the rest is kept for consumption. This price committee would thus become an umbrella marketing committee for all operations and activities related to the sale of products.

The group marketing action plan developed by the Union is as follows:

Table 8. Timeline for collective marketing proposals

	Short term (three months)	Medium term (6 months and more)
Own resources	<ul style="list-style-type: none"> • Conduct a census of its marketable products, including promising crops. • Strengthen processing and marketing capacities of women. • Identify products that will generate the best possible returns. 	<ul style="list-style-type: none"> • Revitalize the existing price committee (governance) and turn it into a marketing committee (managing stock surplus inventory). • Create sales outlets with bundling of products.
External support	<ul style="list-style-type: none"> • Commission an expert for a feasibility study and measure the actual capacity of the Union. 	<ul style="list-style-type: none"> • Seek technical support from experienced organizations such as Afrique Verte (specializing in "cereal banks").

3.3 Consultations with partners and development of new strategic road map for the PO

Following the assessment workshop with the Union, SOS Sahel interviewed the main partners on their relationships and perceptions vis-à-vis the Union and their perspectives on the new vision and proposals developed by the Union. The partners' responses are summarized in Table 9:

Table 9. Partners' perspectives vis-à-vis the Tien-Tieetaa Union (bilateral consultations)

Union visibility, strengths and weaknesses with partners:

- Good image of the Union
- Good audience with projects and NGOs
- Well structured organization, unique in the Southwest region

Union strengths:

- Good governance with bodies that work well
- Strong presence of women with loans supported by the Caisse Populaire
- 100% repayment of loans by women
- Participates in the development of the Municipal Development Program (MDP)
- Developing capacity in warrantage, reforestation, nutritional education

Weaknesses of Union:

- The Union has reached a level of stagnation in its capabilities
- Low level of education of members and leaders
- Little monitoring with development partners
- Men's loan needs are not satisfied
- Union strongly dependent on external support (very low economic autonomy)

Possible changes to achieve the new vision and partners' contributions:

- Attract new members
- Encourage turnover of leaders within bodies, including grassroots groups
- Increase the amount of loans granted to members by increasing the Guarantee Fund at the Caisse Populaire
- A mutual fund is possible, but must take into account competition from the Caisse Populaire
- Expect to overcome very stringent conditions from the Ministry of Economy and Finance to obtain legal status; need to develop appropriate statutes, have skilled personnel, appropriate premises and equipment, promote savings and cumulatively provide loans
- The amount of annual loans granted to all Union members
- Improve the skills of members of the Executive Board with experts in finance and credit
- Search for partners to contribute funds in addition to membership fees

Table 9. Partners' perspectives vis-à-vis the Tien-Tieetaa Union (bilateral consultations) Cont.**Other possible partnerships:**

- The town of Dissin is ready to provide support to the Union with a campaign to raise public awareness for new members
- District technical services can assist the Union in production techniques (e. g. veterinary services and bio-digester for methane gas, electricity and compost)
- Afrique Verte may accompany and support the Union in restructuring its marketing and setting up cereal banks
- The Dreyer Foundation offers to cooperate with the Union to let it have use of its rice huller
- The Caisse Populaire de Dissin could assist the Union in loan management through a "win-win" Memorandum of Understanding

Following bilateral consultations with key current and potential partners, SOS Sahel organized a feedback workshop gathering together members of the Tien-Tieetaa Union and its partners in order to finalize the action plan. The results of the assessment workshop including the Union's proposals were submitted for validation to partners who expressed their perspectives, expectations and requirements to foster win-win collaboration. The results of the workshop with partners and the Union's finalized Action Plan are presented in the appendix to this chapter.

Regarding the setting up of a mutual savings and loan fund, it was decided to first reorganize and train Union members. The mutual fund would be financed by members' individual and collective contributions and also by potential financial partners and would have its own premises.

As for setting up seed production, the Union will first seek to identify varieties and then find producers able to invest in the strategy and thirdly to implement the necessary technical training. Acquiring all necessary certificates and certifications to obtain legal recognition is also important. Seed distribution should also be planned and establishing or strengthening relationships with such key institutions as the National Union of Seeds should not be overlooked.

To better market local products, the Union will focus its reorganization on finding and/or strengthening partnerships to improve access to markets, for example Afrique Verte for grain markets but also with processors and other influential actors on market linkages. Certain financial aspects will also be dealt with in accordance with the goal of having a mutual funding (opening a bank account, guarantee fund, etc.). Efforts will also be made to give the Union better visibility, in particular in the market.

Finally, in relation to transforming the Union into a Federation, it was agreed to start reorganizing the Union and the groups by value chain and to increase efforts to meet legislation requirements, which would then allow legal recognition of the future federation. Awareness building and appropriate training will also be implemented while necessary affiliations will be established.

Table 10. Tien-Tietetaa Union's Plan of Action after consulting with partners

Scheduled Activities	Partners/actors
CREATING A SAVINGS AND LOANS MUTUAL FUND	
Commission an expert for a feasibility study and measure the actual capacity of the Union.	EB; Women and men facilitators (Union)
Member training, organization, and operation of a mutual fund (March-June 2012)	Micro-finance structure
Women and men facilitator training on savings and loans (July-December 2012)	Women and men loan facilitators (Union)
Feasibility study (2012)	Union EB and SOS SAHEL
Encourage savings and loan groups (2013)	Union
Seek approval from the Ministry of Finance for savings and loan groups (2013)	Bureau, women and men loan facilitators, resource people
Generating equity capital (5000 F CFA shares, savings, etc.) (2013)	Members, Union Bureau, facilitators
Seek support from financial partners to launch the savings and loans (2013)	Union bureau, identify a member who will be in charge of partnerships
Have management technicians and security staff (2013)	Union; technical and financial partners
Equip adequate premises (2012-13)	Union bureau
Logistics for the mutual (equipment, motorcycles, vehicle) (2012-13)	Union bureau
SEED PRODUCTION BY THE UNION	
Sensitizing seed producers (January 2012)	Union, technical services
Identify varieties and producers able to produce seeds (January - February 2012)	Union, technical services
Training on seed production techniques (March - April 2012)	INERA, Controllers
Certification for seed production, purchase of basic seeds from INERA (April -May 2012)	Producers, technical services
Organize and recognize seed producers by seed variety (May - June 2012)	Union, technical services
Technical monitoring of seed producers (May - November 2012)	Controllers, INERA, agricultural services
Define a distribution system for seeds produced for Union members (November 2012)	Union
Contact the National Seed Union (March - April 2012)	Union
Affiliation of seed producers to the National Seed Union (May - June 2012)	Union

Table 10. Tien-Tietetaa Union's Plan of Action after consulting with partners (contd.)

Scheduled Activities	Partners/actors
GROUP MARKETING	
Technical management mentoring, developing working tools and training (2012-13)	Union, Caisse Populaire
Negotiate a partnership to access cereal markets (2012-13)	Afrique verte; SOS Sahel
Training of resource persons to develop projects, and identify partners (2012-2013)	SOS Sahel
Support to the creation of the guaranty fund (mutual) (2012)	Crédit Sud; Caisse Populaire
Define the types of loans (production, food security, IGA) (2012)	Union Bureau, Caisse populaire
Set up an account in the name of the mutual fund with the Caisse Populaire (2012)	Union Bureau, Caisse populaire
TRANSFORMING INTO A FEDERATION (OF UNIONS)	
Sensitize/Inform on the transforming the Union into a federation (January – February 2012)	Union, municipality, district technical services
Literacy training for group members (January - April 2012)	Union, Provincial Directorate
Training members in PO management (March – April 2012)	Union, Agricultural services
Create new warrantage groups (January - December 2012)	Union, technical services
Reorganize groups by crop sector (June - October 2012)	Union, technical services
Drawing up of legal statutes for the federation	Controllers, INERA, agricultural services
Convene federation constituting assembly	Union, technical services
Undertake administrative action to obtain legal recognition of the federation	Groups and members of Unions
Affiliation to the Confédération paysanne du Faso CPF (janvier 2013)	Union

3.4 Conclusions and follow up by Tien-Tietetaa Union after GAIN

The assessment workshop, the consultations and the feedback workshop helped develop a vision and goals for the Union. It also clarified the type of collaborations needed with institutional and economic partners to achieve these objectives and to establish a roadmap with specific timelines.

To ensure that the Union has the internal capacity to implement the action plan, five Union women leaders had the opportunity to make a training trip to SEWA, in India. This NGO offered a program of visits and training provided by local trainers and leaders during several field trips during which the Tien-Tietetaa Union women leaders learned how the SEWA savings and loans system is operated from the village all the way up to the SEWA Bank in Ahmedabad. The visitors from Burkina Faso were very impressed with several of SEWA's operating elements. The first concerns the specialization by value chain, thus rendering the structure more efficient as common needs and problems are shared. The

second concerns the important role of savings, which is one of the cornerstones to empower the organization and its members (including conditionality links forged with credit). The five Union leaders were able to understand better the practices of SEWA in regard to governance, savings and loans, the fundamental role of appropriate and continuous training for rural women who are often illiterate, and especially to their democratic and decentralized governance with a flawless information flow between all members. Based on this training trip, Tien-Tieetaa women leaders have resolved to initiate the following changes in their Union:

- 1). Reorganize the Union in value chain, drawing on the SEWA model, so that members involved in the same value chains, and thus having the same needs and constraints, may interact more efficiently.
- 2). Systematize the relationship between loans and savings. Information sessions are planned to educate members about it.
- 3). Provide training for grassroots leaders starting with the three leaders in each village, and focusing specifically on their roles and responsibilities.
- 4). Consult with experts in order to receive advice and technical assistance to transform the Union into a federation.

The new vitality within the Union generated by the GAIN assessment and the wealth of knowledge and broadening of the Union leaders' outlook after the trip to SEWA has given a real boost to the Union. The durability of the momentum created will have to be monitored and it will be useful, in the medium term, to take stock of the objectives and timelines laid out in the Union's roadmap to assess if the changes stimulated by using the GAIN methodology had an impact on improving farmers' access to markets and food security.

4. Brief comparative analysis of GAIN application to West Africa

Beside the Tien-Tieetaa Union in Burkina Faso, the GAIN methodology was also applied to two other producers' organizations namely in Cameroon (Union of producers in Noun District) and in Mali (Union of cooperatives "women in action"). All three organizations were subjected to exactly the same GAIN methodology and below is a short summary of the main findings across the three experiences. The focus of this section is on the reliability of the GAIN methodology and effectiveness of its approach.

4.1 Main economic activities of the PO studied

The three cases examined by the GAIN methodology in Burkina Faso, Cameroun and Mali present three very contrasting situations, when considering their agricultural potential, the main agricultural activities practiced by the members as well as non-farm income generating activities. Table 11 below provides a summary:

Table 11. Key economic activities of the studied producer organizations

Umbrella organizations	Noun CIG Groups	National Union « Women in Action »	Ten-Tiétaa Union
Country	Cameroun	Mali	Burkina Faso
Main Agricultural Products	Maize, cassava, rice, vegetables and coffee	Millet, sorghum, cowpeas, rice, vegetables (tomato, onions)	Maize, sorghum, ground-nuts, millet, rice and cowpea, cotton, vegetables
Agricultural potential	High, good agro-climatic conditions	High along the river, lower in the North	Land degradation, water scarcity
Main non-field products	Livestock	Grain processing, cloth dyeing, fishing	Livestock (pork, etc.), small scale trading

4.2 Governance and decision-making modalities

The three GAIN workshops highlighted the importance of individual members' commitment to ensure that their organization's operations be effective. If all workshop participants claim that "unity is strength", it remains true that responsibilities are often in the hands of a few individuals. Structuring organizations effectively requires building awareness for all members regarding their individual and collective roles and responsibilities and training in leadership and team spirit building.

The Ten-Tiétaa Union of Burkina Faso was the most structured and has the strongest governance of the three organizations that were analyzed. It is structured around different levels of decision-making and information sharing to facilitate implementing services tailored to the needs of its members, particularly in terms of training and access to credit, especially for women. In contrast, the Noun Département Producers Union in Cameroon has no strong formal structure and is almost informal. Leadership is centralized and the relationships between different groups are not very clear. This is why member participants took advantage of the GAIN assessment workshop to develop a more formal structure, namely a formal cooperative. In Mali, although "Women in Action" Cooperative Union is formally and legally registered, it does not seem to truly function, apart from the president and founder's initiatives and dynamism; members have complete trust and admire her for her ability and strong personality. During the GAIN assessment workshop, this waiting to have an organization that has existed for two years really work gave participants additional motivation to address its future governance and make it a major focus of the new vision.

Beyond the type of structure, the effectiveness of an organization lies in its ability to put its members, men and women, at the centre of its concerns by giving them the means to claim ownership of the organization to which they belong and empower themselves. The three organizations highlighted the existence of local know-how but how this knowledge may be better used within organizations and between members remains to be defined. The Ten Tiétaa Union has focused on strengthening the technical capacity of its members by strategically having some trainers become specialized to then disseminate knowledge. Nevertheless, this strategy takes little account of marketing skills. In contrast, in the case of Cameroon, the choice of the CIG structure has given greater attention to developing business activities, negotiation skills and bundled sales. In Mali, training is organized on an ad hoc basis on technical issues (micro-gardening) depending on financial opportunities or technical partnership offers.

In all three cases, the GAIN methodology helped highlight how important it is to strengthen technical, financial and "management" capabilities of members of an organization. Combining these aspects is essential to strengthen the empowerment of individual members and to ensure that the organization may fully play its role as a service provider.

Table 12. Comparative governance of the three studied producer organizations

Umbrella organizations	Noun CIG Groups	National Union « Women in Action »	Ten-Tiétaa Union
Governance	Unstructured group with CIG loosely interrelated	New formal union, but not yet functional. Union with cooperatives scattered over different regions	Very well structured Union with specialized village committees and functioning executive bureau
State of internal flow of information	Smooth flow of information on sales but little on governance (group meetings, informal meetings between groups, word of mouth)	Informal and individual flow of information among members	Good flow (meetings, word of mouth, flyers, low use of radios and telephones) Weakness of commercial information
Training	Negotiation of labor for plowing activities; Trading market negotiation for the sale of maize; Purchasing and sales bundling	Ad hoc training depending on opportunities (e.g. micro-gardening, literacy)	Strengthening of technical, human and financial management capabilities. Training of trainers. Lack of training in the field of marketing

4.3 Level of autonomy of the organizations

The analysis of the three PO's partners revealed a common thread among them: they have a strong dependence vis-à-vis a variety of public or semi-public partners. As for the partners, the differences between the three organizations are largely due to the degree of market integration, more developed for the Noun Department Producers Union in Cameroon while it is almost non-existent for the Tien Tietetaa Union of Burkina Faso.

In addition, the three organizations need to establish new partnerships with institutional actors (e.g. access to training, information, land, participation in the development of policies and programs) and even more so with economic actors (e.g. training, inputs, commercial contracts) to develop. The effectiveness of these partnerships depends on several factors, including the objectives and interests of selected partners and the organizations' ability to influence the content and modalities of such partnerships based on their needs and vision. In the case of Burkina Faso and Mali, organizations have closer relationships with institutional partners than with the economic ones. By contrast, in the case of Cameroon, economic partners are favoured while institutional ones are perceived with mistrust. However, in all cases, weak bargaining power results most often in open trade transactions occurring on a case-by-case basis (less ability to build regular relationships with commercial buyers).

The development of a new vision accompanied by an action plan (or roadmap) as those developed during the GAIN assessment workshop is a first step towards a greater ability to negotiate with partners and possibly choose which one(s) to appeal to for technical or financial assistance. Specific situations will entail developing, strengthening or renegotiating partnerships that allow members to develop marketing strategies, diversify their income-generating activities beyond farming or strengthen their organizational or leadership capacity. This process should take into account existing financial and human capabilities within organizations. This new vision must be carried out in parallel to the establishment of mechanisms that will improve organizations' governance and strengthen their autonomy, especially at the financial level. These mechanisms may include a greater pooling of member resources (strengthening "tontine" in Cameroon, creating a fund from individual members' contributions in Mali), the establishment of decentralized coordination committees (Mali) or mutual savings and loans institutions (Burkina Faso).

Table 13. Key partners of the three studied producer organizations

Umbrella organizations	Noun CIG Groups	National Union « Women in Action »	Ten-Tiétaa Union
Institutional	Rather weak and poorly perceived relationships with institutional partners	Particularly good relations with the Ministry of Agriculture and municipality	Good relationships and significant financial and technical support from NGOs, Ministry of Agriculture, municipality
Economic relations	Good bargaining power including maize sales bundling	Low bargaining power with traders	Few: Private Companies for the purchase of seeds and fertilizers and Caisse Populaire. Low bargaining power with traders and Caisse Populaire

4.4 Level and modalities of market integration

In all three organizations, members deal with similar agricultural value chains. However, agro-climatic and land conditions are more or less favourable and have an impact on the level of vulnerability of producers and the types of risks they may be willing to take. For instance, in Cameroon, Noun producers have fertile land and generally good quality seeds, which gives them surplus production and allows them to focus their attention on marketing.

In contrast, the Tien-Tietetaa Union and the “Women in Action” Union are characterized by low market integration (except for the cooperative “Women in Action” Bamako). The low level of productivity, the lack of adding value to products, poor quality, surplus variability in terms of marketing, as well as the organization’s inability to access information on the market are all causative factors.

Cameroon’s experience shows that developing strong relationships with business partners can increase the bargaining power of producers to access certain means of production such as labor and inputs; establishing grouped sales of products seems to facilitate negotiating better prices with traders. However, the opportunity to develop some markets is limited by the lack of structure between groups, collective commitment and rigorous management services provided by the umbrella organization. Setting up information sharing systems along with greater transparency to increase the level of trust and cooperation on these commercial transactions were discussed by the three organizations during the GAIN workshops.

Table 14. Product marketing practices of the studied producer organizations

Noun CIG Groups	National Union “Women in Action”	Ten-Tiétaa Union
Bundled sales and diversified clients	Small quantities sold on local markets Weak bargaining power	Remains subsistence agriculture with small surplus for sale Individual sales Warrantage practice

5. General conclusion

Policies and development programs need effective producer organizations that can ensure good governance, capacity building and empowerment of their members if they want to have an effective impact and sustainability. Similarly, organizations need an environment that enables them to grow. From this observation, the GAIN methodology is an innovative tool that empowers members of these organizations to find their own answers.

This chapter has presented a new methodology called GAIN (Self-Governance needs-Integration-endogenous) developed to diagnose and induce endogenous transformation of producer organizations. The aim is to facilitate economic transition for POs by supporting economic development services to members autonomously, efficiently and sustainably. The main original motivation was to facilitate a better market integration for small farmers through organizations such as unions of cooperatives and POs.

The basis of the GAIN methodology comes from time and again observing malfunctioning POs in West and Central Africa during the All-ACP project for the promotion of staple food value chains. In contrast to these failures, the highly successful Indian women's organization SEWA is considered an exemplary model of sustainable and effective integration for small farmers and rural women in the rural economy.

Applying GAIN in three different countries and with contrasting organizations has shown that it can be used effectively to establish a shared and global assessment of an organization along with strategic priorities for the future. It also has the potential to be used with organizations at different levels, be they more or less formal or structured, by tailoring questions to the specific context and the ability of participants.

For most of the participants in these GAIN workshops, this was the first time they were faced with an assessment exercise where they were given the right to speak and the time to express themselves. This makes this workshop a training experience. The merit of this methodology is that it is built on making organization members more responsible and on encouraging them to develop their own solutions. There are no funding or finalized projects at the end of the workshop; participants and their organizations need to take control of the collectively discussed proposals and organize themselves to implement them. This is the first step in a long process of change that requires building long term relations with local partners. Presenting SEWA's successful experience in this area is a very strong argument that inspired participants as it shows that the ability to change and to complete this process is in each and everyone's hands.

5.1 Scope of GAIN application

The GAIN methodology presented in this chapter has been designed for producer organizations at an intermediate level of organization that is to say, halfway between village groups (such as common interest groups) and national organizations (platforms, federations, inter-branch organizations). This choice was dictated by our initial goal to develop an effective assessment tool that can help small farmers to better integrate the market and enable higher economic returns for the activities and occupations of these POs' members. These criteria influence the choice of POs and the member participants as well as the role of NGOs that are chosen as facilitators and local organizers of the methodology.

The prerequisites that are required to ensure that the GAIN methodology is successfully applied are listed here below.

Choosing umbrella organizations and selecting participants

Producer organizations targeted by the GAIN methodology must have an economic function and current or potential relationships with the market, and their members must be able to not only produce but also process and market their products.

- The degree of formality of the structure may vary, but some form of association must exist between the members (or grassroots groups) even if it is partial, limited or informal;
- Once the PO is identified, the selection of participants for the GAIN workshop must reflect the various components of the organization, including an adequate representation of women members, a representation of major crops, value chains or income-generating activities, as well as a balanced representation between management and simple PO members;
- This level of representation must bring about a wide contribution to the assessment and ensure that the results of assessment workshop take into account the sensitivities of all the PO members (and not exclusively those of management).

Local support for the implementation of GAIN

- The conduct of the assessment workshop requires an intensive group effort and hence the need to mobilize sufficient resources to succeed. In addition to the main facilitators (minimum 3), the approach requires the same number of translators, rapporteurs and administrative and logistical support. It is often more efficient to team up with a local partner organization (NGO) that has or can mobilize the necessary human resources, knowledge and field experiences with the PO to ensure the proper conduct of the GAIN assessment when it is initiated by an extra-national (e.g. FAO).
- Two activities are necessary prerequisites before starting the GAIN assessment, once the local NGO is identified and the list of people to mobilize is established. The first is to provide training for the team of facilitators (initiator and local NGO). This training includes both the philosophy and principles of GAIN in its various steps and procedures. During this training, the emphasis is on the leading role of PO members that will have precedence in the GAIN assessment workshop process. The organizers only play a facilitator role to guide the discussions and deliberations between PO members.
- The second preliminary step is conducted by the local NGO with the PO to:
 - have a better knowledge of the organization and understand members activities;
 - present the objectives and expectations of the assessment workshop and the active role that PO members are to play in its conduct;
 - establish a list of participants in the PO on the above listed criteria;
 - assess translation needs and the choice of methodological tools based on the selected participants' capabilities and the geographical context of the workshop.
- The logistics of the workshop should be carefully prepared by the local NGO in collaboration with the initiator (FAO), taking into account the requirements for a three-day workshop with 30 participating members and a team of six animators / facilitators, three rapporteurs and three translators (depending on local language requirements).

Whichever way the GAIN methodology is used, it is important to remember that the first precondition is that the organization and its members have to truly want change and, secondly, that the local environment offers opportunities for growth. The impact of this methodology on institutional change processes and ultimately small farmers' livelihoods depends on the energy and resources that they can mobilize within their organizations and then with partners. Although the environment plays an important role, change can only come from within and from grassroots members through a process of

experimentation and adjustment, over time. This process is driven by the belief that when producers, men and women, put their energies and skills to set common goals and benefits, they are able to find sustainable solutions.

5.2 Possible extensions to GAIN methodology

The GAIN methodology started out with the explicit goal to provide an effective tool to facilitate integration of small farmers into markets. However, it is obvious that the possible fields of application of the GAIN methodology go beyond this goal. Firstly, the GAIN methodology can be applied with producers organizations, groups, associations or cooperatives for a range of objectives developing new market opportunities through certification, management of common resources (water, land), management of renewable energy projects, or better coordination to adopt new techniques to better adapt to climate change. In each of these cases, the GAIN methodology and its stages can be appropriately adjusted or adapted to suit a particular situation.

The GAIN methodology can also be adapted to broader organizations such as platforms, federations and inter-branch groups. In this case, even if the overall conceptual framework of the GAIN methodology and the underlying principals remains the same, some changes would be needed. Particularly, the organization's internal assessment themes and sub-themes can be adjusted depending on its features and functions and on the final goal. For example, the sub-theme "market access" may not be applicable to an inter-branch group or a national federation. By contrast, other sub-themes can be introduced depending on how the methodology needs to be applied to specific organizations. The coordination phase with partners can focus on institutional partners rather than economic partners. However, the consultation process is broadly the same, including reconciling expectations and goals on either side as per the GAIN methodology.

The GAIN methodology could also be applied to better understand the barriers to change that can be linked to power relations, roles of men and women, conflicts of interest and personal motivation within an organization. It is important to understand the informal aspects, often "invisible" to then be able to better support organizations in their democratic development and their ability to represent their members.

The methodology could also be applied in analyzing in more detail favourable or restricting factors affecting an organization (climate, political situation, infrastructure, etc.) as well as legislation and national and local policies issues. This could point to ways for improving better linkages between producers' demands with requirements from national and local authorities. This could also strengthen the participation of organizations in the process of developing policies that affect them.

Finally, the GAIN methodology can also be used as a tool for a sectoral development strategy under the rubric "Strengthening capacities of small producers and their organizations." For example, all national investment strategies and programs call for strengthening the capacity of farmers and their organizations to better organize and equip themselves. GAIN can be an effective instrument in the first phase of such processes. In this case, the GAIN methodology can be adapted to include training program that allows a larger number of NGOs and other support organizations to acquire the necessary skills to conduct the GAIN assessment and therefore benefitting a larger number of qualified POs.

Accordingly, a training program on the GAIN methodology can target NGOs, representatives of professional organizations, state agents, including those responsible for outreach and technical advice and

other technical support staff providing support to POs. The final goal of these courses is to generalize the practice of the GAIN assessment as a necessary prerequisite that ensures that POs actively participate in development programs or investment initiatives within the framework of national development policies and strategies.

In summary, the GAIN methodology can be applied for other uses or purposes such as:

- (i). Participatory evaluation of producers' organizations' capabilities and capacity building needs;
- (ii). Informing policies and development programs whose aim is to create an enabling environment to strengthen organizations;
- (iii). Strengthening the governance of organizations, not only to facilitate better access to the market for their members but also for other purposes such as access to local basic services (health, education, training, etc.), climate change adaptation and responsible natural resources management.

Part 2

**FOOD VALUE CHAIN
COUNTRY CASE STUDIES**

Chapter 8

Cocoa and cotton commodity chains in West Africa: Policy and institutional roles for smallholder market participation

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1. Introduction

Cocoa and cotton are important commodity exports from West Africa. Cameroon, Côte d'Ivoire, Ghana and Nigeria export nearly 70 percent of the world's cocoa (FAOSTAT, 2012). West African exporters are the second largest regional group exporting cotton, providing 11 percent of world cotton trade. Mali and Burkina Faso are the two largest West African cotton exporters, accounting for half of regional exports (ERS, 2010). Cocoa and cotton are not only important sources of export revenue, but also important sources of agricultural income, including income to smallholder farmers in those countries. Cocoa provides 38 percent of agricultural value added in Côte d'Ivoire and 12 percent in Ghana. Cotton accounts for 12.7 percent of agricultural value added in Mali and 7 percent in Burkina Faso (FAOSTAT, 2012 and World Bank, 2012).¹

Cocoa and cotton often involve long value chains and payments to farmers for the commodities are a small part of the cost of the consumer products derived from these goods. There may be significant opportunity to raise farmer income by "shortening the marketing chain", thus providing to farmers a greater share of the value added in final consumer products. Value chain analysis has been used for both cocoa and cotton in West African countries to guide interventions aimed at improving smallholder farmer incomes (Cappelle, 2008; FIAS, 2007; Gilbert, 2006; ICCO, 2006; Poulton *et al*, 2004; RATES, 2005). These efforts have often focused on increasing the market power of farmers by strengthening farmer organizations and by correcting market failures along the value chain that influence credit, inputs, quality, and information. International assistance to these commodities in these countries has sought to replace market institutions that were missing or functioning poorly following structural adjustment reforms that reduced the roles of parastatal marketing boards which had monopolized both domestic marketing and exports (Gowkowski, 2008; ICCO, 2010). The claim of those interventions has been that they were fostering innovations targeted to improving smallholder farmer incomes (e.g. STCP, 2010; Tschirley *et al*, 2009).

Value chain analysis often focuses on new initiatives that involve contracting mechanisms with smallholder farmers in new markets. These market mechanisms are only apparent for the more mature cotton and cocoa markets in quite small niches, such as fair trade. In that case the one successful cooperative - Kuapa Kookoo in Ghana - has become a partial owner rather than a contractor with its upstream partners. Nevertheless, similar issues arise when considering institutions and policy options aimed at raising smallholder farmer income, particularly as reforms change existing value chains. Market failures must be addressed, geographic and agronomic specialization must be considered, and scale economies, spillovers to other markets, as well as roles for NGOs and aid interventions in institutional development must also be taken into account.

This chapter explores issues and recent experience with policy reform and institutional changes aimed at improving smallholder farmer income for cocoa and cotton farmers in West Africa. Analysis and results are based on earlier research conducted in Burkina Faso, Cameroon, Côte d'Ivoire, Ghana, Mali and Nigeria.² In the next section, background information on the cocoa and cotton sectors of these countries is presented, including descriptions of value chains, the roles of small farmers, and the nature of interventions. The following section highlights the key issues relevant to raising farm income: limits on raising farm income through market interventions, institutional changes after privatization, and market failures in quality, inputs and credit. Policy options are then examined in light of these issues, and successful outcomes are

¹ Data reported here for 2005 and 2009 (see Table 1) are typical of the roles played by these West African countries in cocoa and cotton world markets, and of the roles of these commodities in agriculture in those countries.

² Research on cocoa was in collaboration with the Small Tree Crops Program (STCP) of IITA. USAID funded that research as well as research on cotton in Burkina Faso and Mali. Subsequently, the World Bank funded research on agricultural policy in Côte d'Ivoire. FAO supported updating of that work as well as viewing interventions from a value chain perspective.

discussed. The paper concludes by assessing implications for smallholder farmers. Although correcting market failure and improving producer organizations may yield benefits to farmers, these gains along the value chain are likely to be small relative to gains from enhancing productivity, given constraints on marketing interventions. Mature markets like cocoa and cotton may differ from new initiatives in that respect, and institutional development - particularly for inputs and credit - may be needed as sectors reform simply to maintain existing farm income levels.

2. Background

2.1 Cocoa and cotton in West Africa

Several West African countries generate significant export revenue from cocoa and cotton exports and are major players in world markets for these commodities. The four largest West African cocoa exporters accounted for about 70 percent of cocoa exports in 2005 (FAOSTAT, 2012). The two largest West African cotton exporters played a somewhat smaller role, having shipped about 5.5 percent of worldwide cotton exports in 2005. Other West African cotton exporters account for another 5.5 percent of world cotton trade (ERS, 2010). Cocoa trade is closely related to production since only a small amount of production is consumed domestically by any major cocoa exporter. The pattern of world trade in cotton exhibits a significant share of production used domestically in some major producing countries. Cocoa and cotton trade patterns are more similar in West Africa, however, since most production is exported rather than consumed domestically, after varying degrees of primary processing.

Three of the countries examined here are largely dependent on a single commodity export (Burkina Faso, Ghana and Mali), whereas other countries export several commodities (Cameroon, Côte d'Ivoire and Nigeria). Table 1 reports cocoa and cotton exports in 2005 and 2009 from the six countries examined here. Côte d'Ivoire is shown to export nearly USD2 billion worth of cocoa, 26 percent of its total exports, and Ghana exported nearly USD1 billion of cocoa, a third of its exports in 2005. Burkina Faso and Mali exported over USD 200 million worth of cotton, amounting to 62 percent and 24 percent of total exports, respectively, and over 60 percent of agricultural exports for both in 2005 (FAOSTAT, 2010). Growth elsewhere in the economy decreased these shares in some cases for 2009.

Table 1. Cotton and Cocoa Exports, 2005 and 2009

Country		2005		2009	
		Cotton	Cocoa	Cotton	Cotton
Burkina Faso	Exports (USD million)	214	0,8	250	
	% Processed *	99	0,0	98	
	% of Ag. Exports	77	0,3	81	
	% of Tot. Exports	62	0,2	53	
Cameroon	Exports (USD million)	133	247	106	256
	% Processed *	100	15,7	100	9,8
	% of Ag. Exports	22	40,9	16	39,0
	% of Tot. Exports	4	8,3	3	7,1
Côte d'Ivoire	Exports (USD million)	148	1921	102	2019
	% Processed *	94	55,2	96	59,6
	% of Ag. Exports	5	63,6	3	58,1
	% of Tot. Exports	2	26,5	1	23,8
Ghana	Exports (USD million)	7	912	5	1044
	% Processed *	72	16,3	53	24,6
	% of Ag. Exports	1	79,6	0	74,3
	% of Tot. Exports	0	32,5	0	24,9
Mali	Exports (USD million)	267		201	
	% Processed *	99		98	
	% of Ag. Exports	83		64	
	% of Tot. Exports	24		13	
Nigeria	Exports (USD million)	24	470	24	331
	% Processed *	83	5,6	85	6,0
	% of Ag. Exports	4	71,8	4	54,9
	% of Tot. Exports	0	1,0	0	0,5

1 Processed :

Cotton : (Cotton Lint / Tot. Cotton)*100

Cocoa : [(Cocoa butter + powder + paste) / Cocoa beans Prod. Value]*100

*Processed means converted from seed cotton to lint for cotton, and from cocoa beans to butter, powder and paste for cocoa. There are post-harvest activities potentially done on the farm that precede this level of processing, especially for cocoa (fermentation and drying).

Source : FAO, FAOSTAT, 2012

Some primary processing is required for each crop. Seed cotton is converted to lint in gins located near farms in rural areas, so a large fraction of cotton is exported as processed. Converting cotton lint to thread, textiles and clothing is mostly done elsewhere. Cocoa beans are sorted and cleaned at the port in a process referred to as usinage, and are mostly transformed to cocoa butter, powder and paste overseas. An increasing amount of cocoa is processed in Accra and Abidjan, however, as the major

producers (Archer Daniels Midland [ADM], Cargill, Barry Callebaut) have recently built modern plants near these ports. In 2005 about half of cocoa beans were processed in Côte d'Ivoire and 16 percent in Ghana, with Ghana's share of processing increasing more recently. Use of cocoa products in the production of chocolate and processed foods remains mostly in Europe and North America.

Table 2 shows shares of agricultural production value, agricultural value added and gross domestic product (GDP) generated on farms by seed cotton production and by cocoa bean production.³ Since input use is low, especially for cocoa and for subsistence crops, similar shares are found for production and value added. These shares are very large for cocoa in Côte d'Ivoire and Ghana, at 22 percent and 18 percent of value added, respectively. The value added share is also large for cotton in Mali, at 12 percent. Larger and more diverse agricultural economies and larger proportions of subsistence crops yield smaller shares in the other countries. Agriculture's share of GDP has been declining in these countries, but sizeable shares of GDP from these crops are found in some cases. Cotton production accounts for 4.3 percent of GDP in Burkina Faso and 4.0 percent in Mali. Cocoa production accounts for 4.9 percent of GDP in Côte d'Ivoire and 6.9 percent in Ghana. These statistics show the considerable importance of these two crops in the rural economies of these countries, and hence their importance in determining smallholder farm incomes.

Table 2. Gross Production Value (GPV) as a Share of Agricultural Production, Value Added from Agriculture and GDP, 2005 and 2009

Country	GPV as a % of	Seed cotton		Cocoa beans	
		2005	2009	2005	2009
Burkina Faso	Agriculture	14,58	8,66		
	Value Added	13,23	..	98	
	GDP	4,34	2,60	81	
	% of Tot. Exports	62	0,2	53	
Cameroon	Agriculture	2,45	0,81	5,03	7,91
	Value Added	3,51	..	7,22	..
	GDP	0,67	0,26	1,37	2,51
Côte d'Ivoire	Agriculture	2,77	0,75	19,72	24,55
	Value Added	3,03	0,86	21,54	28,34
	GDP	0,69	0,21	4,91	6,99

³ These data for 2005 and 2009 were taken from FAOSTAT (2012) and in the case of value added and GDP from World Development Indicators (World Bank, 2012). Most studies consulted for this paper provided similar statistics to highlight the roles of exports and farm income from these crops, which show wide variations. This is likely due to poor data quality rather than changing roles for these crops either in export markets or in a country's agricultural sector.

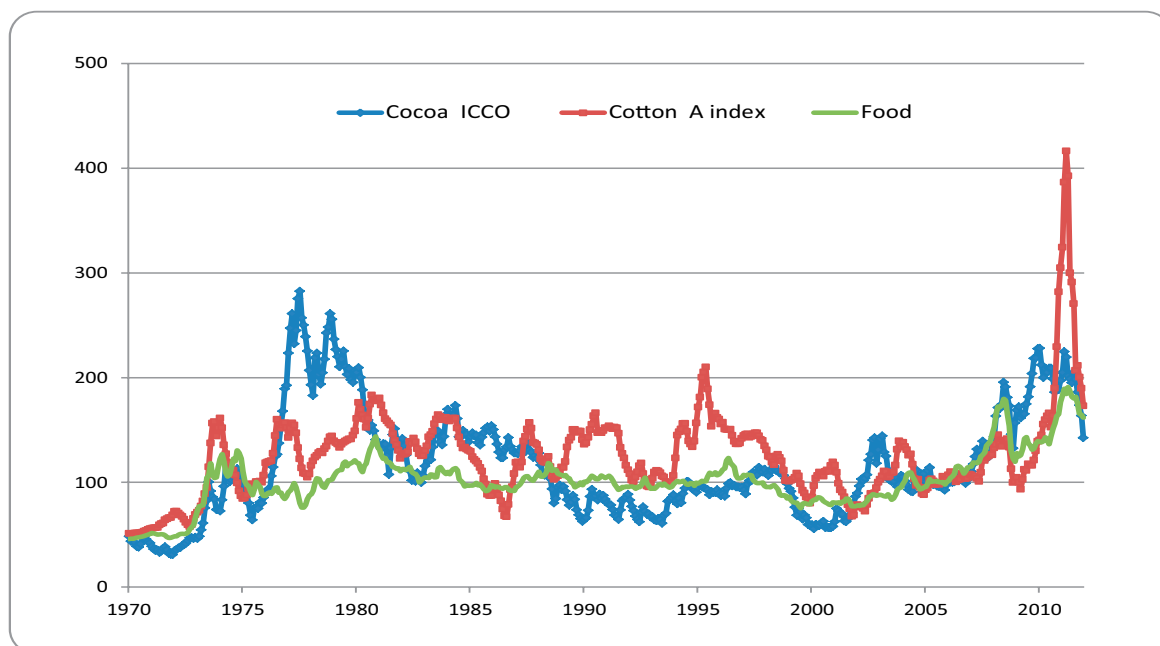
⁴ Data for both the ICCO cocoa price and the cotton A index were taken from IMF (2012). The Cotlook A index has varied in definition over time. In the past regional indices have been published, which show qualitatively similar trends.

Table 2. Gross Production Value (GPV) as a Share of Agricultural Production, Value Added from Agriculture and GDP, 2005 and 2009 (Cont.)

Country	GPV as a % of	Seed cotton		Cocoa beans	
		2005	2009	2005	2009
Ghana	Agriculture	0,10	0,10	8,98	6,31
	Value Added	0,20	0,16	18,28	10,28
	GDP	0,07	0,05	6,85	3,19
Mali	Agriculture	6,92	1,46		
	Value Added	11,91	..		
	GDP	4,02	1,08		
Nigeria	Agriculture	0,42	0,40	1,09	0,93
	Value Added	0,79	..	2,08	..
	GDP	0,26	0,19	0,67	0,44

Source : FAO, FAOSTAT, 2012 for gross production value in agriculture, seed cotton and cocoa beans World Bank, 2012, World Development Indicators for value added from agriculture and GDP.

These West African countries have faced volatile world markets for these commodities for decades. Figure 1 shows monthly international price indices for cocoa and cotton from 1970 to 2011 (IMF, 2012). Those indices are all equal to 100 in 2005. Figure 1 shows that cocoa and cotton prices have exhibited greater volatility than agricultural prices generally (as represented by the international food price index of the International Monetary Fund [IMF, 2012]). In the case of cocoa, the International Cocoa Organization (ICCO) price – an average of prices on the New York and London commodity exchanges – is typically used to gauge world prices. International cotton prices are determined from the Cotlook A index, based on quotations for far eastern delivery of lint from key exporting sources worldwide as reported in *Cotton Outlook* by Cotlook.⁴ In 1970 both cocoa and cotton prices were half the values they had in 2005. From the late 1970s until 1981 cocoa prices were nearly triple their 2005 levels and cotton prices were nearly double. Cotton prices were nearly double their 2005 levels in 1996, as well, and cocoa prices in 2010 were more than twice their 2005 levels. Cocoa prices generally fell from 1985 until the commodity price run-up beginning in 2007, and they were late among agricultural commodities to exhibit increases. Cotton prices have been highly volatile, and have fallen since the mid-1990s due in part to competition from synthetic fibers and new production technologies based on biotechnology (Genetically Modified Organisms - GMOs). They did not show the extreme increases experienced by other agricultural commodities in 2007 and 2008, but spiked later as land was removed from cotton production worldwide. Both variability of world prices and downward trends in those prices have posed problems for farmers in West Africa as well as for public institutions seeking to influence farmgate prices. Public institutions have historically taxed and stabilized farmgate prices, but downward trends in prices have limited the ability of governments to extract tax revenue through explicit or implicit means.

Figure 1. Monthly International Cocoa and Cotton Prices, 1970-2011

Source: IMF, *International Financial Statistics*, 2012

2.2 Structural adjustment and privatization

After independence was achieved, parastatal marketing boards were created using structures similar to colonial institutions for marketing of both cocoa and cotton (Bassett, 1988). These institutions differed somewhat by crop and colonial heritage. In the case of West African cocoa, British colonies (e.g. Ghana and Nigeria) utilized state enterprises to physically market the commodity, whereas French colonies (Cameroon, Côte d'Ivoire) heavily regulated private entities. In the case of cotton, publicly-owned gins transformed seed cotton to lint in an institutional framework similar to that found for cocoa in British colonies; this was true even in French West Africa (Abbott, 2008; Baffes, 2008). Structural adjustment programs fostered by the IMF and the World Bank have driven reforms of these institutions. A key aspect of those reforms was privatization of the parastatal boards, which were viewed as inefficient, high cost firms. The parastatal boards were pursuing broad development goals, and not just marketing of cocoa or cotton. They employed more people than private firms, and incurred high costs in stabilizing prices as world prices for these commodities fell. Public funding and loans from the IMF were necessary in several cases to keep these parastatals from going bankrupt.

Private marketing entities have only gradually replaced public institutions in West Africa, and privatization has proceeded more slowly, particularly for cotton, relative to reforms elsewhere in Africa. While pressure for structural adjustment reform began in the mid-1980s, devaluation of the CFA franc in 1994 represented a turning point in privatization of commodity parastatals in French West Africa. Nevertheless, actual reforms have occurred only gradually since that time. Domestic marketing institutions have been liberalized ahead of exporting or processing entities. Once commitment to privatization began, phased liberalization sought to reform marketing institutions with considerable uncertainty as to the form those institutions should take. There was concern that liberalization efforts undertaken earlier in many African countries had not made appropriate institutional reforms and markets had suffered afterwards. There were not many good examples to follow, however.

In the case of cotton, negative experiences with structural adjustment reforms, particularly in East Africa, have encouraged West African governments to move slowly (Banquedano, 2009). In both Burkina Faso and Mali the state still retains at least partial ownership of cotton gins. Gins in Burkina Faso were converted to joint public-private ownership on a regional basis in 1999 (Akiyama *et al*, 2001). Under pressure from the IMF, Mali attempted to sell interests in the existing public cotton gins, but their poor financial condition and low cotton prices forced delays in the sale of those gins.

Reforms of cocoa parastatals occurred more quickly in Nigeria and Cameroon than in Côte d'Ivoire or Ghana. Nigeria abandoned its parastatal in 1986. Cameroon began reforms in 1991 which were completed in 1994. Côte d'Ivoire committed to privatization in 1999, and then only gradually reformed its export monopoly. It already had the structure in place since private trading firms such as Cargill, ADM and Barry Callebaut were handling exports. Ghana partially reformed its domestic marketing structure in 1991, permitting private licensed buying companies to purchase cocoa from farmers, but its export parastatal - Cocobod - still holds a monopoly on exports. As this reform process evolved, Ghana and Côte d'Ivoire have emerged as the two dominant cocoa exporters, while production and market shares for Nigeria and Cameroon have fallen. The chocolate industry now supports maintaining the public export monopoly held by Cocobod in Ghana, where high quality cocoa bean exports have been best maintained.

Existence of parastatals meant that state entities (or heavily regulated private entities) provided the institutions and services necessary for marketing of cocoa and cotton. Privatization has required new, different institutions to replace those formerly provided by the state. The best example of this is market information. Prior to reform, parastatals typically set official prices on a pan-territorial and pan-seasonal basis, so no market information system was needed. After reform, private market prices would vary over time, location and quality. Not only has this made it more difficult to collect information on farmgate prices, but it has also made it more difficult for farmers to know what market prices are. Various projects have sought to improve market information for small farmers, but they have typically provided information on the ICCO price or Cotlook A index (world prices), which were often disconnected from local prices paid to farmers. Parastatals provided other public goods beyond market information, including research, extension, infrastructure, and disease control. The private sector was eager to take on export marketing activities after reform but these public goods were often not provided following privatization. New legal frameworks were also necessary once marketing began to be carried out by private rather than public actors.

Parastatals also either implicitly or explicitly taxed exports of cocoa and cotton. One stated goal of liberalization initiatives has been to raise farm income through reduction of those taxes. Analysis of prices along the marketing chain to be presented below will show that these taxes could be quite substantial. But reform did not always bring elimination of these taxes, and did not always bring higher farm income when taxes were cut. In the case of Côte d'Ivoire, export taxes fell from 1999 until about 2003, but exporter margins adjusted the most in response. Then the costs of the civil war encouraged the government to find new institutional means to reinstitute export taxes at close to their previous levels.

Evaluation of the extent of export taxes is clouded by the stabilization objectives of the parastatals. Since governments were setting floor prices at the farmgate, implicit export taxes would increase as world prices increased and fall as world prices declined. Financial difficulties of parastatals came about in large part because eventually price floors were stabilizing prices at or above equivalent international price levels and implicit taxes went to zero or lower (negative). At higher world prices, particularly for cocoa, implicit export taxes increased once again, and some see reduction of these taxes as an opportunity for improving farm income. In the case of cotton, higher prices mostly reduced losses incurred by the publicly owned gins.

Value chains for cocoa and cotton remain similar to those found under parastatal management in West Africa. Institutional reforms have occurred slowly in response to gradual privatization. Aid efforts during the privatization era often took the view that there were few real public goods, and that private sector entities would provide all the services previously offered by parastatals. Even market information was viewed at times as a private good. Those aid efforts often failed to provide the services necessary for well-functioning markets. Research activities have declined and extension services are now very weak. Some successful innovations may be found in reforming markets, however, which will be discussed later.

2.3 Effects of agronomy and environment on value chains

Value chains for cocoa and cotton involve farm-level activities that influence quality, intermediaries who transport commodities to ports or processors, exporting firms, and manufacturers who transform processed products into finished consumer goods. These value chains differ by commodity as agronomic and environmental factors come into play. Some issues along the marketing chain as well as solutions intended to raise farmer income are commodity specific, while others overlap.

Processing of cocoa beans into butter, powder and paste has typically occurred in Europe and North America. Early efforts to process cocoa beans into intermediate products in Africa yielded low quality products. New processing plants located near the African ports of Abidjan and Accra are owned and operated by multinational processing/trading firms. Managers insist that quality is now equivalent to that produced in plants in more developed countries, but the cost is higher in Africa. Reduced export taxes on processed products and the ability to get around market share restrictions on exports have encouraged multinationals to locate processing facilities in Africa. Manufacturing and consumption of chocolate and the use of cocoa in processed foods still occur primarily in developed countries.

Cotton is transformed from seed cotton into lint in gins located in rural areas in West Africa. Locating gins near the farms reduces transport costs, as roughly only 40 percent of seed cotton weight becomes lint. Conversion of lint to yarn, thread, fabric and textiles is mostly performed in developing economies outside of Africa. While there is some manufacturing of clothing in Africa, fabric and textile production is less likely to be located in Africa. Cotton production and clothing manufacturing may be labor-intensive, but textile production is often capital-intensive.

Farmer practices and post-harvest activities influence product quality for both cocoa and cotton. Fermentation and drying of cocoa beans after harvesting pods from trees are critical steps, sometimes not well performed, that occur on the farm. If farmers sell wet cocoa, drying may be accomplished by traders or by exporters at the port. Chocolate manufacturers have a long history of utilizing chemistry to combat quality problems with cocoa from Africa.

In the case of cotton, input decisions, particularly on pesticide use, can also significantly influence product quality. These activities are important to subsequent uses and therefore determine payments by exporters and downstream agents, but premiums for quality seldom reach back to the farmgate and remain low within African markets (Poulton, 2006).

Provision of inputs and credit are also essential features of value chains that differ somewhat across these two commodities. Cotton is an input-intensive crop, requiring fertilizer and pesticides. Credit is essential to finance input use. Problems following reforms in other African countries can often be traced back to problems with credit and input markets after liberalization (Goreaux, 2003; Baffes, 2004). For cocoa, relatively few inputs are used but credit is seen as essential to marketing activities and thus to

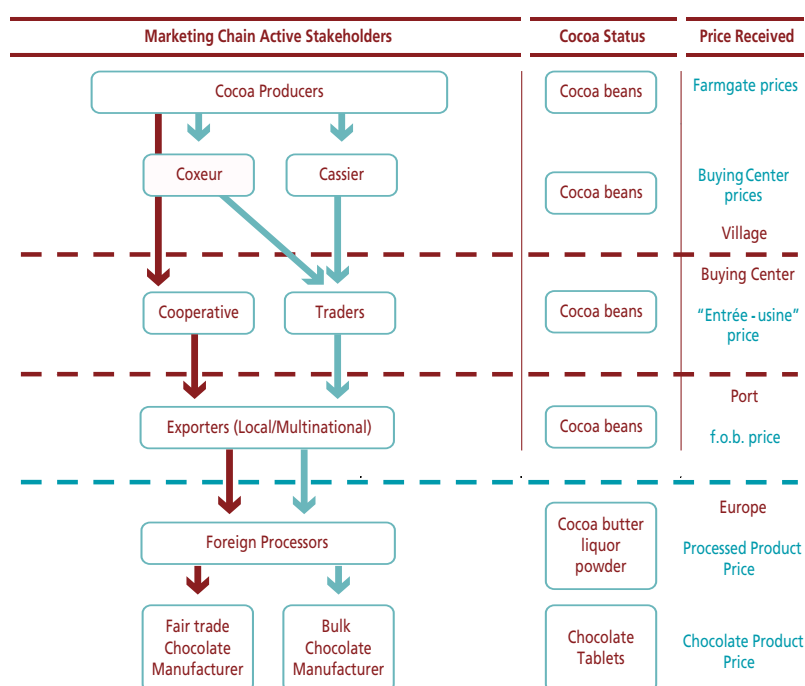
the success of producer organizations whose primary function is (or should be) buying cocoa from farmers and selling it to exporters.

One of the most obvious differences between cocoa and cotton is the system of transportation from the farmgate to either the port or processor. Cocoa is produced under the canopy of a rain forest and harvest occurs during the rainy season. Roads remain poor so traders have invested in all-terrain vehicles. Agents whose names vary from one country to another (pisteur in Côte d'Ivoire, cassier in Cameroon) come to farms to purchase cocoa.⁵ Problems with inadequate drying or fermentation, and possibly market power of local traders as well, derive from this system of acquiring cocoa at the farmgate. Producer organizations also often lack a system of buying agents, making it difficult to compete with traders. Cotton is often transported by farmers to ginning agents or traders. Cotton farmers are likely to be located in less remote locations, served by better transportation networks. Roads in cotton areas were often constructed by parastatals.

2.4 Prices along the value chain

Figure 2 depicts the cocoa value chain in West Africa, utilizing Cameroon (and its language) as an example. Cocoa beans are produced by smallholder farmers and sold at the farmgate to agents (cassiers, coxeurs, pisteurs), who are sometimes independent and sometimes employees of traders. Small and large traders, as well as producer cooperative organizations, are located in buying centers in the larger villages or towns. Farmers or buying agents may sell cocoa beans to cooperatives. Traders and cooperatives deliver cocoa beans to both local and multinational exporters at the port, who ship cocoa beans overseas to foreign processors. The processors now located in Africa are owned by the multinational exporters. Those processors transform beans into butter, powder, paste and liquor which are in turn sold to chocolate manufacturers and food processors. Prices for cocoa can be observed at the farmgate, in the buying centers, at the port, or in overseas markets.

Figure 2. Cocoa Value Chain in West Africa



Source: Abbott, Muir and Wilcox, 2006

⁵ Farmers who brought their cocoa to buying centers received lower prices, even before considering transportation costs, than farmers who waited for agents to come to the farm in Cameroon (Wilcox, 2006).

Table 3 shows estimated prices along the cocoa value chain for the year 2002 in Côte d'Ivoire, Ghana, Nigeria and Cameroon (Abbott, Wilcox and Muir, 2005). Many of the transaction costs in this table are rough estimates based on observing typical prices at various points along the value chain. The world price (ICCO price) is set at the border in Europe or the United States. Country-of-origin premiums or discounts apply to the ICCO price. Ghana exports higher quality cocoa and so gains a substantial premium. Cocoa from Cameroon is sold at a discount, while cocoa from Côte d'Ivoire and Nigeria receives roughly the ICCO price. Data on ocean freight rates are also available, allowing estimation of export taxes. In the case of Côte d'Ivoire explicit export taxes may be observed. For Ghana explicit export taxes appear to be quite small, but the margins collected by Cocobod are much greater than margins collected by private exporters in the other three countries, indicating substantial implicit export taxation. It is alleged that these exporters exercise market power at this point in the market, so that these margins include monopoly rents. In some cases these rents accrue to private agents, but in other cases they accrue to the government. It is also alleged that chocolate manufacturers and processors may exert market power (Oxfam, 2001). Table 3 estimates margins for both processors and chocolate manufacturers in Europe and the United States. While these may seem large, all activities along the value chain also incur costs. Those who argue for "shortening the marketing chain" would like to see these margins reduced. However, private agents, particularly the multinational exporters, argue that they are real transaction and processing costs.

Table 3. Cocoa Price Linkages, 2002 – Cameroon, Côte d'Ivoire, Ghana and Nigeria*

Country	Côte d'Ivoire	Ghana	Nigeria	Cameroon
Farmgate prices	625	974	1232	1135
Pisteur costs	57	57	57	129
Buying Center Price	682	1031	1289	1264
Trader costs	105	90	64	77
Exporter prices	786	1121	1352	1342
Export tax	501	169	6	0
Ocean freight	78	91	80	75
Exporter margins	470	737	437	331
Processor Prices (cif)	1836	2117	1876	1748
Country of Origin Premium or Discount	-29	252	11	-117
	EU/U.S.			
ICCO price/ average processor price	1865			
Processor Costs	411			
Chocolate manufacturer price	2277			
Manufacturing costs	1873			
Consumer (retailer) prices	4151			

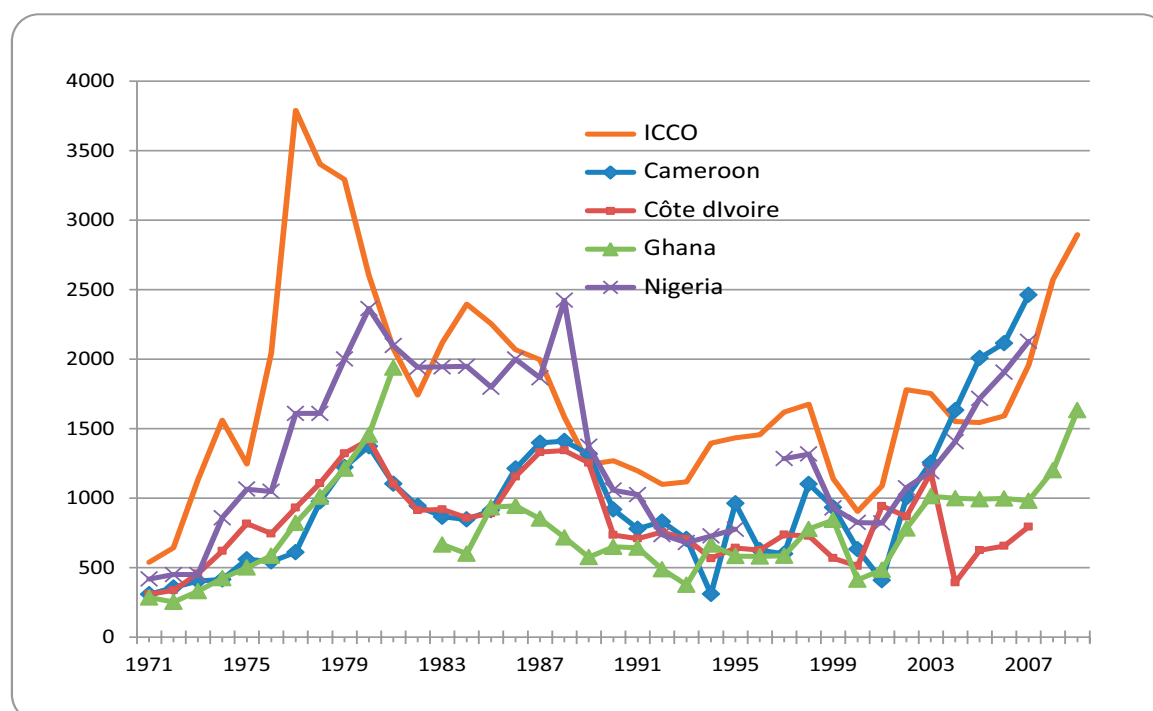
*Prices are in USD per metric ton, cocoa bean equivalent basis.

Source : Abbott, Muir and Wilcox, 2004

Figure 3 shows farmgate prices in Cameroon, Côte d'Ivoire, Ghana and Nigeria from 1970 to 2007 as well as the ICCO price. It is important to bear in mind that transaction costs between the farmgate price and the ICCO price are significant, but the relationships of these prices demonstrate the consequences of reform as well as the stabilization objectives of parastatals. Nigeria was first to liberalize and its farmgate price most closely follows the ICCO price, with the smallest margin as well. The

farmgate price in Cameroon also follows the ICCO price after liberalization in the early 1990s. Prices in Côte d'Ivoire and Ghana exhibit stability and are substantially below the ICCO price. The effects of liberalization in 1999 in Côte d'Ivoire, followed by reinstating export taxes in 2003 at the beginning of the civil war, are also evident. Moreover, the steep recent increase in world cocoa prices is seen in prices in Côte d'Ivoire and Ghana, with substantial export taxation persisting. Margins of chocolate manufacturers and cocoa processors also vary with world cocoa prices.

Figure 3. Cocoa Producer (Farmgate) Prices Compared to the ICCO Price, 1970-2007



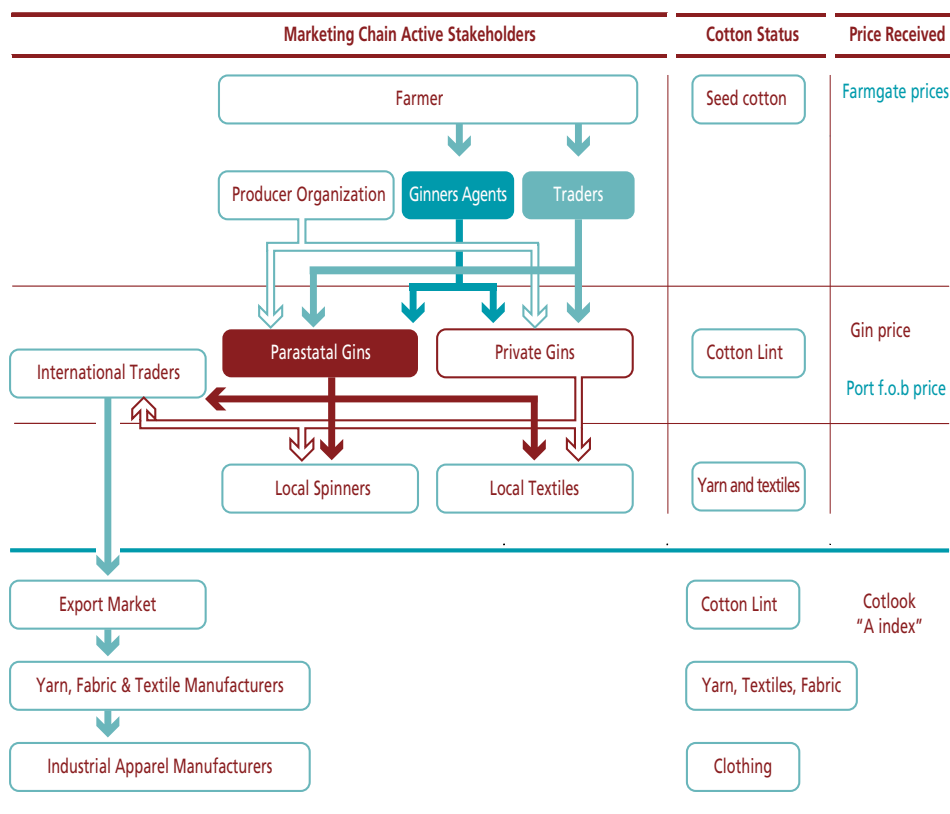
*Prices in USD per metric ton.

Sources: FAO, FAOSTAT, 2010 and Abbott and Wilcox, 2004 for farmgate prices.

IMF, International Financial Statistics, 2010 for ICCO price.

Figure 4 shows a stylized value chain for cotton in West Africa based on Baffes (2007) description of the cotton market and a value chain drawn by RATES (2005) for Tanzania. Farmers sell seed cotton to ginner's agents, traders or producer organizations. Parastatal or private gins transform seed cotton to cotton lint at an outtake ratio of about 40 percent. Cotton prices may be reported on a seed cotton or lint basis, using the uptake ratio and cost estimates to move from one to the other. Lint may be sold to local spinners and textile manufacturers to support domestic textile and clothing industries but it is more frequently sold to international traders in West Africa. In the export market cotton lint is sold to yarn fabric and textile manufacturers, who in turn sell products to industrial apparel manufacturers. World cotton prices are reported as the A index, a measure of prices at borders of countries importing lint.

Figure 4. Cotton Value Chain in West Africa



Source: Abbott, adapted from RATES, 2005 and Baffes, 2007

Table 4 presents cotton prices in Burkina Faso, Mali and Côte d'Ivoire for 2005 at the farmgate, the gin, the port and the EU border (A index). Farmgate prices are at a similar level in the two major exporting countries and are somewhat lower in Côte d'Ivoire. Based on Baffes (2007) estimates of transaction and ginning costs, gins appear to be incurring losses in all three cotton-exporting countries. Margins in transportation costs are lower than were found for cocoa. This is alleged to be a more competitive industry at the processing and manufacturing levels.

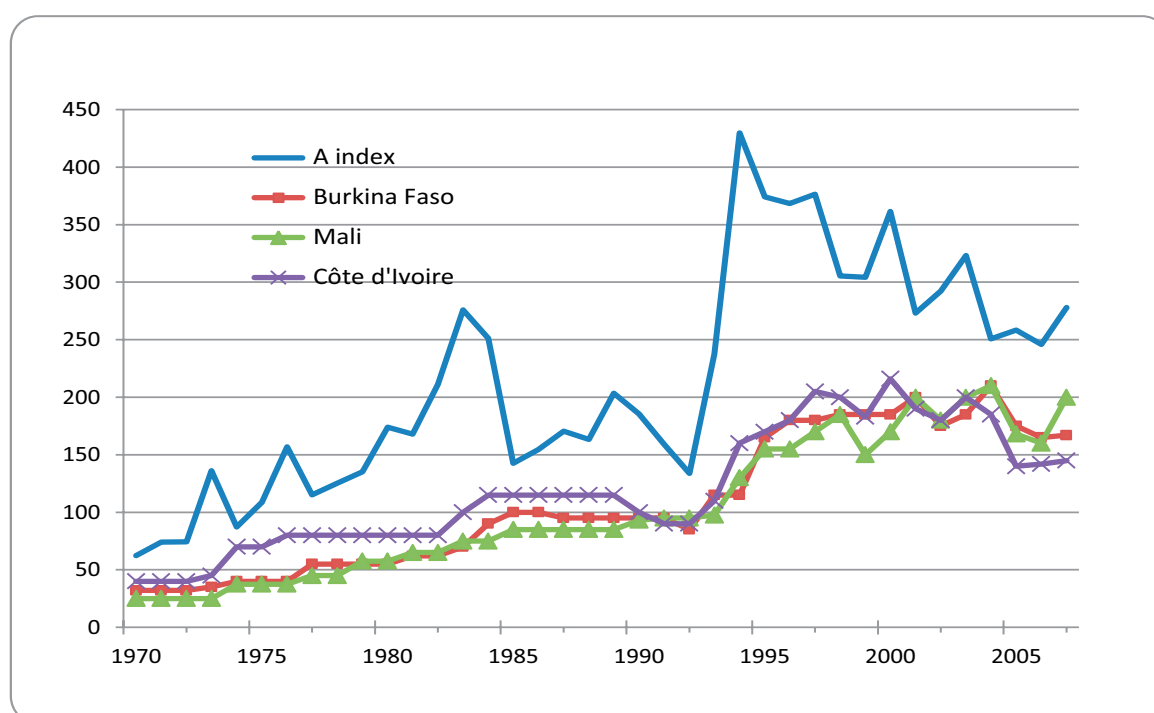
Table 4. Cotton Price Linkages, 2005 – Burkina Faso, Mali, and Côte d'Ivoire*

		Burkina Faso	Mali	Côte d'Ivoire
Farmgate price	Seed cotton	175	168	140
	Lint basis	422	405	337
Gin losses		-106	-89	-21
West Africa				
Ginning cost		225		
Gin price	Cotton Lint	541		
Transport costs - domestic		75		
Port f.o.b. price		616		
EU				
Ocean freight		49		
A "index"		665		

Source: Baffes, 2007. *Prices are in Fcfa /kilogram on a cotton lint basis. Farmgate price is also expressed as seed cotton basis in local currency. Gin prices and other downstream prices are after transformation from seed cotton to lint at an outturn ratio of 41.5 percent (from Burkina Faso data).

Figure 5 compares cotton producer prices to the A index on a lint basis in CFA per kilogram. The extent to which parastatal gins stabilize farmgate prices is even more evident for cotton than for cocoa. While there was substantial variability in world prices from 1970 to 1993, farmgate seed cotton prices remained steady, with step increases in domestic prices following world price increases around 1975 and 1985. In 1995, as world prices in domestic currency increased again, due largely to CFA devaluation, farmgate prices were raised, but a substantial relative difference persisted, especially when world prices were very high. When world prices declined, especially after 1995, domestic cotton prices remained constant, and the shrinking margins have led to losses for gins. Currency matters to these trends - cotton prices measured in CFA have been in steadier decline since the mid-1990s than they appear to be in US dollars (as in Figure 1).

Figure 5. Cotton Producer (Farmgate) Prices Compared to the A index, 1970-2007



Sources: FAO, FAOSTAT, 2010 and Baffes, 2007 for farmgate prices. Prices are in Fcfa per kilogram, seed cotton basis. Baffes, 2007 for A index fob West Africa in seed cotton basis.

In the cases of both cocoa and cotton, comparisons of farmgate prices to world prices suggest that margins could be reduced in order to improve farm income. Many studies simply use this sort of price information to argue for marketing interventions to improve farmer welfare, noting large differences between farmgate and consumer prices. But there are significant transaction, transformation and processing costs along the value chain. Nevertheless, the fact that these margins shrink when world prices decline and expand when world prices increase suggests there may be some scope for reduction of these margins. Whether margin reductions would translate into higher farmgate prices will be explored below.

2.5 Smallholder farmers

Subsequent analysis will explore policy options, institutional reforms and market innovations that have the potential to raise farmgate prices and thereby raise farm income. The specific concern is whether or not benefits from these interventions accrue to smallholder farmers, particularly those with less than two hectares. Cocoa and cotton yield higher incomes to farmers than are realized by subsistence farmers producing millet and sorghum in West Africa. Cocoa in particular is referred to as a plantation crop, suggesting that these farmers may have larger land holdings than is typically the case. However, the rhetoric of aid projects and NGO innovations, such as fair trade and organic cocoa or cotton, argues that interventions are aimed specifically at smallholder farmers.

Data on farm size for cocoa or cotton farmers have been difficult to find. According to Oxfam (Cappelle, 2008), cocoa farmers in Ghana farm an average of 10 hectares, with considerable regional variation. The range of farm size in Côte d'Ivoire was set at 1.5 to 5 hectares, however. For the case of cotton in Burkina Faso, average farm size is about 3.3 hectares. In Mali the average size of a cotton farm is estimated to be 1.5 hectares. Except for Malian cotton farmers, these averages are above those typically found for West African subsistence farmers.

These data need to be viewed with caution because substantial variations in farm size are observed both across regions and across farms within a region. Differences between countries also arise because opening of new lands has been important for the expansion of production of both these crops. For cocoa growers, the process of abandoning land where diseases have taken over and moving to new lands (virgin rain forest) is an ongoing practice (Ruf, 1995). Moreover, allowing immigrants from other countries to begin cocoa farms on new lands is an important political issue in Côte d'Ivoire that helped promote cocoa expansion in the 1980s and 1990s and also led to political tensions in the 2000s (Woods, 2003; Abbott, 2007). This process has led to smaller land holdings than are found in Ghana, but the practice of moving to new lands is also a feature of the Ghanaian cocoa sector. In the case of cotton in Burkina Faso, elimination of the tsetse fly and the diseases it carries has opened new lands to cotton cultivation, allowing for larger cotton farms than are found in neighboring Mali.

Land used for cocoa, cotton and subsistence crops may not be strictly comparable. Cocoa is grown under the canopy of a rain forest, and in collecting data one often counts trees rather than hectares (Wilcox, 2006). Cotton is grown in specific regions in West Africa in preference to subsistence crops, and land quality is typically lower in regions where only subsistence crops are grown. Many farmers grow subsistence crops in addition to cotton or cocoa. Another aspect of African agriculture is that low-quality land availability may not be the binding constraint to hectares planted and poor farmers may become better off by expanding the size of their farms through the acquisition of animal traction and adoption of new technologies. Credit constraints may prevent cotton farmers from becoming larger, as well. Family size is also a somewhat elusive concept and farms of the same size but with larger families yield lower per capita incomes. Although better land quality and higher incomes for export crops mean that cocoa and cotton farmers are not as poor on average as subsistence farmers, the wide distribution of land holdings means that there are many poor farmers even in cotton- and cocoa-producing regions.

A more important issue may be whether or not proposed interventions are biased against adoption by smallholder farmers. For example, is it more difficult for smallholder farmers to band together into producer organizations, or are there membership restrictions related to farm size? For the interventions examined here, there is little evidence of a bias against smallholder farmers. Most interventions explicitly state an objective to focus on small farmers and have no interest in showing a bias against small farmers. But scale economies in marketing and distribution as well as in credit markets may

work against smallholders benefiting from specific interventions along the marketing chain. Moreover, interventions that improve the farmgate price yield benefits in proportion to the size of the farm.

2.6 International interventions

Several international approaches have targeted interventions along the value chain as a means to raise smallholder farmer income for cocoa and cotton. The IMF, World Bank and aid agencies continue to push for privatization, which remains incomplete in some West African countries for both cocoa and cotton. Private NGOs have fostered niche solutions via Fair Trade, organic and traceability programs. The ICCO, United States Agency for International Development (USAID), Sustainable Tree Crops Program (STCP) and others have run aid programs that include marketing components and that target smallholder farmer income.

The completion of privatization remains problematic for several reasons. Cotton exporters in West Africa have been extremely slow to privatize cotton gins. While plans have been in the works to create joint public/private ownership of gins, given low world prices for cotton and the consequent poor financial condition of gins in West Africa, it has been extremely difficult to find private buyers for the existing cotton gins. The sale of Mali's gins has been delayed for several years as its French partner, Dagrís, has failed to tender an offer for the gins. Maintaining functioning gins in rural areas is critical to continued success of a cotton industry. In the case of cocoa, privatization is most incomplete in Ghana, where Cocobod continues to maintain a public monopoly on exporting. The chocolate industry defends Cocobod and opposes privatization because Ghana remains the one country providing higher quality cocoa to the world market. Ghana continues to receive a substantial premium over the ICCO price. Most cocoa is sold in bulk at an average quality level, and the small needs for higher quality cocoa are now met from the production provided from Ghana. In other countries privatization of gins and exporters has progressed further, but the institutional reforms to provide critical components of functioning private markets, to regulate those markets, and to provide missing public goods remain incomplete.

Small niche markets have been developed by private NGOs for both cocoa and cotton, with better success to date in cocoa. One cooperative in Ghana, Kuapa Kookoo, provides 45 percent of the volume of cocoa fair-traded in the world (Fair Trade Foundation, 2010). Fair Trade Foundation and ICCO (Consultative Board on the World Cocoa Economy, 2005) indicate there is only one other very small fair-trader of cocoa in West Africa, with the remainder of fair-trade cocoa coming mostly from Latin America. Kuapa Kookoo has become a very large, successful entity in Ghana, but only exports 12 percent of its cocoa to the fair-trade market, with the remainder sold as bulk cocoa. Kuapa Kookoo also continues to operate in a publicly regulated market, and uses Cocobod as its exporting agent. Because Ghana continues to set official prices for cocoa, Kuapa Kookoo uses fair-trade premiums to fund development projects. The Fair Trade Foundation (2010) indicates that there are initiatives for both fair-traded and organic cotton from West Africa, but volumes exported from either of those entities remain extremely small. Limited demand for fair-traded and organic products severely limits the scope of these initiatives to expand their activities and to serve a significant share of West Africa's smallholder cocoa and cotton farmers.

The sustainable tree crops program (STCP) run by the International Institute of Tropical Agriculture (IITA) and funded by USAID has sought to improve the welfare of smallholder cocoa farmers in Cameroon, Côte d'Ivoire, Ghana and Nigeria. STCP aimed to strengthen producer organizations and to enable them to compete more effectively against local traders, gaining premiums from the marketing chain. One implicit goal of STCP that has not been realized has been to replicate the model of Kuapa Kookoo widely across West African cocoa exporting countries. The program has had more success in developing science to combat fungus and improving extension services by fostering farmer field schools. USAID has also

intervened in cotton markets in West Africa, partly in response to the World Trade Organization (WTO) Doha Round initiative targeting West African cotton. That project contains relatively small efforts to address the value chain compared to the size of the cotton sector in the many West African countries served by the project. The ICCO, NGOs and other international entities have also fostered development projects in the cocoa and cotton sectors. Those projects often target improvement of marketing institutions.

3. Issues

Five critical issues condition the likely effectiveness of efforts to extract greater value from the marketing chain for smallholder farmers. These include: prospects for shortening the marketing chain; incidence of taxes and what share of reductions in taxes and transaction costs (or margins) are passed back to farmers; provision of public goods post-privatization; delivery of quality after liberalization; and missing or incomplete input and credit markets. Each of these factors limits the extent to which privatization and tax or cost reductions will in fact result in higher smallholder farmer income.

3.1 "Shortening" the marketing chain

For both cocoa and cotton only a small share of consumer prices for finished products is represented by farmgate prices (see price linkage data in Tables 3 and 4). Numerous studies use this evidence to conclude that farmgate prices could be raised by extracting greater farmer income from the long value chain. The notion of "shortening the marketing chain" argues that it is possible to lower costs (or margins) along non-competitive value chains. The data are clouded somewhat by the degree of price stabilization pursued by the parastatal marketing boards and by longer-term downward trends in world prices that have been experienced at times for each of these commodities. Marketing chains are longest in times of high world prices and become shorter when world prices fall. In the case of cotton, for example, losses to cotton gins from 2005 to 2007 suggest that these gains are illusory. Traders and large exporters argue that marketing chains are now efficient and that transaction costs along the marketing chain are quite real and difficult to reduce.

The notion of shortening the marketing chain has a long history in the research on African commodity markets. An early debate on whether or not African agricultural markets were competitive or oligopolistic was used as a justification for allowing the parastatal marketing boards to replace non-competitive traders. Others at that time asserted that the markets were high in cost but nevertheless competitive, with numerous agents along the supply chain collecting small markups. One idea suggested that reducing the number of agents, hence shortening the marketing chain, would reduce transaction costs (made up of many small margins) and so raise farmgate prices (Duncan and Jones, 1993). The notion persists that these marketing chains are inefficient and that transaction costs along these chains could be reduced. Some arguments are based on inefficiency while others are based on market power of agents along the marketing chain. Some continue to argue that the large traders of these commodities, as well as exporting agents, hold significant market power (Oxfam, 2001 and Cappelle, 2008).

Improved infrastructure is one means by which marketing transaction costs could be reduced if marketing chains are inefficient. In the case of cotton, parastatal boards built roads in cotton-producing areas to reduce those costs, but in the case of cocoa the roads remain poor and investment in capital (e.g. trucks) by traders substitutes for road construction. Investment in roads remains an option for reducing transaction costs (World Bank, 2007). Other investments in market infrastructure – including

institutions such as better market information and legal reforms such as warehouse receipts - also offer opportunities to lower transaction costs.

Our research has revealed that there may be significant fixed costs and therefore scale economies for both marketing and processing of cocoa and cotton. A successful innovation by Cargill, discussed later, has exploited these scale economies by utilizing larger trucks for transporting cocoa to the port and using industrial-scale gas dryers for which unit costs are lower. Moreover, problems with cocoa cooperatives were often due to lack of transportation capital. Small all-terrain vehicles may be effective for collecting cocoa from remote farmers but as one gets closer to the port larger trucks are more cost-effective. Rental markets for transportation were limited and imperfect. In general, the successful traders were quite large and could cover fixed costs of doing business against larger volumes. Similarly, fixed costs and scale economies appear to be factors in primary-processing activities. Fixed costs have an impact on cotton gin operations and on “usinage” (drying and sorting cocoa beans) as well as on primary processing of cocoa. Marketing agents, including producer organizations, need to be organized in order to exploit these scale economies.

STCP and ICCO have also pursued marketing interventions to establish traceability of cocoa exports back to the village of origin, along the lines of the French system of *appellation contrôlée*. STCP's original goal was to utilize “village of origin” as a basis for gaining premiums in cocoa marketing. But participants of STCP in the chocolate industry argued that demand for quality cocoa is weak and these identity preservation-based premiums would not be realized. The continued emphasis on traceability by an ICCO project probably reflects European food safety concerns rather than cost or premium considerations along the cocoa value chain. The safety concern is of considerably less importance along the cotton value chain given that cotton is not food. Traceability will add, not reduce, transaction costs along the value chain.

The niche market solutions (e.g. Fair Trade, organic) are also aimed at gaining premiums along the marketing chain and also require traceability. Costs for these marketing options are very likely to be higher than trade in bulk cocoa or cotton. The goal of these options is to gain premiums, not to reduce transaction costs. Once again, limited demand for high quality products prevents premiums from being realized by a large numbers of farmers.

3.2 Tax incidence

Consumers, intermediaries, processors, manufacturers and farmers share in any reductions of taxes, rents or transaction costs along the value chain. Tax incidence across these agents depends on market responses, as measured by elasticities. Tax incidence is greatest on the most inelastic agents – which may well be the intermediaries, processors or manufacturers. While supply of cocoa and cotton by farmers is not likely to be extremely elastic, consumer demand for these products is also likely to be inelastic, as is the derived demand of intermediaries. Transaction costs near the farmgate are also a much smaller share of consumer costs than they are of farmgate prices, affecting the relative shares of change in tax and transaction costs. Abbott, Wilcox and Muir (2005) simulated various interventions along the cocoa value chain and found small shares of tax reductions or cost savings accrued to farmers. While assumptions were necessary to establish elasticities, and although the magnitudes of elasticities – particularly of consumer demand – are disputed, it is clearly the case that price changes at the farmgate will only be a fraction of changes along the value chain, even if the shares are not precisely known.

Sharing of tax and transaction cost reductions is complicated by two additional factors. Several studies argue that exporting agents, processors and chocolate manufacturers are oligopolistic firms, so market power is relevant. Sexton *et al.* (2007) argue that market power exacerbates the rents captured by

intermediaries, and thus their tax incidence as well. Moreover, the largest cocoa exporting countries, Côte d'Ivoire and Ghana, probably have a degree of market power in international markets which is exercised by the government as it taxes exports. In those cases where market power exists, some of export taxes are borne by foreigners: the whole point of applying optimal export taxes is to collect revenue from foreigners. When those taxes are relaxed, the benefits accrue to those foreigners more than to farmers. The literature has recognized that at least in the case of Côte d'Ivoire export taxes may be optimal policy (Yilmaz, 1999; Consultative Board on the World Cocoa Economy, 2007). When Côte d'Ivoire reduced export taxes in 1999, it is likely that benefits accrued not only to consumers but also to the exporting intermediaries, whose oligopoly rents appear to have increased over that period. When export taxes were reinstated in 2003, rents declined (Wilcox and Abbott, 2005). Intermediaries may well be the least elastic agents in the supply chain, so such results should not be surprising. Another observation consistent with a potential importance of market power is that processors have pursued backward integration along the value chain towards the farmgate. Wilcox and Abbott argue that this could not only benefit from scale economies in marketing but also confer local market power on the processors/exporting agents that would otherwise be held by local traders.

The second factor that could limit farmers benefiting from transaction cost reductions is imperfect market integration. Estimates of price transmission from world prices to farmgate prices are low for both cocoa and cotton. Imperfect price transmission could arise both from stabilization efforts by the government and from imperfect market integration. In his study of farmgate prices in Cameroon and their relationship to port and world prices, Wilcox (2006) found considerable regional variation in price transmission and strong evidence of imperfect integration, at least for some markets within Cameroon. Unexplained arbitrage opportunities also appear in local price data. Cameroon liberalized in the early 1990s, and since then the government has not exercised policies to stabilize domestic prices. Therefore, evidence of imperfect price transmission is evidence of imperfect market integration there. Once again, this mechanism limits the extent to which any downstream changes in transaction costs or the sharing of value added would be passed back to farmers.

Even innovations such as Fair Trade, which directly intervene to raise some farmgate prices and avoid market responses that diminish transmission of benefits to farmers, may hurt other farmers. Abbott, Wilcox and Muir (2005) found the niche interventions have this effect in that these institutions raised prices for some farmers – those participating directly in the activity – but lowered prices for the remainder of the market. This effect is small as long as these niche strategies remain small components of the overall market. Single-country tax reductions can have a similar effect, raising prices in the domestic market of that country, but lowering prices for farmers in other countries. This mechanism is limited by the issues discussed above that limit transmission of cost changes upstream to farmers, regardless of the type of intervention.

Thus, there are several mechanisms – tax incidence sharing based on relative elasticities, market power, and imperfect market integration – that severely limit transmission of value added, tax, rent and cost changes upstream to the farmgate.

3.3 Public goods after privatization

An issue mentioned earlier, which bears repeating, is that public goods are not readily provided by the private sector after structural adjustment reforms liberalize markets. It is clearly the case that provision of public goods declined substantially after structural adjustment reforms in the six West African countries examined here. Budgets for research and extension that depended on export tax revenue and on the profits of parastatals diminished even before the parastatals were eliminated. Market information was not necessary when official prices were announced and applied throughout the country and year, but it

needed to be accessible when private market prices prevailed. In the case of cocoa in particular, disease control was an important activity of the government. Fungicides could be applied to prevent spread of disease at the edges of cocoa-growing areas, and reducing fungus outbreaks on one farm protected neighboring farms. These activities appear to be less effective in the more liberalized cocoa producing countries. Stabilization was probably also viewed as a public good by farmers, who have shown a strong preference for stable prices during policy discussions after liberalization led to greater price volatility. In the case of cotton, parastatals also installed infrastructure such as roads, but this activity ceased as structural adjustment programs disciplined the activities of those parastatals.

There has been some debate over which privatization activities were truly public goods and which goods were better provided by the private sector. That debate has led to some extreme aid interventions, such as projects intended to foster better market information which would collect fees from farmers for that information. Those interventions probably erred on the side of relying too much on the private sector. The record also shows that the private sector chose not to provide certain activities following reforms. An effective government is needed to provide the numerous public goods mentioned above, which are important to proper functioning of cocoa and cotton markets.

3.4 Quality

Product quality is an important factor determining the success of traders, including cooperatives and producer organizations. Both cocoa and cotton from West Africa are typically sold as bulk commodities, with only small niches that offer potentially higher quality products. The chocolate industry in particular has emphasized that most cocoa is an ingredient in processed foods or is used to produce bulk chocolate, with premium chocolate being a very small share of the market. But minimum quality standards must be adhered to, and they are regulated on the international exchanges that trade these commodities. At least in the case of cocoa, specifications applied by exporting-agent purchases are simpler than international contract standards.

Labor-intensive farm practices influence quality for both cocoa and cotton. Exporting agents and processors insist on dry, well-fermented cocoa in West Africa, but other standards are less important. Drying and fermentation may occur on the farm, but market failures often result in farmers selling wet, moldy or poorly fermented cocoa. Particularly when prices are higher, demand is strong or production is low, there is a rush to market that gives rise to problems with quality. In the case of cotton, the use of pesticides can affect fiber characteristics and so enhance the quality of the cotton lint produced by a gin. In the case of cocoa, processors and chocolate manufacturers have sometimes found chemical solutions to cope with quality issues in products delivered from Africa. In those cases, farmers forgo potential premiums for higher quality generating higher prices that now cover additional processing costs instead.

There is evidence that quality of cocoa and cotton exports from Africa has declined after privatization, but there is also some controversy on this issue (Gilbert, 2006). One example is that premiums to red colored cocoa that had accrued to Cameroon are no longer realized as premiums above the ICCO price for that country. In Côte d'Ivoire the share of cocoa purchased at the port as "number two" rather than "number one" quality increased substantially after reforms, but exporters have been able to maintain the level of quality sold on international markets by blending products purchased from traders. Poulton (2006) argued that quality premiums for both cocoa and cotton have been either low or non-existent after privatization, so that farmers have not realized incentives to maintain quality, nor have they gained a higher income that could contribute to providing higher, consistent quality. If premiums exist for cocoa they are provided to traders by exporting agents at the port. For cotton they would be provided by the gins. Quality standards are not well enforced at the farmgate, and enforcing quality standards in their

purchases has been a problem for producer organizations. In the rush to market for cocoa it was not uncommon for producer organizations to pay the same price regardless of quality and to accept lower-quality cocoa in order to maintain volume.

Issues of maintaining quality were often paramount in discussions with traders. For example, it was evident that some traders gave up arbitrage opportunities when they were unable to manage markets to maintain quality. Successful cooperatives and traders would establish relationships with the entities buying their product – exporting agents in the case of cocoa and gins in the case of cotton. Maintaining those relationships required reliable delivery of significant volumes of higher-quality product. Even tests for quality were performed less often for traders or cooperatives who had built solid reputations. Any innovations that would allow farmers to realize greater benefits from the value chain will have to pay serious attention to mechanisms that ensure product quality.

3.5 Inputs and credit

Input and credit markets are especially important to the West African cotton sector. As noted earlier, fertilizer and pesticides are important inputs to successful cotton cultivation. Prior to liberalization these inputs would typically be provided by the parastatal cotton gin. Payment of the effective credit offered through parastatal input provision was made through deductions from payments for the cotton when it was delivered by farmers to the gins. Cotton production served as collateral for input loans. These relationships broke down after reform and the ties between inputs, production and credit have been difficult to maintain afterwards. In earlier reforms in East Africa as well as later reforms in certain West African countries, particularly in Benin, it was not uncommon for farmers to sell their cotton to agents who had not provided the input credit, so loans remained unpaid. Goreux (2003) coined the term “poaching” to describe this practice of renegeing on debts by selling to a different agent⁶. There is evidence that the demise of East African cotton sectors following structural adjustment reforms was generated by these failures in input and credit markets (Srinivasan, 2008).

Other problems with input and credit also stemmed from disappearance of prior parastatal practices, and lack of institutions to provide credit and inputs to farmers following reforms. There were often spillovers of cotton credit to subsistence crops because other options to obtain credit were either unavailable or too costly to farmers. In West Africa much of the fertilizer used in maize and sorghum production was provided by a cotton parastatal and intended for cotton production. While this practice would lead to improved yields for subsistence crops, lower fertilization and so lower yields would be realized for the export crop. Parastatals also would cross-subsidize inputs by charging farmers costs for specific inputs that differed from the costs of those inputs incurred by the parastatals. Thus, farmers did not see incentives to make the right marginal choices for input use because they saw the wrong prices for those inputs (Banquedano, 2009).

While credit is critical to cotton cultivation and one of the most important issues in development of a private cotton sector, it is also of some importance to West African cocoa sectors, even if requirements for credit there are much smaller. The greatest needs for credit in the cocoa value chain are in marketing credit or credit for trading infrastructure. Traders who purchase cocoa must pay in cash. Traders also need trucks and warehousing, as well as possibly drying facilities. Successful traders and producer organizations who have established relationships with exporting agents obtain credit for marketing activity from those exporting agents. Multinational exporters provide much of the credit available to the

⁶ Poaching has been referred to as “side-selling” in some value chain discussions. In each case farmers did not honor contracts related to credit, where output served as collateral.

cocoa sector. Credit had been provided to trading agents by parastatals prior to reform, and institutions have been slow to arise that will provide credit widely to trading agents. Multinationals identify and offer credit to only the most reliable agents.

In both the cases of cocoa and cotton one initiative to improve smallholder farmer income is establishment of producer organizations. In order for these to function as effective business entities/marketing agents, by purchasing cocoa or cotton from member farmers and selling it at the port or to the gin, they need credit to conduct their operations. For example, a successful cocoa cooperative would have its own truck and warehouse, and would require credit to obtain that capital. Producer organizations have cited credit as a critical need. While parastatals continue to exist in cotton, privatization of cocoa has given rise to some public sector efforts to offer credit to producer organizations. Several programs observed by this author were failures, as default rates on loans to cooperatives were extremely high. Little discipline has been imposed when cooperatives have defaulted.

After reforms it is not uncommon to find that the private sector does not provide inputs, a seemingly private good. It is likely that problems with development of input markets stem at least in part from problems with credit markets. Lack of adequate legal institutions has contributed to missing or incomplete credit markets, and hence to missing or incomplete input markets as well. For the West African cocoa and cotton markets to succeed under privatization, a solution to these problems of credit and input provision are essential. Many of the successes have been private initiatives, but a supportive policy environment is needed.

4. Policy options

Policy alternatives need to be considered broadly, and must include institutional development along with changes to price wedges and incentives. Since value-chain interventions are mostly about enabling new private sector activity, policy is mostly about creating the appropriate environment for that activity. Policy options to improve farm income include taking steps to complete privatization, adopting policies that affect pricing and taxation, legal reform and institutional development. Each of these offers some opportunity to raise smallholder income subject to constraints and limitations indicated in the discussion of economic issues above.

4.1 Privatization

As noted earlier, privatization has been partial and incomplete for both cotton and cocoa in several of the West African countries studied here. Cocobod maintains a public export monopoly in Ghana for cocoa, while domestic marketing activities have been privatized. In Burkina Faso the solution to privatization has been regional monopolies partially owned by the state. In Mali a similar solution has been proposed, but sale of cotton gins to private entities has been delayed due to the poor financial condition of the gins. National governments have been reluctant to adopt privatization for these critical export commodities, and there is still resistance to completing the privatization process.

In the case of cotton in West Africa, one solution, recommended even by the World Bank, seems to be the strategy pursued in Burkina Faso: regional monopolies partially owned by the state (Goreux, 2003). Where more aggressive privatization has been pursued, the problems of credit and input provision – given the practice of side-selling or poaching – have been severe. It appears that the public sector needs to continue

to play a role in credit provision, and credit provision is critical to providing essential inputs to cotton. In any case, credit tied to production must be based on credible commitments. Whatever solution is found, whether it involves privatization or not, must address the issues of credit provision that have been problematic in most African countries where more complete privatization has been pursued. This may include legal reforms and better enforcement of contracts rather than public provision of credit. However, to date there are not many cases of successful private provision of credit for cotton in Africa. Moreover, maintaining gins is critical to the viability of a cotton sector; it is simply not an option to allow these gins to go out of business.

In the case of cocoa, Côte d'Ivoire showed great reluctance to privatize. Even when the government announced that privatization would be pursued, it delayed taking action to put privatization into force. The government found ways to continue some of the more problematic policies brought about by public sector management of the cocoa industry – notably high export taxes. In Ghana, the public export monopoly continues to be the source of high quality cocoa to world markets. Hence, even the chocolate industry is reluctant to see it privatized. Deterioration of quality has been cited as a problem in other cases where privatization reforms have been pursued, and key industry participants do not want to see that happen in Ghana. Thus, as in the case of cotton, full privatization in cases where it is partial and incomplete is often not considered among the best policy choices, and it continues to face resistance from national governments.

The principal concern about complete privatization remains the problem of missing markets and imperfect marketing institutions following privatization. The best example is the case of credit for cotton, but similar problems with institutional development have been critical for cocoa as well. Slow privatization of cocoa in Côte d'Ivoire was due to a belief that preparation in the form of institutional development was needed before privatization provisions were finalized, yet there was a great deal of uncertainty as to what measures were required. Earlier privatizations in Nigeria and Cameroon had occurred rather quickly, and in cases of more recent privatizations phasing of reforms has been preferred.

In Africa a tension remains between government failure and private market failure. The rationale for privatization – inefficient and sometimes corrupt parastatal exporters and gins – remains an issue in these markets. The inefficiency is due in part either to the parastatal pursuing broad development goals beyond simply marketing the commodity in question or to the evolution of world prices that reduced financial viability of the parastatal. Private sector participation will likely force some public firms to focus more directly on marketing or processing efforts only. But a balance needs to be found, with a continuing role for government, since the private sector will not provide public goods when privatization requires the state to discontinue certain activities. The most important policy concern then, as reforms are pursued, is to foster institutional development of marketing, recognizing both the role of the national government and potential efficiencies from private sector participation.

4.2 Pricing and taxation

Institutional development may be the primary policy concern that should be addressed, but a great deal of attention continues to focus on pricing and taxation issues. Parastatals had set official prices on a pan-territorial, pan-seasonal basis. In that way, they stabilized prices and made the setting of prices for cocoa and cotton deeply political issues. When privatization has led to prices being determined by private market forces, political entities – including producer organizations – have continued to try to influence those prices, with limited success. Producers have shown a continuing desire for stability, so policy regimes to provide that stability have been considered. In the case of Côte d'Ivoire the government found new institutional means to implement former policy regimes. High, and now explicit, export taxes have continued after a brief respite following initial privatization. Cocobod in Ghana has

used the public export monopoly to continue imposing high implicit export taxes. In cotton-producing countries, low world prices have meant that collecting high export taxes is not possible, while stabilizing farmgate prices at historical levels. Allowing those prices to fall below those historical levels, and be in line with world prices, has met substantial political resistance.

Reduction or elimination of export taxes had been a goal of policy reform for these sectors, with the hope that this would lead to higher farmgate prices. This would not always be the case, however, and is not always in the interest of the exporting country, for two key reasons. First, when export taxes are eliminated it is not always farmers who see their prices change. The tax incidence may have fallen on intermediaries, processors, manufacturers or consumers rather than farmers, so elimination of the tax would benefit those who had been paying it. More of the tax is paid by the more inelastic market participants, who are unlikely to be farmers, and this incidence is exacerbated when there is countervailing market power along the supply chain. Abbott, Wilcox, and Muir (2005) found only small shares of export tax elimination benefiting farmers. Second, when the country is a large supplier to the international market, and so has market power, an export tax may be optimal policy. It is governments, not the private sector, who have the power to implement such a policy. Both Côte d'Ivoire and Ghana are likely to have market power in cocoa exporting, whereas the other cocoa exporters and cotton exporters have shares of the world market too small to impose optimal export taxes. Optimal export taxes occur because foreigners pay part of their tax, so elimination of those taxes would benefit foreigners not farmers. Thus, market forces likely mean that in many cases the elimination of explicit or implicit export taxation will not result in substantially improved farmgate prices.

Numerous price interventions have been proposed to improve smallholder farm income. In order to maintain stable prices, some have suggested price bands regulation in private markets. Either export taxation or domestic subsidies have been proposed to establish floor and ceiling prices for cotton or cocoa. However, the same problems faced by the parastatals, particularly high costs in the face of declining world prices, would persist under such a regime. Moreover, price setting would remain a political issue, while prices would not efficiently allocate resources. Those exploring stabilization policies have found such regimes to be typically both costly and ineffective (Wright, 2001).

Pricing interventions have also been proposed to correct the market failures in input and credit markets. In other parts of Africa input subsidies are being used to foster agricultural development, in spite of the potential inefficiencies and high costs such subsidies could bring. A larger problem is that subsidies will fail to work if input and or credit markets are missing or incomplete. Often the problem with these markets is not pricing per se, but rather an institutional issue which simple application of subsidies does not address.

In the case of cotton another factor influencing potential adoption of new biotechnology production methods has been seed pricing. Hybrid cotton seeds sold by Monsanto include technology fees that could capture the entire benefit from the new technology, leaving farmers in the same position they were prior to adoption. Monsanto and the government of Burkina Faso have been trying to negotiate these technology fees. The government wants to preserve the greatest benefit for its farmers, while Monsanto is unwilling to charge lower fees than it does in other markets. Other concerns with biotechnology, in particular possible repercussions in trade with the European Union, have meant that most African governments have been reluctant to pursue adoption of this technology. In addition, most governments have been slow to establish policy and regulatory frameworks to deal with biotechnology and the pricing, technology and environmental issues it raises (Vitale *et al*, 2007).

Another pricing issue has been the application of fair-trade premiums to farmers. The only large fair-trader, Kuapa Kookoo, operates in Ghana where official pricing prevails. This means that farmers in fact

do not receive higher prices for fair-traded cocoa, but proceeds from fair-trade finance-development funds can improve the environment where those farmers live. These proceeds are used to build roads, schools, health clinics and infrastructure. Abbott, Wilcox, and Muir (2005) argued that maintaining artificially high prices for cocoa would cause the same problems that are characteristic of agricultural policy elsewhere in the world, such as oversupply in the long run, especially in places that do not have a comparative advantage. Decoupled payments are preferred for these commodities, and these are currently what are being achieved through the development funds.

In summary, pricing interventions are unlikely to benefit farmers greatly, but they may well introduce inefficiencies. Better options include policy regimes that foster market institutional development.

4.3 Institutional development

The two most important components of market institutional development are provision of public goods and creation of a legal framework for private trade of commodities. As noted earlier, privatization causes the state to withdraw provision of a number of public goods, so alternative institutional mechanisms are required after reform. These include market information, research, extension, disease control, and other activities. Moreover, some private markets have not functioned well after reform, and require institutional innovations, notably the credit and input markets. In addition, if commodities are to be traded in private markets, new legal institutions are required that were unnecessary when the public sector physically conducted trade. Phasing of privatization has been preferred recently in West Africa, allowing some institutional development to occur before privatization.

The best example of necessary legal reform is the system of warehouse receipts. This institution allows trading of commodities based on paper receipts rather than by requiring individuals to physically hand over the goods being sold. Legal frameworks ensuring contract provisions, quality certification, and requirements for warehouse operations need to be established. These frameworks were not needed when the public sector owned the commodity after it left the farmgate. This system has been established only slowly in reforming cocoa markets.

Other legal reforms include establishment of quality standards and regulatory regimes for genetically modified organisms (GMOs) and biotechnology adoption. New legislation is required in each of these cases. Parastatals maintained quality standards for purchasing of commodities, but they did not create a legal framework for private-sector trade under quality standards enforceable by contracts. Private sector solutions often evolve to meet the need for quality standards, as well. In the case of cocoa exporting, firms enforce relatively simple quality standards in their purchasing activities at the port. Those standards are well known, but often do not result in premiums paid to farmers who meet the standards. In the absence of national quality standards, institutions such as producer organizations have had difficulty enforcing quality standards in their purchasing activity. Adoption of biotechnology is a new endeavor, requiring entirely new legislation.

Because cocoa exporting has been taken over by multinational corporations, some countries (Cameroon and Côte d'Ivoire) have implemented what amount to antitrust regulations to combat exporter market power. In Côte d'Ivoire market shares of exporters are limited by regulation. Overlapping ownership has permitted some evasion of this restriction, and firms have established processing plants in-country to export greater market share. Abbott and Wilcox (2004) found greater market power for these firms during the period when the state had reduced export taxes than would have been expected given the extent of the exporting firm concentration observed. Cameroon has prohibited exporting by multinational firms in order to accomplish similar objectives. To circumvent this regulation multinational

firms find Cameroonian partners, and straddle through these exporting agents, operating in domestic and international markets but not as exporters per se. It is not evident that attempts to reduce market power of oligopolistic multinational firms have been effective, with the exception of export taxation, which may capture rents that would have otherwise gone to those firms.

Fostering stronger producer organizations is another goal of market institutional development. Aid projects have worked to strengthen cooperatives, and governments have provided subsidized loans to cooperatives. Inter-professional organizations have been created to try to give farmers more voice in policy matters influencing these markets. Aid projects have also pursued – with some success – new market institutional structures involving public/private partnerships. A number of innovations can be seen along the cotton and cocoa value chain as liberalization has occurred, some of which have improved the positions of smallholder farmers.

5. Successful innovations

In spite of the problems cited above, some interventions have resulted in innovations along the value chain that have raised income for some farmers. These include efforts to establish more effective producer organizations, niche market solutions – notably fair trade – efforts to provide credit, and efforts by multinational exporting firms to improve market institutions.

5.1 Producer organizations

Much emphasis has been placed on the role of more effective producer organizations to increase farm income. In the past, producer organizations in Africa have concentrated on negotiating with parastatal boards and the government to determine the official price for cocoa or cotton. To the extent that those parastatals held market power, the producer organizations would countervail against the market power of traders and exporters. Effective producer organizations also function as competition for traders, providing the same trade in services – buying and selling the commodity that traders also buy. In addition, producer organizations have served as vehicles for provision of credit and inputs to farmers. Many of the functions performed by producer organizations are simply the business of a trading entity. Producer organizations may therefore play both a political role and an economic role.

In the case of cotton, inter-professional boards (IPB) have been created in some countries to negotiate with the cotton gins to establish official producer prices and to represent the interests of producers. Producers are included as members of those boards. These boards emphasize the political aspects that are also pursued by producer organizations, negotiating the terms of sale for cocoa or cotton. This remains an appropriate function in the case of cotton, when regional monopolies persist, but if a market is privatized and price is determined in that market, the political function of a producer organization or an IPB becomes irrelevant. One problem with producer organizations is that often too much emphasis is placed on political rather than economic functioning, in an environment where they no longer have countervailing market power and prices are not determined by negotiation.

The more effective producer organizations (cooperatives) have become effective businesses which earn price premiums for their members. In the area of marketing, STCP has worked to support Cameroonian producer organizations in their efforts to become traders and to achieve better prices for their members.

In his survey of Cameroonian farmers, Wilcox (2006) found that farmers who sold to cooperatives received prices about 10 percent higher than those realized from sales to independent traders. Thus, there is some scope for producer organizations to achieve higher prices for their members if they function as effective traders. The most difficult problem faced by Cameroonian producer organizations was arranging transportation to the port, as an effective rental market for transportation services did not exist.

Wherever we encountered successful producer organizations acting as traders, and in fact whenever we encountered successful traders, those organizations and traders indicated that they had a partnership with one of the multinational exporting entities. Arrangements between multinationals and traders or producer organizations yielded a number of benefits. Those entities realized higher prices and obtained marketing credit from the multinationals. In addition, controlling for quality was less stringent as long as the entity provided consistently high quality. Multinationals sought partnerships with traders and producer organizations which could consistently provide both high volume and high quality. Only a minority of producer organizations we encountered had achieved such relationships; they were found more often with successful traders.

The model for STCP marketing efforts was the mega-cooperative Kuapa Kookoo in Ghana. That cooperative became a licensed buying agent at the time Ghana liberalized domestic trade in cocoa and operates in 1100 villages. It is the largest cooperative in Ghana and the largest supplier of fair-traded cocoa in the world, an effective business entity that successfully manages the logistics of buying cocoa from remote farmers and delivering that cocoa to the port. Its role in fair trade will be discussed below when we consider niche-market solutions, but that is a minority of its operation, and its success must be attributed to more than participation in fair trade. Only 12 percent of its cocoa sales now go to the fair trade market, and even that share is much larger now than in the recent past. Like other examples of successful producer organizations, the defining feature of this organization is that it recognizes its role as a business rather than political entity. The STCP efforts to replicate the model of Kuapa Kookoo have not been successful to date, however.

5.2 Fair trade

Fair trade and other niche-market solutions (e.g. organic) are often pursued as vehicles for gaining greater value added for farmers. For cocoa and cotton these efforts show only limited success, and only a small number of farmers can potentially be served by this option.

As noted above, Kuapa Kookoo in Ghana is the world's largest fair trader of cocoa. It provides roughly 45 percent of fair-traded cocoa in the world. There is only one other small African fair-trade outlet, providing very small volumes of cocoa. The Fair Trade Foundation (2010) also indicates a couple of producer organizations that engage in fair trade cocoa, but only report sales volumes for Kuapa Kookoo. The remainder of fair-traded cocoa other than from Kuapa Kookoo comes from Latin America, not Africa.

Industry sources have also indicated that they go to Latin America in search of higher quality cocoa. They emphasize that most cocoa is sold as a bulk commodity, and that the market for higher quality cocoa, as well as for cocoa with an identifiable origin, is very small. They note that most cocoa is used in manufacturing and processed foods, where origin identity would be lost. Data on volumes of fair-traded cocoa are consistent with the industry contention that this is a very small market.

In addition to identity preservation, fair trade arrangements pay a minimum price plus a premium to farmers. In the case of cocoa, the minimum price of USD1600 per metric ton is currently well below the ICCO price, although that has not always been the case. Fair-traded cocoa continues to receive a 10 percent premium above the ICCO price as well. As noted earlier, because there is an official farmgate price in Ghana, the premium is decoupled from production and accrues to a foundation to administer development projects. There are no other cases of African cocoa or cotton farmers receiving significant premiums through participation in fair trade.

Fair trade arrangements often involve contracting with downstream agents, but not in the case of cocoa. Kuapa Kookoo has instead become a part owner of Day Chocolate in the United Kingdom, which is its principal buyer and manufacturer. Oxfam is another owner of this chocolate manufacturer. The World Wildlife Foundation participated in the establishment of Kuapa Kookoo as part of its effort to preserve rain forests. As for other niche-market solutions, there has been significant NGO involvement in the evolution of Kuapa Kookoo.

Kuapa Kookoo is successful not only because of its participation in fair trade, which is a minority of its business, but also because of its success in managing the logistics of cocoa trade. Both the small share of fair-traded cocoa from Kuapa Kookoo and elsewhere, and the failure of other African entities to penetrate this business are indicative of the small niche opportunity this option offers.

5.3 Credit

As observed earlier, provision of credit is critical not only to generation of farm income but also to successful operation of producer organizations. In the case of cocoa, the most important source of marketing credit has been multinational exporters. Both traders and some producer organizations benefit from arrangements with these multinationals, and provision of credit is one of the most important benefits. In the case of cotton, credit is critical to the provision of inputs, and cotton is input-intensive. Moreover, traditionally credit has been provided to farmers by the parastatal gins. As cotton sectors reform, some have sought ways to maintain credit provision from the state, or from partially state-owned cotton gins.

Microfinance is often seen as a solution to credit market failure in developing countries. However advocates of microcredit argue that it is inappropriate for agriculture. The amount of credit required is much larger than typical microfinance loans, and the duration of the loans is much longer for seasonal agricultural credit than is common for these loans. For loans of the amount and duration required, interest charges can be quite high. Nevertheless, there is some evidence of the use of microcredit in Mali to support farmers in both cotton and subsistence crop production (Banquedano, 2009).

One argument in favor of supporting producer organizations is that they are a logical vehicle for the provision of credit. Not only is the provision of credit absolutely critical for cotton production because of the heavy use of inputs, but producer organizations acting as traders also require capital for both marketing and transportation to effectively run their operations.

5.4 Multinationals

Multinationals are often seen as the villains in value chain analysis, where the hope is that some of the value added captured by exporters, processors and manufacturers can end up in the hands of farmers. Several of the more successful marketing innovations in cocoa and cotton, however, are the

result of activities of multinationals and in particular partnerships between multinationals and producer organizations. As noted above, the most successful cooperatives maintained partnership relationships with multinational firms. They obtained premiums to quality of high volumes of sales when they successfully maintained those relationships. They also received logistical support.

In addition to supporting producer organizations as competitive traders along the marketing chain, there have been some efforts in Côte d'Ivoire by multinationals to move up-country and compete with traders in buying centers. Cargill established up-country buying stations for cocoa, rather than simply waiting for cocoa to arrive at the port. It could thus exploit scale economies through the use of gas dryers as well as large trucks to transport cocoa to the port. It effectively competed with traders, offering higher prices to farmers. The success of this activity brought resistance and political action from local traders, which discouraged Cargill from expanding this activity. The advantage to Cargill had derived as much from scale economies as from countervailing market power.

In addition to establishing up-country buying stations, multinationals have also been expanding processing capacity in African ports – specifically in Abidjan and Accra. Côte d'Ivoire was initially targeted for processing capacity expansion, but civil war there has led multinationals to look to Ghana as an alternative. The quality of processed cocoa products from Africa used to be quite low, but the multinationals contend that the modern plants built in Africa now produce products of the same high quality standard achieved in Europe and North America. Processing costs in Africa are believed to be higher than in developed countries, but export taxes on processed products are lower than those on raw cocoa, encouraging African processing. Moreover, multinationals face market share limitations in Côte d'Ivoire on cocoa bean exports and can export larger volumes if they export processed products. Cocoa processing plants are relatively capital-intensive, and ownership remains with the multinationals, so in-country benefits are limited to small amounts of additional labor demand and tax revenue. It is unlikely that the relatively small amount of processing in Africa changes the labor demand for cocoa beans or even the regional composition of that demand. Thus, it is not evident that establishing processing in Africa will convey significant new benefits to smallholder farmers.

Multinational cocoa exporters have also responded to demands for greater corporate social responsibility. Some cocoa manufacturers have indicated a desire to engage in fair trade for an increasing portion of their sales. The STCP initiative was also supported by multinational cocoa processors and chocolate manufacturers as part of their effort to address the alleged child labor problem on cocoa plantations. As a result, multinationals have provided a substantial amount of development assistance to cocoa-exporting African countries.

Multinationals argue that their margins represent real costs rather than rents. If that is true, opportunities are limited for farmers to take higher shares of that value added. But the multinational exporters seek active partnerships with traders and also producer organizations. Potential benefits likely derive from scale economies and addressing market failure in quality provision, rather than countervailing market power.

6. Implications for small farmers

Value chain analysis is now a popular approach to identifying new opportunities to raise smallholder farmer income. The best examples of success are identification of new markets, supported by contracting farmers to supply those niches. Cocoa and cotton exhibit value chains in which farm income represents a relatively small component of consumer costs. Advocates for value chain analysis have argued there are opportunities to “shorten the marketing chain” for these commodities, providing higher value added to farmers. But these are

mature markets in bulk commodities, with well-established value chain links, not new markets. Opportunities for altering income distribution along these value chains may arise when structural adjustment reforms eliminate the roles of state trading entities. But efforts to extract greater value added from multinational traders, processors and manufacturers have realized limited success at best. Nevertheless, many of the same issues that arise in identifying new marketing opportunities matter to reforming these mature commodity markets. Market failures must be addressed, geographic and agronomic specialization must be considered, and scale economies, spillovers to other markets, as well as roles for NGOs and aid interventions in institutional development all matter. As seen in the case of cotton, there may be a need for defensive measures to preserve farm income after reform rather than finding measures to increase that income.

In establishing new markets and reforming old ones, the debate over market failure versus government failure remains relevant. Problems of inefficiency and corruption lay behind the impetus to liberalize cocoa and cotton markets. But reforms have been slow, particularly for cocoa and cotton in West Africa. National governments as well as sectoral actors have been reluctant to implement reforms after observing problems following privatization elsewhere. It should be clear now that a role for the government remains, even if private sector participation may bring greater efficiency to trading or processing activities.

Two key roles remain for the government: First, because parastatals provided certain public goods which are not provided by private firms after privatization, the state must continue to provide research, extension, market information, disease control and other public goods to these markets. Second, the state must also create an enabling regulatory environment that allows new marketing institutions to develop. There is a considerable need for substantial institutional development in new activities as well following reform. The government needs to take a lead role in fostering appropriate new marketing institutions. That role may be necessary not only to preserve provision of public goods, but also to ensure proper functioning of critical private markets. Credit market failure is a key problem that must be addressed. Quality control is also important. The demand for stability by farmers remains after privatization as well, so the government must play a role in fostering risk management strategies under the new market structures.

Approaches based on value chain analysis rely heavily on establishing better producer organizations. In Africa those organizations often see their role as aggregating the negotiating strength of small farmers in order to countervail market power of other agents along the value chain. The political role of such organizations is more important in a publicly-managed market, where official prices prevail, than in a private market. In a private market setting negotiations may have some influence over explicit export taxation, but in the end it is likely that the market and not political negotiations will determine the farmer's share of value added. It may be the case that after reform too much emphasis remains on the political rather than the economic functions of producer organizations.

Past experience with producer organizations in West Africa shows a number of problems and a few successes. An open question is whether the structure of producer organizations is biased against smallholder participation. Historically, producer organizations were organized in hierarchical structures to support negotiating entities in the capital, taxing farmers in order to provide that support. They have also been a vehicle through which the state has funneled credit (badly) to farmers after privatization. Producer organizations face the same scale economies as traders in both delivery of high volumes and provision of credit. These factors may cause producer organizations to prefer larger farmers as members. Emphasis on political rather than business activities – and possibly corruption – has led to limited contribution to farmer welfare from these organizations. But some successes can be found.

Successful producer organizations in privatized markets need to serve as efficient business entities. One of their primary functions is to compete with traders, buying commodities from farmers and selling them to processors or on the international market. Managing the transportation logistics and maintaining quality control are critical skills that need to be developed. Producer organizations are also a logical vehicle for provision of inputs and credit to farmers.

In the cases of cocoa and cotton, the most successful producer organizations behaved like successful traders and established strong working relationships with one multinational exporter. In the case of cocoa markets, where privatization has gone further than for cotton, the best source of credit for those markets has been the multinational exporters. In order to maintain these relationships, producer organizations need to overcome problems of quality control in purchasing from farmers and local traders. The successful producer organizations observed in the cases of cotton and cocoa have been able to gain small premiums for their members by delivering consistently high quality in large volumes to their partner multinational processors and exporters. Multinational firms welcomed improvement of producer organizations as effective trading entities and have assisted in promoting this marketing alternative. Politics have kept multinational firms at the border, so these firms benefit from these options to make internal markets more efficient.

Expectations about the prospects for extracting additional value added for smallholder cocoa and cotton farmers need to be tempered by the reactions of markets to changes in transaction costs, taxes and rents along the value chain. Tax incidence effects mean that changes (reductions) in costs accrue to the more elastic agents, so at best the benefits of tax or transaction cost reductions must be shared with consumers and intermediaries. Moreover, marketing activities may be subject to substantial fixed costs and scale economies. In the cocoa and cotton markets, trader and processor margins may vary as they stabilize farm income and absorb world price fluctuations, while generating profits to cover fixed costs. If intermediaries do have market power, it is exercised in the context of scale economies and changes that may have more impact on other agents along the value chain or short run profits than on farmer incomes.

The activities in cocoa and cotton markets most closely resembling other value chain activities are the niche-market strategies that include fair-traded and organic production. Limited demand has relegated these activities to being relatively small contributors to farm income. These are bulk commodities for which identity preservation and high quality are likely to generate small premiums at best. If these became larger, they could become "beggar-thy-neighbor" strategies – raising some farm incomes at the expense of others. They provide good opportunities for farmers who are part of the niche, but are unlikely to be useful as a broad development strategy benefiting large numbers of farmers.

As is the case for other commodities, there are clearly market failures that need to be corrected in the cocoa and cotton markets. Privatization brings the need for new marketing institutional development, and for the correction of market failures that arise as the state exits certain functions. This has been especially evident for cotton, where collapse of input and credit markets following privatization has resulted in declining production and lower farm incomes. The premiums achieved from extracting additional income along the value chain are likely to be relatively small, however, based on experiences in cocoa markets. Strategies to raise productivity on the farm are likely to contribute more to increased smallholder farmer income than innovations along the supply chain.

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Chapter 9

Constraints to smallholder participation in high-value agriculture in West Africa

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1. Introduction

During the past two decades non-traditional high-value agriculture increased considerably in West Africa, while traditional tropical export crops started to lose importance. This rise of high-value agricultural markets has been accompanied by large and rapid structural changes. First, a few large food multinationals increasingly dominate international food chains. Second, high-value agriculture is increasingly characterized by highly vertically-coordinated supply chains. Third, food standards increased sharply since the mid-1990s and now impose a large number of requirements on agricultural exports. These changes have important implications for farmers around the world, who find themselves confronted with new competitive pressures as well as new opportunities from these developments, and who may or may not benefit from being integrated in these high-value supply chains.

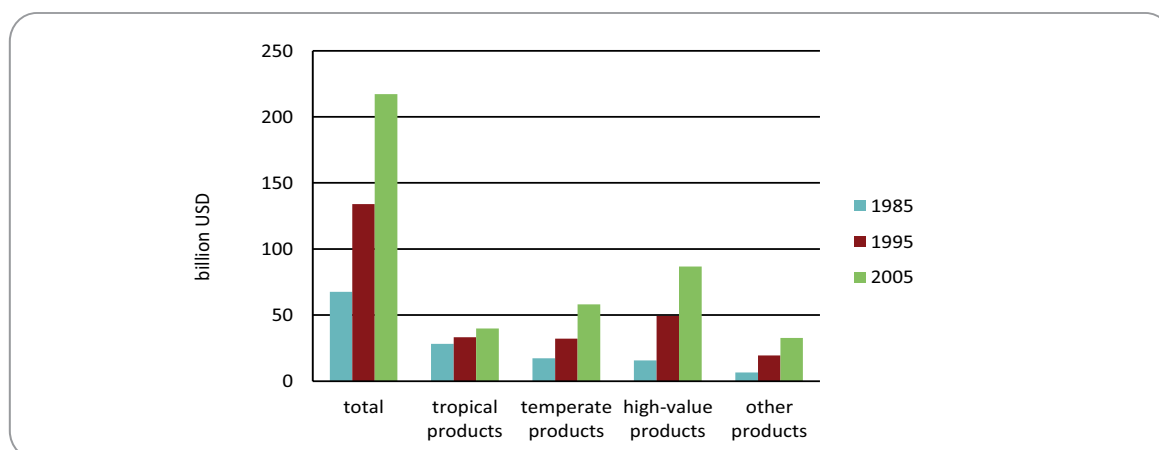
In this chapter we review these recent structural changes in high-value agricultural trade and their importance for West African agro-food markets; we also discuss their implications for West African farmers and rural households. In this chapter we draw on secondary data and on data from our own surveys in the past years in specific sectors – in particular the horticulture export sectors in Senegal.

The chapter is organized as follows: First, we document the increase of high-value agricultural production in West Africa. In the next section we discuss the organization and structure of high-value agricultural supply chains. Then we discuss the constraints to smallholder participation in high-value supply chains, the role of producer organizations and the empirical evidence about inclusion or exclusion of small farmers. In another section we focus on the indirect linkages and benefits for smallholders. A final section formulates policy recommendations to enhance the benefits for smallholders from the development of high-value agricultural markets.

2. Increased importance of high-value commodities

World trade in food and agricultural products is increasing and has almost doubled during the past two decades, from USD 243 billion in 1980 to USD 720 billion in 2005 (FAOstat, 2009). Thirty-six percent of world agricultural trade originates from developing countries and the structure of developing country exports has changed significantly since 1980.

Figure1. Changing structure of developing countries' agro-food exports, 1985 - 2005



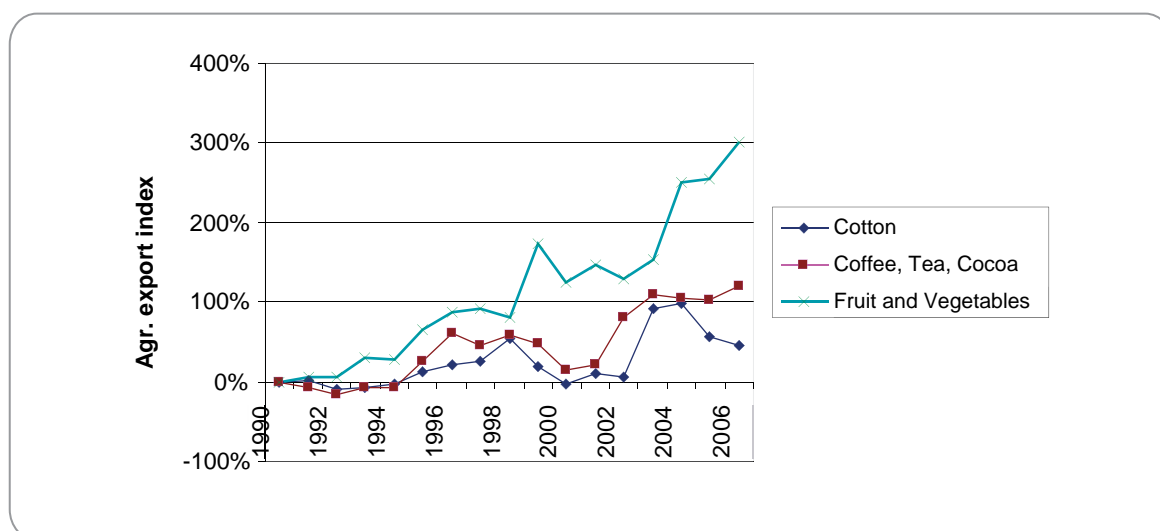
Source: Maertens, Minten and Swinnen (2012)

Tropical products include coffee, cocoa, tea, nuts and spices, textile fibres, sugar and confectionary; temperate products include cereals, animal feed and edible oils; high-value products include fruits, vegetables, fish, seafood, meat and meat products, milk and dairy products; other products include tobacco and cigarettes, beverages, rubber, and other processed food products.

¹ Developing countries include all low- and middle-income countries in Africa, Central America, South America and the Caribbean, East Asia, South Asia, Southeast Asia and Central Asia.

Exports from developing countries are characterized by a sharp increase in the export of non-traditional agricultural products, while the traditional tropical export commodities such as coffee, cocoa and cotton are losing importance (Figure 1). The share of traditional tropical commodities, including coffee, cocoa, tea and cotton has decreased from 24 percent of West African exports in 1986 to 7 percent in 2006. Meanwhile, the value of non-traditional exports from West Africa has tripled over this period (FAOstat, 2009) (Figures 1 and 2).

Figure 2. Index of agricultural exports from West Africa, 1991-2005



Source: Calculated from FAOstat (2009).

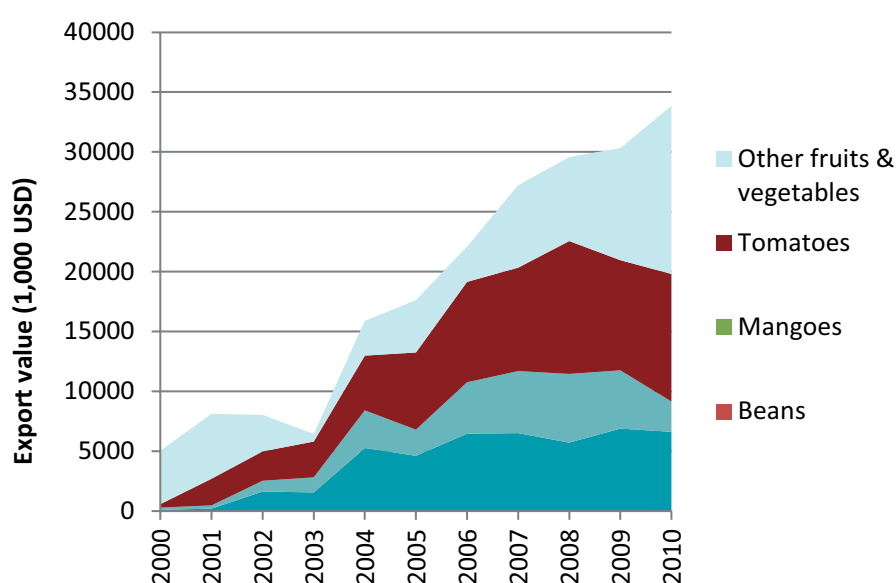
These non-traditional exports primarily include higher-value products such as fish and seafood, fruits, vegetables and flowers, products that are consumed in fresh or processed form and for which the value (per weight or per unit) is typically much higher than for more bulky primary commodities that are destined for further processing such as the typical tropical products.² Horticulture products in particular are playing an important role in the sharp growth of high-value and high-standard agricultural produce. In West Africa the export of fruits and vegetables to high-income regions has increased from USD 150 million in 1990 to USD 600 million in 2006 (FAOstat, 2009). Several West African countries, including very poor countries such as Burkina Faso, Côte d'Ivoire, Ghana, Guinea and Senegal, have become important suppliers of fresh fruits and vegetables to European Union (EU) markets (Boxes 1 and 2).

² In some West African countries, e.g. Benin and Senegal, the export of fish and seafood accounts for the largest share in high-value exports.

Box 1. The rise of Senegal's fruits and vegetable exports

After Senegal's independence in the 1960s, groundnut was the dominant export crop. Yet since the 1970s, declining world demand and competition with other oilseed crops reduced the profitability of Senegal's traditional export sector. Although still relatively small compared to export products such as groundnuts and fish, non-traditional export products such as fresh fruits and vegetables (FFV) have become increasingly important. In the past 10 years exports of FFV have increased from 4 800 tonnes in 1998 to almost 25 000 tonnes in 2007.

Figure 3. Value of horticulture exports from Senegal, 2000 – 2010



FFV exports also became more diversified. In 1997 more than 75 percent of FFV exports consisted of one crop (French beans). Since the early 2000s the export of tomatoes and mangoes has also grown. The greater majority of exported fruits and vegetables are destined for the EU market, mainly Belgium, France, Luxembourg and the Netherlands.

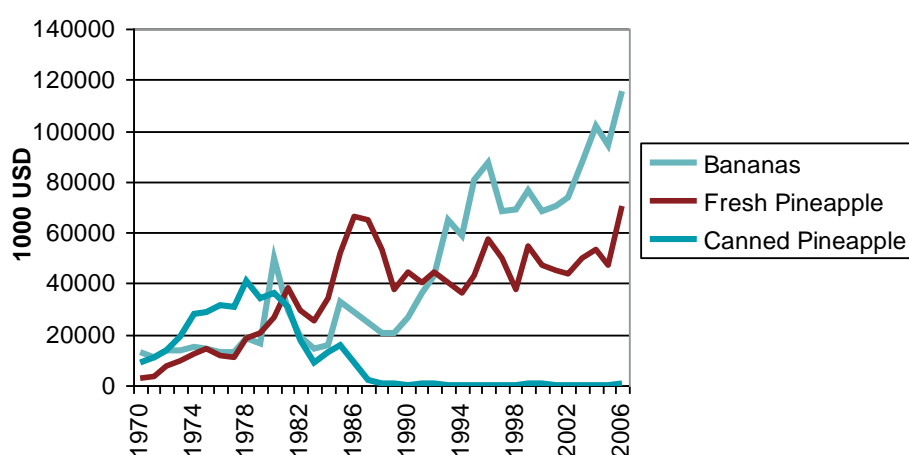
Source: Maertens, Colen and Swinnen (2011)

Box 2. West Africa's largest fruit and vegetable exporter: Côte d'Ivoire

Côte d'Ivoire has always been the main horticultural exporter in West Africa. In 1999 Côte d'Ivoire exported USD 140 million worth of fruits and vegetables, thereby reaching approximately the same level as Kenya and second only to South Africa among sub-Saharan African countries.

Already in the 1960s, in the years after independence, the government successfully diversified its income earnings, reducing the contribution of cocoa and coffee to agricultural export revenue from 90 percent in 1961 to 77 percent in 1975 and largely increasing the export of bananas and pineapples. At this time, most of the pineapple exports were in the form of canned pineapple and pineapple juice. But in the 1980s world prices declined, and Côte d'Ivoire switched to fresh pineapple exports by seafreight.

Figure 4. Exports of fruits from Côte d'Ivoire

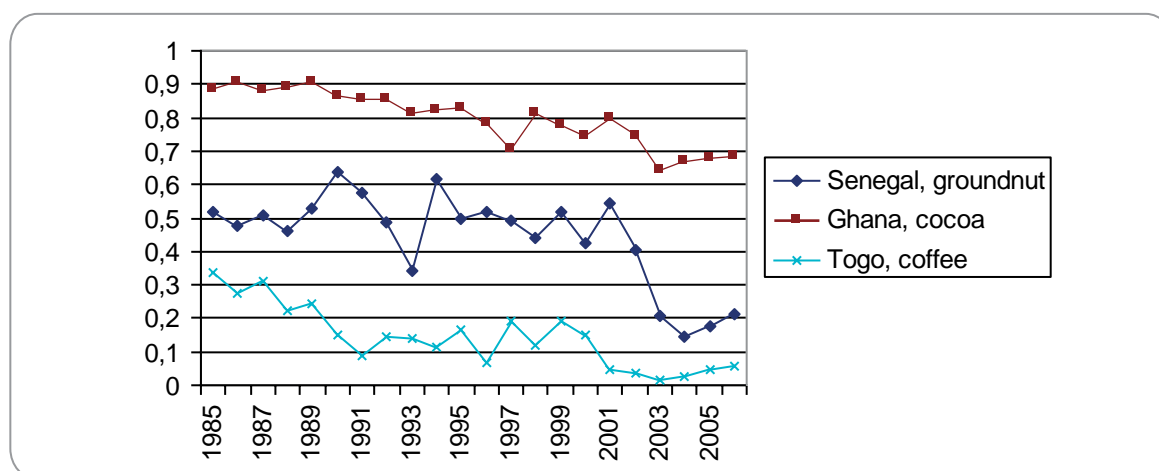


This move took advantage of Côte d'Ivoire's location in terms of proximity to Europe, a factor which is much more important in fresh pineapple trade than in the market for canned pineapple. The export of fresh fruits is much more demanding in terms of quality standards and logistics, but when these requirements can be satisfied, fresh pineapple export is much more profitable than the market for canned pineapple.

Source: Minot and Ngigi (2004); FAOstat (2009)

The importance of this shift from traditional to non-traditional export commodities is twofold. First, many African countries have for decades been highly dependent on one or just a few export commodities, which has made countries vulnerable to volatilities and shocks in world market prices. For example (Figure 5) the share of cocoa and coffee in the value of agricultural exports of Ghana decreased from 88 percent in 1985 to 68 percent in 2005. Similarly, the share of groundnut in Senegal's agricultural exports decreased from 52 percent in 1985 to 21 percent in 2005, the export value in both countries fluctuating largely over the years due to volatile prices. The shift towards non-traditional exports implies more diversified export portfolios, which reduces these vulnerabilities.

Figure 5. Share of main traditional export crops in value of total agricultural exports for Ghana, Senegal, and Togo (1985-2006)



Source: FAOstat, 2009

Second, non-traditional exports are high-value products for which the value per unit or per weight is much higher compared to typical traditional tropical exports, such as coffee, tea and cocoa. This creates opportunities for rural income mobility and poverty reduction among smallholder producers in these countries.

Relative to other regions in Africa, the growth in high-value exports from West Africa is still limited and has taken off rather late. Especially in Eastern and Southern Africa, the shift towards non-traditional exports has been even more pronounced and horticultural exports started to boom earlier. In West Africa, the real boom only started after 1994, when the currency of the West African monetary union was devaluated. If West Africa is to follow the trend of East and Southern Africa, we can expect to have a continuation of the strong growth in non-traditional exports in the coming years.

The increase of high-value agricultural production in developing countries is mainly related to increased exports to the industrialized world. Yet in some developing countries high-value production for the local markets is also increasing. In some developing countries, mostly in Latin America and Asia, the role of supermarkets has increased rapidly and this has been accompanied by a rise in the local demand for high-quality food products (Gulati *et al.*, 2007; Reardon *et al.*, 2003). In most West African countries, the local consumption of these goods is low and the role of supermarkets is relatively unimportant compared to other developing regions. In West Africa, high-value agricultural production for the local market is still very limited and virtually all high-value agricultural products are directed to the European market.

3. Organization and structure of high-value chains

The shift towards high-value agriculture is accompanied by a shift in the organization and structure of the supply chain. High-value chains are characterized by products of high value, the use of stringent food quality and food safety standards, the importance of private standards in addition to public requirements, a high level of consolidation at some nodes in the chain (mostly at the levels of processing, distribution and/or retail) and high levels of vertical coordination at all nodes of the chain.

The characteristics of high-value chains have important consequences for the participation of small farmers and the distribution of benefits. In this section we go into more detail on the structure and organization of high-value agricultural supply chains.

3.1 Increasing food standards

During the past decade food standards, including public regulations as well as private corporate standards, have risen sharply. Fresh food exports to the EU, for example, have to satisfy a series of stringent public requirements, including marketing standards, labelling requirements, regulations concerning contamination in food, general hygiene rules and traceability requirements. Private standards, established by large food companies, supermarket chains and non-governmental organizations (NGOs), also play an increasingly important role in agro-food trade (Jaffee and Henson, 2005). Such standards increasingly go beyond food quality and safety specifications and include ethical and environmental standards as well. Although private standards are not legally mandatory they have become de facto mandatory as a large share of buyers in international agro-food markets now require compliance with such standards, e.g. GlobalGAP standards (Henson and Humphrey, 2008).

Food standards are particularly high for non-traditional, high-value exports (including fruits, vegetables, fish, seafood, but also meat, milk and dairy products). These standards concern perishable goods, which are consumed fresh and are much more prone to food safety risks and quality concerns by consumers. In addition, private food companies and supermarkets use these high-value commodities as strategic products and use standards as a product differentiation tool. Private standards for horticulture products have been increasing especially sharply. Some private standard-setting bodies and certification schemes have initially focussed on fruits and vegetables, e.g. the GlobalGAP (Box 3).

Box 3. The stringency of private standards: EurepGAP/GlobalGAP

In 1999 the Euro-Retailer Working Group on Fresh Produce (EUREP), consisting of 30 major food retailers in 12 European countries, established the EurepGAP standard, covering 85 percent of fresh produce retail sales in 2004 (Garcia-Martinez and Poole, 2004). The EurepGAP standard consists of a series of protocols for the application of Good Agricultural Practices, initially focused on the production of fresh fruits and vegetables. These protocols include requirements related to site management, varieties, soil management, fertilizer usage, irrigation, crop protection, and waste and pollution management, as well as some conditions on worker health, welfare and wildlife conservation (Jaffee, 2003; Henson, 2006). Independent agencies are assigned for inspection and certification. In 2007, EurepGAP expanded and was renamed GlobalGAP. Currently, GlobalGAP includes many more products, but initially the focus was on fresh fruits and vegetables, indicating that demand for increased standardization of food quality and safety was particularly high for this type of perishable, high-value product.

Source: Henson (2006), www.globalgap.org.

Public and private food standards have often been mentioned as barriers for food exports from developing countries but it is remarkable that many poor countries in sub-Saharan Africa (SSA) experienced accelerated growth in fresh produce exports, mostly to the EU, exactly during a period of sharply increased EU food quality and safety standards. As a response to increasing standards in world

markets, several developing countries formulated their own standards and created their own labels. For example, the label *Origine Sénégal* was recently introduced in Senegal. To be exported under this label, Senegalese fruits and vegetables must satisfy a series of quality and food safety requirements which are controlled before the products leave the country.

3.2 Increased consolidation in food processing and retail

In the past decades global food-supply chains have become increasingly concentrated, with large food companies and multinational firms dominating the chains. This is most apparent at the level of food retail. Food distribution worldwide is increasingly organized around large super- and hyper-market chains. This so-called “supermarket revolution” first emerged in industrial countries but is spreading rapidly through developing countries as well. The food distribution sector in high-income countries is becoming increasingly concentrated around a few large retail chains. For example, in European countries the five-firm concentration ratio (i.e., total market share of the five top companies) in food retail is particularly high, above 60 percent in many countries, reflecting the dominance of large retail chains.

Food processing and exporting has also become increasingly consolidated. In many countries, there are only one or a few exporting companies. For example, in Senegal the number of firms processing and exporting French beans was reduced from 27 in 2002 to 20 in 2005 and to 14 in 2008. The tomato export sector in Senegal is also heavily dominated by only one multinational company. This same company is also responsible for a high share of the exports of tropical fruits and vegetables from Côte d’Ivoire, Ghana and Mauritania to the European Union.

3.3 Vertical coordination

Global food supply chains are increasingly dominated by large multinational food companies, while trade is increasingly regulated through standards set by these private companies or by national, regional and international authorities. This has led to changes in the governance systems of global food-supply chains. Rather than being based on spot-market transactions, high-standard food-supply chains entail varying levels of vertical coordination at different nodes in the chains.

At the import-export node of the chain, this is apparent in the vertical relationships between supermarkets and food importers or specialized overseas suppliers. For example, most West African exporters have *ex ante* agreements with European importers before the start of the season. Some of these agreements are oral and do not include binding specifications in terms of prices or delivery dates. However, most large exporters increasingly engage in more binding contracts with buyers, including a (minimum) price, quantity and timing of delivery. Some exporting firms even receive pre-financing from their overseas partners (Maertens *et al.*, 2005).

Upstream, the changing governance systems in global supply chains have resulted in increased vertical coordination. Producers in developing countries have tight relationships with exporters, food processors and supermarkets in these countries. This is most apparent in the form of contract-farming between agro-industrial firms and local primary producers. In the most extreme case primary production is completely vertically integrated in upstream processing and trading activities.

A. Contract farming

The contracts that exporting firms offer to farmers are usually specified for one season and indicate the area to be planted, the technical itinerary to be followed – including the variety, type and quantity of fertilizers and pesticides, time of planting and harvesting – and the price. Generally the firms provide the inputs, especially seeds and chemicals, on credit and give technical assistance during the growing season. In some cases this technical assistance even goes as far as the complete management of fertilizer and pesticide application and daily or weekly inspection of farmers' fields. Other firms leave management decisions to the farmers and provide technical field assistance only a couple of times during the season. Apart from credit in the form of inputs, some firms also give cash credit to their contractors. By providing these interlinked contracts, exporting and processing firms solve the credit and input market imperfections faced by producers. By engaging in these tight contracts they assure the quality and accurate timing of production and harvesting that are required for accessing the European market.

For example, the contracts in the French bean sector in Senegal are usually for one season, for 0.5 to 2 ha of land. The firm provides inputs at the beginning of the season and pays the water bill, cash credit is provided, and sometimes the harvesting is arranged by the company with workers paid by the company.

B. Vertical integration

High value agricultural production and rising food standards are increasingly associated with a shift toward even more extreme levels of vertical coordination. Large exporters increasingly engage in fully vertically integrated estate production in which wage laborers are hired to work at large-scale plantations. This shift is documented, for example, by Minot and Ngigi (2004) for FFV exports from Côte d'Ivoire and by Danielou and Ravry (2005) for pineapple exports from Ghana. Increasing quality and safety requirements, and the difficulty of ensuring these requirements when working with a large number of low-educated small farmers, are usually cited as major driving factors behind the observed supply chain restructuring. In the tomato sector in Senegal (Box 7) no smallholder farmers are involved and 100 percent of tomato exports are produced at a large agro-industrial plantation. Also, in the French bean sector in Senegal (Box 6), a similar case of standards-induced vertical coordination can be observed. Exporting companies have agreed to increase the share of the volume originating from their own estate production and to reduce the share produced through contract farming with smallholders. The companies cited quality rather than quantity as the reason for this change. Even firms that currently rely completely on contract farming mentioned fully integrated production as an important strategy for compliance with food standards in the future and hence for the survival and growth of the firm (Maertens and Swinnen, 2009).

As we will document in the next sections, the governance system in global food supply chains is crucial for understanding how smallholder farmers are involved in these high-value and high-standard agro-food exports.

4. Smallholder participation in high-value supply chains

The shift toward high-value agriculture and the characteristics of high-value food supply chains pose major challenges to the participation of smallholder farmers in these markets. In this section we focus first on the economic arguments related to the inclusion or exclusion of smallholder farms. Then we look at the empirical evidence and point out some solutions to improve the participation of smallholders in high-value agriculture.

4.1 Economic arguments on the inclusion or exclusion of smallholders

Without intermediary actors providing linkages to the retail sectors, coordinating the supply chain, and providing technical and financial assistance to overcome the market imperfections faced by smallholders, it is virtually impossible for small farmers to comply with all the requirements of high-value agricultural markets. Small farmers lack access to information on the rapidly-changing food regulations and quality standards in global markets, technical knowledge to comply with complex food safety and hygiene requirements, and financial means to make the necessary investment. Moreover, labelling, certification and hazard control systems typically require large investments which are only feasible on a large scale. Exporting and processing companies have set up systems of vertical coordination, mostly interlinked contract schemes, to overcome these constraints in order to include rural producers.

However, a key concern is that exporting and processing companies, which take a leading role in increasing vertically-coordinated supply chains, will exclude a large share of farmers, in particular small farmers. There are three important reasons for this:

1. Transaction costs favor larger farms in supply chains. There is an important fixed transaction-cost component in the costs of exchanges between farms and companies, such as administrative costs, costs for time spent communicating, negotiating and monitoring contracts, costs related to the storage and transportation of goods, etc. Especially in high-value supply chains, these transaction costs can be extremely high: quality and pesticide use need to be intensively monitored, cool-storing capacity is important, and the timing of planting, pesticide use, harvesting and delivery are all crucial. All this makes it more costly for exporting companies to deal with many small farmers than with a few larger suppliers.
2. When some amount of investment is needed in order to contract with or supply to the company, small farms are often more constrained in their financial means for making necessary investments, either because they do not have sufficient resources of their own or because they have problems accessing external funds in imperfect rural financial markets.
3. When the agro-food company provides input and credit schemes and assistance to overcome financial and technical constraints, small farmers typically require more assistance from the company per unit of output. Small farms are more likely to lack essential management capacity and they are less likely to have at least some of the investments themselves.

These costs would explain why agro-food companies prefer to contract with the larger farmers and why poor smallholder farmers would be excluded. However, empirical observations show a very mixed picture of actual contracting, with many more small farms being contracted than one would predict (Swinnen, 2005). There are several reasons that might explain why companies want to contract with small farmers:

1. The most straightforward reason is that companies have no choice. In some cases, small farmers represent the vast majority of the potential supply base. For example, in the les Niayes region in Senegal (Boxes 4 and 6) where most of the exported French beans are produced, 88 percent of the households cultivate less than 10 ha, which is considered the threshold to be classified as smallholder. Exporting companies therefore necessarily contract with small farmers. The average farm size of contracted farmers is 5 ha.
2. Company preferences for contracting with large farms are not as obvious as one may think. While processors may prefer to deal with large farms because of lower transaction costs in, for example, collection and administration, contract enforcement may be more problematic – and hence costly – with larger farms. In several interviews company managers indicated that (smaller) family farms

were less likely to breach contracts or to divert company investments than large cooperatives or farming companies (Swinnen, 2005).

3. In some cases small farms may have substantive cost advantages. This is particularly the case in labor-intensive, high-maintenance production activities with relatively small economies of scale. For example, Key and Runsten (1999) present evidence that production costs for small farmers in Mexican vegetable contract production were 45 percent lower than those of specialized farms owned by the processing companies. Costs were lower primarily because of imperfections in labor and land markets. Small farmers had significantly lower labor costs because of access to unremunerated family labor, for which markets are missing, and much lower costs of supervising, transporting and recruiting labor input; also pest control costs were lower due to better crop monitoring and thereby lower chemical use. Further, small farmers' yields in vegetable production were 20 percent higher than on the firm's own farms.
4. Processors may prefer a mix of suppliers in order not to become too dependent on a few large suppliers.
5. Processing companies also differ in their willingness to work with small farms. Some processing companies continue to work with small local suppliers even when others do not. These companies have been able to design and enforce contracts which both the small firms and the companies find beneficial. This suggests that small-scale farmers may have better future opportunities when effectively organized.

4.2 Empirical evidence

The extent of smallholder exclusion from high-value supply chains is a contentious issue and mainly an empirical question. In horticulture supply chains in countries of sub-Saharan African (SSA) there is a wide variation in the share of produce that is procured from smallholders. For example, the pineapple and banana sectors in Côte d'Ivoire and the vegetable sector in Ghana are largely based on smallholder contract farming (Minot and Ngigi, 2004) while other sectors, such as the tomato sector in Senegal, rely on procurement from large commercial farms or company own estate production (Maertens *et al.*, 2011) (Table 1). Some studies have documented that the share of smallholder contract farming in high-value horticulture supply chains in SSA is decreasing as a result of increasing standards (e.g. Dolan and Humphrey, 2000; Danielou and Ravry, 2005). Other studies have shown that among the smallholders it is mainly farmers with more land and non-land assets who are involved in high-value contract farming while the poorest are excluded (e.g. Minot and Ngigi, 2004; McCulloch and Ota, 2002; and Legge *et al.*, 2006). In contrast, some other case studies in Senegal and Madagascar have shown that small farms are included (e.g.; Maertens and Swinnen, 2009 and Minten *et al.*, 2009).

However, collaboration is costly and farmers' associations will be established only if the benefits from collaboration cover the cost. It is often difficult to establish collectively-approved rules, to secure commitment from members, and to monitor and enforce compliance. The failure of producer organizations is often explained by their attempts to undertake activities that they do not have the experience or skills to undertake (Pingali *et al.*, 2005). In some cases they only serve a few influential people and they often lack the necessary skills and resources (Poulton *et al.*, 2006). Successful association requires management and entrepreneurial skills, which are often lacking in a group of poorly educated small farmers. Especially in the case of high-standards fresh production, technical and coordination skills are extremely important. In addition, such production requires very large investments, such as cooling centres and laboratory facilities, which can be very difficult to finance even for a large and well-organized farmer organization.

Table 1. Smallholder procurement in sub-Saharan African export supply chains

Country	Commodity (group)	Year of survey	Share of FFV exports sourced from smallholders	Number of smallholder FFV producers
Ghana	Fruits & vegetables			3,600*
	Pineapples	2006	45%	300-400
	Papaya	2006	10 - 15%	
	Vegetables	2002	95%	
Côte d'Ivoire	Pineapple	1997	70%	
	Mango	2002	< 30%	
	Banana	2002	100%	
Senegal	French beans	2005	52%	600 - 900
	Cherry tomatoes	2006	0%	0
Kenya	Fresh fruits & vegetables	2002	47%	
	Fresh fruits	2002	85%	
	Fresh vegetables	2002	27%	7,000
Madagascar	Fresh vegetables	2004	90-100%	9,000
Zambia	Vegetables	2003		300
Zimbabwe	Fruits & vegetables	1998	6%	10*

Source : Maertens, Minten and Swinnen (2012)

4.3 The role of farmer organization in the inclusion of smallholders

The importance of large transaction costs in modern supply chains, which are more efficiently handled at a larger scale, provides an incentive for small farmers to coordinate their activities. Joint certification, quality control, improved access to information, linkages to customers, etc. would allow small farmers to operate at the same scale and cost as larger production units. By reducing the number of small-scale transactions, they can reduce the costs faced by agri-business companies dealing with a large number of small farmers. In this way they can ensure that poor smallholder farmers are also included in contract schemes. Moreover, organizations of small farmers strengthen the voices of small producers facing the highly consolidated retail industry and improve their bargaining power in the negotiation of contract schemes or employment conditions.

Box 4. Coordination problems among producer organizations in Senegal

ONAPES (Organisation Nationale des Producteurs Exportateurs du Sénégal) comprises Senegal's largest agricultural exporters (80 percent of exported goods); SEPAS (Sénégalaise des exportations de produits agricoles au Sénégal) comprises approximately 15 smaller exporters/producers. They are involved in all aspects of the supply chain, including the supply of inputs, logistical services, technology services and production of FFV for export market. In response to the increasingly stringent food quality and safety standards, ONAPES exporters are increasingly shifting towards large-scale plantations rather than contract farming. On the other hand some SEPAS members are finding it difficult to guarantee the required supply and quality level asked for by overseas customers. Most of the exporting or processing companies in Senegal work with individual farmers, not with farmer organizations.

Small-scale producers in Senegal are organized in federations such as the Federation of Vegetable Growers in the Niayes region (FGMN, Fédération des Groupements Maraîchers des Niayes), which groups 18 000 small scale producers, and the National Union of Vegetable Producers (UNMS, Union Nationale des Maraîchers du Sénégal). But these producer organizations often lack organizational and managerial skills at their lower levels and face difficulties in formalizing links with private investors and in coordinating the different groups.

The Senegalese government is currently coordinating the PDMAS program (Projet de Développement des Marchés Agricoles au Sénégal) to promote the development of high-value agricultural export products. This project specifically focuses on linking small producers and private stakeholders, to ensure the inclusion of small farmers. A major challenge of this program will be to achieve sustainable cooperation between the different organizations of exporters, and between exporting and processing companies and smallholder farmer organizations.

Source: Authors' research.

Therefore, it is crucial to establish sustainable partnerships between producers' organizations and private sector actors. It is argued that the best strategy to support farmer organizations is to concentrate on linking farmer organizations with existing private sector channels (Stockbridge *et al.*, 2003). Cooperation between farmer organizations and the private sector reduces transaction costs for both parties. The private sector may have interest in supporting farmer organizations in order to access sustainable quantities or acceptable quality of products. Hellin *et al.* (2009) argue that at the initial stage there is an important role for public policy and development agencies to establish producer groups and to build managerial and technical capacity. As farmer organizations evolve, it is critical to link them with private sector actors. In the sector of cotton exports, there are now models of farmer organizations capable of engaging both with commercial and public service organizations, following moderate inputs of outside training and facilitation (Bingen *et al.*, 2003). In Ghana, a private processing company promotes the establishment of farmer organizations to reduce transaction costs related to quality standards (Box 5).

The exclusion of small farmers from contract schemes with exporting agro-food companies remains a debated issue. The decision of an agro-food company to contract individual farms or to set up its own large-scale production site is likely to depend on a number of different factors. The more delicate the product and the stricter the quality and safety standards, the more costs are involved in working with a large number of small and often very poorly educated farmers. Also, the availability of cheap labor, land and water in the region can be determining factors. When land and water are easily accessible, it might be more profitable for the firm to set up its own large production site as is the case in the tomato

Box 5. Private support for farmer organizations in Ghana

An example of successful cooperation between private investors and a local producer organization is the Blue Skies Company Ltd. in Ghana. The company was established in the Eastern Region of Ghana in 1998 by a private investor to process fresh chilled pineapple, mangoes, watermelon, passion fruit and papaya for export, mainly targeting European supermarkets. Its products had to be certified as meeting the EurepGAP protocol for quality practices. To ensure this, the company established linkages with farmers and undertook the technical and financial responsibility for certification for all its suppliers. The company sources from some 135 suppliers, including 77 small-scale producers of pineapple. Blue Skies does not work with formal cooperatives, which in Ghana were active mainly in the traditional export and staple crops, but with smallholders in groups which the company itself has promoted.

Source: Gorman and Webber (2010).

export sector in the Senegal River Delta (Maertens, Colen and Swinnen, 2011). On the other hand, when the distribution of land is such that there are only small farms, the company has no choice but to work with these farmers, for example in the French bean sector in Madagascar (Minten *et al.*, 2009) and the French bean sector in les Niayes, Senegal (Maertens and Swinnen, 2009).

5. Direct and indirect benefits for smallholders

Horticulture exports clearly offer important potential for raising rural incomes and reducing poverty because of their high intrinsic value and labor intensity (see e.g. Aksoy and Beghin, 2005; Anderson and Martin, 2005; World Bank, 2008). Many African countries pursue the development of horticulture export supply chains as a specific poverty-reduction strategy. The main focus of policy-makers and donors for achieving pro-poor growth through high-value agricultural production has been on finding ways to assure the inclusion of smallholder producers in profitable high-value chains and contract-farming schemes.

However, smallholder producers might also benefit from the development of high-value agricultural exports through labor market effects. The growth in high-value supply chains has been associated with increased employment in agro-industrial firms. Where high-value export supply chains have moved from being based on smallholder contract farming toward agro-industrial estate production, additional employment has been created on the fields belonging to these companies. Moreover, employment has been created in post-harvest processing and handling of high-value produce as more stringent requirements for sorting, grading, washing and labelling, etc. incorporated in public regulations and private standards have increased the need for labor-intensive post-harvesting activity.

We document the importance of these labor markets effects in the case of SSA horticulture exports in Table 2, showing figures on the number of employees in horticulture agro-industries in several subsectors and countries. The figures show that in many poor African countries, thousands of people are employed in the horticulture agro-industry. Part of this employment might consist of urban jobs in processing units and pack houses but the lion's share is rural employment. Moreover, a major share of the thousands of employees in the SSA horticulture agro-industry is female.

Table 2. Employment in Sub-Saharan African export horticulture supply chains

Country	Commodity	Year of survey	Number of employees in the FFV agro-industry	Share of female employees
Cameroon	Banana	2003	10,000	
Côte d'Ivoire	Banana and pineapple	2002	35,000	
Kenya	Flowers	2002	40,000 - 70,000	75%
	Fruits and vegetables		2,000,000	
Senegal	French beans	2005	12,000	90%
	Cherry tomatoes	2006	3,000	60%
Uganda	Flowers	1998	3,300	75%
Zambia	Vegetables	2002/03	7,500	65%
	Flowers	2002/03	2,500	35%
South Africa	Deciduous fruit	1994	283,000	53%

Source: Maertens, Minten and Swinnen (2012)

These employment and labor market effects have received only limited attention by researchers and policymakers. Yet the studies that have taken labor market effects into account in their analysis of the welfare implications of high-value export expansion in developing countries all point to the importance of these effects. For example, McCulloch and Ota (2002) show that employment in the Kenyan horticulture export industry is especially important for the poor. Barron and Rello (2000) find that the tomato agro-industry in Mexico provides jobs for the rural poor, thereby contributing to raising rural incomes in poverty-stricken regions of the country.

For West Africa, our own case studies from Senegal – which are discussed in detail in Boxes 6 and 7 below – show how employment in high-value agro-food exports contributes largely to the income of the poorest households. These case studies document diversity in supply chain responses to increasing standards and the channel through which households benefit in a direct way.

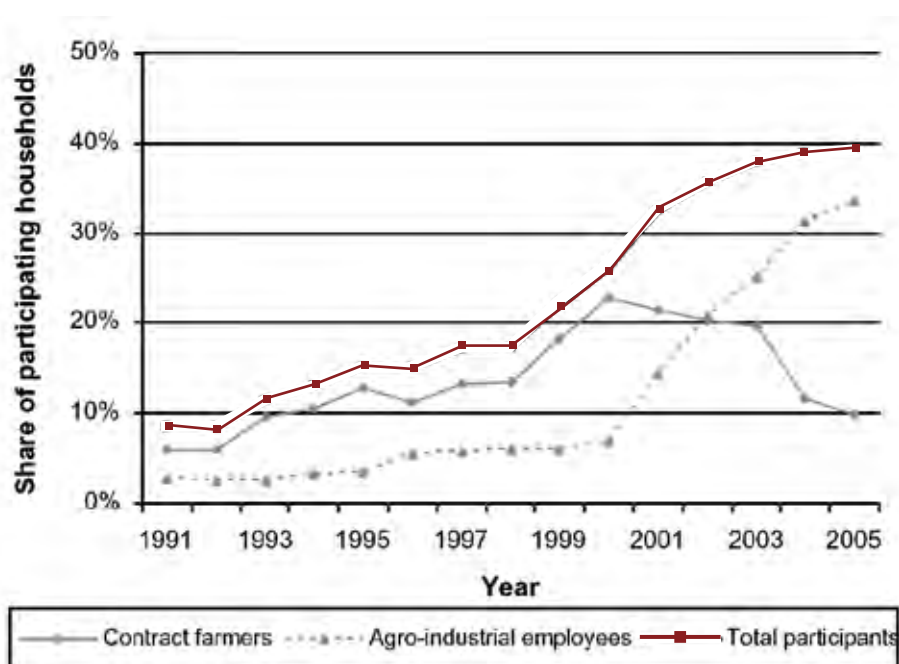
Besides the direct income effects resulting from agro-industrial wage employment, several indirect beneficial impacts are likely to be associated with this type of employment. For example, Maertens (2009) shows how access to unskilled employment in the export agro-industry has contributed to alleviating farmers' liquidity constraints, resulting in increased smallholder agricultural production. Households with agro-industrial employees cultivate between 17 and 37 percent more land and spend between 23 and 75 percent more on agricultural inputs than households without such employment. These significant effects imply that off-farm income is partially invested in the family farm and point to the existence of farm/non-farm investment linkages at the household level. In addition, there might be management and technology spillover effects related to employment on large agro-industrial estate farms.

Another important indirect effect relates to the large share of female workers in employment in high-value agricultural supply chains; gender implications can therefore not be neglected. Based on the case studies in Senegal and wider evidence for other developing countries, Maertens and Swinnen (2012) conclude that the growth of modern supply chains leads to increased feminization of rural labor markets, reduced gender inequalities in rural labor markets, increased female empowerment and economic independence.

Box 6. Income and poverty effects of French beans exports in Senegal

In the French bean export sector in Senegal increasing standards have induced a shift from smallholder contract farming toward vertically-integrated estate production by the exporting companies. It is estimated that smallholder procurement decreased from 95 percent in 1999 to 52 percent in 2005. The largest companies especially changed their procurement system and started their own integrated estate farms as part of a strategy to become GlobalGAP-certified. The shift from smallholder contract farming toward integrated estate farming observed in the bean export sector in Senegal has also shifted the way local households benefit: increasingly through agro-industrial employment and labor market effects rather than through contract farming and product market effects.

Figure 6. Trends in contract farming and employment impact in export-led agro-processing



Although both effects result in significantly higher incomes, the shift in supply chain governance has resulted in a stronger poverty-alleviating effect of high-value horticulture exports.

Figure 7. Revenue and employment effects from contract farming in export agro-industry

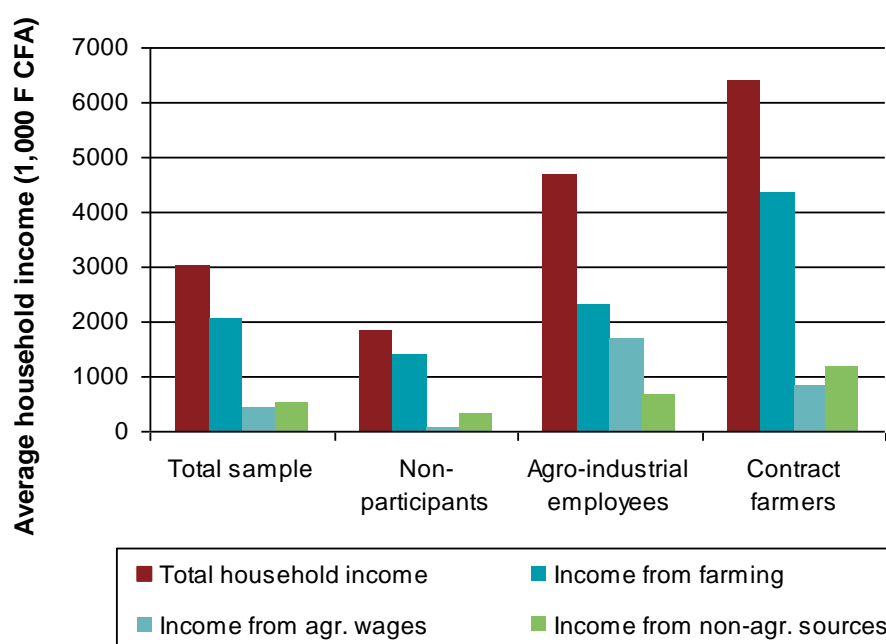
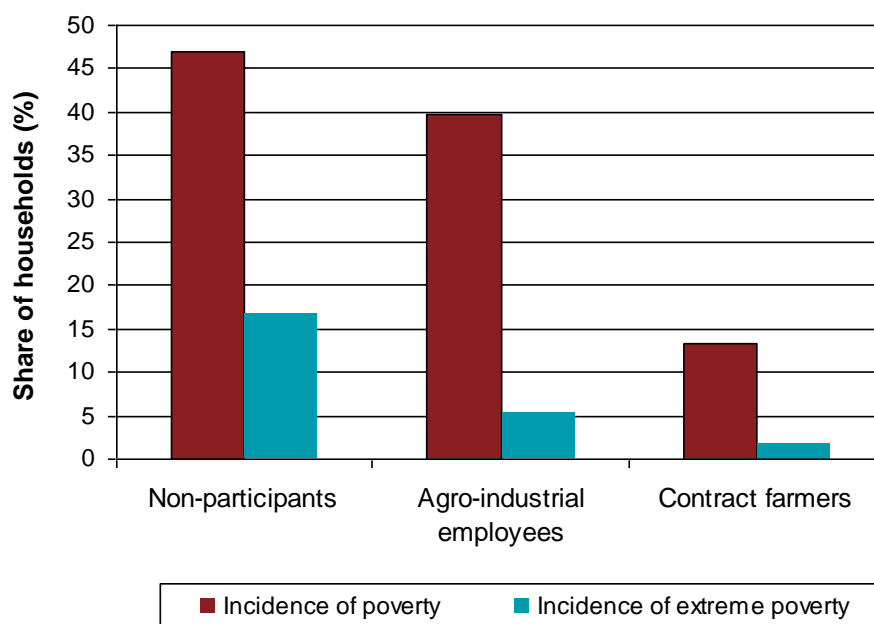


Figure 8. Poverty impact from contract farming, employment and non-participation in export agro-industry



The case study results show that the poorest households mainly benefit through agro-industrial employment while contract farming is biased toward relatively better-off households with more land and non-land assets.

Source: Maertens and Swinnen (2009)

Box 7. Complete vertical integration in the tomato export sector in Senegal

The Senegalese tomato export sector is dominated by one multinational company which was established and started exporting tomatoes from Senegal to the EU in 2003. The export supply chain is completely vertically integrated. Smallholder procurement is 0 percent and production, processing, trade and distribution is completely integrated within the subsidiaries of the multinational companies. In the tomato export sector in Senegal rural households therefore only benefited through labor market effects.

This case study also shows that it is mainly the poorest households who benefit from the labor market effects of increased high-value horticulture exports.

Figure 9. Revenue impacts for farmers working or not in the tomato industry

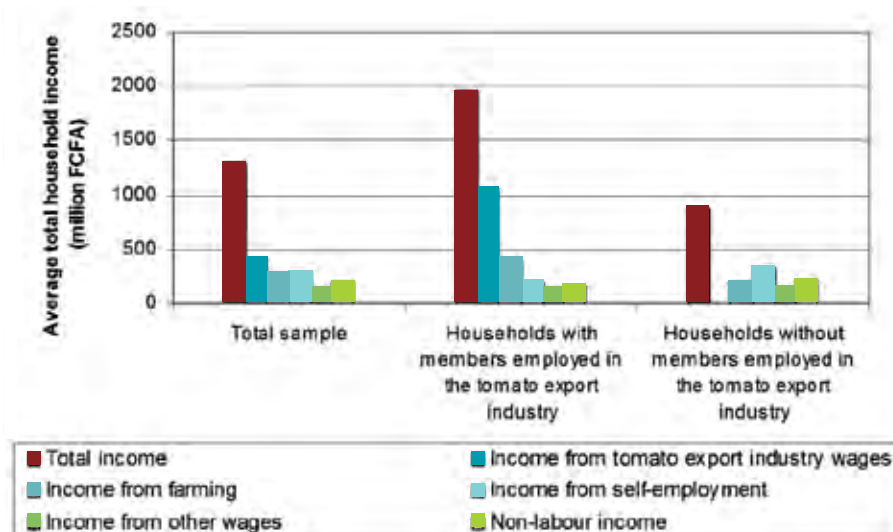
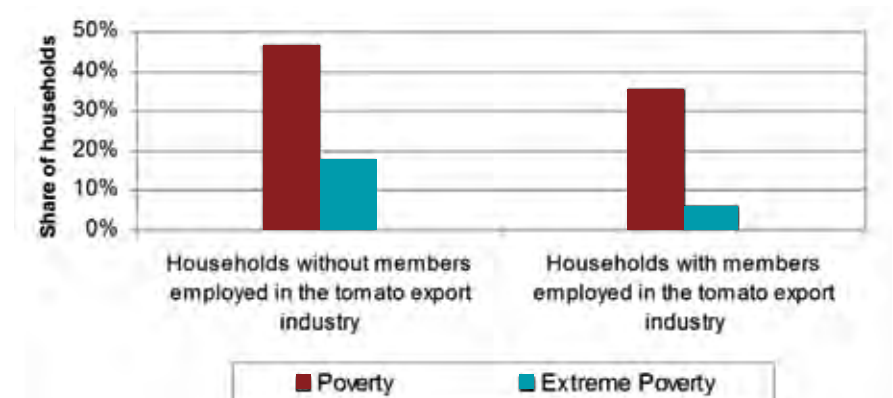


Figure 10. Poverty impact from participation in tomato processing



Households employed in the tomato export industry, either in the fields or in the processing units of the company, have incomes that are more than double the incomes of other households in the region although they initially, before the multinational company started investing in tomato exports in 2003, had lower land and non-land asset holdings. Increased tomato exports have resulted in increased employment, increased incomes and ultimately reduced rates of poverty and extreme poverty.

Source: Maertens, Colen and Swinnen (2011).

6. Policy implications

The importance of high-value agricultural markets in developing regions, including West Africa, has increased greatly over the past decades and is mainly directed towards export markets in the European Union. The shift away from traditional export crops, toward non-traditional high-value agricultural products is accompanied by structural changes. High-value agricultural supply chains are characterized by stringent food standards and high levels of consolidation and vertical coordination. These changes create important opportunities for enhancing agricultural productivity and for increasing rural incomes and reducing poverty but they also impose major challenges for West African countries and for the most resource constrained households. These challenges and opportunities create an important role for policy initiatives which can address the main constraints related to the development of high-value agricultural supply chains and to the participation of the poor in these chains.

In this final section we present policy recommendations to enhance welfare benefits for the rural poor in West Africa. We start with general recommendations, followed by discussion of more detailed policy issues.

The first general recommendation is recognition of the importance of high-value chain development and the vertical coordination phenomena in global and domestic agro-food chains and therefore the need to integrate these developments explicitly: into policy and programme strategies. Structural changes and vertical coordination in high-value agro-food chains are also important developments in low-income countries, in the light of economic growth as well as poverty reduction and rural development. Most West African policy-makers have not integrated these structural developments so far.

The second general issue is that there is significant policy variation across countries and sectors. The implication is that there is no one-size-fits-all strategy but instead several models of supply chain coordination, reflecting commodity characteristics, the distribution of land and labor in the region, and different stages of development. Optimal policies and policy components will also need to differ and change to reflect these differences.

The third general concern is that most policy attention by far has gone to the effect on smallholders. However, it is crucial to recognize and support the beneficial effects of employment in the high-value agricultural sector. The potential beneficial welfare effects from wage employment in high-value agricultural supply chains are usually overlooked by policy makers. As the shift to more integrated employment in agro-industrial firms becomes more pronounced, the direct and indirect effects of this employment should be appreciated and considered in the overall strategy of rural development.

In the rest of this section, we discuss in detail some key policy issues that are relevant for reaping the potential benefits created by high-value supply chains. First, we propose some policies that enable and stimulate the development of these chains, then focus on policies that enhance the participation of smallholders in high-value supply chains.

6.1 Enabling and stimulating the development of high-value supply chains

When policy-makers want to increase the benefits for small farmers through their participation in high-value agriculture, an initial series of policy issues consists of enabling and stimulating the development of these high-value supply chains. There is a need to increase the capacity for producing high-quality and safe food. Some low income countries have been able to establish the regulatory, technical and

administrative arrangements to meet tightening standards in high-value agricultural markets. In addition to increasing the capacity to supply high-quality and safe food, there is a need to create the capacity to respond quickly to emerging food safety issues, changing legislation and a variety of private standards. We indicate some key elements for improving the capacity for compliance to food standards:

A. Improving administrative, infrastructure, technical, scientific and judicial capacity

The public sector can play a role in improving the administrative, infrastructure, technical and scientific capacities for the production and marketing of high-standard food products. The development of food safety management and control systems is essential for participation in the growing high-value agricultural markets and involves attention to the legal system, institutional transformation, human capital formation, and physical infrastructure. Government investment in projects, institutions, and technical assistance to stimulate higher quality and to strengthen public sector quality testing are necessary for building food quality and safety capacity. This could include the development of systems for accreditation, conformity assessment, labelling and certification (e.g. *Origine Sénégal*), establishment and maintenance of monitoring and control systems, investment in laboratory units and scientific human resources, as well as laying down directives for good agricultural practice, promoting better post-harvest practices, developing better traceability systems, etc. However, certain investments, such as in cold storage capacity and transport facilities are more efficiently dealt with by the private sector. High-value chains are typically characterized by vertical coordination to guarantee quality and food safety throughout the supply chain. To stimulate the development of high-value chains, it is therefore crucial to enable and stimulate vertical coordination. This may entail institutional changes, such as specifying property rights, creating the right judicial system and supporting contract-enforcement mechanisms.

B. Farmer and business assistance programmes

Preparing suppliers for quality- and standards-driven markets will make it easier for them to be integrated in high-value agricultural markets. Farmers and smaller agro-food businesses, in particular, face substantial constraints on gaining access to information about changing food safety legislation and quality standards in global markets, as well as translating that information into specific investment needs to realize those investments and manage high-quality production. Farmer and business assistance programs can play a crucial role in providing technical and market information, appropriate credit schemes, and technical assistance for high-value production. In addition, there is a potential role for the government and international organizations in establishing and developing sustainable trading relationships through specific marketing assistance programs.

C. Demonstrating capacity for producing high-standard food

In order to participate in high-value global supply chains, developing countries need to demonstrate their capacity for high-standard food production. It is not enough to comply with stringent food standards; this compliance also needs to be demonstrated, such that specific food products from specific countries are perceived as safe and high-quality products by domestic and foreign consumers. Therefore, conformity in quality and compliance to food safety standards are crucial. Even if individual private firms are able to comply with strict requirements, a country as a whole will not be able to gain market access and significant market share if there is no conformity. This requires specific measures, such as labelling, certification and promotion of high-value products, which involve public as well as private investments.

D. Stimulating investment in the agro-food industry

Probably one of the most essential elements for integration in and development of high-value food supply chains is to encourage private investment – domestic as well as foreign – in the agro-food industry. A good investment climate is the driving force behind economic growth and poverty reduction, and policy uncertainty is the primary concern of firms in developing countries. There is ample evidence that a poor policy environment has a negative effect on investment in the agro-food industry and on vertical coordination programs. As such it constrains integration in high-value supply chains and the beneficial effects of vertical coordination. Macro-economic stability is also a key condition for stimulating domestic investment and attracting foreign investors but this is even more the case for supplier assistance programs or other forms of chain-based finance in vertically integrated supply chains. Because vertical coordination is a financial activity, significant economic instability may cause coordination and enforcement failures, leading to a collapse of contract schemes and obstructing the development of high-value supply chains.

Foreign investment in the agro-food industry can play an important role in increasing the supply capacity for high-standard agricultural production in developing countries and facilitating their integration in global supply chains. Because of their links with their home economies and with subsidiaries in other countries, foreign investors and multinational companies have better access to high-value agricultural markets, better knowledge about food safety and quality issues, and enhanced financial and technical capacities to meet compliance with food standards. This might develop the supply and marketing capacity of the host economy as a whole and through spillover effects improve the capacity of domestic firms.

E. Rethinking the role of government

The development of high-value supply chains and vertical coordination requires a fundamental reconsideration of the role of the government in policy-making. Large companies develop their own standards, their own extension services, supply channels and wholesale exchange institutions, quality testing, etc. Some of these activities are in areas where governments were traditionally considered to play an important role. Hence there are fundamental and difficult questions about the role of the government in such a changed environment.

A central focus needs to be on collaboration between private companies – which play a crucial role in the supply chain process – and public authorities and international organizations. Successful public-private partnerships require a well-organized private sector, with representative and effective farmer business associations that are supported by the government, and a forum for communication. For example, because private companies are often better informed about technical possibilities, private sector involvement is important in public standard setting, development of certification procedures, and the establishment of control systems for food safety. Also, several innovative chain-based financing instruments in high-value supply chains have arisen as private initiatives, which have a (limited) role for government. Government intervention could include provision of the regulatory and legal system which is required for these instruments to function, or government may play a role in co-financing seed money to start up some of these innovations. Governments should be open to innovations which explicitly take into account the supply chain as a structural aspect of the financing problem, while being clear eyed on the role international organizations and the government should play.

A successful example of a partnership between the private and public sector contributing to positive development is a recent collaborative project between the Michigan State University-based Partnership for Food Industry Development (PFID), South African retail chains and local NGOs. This collaboration,

financed by the United States Agency for International Development (USAID), has led to the creation of a framework approach in which small farmers' access to seeds, services, finance and output markets are integrated – much like vertical coordination in private sector driven models. This has led to upgrading of small farmers' supplies and integration of small farmer groups in South African supply chains. Retail chains are interested in working with USAID in Africa to replicate this system.

6.2 Enhancing the participation of small farmers

For policy-makers concerned with pro-poor economic growth, enhancing efficiency and equity in high-value agricultural supply chains is a key goal. Therefore, it is crucial to ensure the participation of the rural farm population in these supply chains as well as equitable distribution of rents in the chain.

A. Reduce transaction costs

The disadvantage for small farmers in high-value supply chains is partially due to transaction costs. Therefore, government policy needs to focus on reducing transaction costs. This can be done in several ways.

First of all, vertically-coordinated systems are a private sector response intended to overcome transaction costs faced by small, individual farmers (access to information, costs related to quality control, etc.) and should therefore be promoted.

Second, the transaction costs faced by private actors interacting with a large number of farmers could be reduced by investing in intermediary institutions. Intermediary institutions reduce the number of transactions and the cost of exchange between farmers and processors or input suppliers. Specific investments could include the creation of farm associations and collection points where processors and retailers can source from many small suppliers at low transaction costs.

B. Investment in infrastructure

Improvements of rural infrastructure can reduce transport costs and, more generally, the cost of including supplies from remote areas. Rural infrastructure is a serious constraint on the development of high-value agricultural activities, and particularly on integrating smaller producers and those in more remote areas. For example, bad roads, regular electricity interruptions, and lagging communication impede the coordination between producers, traders and processors, and constrain investments. Public investments in such infrastructure would stimulate agribusiness investment, vertical coordination with suppliers and inclusion of small farmers in remote areas.

C. Investment in farmers associations

Producer organizations can play an important role by enlarging the scale of the units that traders have to deal with and by improving small farmers' bargaining power. By combining a large number of small farmers, producer organizations reduce the number of transactions for the agro-food processor or exporter. Stimulating farmer associations is an often-mentioned policy – in fact, it is hard to find a policy document which does not describe it as important. However, creation of farmer associations that are integrated in the coordination system of high-value agricultural supply chains might require

innovative approaches. Producer organizations often lack technical background and coordination skills to manage the quality requirements. Governments and development agencies play an important role in supporting the capacity building of producer organizations, especially in establishing and promoting linkages between farmer organizations and the private sector.

D. Enforce competition

Competition in high-value supply chains is of great importance, both for efficiency and equity. Competition induces processors, retailers, and input suppliers to provide more supplier-assistance programs and it constrains rent extraction from suppliers by up- or downstream companies. Given these strong benefits of competition for farmers in the chain, ensuring competition is an important role for the government. Competition should be enforced through both domestic policies (e.g. competition policies, lower barriers of entry) as well as external policies (e.g. liberal trade policies). The importance of competition does not apply only to private companies, but also holds when the government directly or indirectly imposes a monopoly system, thereby extracting rents from farms. Moreover, competition is also important on the input side. The existence of alternative channels of credit or inputs will constrain rent extraction in the supply chains. Therefore investments in alternative sources of farm finance, such as cooperative credit associations and microcredit institutions, should be supported and continued.

E. Enhance the bargaining power of farmers

Empowering farmers is necessary to strengthen their position in the chain and vis-à-vis governments, enabling them to bargain for better contract deals, better policies, etc. Several of the policies mentioned earlier will contribute to this objective, such as stimulating farmers' associations, investing in quality control institutions, and establishing competition policies. There are a number of additional policy measures which can enhance the bargaining position of farmers.

1. Empowering farmers involves investment in institutions to assist farms with contract negotiations and dispute settlements. Measures to increase the transparency of the contract system, provide for dispute-settling arrangements, provide market benchmarks for price negotiations and train farmers in their rights/obligations as contractors are all important to increase competition among contracts, and thereby the bargaining position of farmers. As it is generally either not possible or too costly to resolve disputes in court, alternative dispute-settlement institutions can play an important role.
2. Empowering farmers also requires investment in (independent) institutions for quality and safety control and certification. Investing in quality control centers has the additional advantage of enhancing the bargaining power of suppliers and ensuring appropriate payments for quality in the chain. This will lead to better investment incentives and more equal distribution of rents. Improving quality controls, e.g., by introducing an independent control institution or by letting farm representatives participate in the evaluation, has both efficiency and equity benefits.
3. Empowerment of farmers will also come from having alternative options in accessing inputs and selling their products. Hence, it is important to encourage alternatives in input and output markets. Competition and liberalization of export regimes will also enhance the position of farmers. Investments in projects and institutions supporting higher quality will contribute to this goal.

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Chapter 10

Comparative analysis of mango value chain models in Benin, Burkina Faso and Ghana

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1. Introduction

1.1 Objectives and research questions

This chapter investigates the mango value chains in the West African region. Mango (*Mangifera indica* L.) is a high-value crop that is traded on domestic, regional - and increasingly international - markets. As such this value chain can be seen as exemplary for examining the issue of fostering smallholder-inclusive value chains, enhancing sustainable entrepreneurship, and allows for conclusions about the development of different models of value chains in sub-Saharan Africa.

The largest share of mango production is traded and consumed fresh; the remainder is mostly processed into dried mango or juice/pulp. Over 90 percent of mango production is grown by smallholder farmers with low investment capacity (Vayssières *et al.* 2008). We have selected three West African countries (Benin, Ghana and Burkina Faso) that produce mangoes under generally similar climatic conditions. All three countries are potential suppliers to the European markets because of their relative proximity. Different value-chain models have developed in recent decades in these countries, regarding supply to European markets, relationships with partners in the chain and the level of upgrading of mango production and processing.

The case studies take into account the fact that smallholders are highly heterogeneous, both within and across locations; therefore, conclusions for policy and institutional support are possible which account for different circumstances. By comparing some of the most typical models, we will provide insight into opportunities that exist for smallholders to benefit from value-chain development of high-value products.

The general objective of this chapter is to analyse and compare the mango value chains in Benin, Ghana and Burkina Faso.

More specifically, we will try to answer the following questions:

- What are the currently existing value-chain models for mango sectors in Benin, Ghana and Burkina Faso?
- What are the implications of these chains on the socio-economic position of smallholders?
- What can we learn with respect to institutional innovations and policy interventions in support of smallholder market participation?

1.2 Overview on high value crops

The liberalization of trade and the increasing integration of the global economy offer opportunities to generate higher income to many people around the world. These developments also offer consumers better access to higher quality and increasingly differentiated final products (Kaplinsky, 2000). One of the most important new opportunities for many developing countries is the increased demand for non-traditional high-value agricultural crops on international markets.

The agrifood system currently faces many challenges. Increased population and urbanization, as well as better education in health and nutrition, is leading to an increasing consumer preference for healthy processed and ready-to-eat products in both developing and developed countries. In industrial countries the demand for specialty products and year-round supply of fruits and vegetables is increasing (World Bank, 2008). Trade and investment liberalization and the trend toward export-oriented trade policies have played a role in stimulating countries worldwide to diversify the traditional export commodities

such as cocoa, coffee and sugar, by exploiting their comparative or competitive advantages in the export of high-value crops. High-value crops are products obtained from horticulture (fruits, vegetables and flowers), livestock rearing, fisheries and organic products. The main importing countries of fresh fruit and vegetables are France, Germany, the Netherlands and the United Kingdom.

Brazil, Chile, China and Mexico are strong players on the export markets for these high-value crops, but sub-Saharan African (SSA) countries such as Ethiopia, Kenya, Madagascar, Senegal and South Africa are also gaining access to selected markets (Swinnen *et al.*, 2007; Labaste, 2005). In addition, demand for processed horticulture products is growing in domestic and regional² as well as international markets.

Statistics show that the volume of exports of fresh fruits and vegetables from selected SSA countries to the European Union (EU) has increased from 1998 to 2009 (Bruinsma, 2008). For example, Kenya exported approximately 134 000 tonnes of fresh fruits and vegetables in 2006/2007. The main products include green beans, snow peas, okra, chillies, mangoes and cut flowers. Large investments have been made in the cut-flower, pre-packaged fresh fruits and vegetables sectors, following demand in European markets.

The development of value chains in many other SSA countries faces different constraints which threaten the position of SSA producers on the world market, such as the high costs of certification, and high transaction costs along the chains (e.g. due to poor infrastructure and transport, or to informal taxes). The quality and quantity of horticulture products from many SSA countries is highly heterogeneous, resulting in a poor reliability of supply. In order to overcome quality heterogeneity and increase efficiency of production, some countries have made the transition to large-scale production for some of their crops. This is creating employment opportunities, but frequently leads to exclusion of smallholder producers from export value chains.

Another challenge is strong competition from countries in Asia and South America which have lower production costs and better economies of scale. An example is the export of fresh pineapples from Côte d'Ivoire to Europe. Exports increased from the 1970s to the 1980s, with a peak of 193 775 tonnes in 1986. At that time, Côte d'Ivoire accounted for 95 percent of total pineapple imports in Europe. However, in the early 1990s large companies such as Dole and Del Monte, which had plantations in Central and South America, penetrated the EU market with a new pineapple variety (MD2). The predominantly small-scale producers in Côte d'Ivoire had to compete with large companies benefitting from economies of scale and at the same time had to respond to increasingly stringent market requirements. Consequently, Côte d'Ivoire pineapple exports fell. The sector is slowly regaining a position on the international market with the introduction of its own pineapple brand and the introduction of a tracking and tracing system. This example shows the vulnerability of EU export dependence and the need to be able to respond quickly to changes in the market (Ruben *et al.*, 2007).

As in the case of Côte d'Ivoire, most developing countries face constraints that prevent agricultural commodity chains from being flexible and being able to take full advantage of new or changing market opportunities. Furthermore, targeting exclusively international export markets at the expense of alternative markets need to be reconsidered. Frequently, export markets are targeted because of their higher prices, while in fact their high costs, risks, and low competitive advantage would make it more sustainable and profitable for producers to engage in domestic or regional markets.

² West African region.

These constraints can force smallholders into positions that are economically suboptimal. The inclusion of existing smallholders in new or alternative value chains (e.g. new products, technologies, institutional innovations, organizational systems) could enable them to capture higher returns, but only when this is in line with potentially available resources, equitable distribution of benefits and institutional conditions (see e.g. Maertens and Swinnen, 2007; Minten *et al.*, 2006). Moreover, a better economic position for smallholders can have a significant spin-off to off-farm economic activities such as processing, transport or packaging.

Strategies for achieving inclusion of smallholders in new or alternative value chains are diverse, and depend on the characteristics of the producers. Contextual issues and producer access to resources (e.g. inputs, technology and skills) result in heterogeneity among the producers (cf. Hunt and Morgan, 1995). Therefore, it is necessary to customize value-chain models according to the characteristics of the producer, in order to increase the sustainability of the chain and reduce the risk of producer exclusion.

2. Methodology

In order to answer the research questions, we will start with a general description of the mango sector in each of the three countries. This will be followed by presentation of a simplified typology of chain models that include smallholder producers. We will discuss some of the most typical models in the three countries, and present the selected case studies. Finally, we will assess the case study models based on selected indicators, so that we can compare the implications for smallholders.

2.1 Sample choice

In order to allow for a comparison of the effects of different value-chain business models on the position of producers, ideally we would select a homogeneous sample of smallholders. The scope of this study covers several different countries, however, so it was impossible to select a fully homogeneous sample, because contextual factors such as climate and soil conditions influence the performance of the producers in the chain.

In order to make a valid comparison, we have used the following criteria for the selection of the smallholder producers:

- The acreage of the mango orchard does not exceed 10 ha;
- Mango is produced with a commercial objective;
- The mango orchard consists of predominantly improved mango varieties ($\geq 50\%$).

More details on the exact sample size for each case study are presented in section 6.1.

2.2 Data collection methods

Data from smallholders were collected through administration of semi-structured questionnaires and focus group discussions during the period from 27 February to 11 March 2010. The semi-structured questionnaire for the smallholders is composed of a series of open-ended and closed questions. It includes several components, including smallholder characteristics, investments made in mango production over the past five years and efficiency of commercialization, as well as information on the

organization of the chain, and perceptions on current situation and trends. For focus group discussions and interviews with other stakeholders in the chain, an interview guide was prepared with open questions. This enabled an informal but guided conversation with respondents.

2.3 Methodology for assessment of value-chain models

In our assessment of value-chain models, we assume that a chain has a positive effect on the socio-economic position of smallholders if:

- it is successfully linking the farmers to markets;
- mango production is a profitable business for smallholders.

In order to measure these characteristics we have selected a number of key indicators. The scope of this study did not permit interviewing a representative sample of smallholders in each value chain, which would allow in-depth statistical analysis. Therefore, we have applied informative research methods. Indicators on economic and financial profitability are generally difficult to measure with a small sample size,³ and it is also difficult to draw comparisons between different countries. Prices, costs and purchasing power vary greatly between countries. For this reason, we have selected a number of indicators which can be measured by surveying the perceptions of the smallholders in the chain models.

The table below shows the indicators and proxies that have been selected to assess the chain models.

Table 1. Model indicators for analyzed value chains

Characteristics	Indicator	Proxy
1. Successfully linking farmers to markets	1. Market efficiency	Fruit losses at farmgate
2. Profitable business for smallholders	2. Business performance	a. Level of investment b. Contribution of mango farming to total income c. Perception of current situation and trends

1) Market Efficiency

This indicator highlights the effectiveness of the smallholder producer at reaching outlet markets. If farmers are able to add value to their full production, they can reach market more efficiently. Therefore we have calculated percentages of fruit lost as well as the perceived reasons for losses.

2) Business performance

a. Level of investment in mango production

This indicator has been selected because it demonstrates the importance of mango production for the farmer. It demonstrates the farmer's devotion to the business, how s/he is judging the expected income and the risks, and to what extent s/he is dependent on mango production. Therefore, if we assume that producers only invest when they judge mango farming to be a profitable activity, their willingness to invest can be used as a proxy for business performance. To measure the level of investment, we asked producers whether during the past five years they have made investments such as weeding, pruning of trees and making a fire belt, which can be considered to be the basic field maintenance activities. In addition, we asked them whether they have made any additional investments, such as treatment

³ Not all respondents were able to answer all questions in the questionnaire, or questions were not of sufficient quality to be included in the analysis.

against pests and certification of the fruit, which require specific resources. The sum of these answers (0=no, 1=yes) we have used to calculate an index, which we can use to compare the different groups of smallholders.⁴

We have counterbalanced this index with two additional indexes showing the extent to which the investments have been subsidized by business partner/government/non-governmental organizations (NGOs) (0=no, 0.5=partly, 1=yes), which will allow us to calculate the Net Investments (actual farmer investments). Also, we have asked the respondents to what extent this subsidized investment was by request of the producers themselves (0=no, 1=yes).

We base this approach on the recent observation of development practitioners⁵ that highly subsidized interventions to support smallholder inclusion in value chains may have “quick wins” but do not guarantee the sustainability of the intervention. This means that after projects end, the gains for small producers may fail to continue because of a lack of ownership and market distortion in local input and service markets.

b. Contribution of mango farming to total income.

Traditionally, smallholders are involved in the production of a mixed portfolio of staple food crops, cash crops and livestock. The contribution of mango production to the total income will point to the importance of the crop for the producer and therefore indicate the business performance of the smallholder.

c. Perception of current situation and trends

The perception of the smallholders about their current mango farming activities, their satisfaction with their income from mango production and their vision of their future as mango producers will give us additional information about the satisfaction of the producers with the remuneration they receive for their activities within the chain. We have proposed a number of statements to the smallholders and asked them whether they agreed or not (not true at all=-2, not true=-1, indifferent=0, true=1, very true=2).

3. Mango Sector in Benin, Burkina Faso and Ghana

Below we briefly describe the general context of mango production in the three countries studied. We review the economic environment, followed by an overview of the mango sector in each country.

3.1 Benin

A. Policy framework/macro-economic context

Benin has a coastal West African economy, based on the agriculture sector which employs around 80 percent of the population. Approximately 65 percent of the population lives in rural areas and relies on small-scale agriculture for income. Farmers suffer from a limiting environment and income levels are usually insufficient to invest in quality inputs such as seeds, fertilizer or farm machinery (UNDP, 2008).

⁴ We have tried to limit the variable that some investments are more relevant in other countries.

⁵ See for example the M4P approach (DFID and SDC, 2008).

Cotton is still one of the main export commodities, despite falling prices on the world market and inefficiencies in the value chain. Industry is underdeveloped and restricted to simple import substitution products and basic agro-industrial factories. In the 1990s, the government commenced the privatization of state enterprises such as breweries and textiles, tobacco, cement and petroleum producers, which has significantly reduced government spending and increased foreign direct investment.

B. Mango sector

Substantial volumes of mango are produced in Benin, which are mainly sold domestically but also regionally to Niger and Nigeria. Reliable data are absent but FAO estimates the area covered with mango⁶ to be 2400 ha in 2008 with an annual production of 13 000 tonnes (FAOSTAT). The mango is produced by smallholders who usually have a mixture of mango varieties in their orchards.

The main area of production is situated in the north of Benin. In the 1990s the government of Benin established a large factory to process pulp/juice of mango and other fruits and vegetables. After a few years of limited production, the factory was privatized, but because of inefficiencies and management issues, the factory has since closed. Initially the government promoted the plantation of mango orchards to ensure provision of raw material; therefore in the zone of the factory many plantations can still be found.

The main fraction of commercialized mango is traded within the country, mostly to urban markets in the south. A small fraction is traded to Niger and Nigeria in bulk for low prices, especially to regions where food insufficiencies exist. Benin does not currently export mango to Europe and only a marginal amount of mango is processed into juice or dried mango for the domestic market.

High losses of mango are reported in Benin. In 2006 Boueyi *et al.* observed that much fruit is lost before the end of the marketing trail, often even at the farmgate because producers are unable to find buyers and an acceptable price. Fruit fly infestations are also causing heavy losses in mango production, both in terms of fruit quality and yield. In Benin (department of Borgou), loss averages in 2006 varied from 20 percent in the beginning of April to more than 50 percent in June (Vayssières *et al.*, 2008). The high infestations can be linked to increasing populations of *Bactrocera invadens*, a new invasive fly species coming from Sri Lanka. Research and initial experiments with control methods such as biological pesticides, baits, weaver ants and parasites have shown promise. However, producers in Benin currently have no access to these inputs.

Mango producers in Benin are not organized and face constraints, such as lack of access to credit and technical support, as well as high losses, which restrain the effective linkage of the producers to new markets and reduce the potential creation of value from mango.

3.2 Burkina Faso

A. Macro-economic context

Burkina Faso is a landlocked country bordered by Benin, Ghana, Ivory Coast, Mali, Nigeria and Togo. It has enjoyed good social and political stability for nearly two decades, and the country has undergone a process of democratization and structural reforms (UNDP, 2009). Burkina Faso benefits from a sizeable annual amount of Official Development Assistance (ODA), which was 15 percent of Gross Domestic Product (GDP) in 2007, a percentage that has increased steadily since 2004 (when it was 12%) (UNDP, 2009).

⁶ FAO Statistics for product group "Mango, Mangosteen and Guava". The latter two products are produced marginally in Benin.

Despite development efforts, at least 50 percent of the rural population lives below the poverty line. Sixty-seven percent of the total population depends on agriculture and animal husbandry and 86 percent of all jobs and income in Burkina Faso are generated by agriculture. Cotton is the biggest income-generating crop for export (World Bank, 2009).

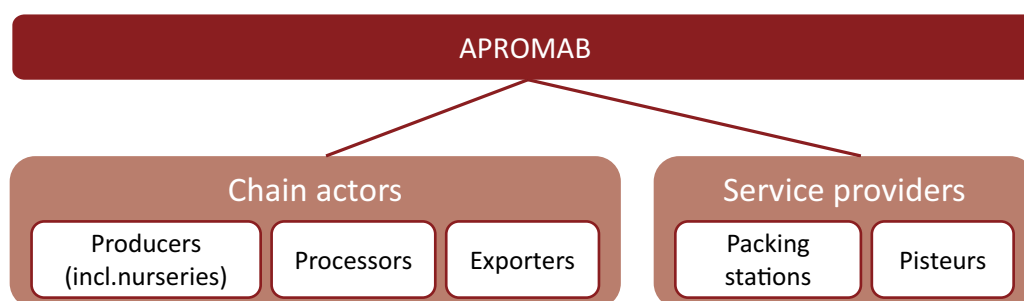
The country is extremely vulnerable to climatic variability; the erratic rainfall pattern regularly leads to food shortages. The production of mango is less vulnerable to drought than other crops, such as maize and cotton, and mango does not exhaust soil nutrients as much as cotton does.⁷

B. Mango sector

Besides cotton, mango is one of the few exportable crops produced in Burkina Faso. Mango production is part of the traditional farming system and is mostly grown on small-scale farms. Different quality grades of mango are exported from Burkina Faso: organic and/or fair-trade certified mango as well as conventional mango. Also, a substantial share of mango is processed into dried mango, juice and pulp, for domestic and export markets.

The mango sector in Burkina Faso is generally structured as follows: in the villages the producers are organized in village farmer groups and several groups together form a cooperative. Several co-operatives together in turn form a union and finally the unions become a (usually national) federation. In Burkina Faso, an official federation for mango producers does not exist; however the Union of Vegetable and Fruit Producers (UFMB) operates formally as a federation.

Figure 1. Composition of APROMAB



In addition to this, in 2006 the *Association des Professionnels de la Mangue au Burkina (APROMAB)*, was created, which is a communication and lobby platform composed of representatives of all major chain activities (see Figure 1), as well as service providers (packing stations, “pisteurs⁸”). The establishment of APROMAB has been promoted by support programs such as the World Bank and the Dutch development organization SNV.

PAFASP The Agricultural Diversification and Market Development Project (*Projet d’Appui aux Filières Agro-Sylvo-Pastorales, PAFASP*), is a six-year project that started in 2006 and received

⁷ However as transfer of CO₂ from the atmosphere, we have to note that CO₂ sequestration does not represent a long term carbon sink and therefore does not contribute to long term reduction in greenhouse gas concentrations.

⁸ Pisteurs are wholesale traders who usually collect mangoes at the farmgate and sell to exporters and retailers.

USD 66 million in financing from the World Bank. The project objective is that by the end of 2012 the total volume of exports on the international and inter-regional markets for four selected products, including mango, will achieve significant increases.

For mango producers, the program provides subsidies of 65 percent for field maintenance, 95 percent for training and 90 percent for phytosanitary treatments. To control fruit flies, PAFASP has procured a biological product and invested in training of technicians. The project has also financed large infrastructures, such as packaging and cold storage facilities in Bobo-Dioulasso, to improve the export product safety system.

In Bobo Dioulasso, a major town in the mango production zone, three major packing stations have been established. One of these is funded by the PAFASP project, and was built to serve all fruit and vegetable chain actors in the region. It is the largest station in the area, with modern equipment for proper sorting, grading and packing. The building is currently rented by a private company and has handled more than 10 000 tonnes of mango.⁹ Two other private pack houses in Bobo Dioulasso are Fruiteq and Ranch de Kobalt. In the pack houses, the mature mangoes for export are selected, cleaned and packed, after which the largest share is transported by train to the harbour in Abidjan (Cote d'Ivoire) and shipped by sea. Small volumes of ripe mangoes are transported by air for better control of anthracnose.¹⁰

3.3 Ghana

A. Macro-economic context

Ghana is a coastal West African country bordered by Togo to the east, Cote d'Ivoire to the west and Burkina Faso to the north. Ghana has emerged as a politically stable country within Western and Central Africa. It managed to achieve a peaceful political transition in 2008-2009, and it has a strong political and policy environment for social and economic development and poverty reduction. The country is rated highly on the Doing Business ranking of the World Bank (ranked 7th for all sub-Saharan African countries). The country's economic growth and poverty reduction indicators have been among the best in SSA for the past 15 years. Poverty reduction took place mostly in urban areas, however, while in rural areas (Northern, Upper East and Upper West regions) poverty is still prevalent. About 51 percent of the poor live in rural areas, and the poorest are small scale subsistence farmers. Small scale farmers constitute 85 percent of all agricultural land holders in Ghana.

The agricultural sector is considered a major engine of economic growth and contributes an average of 35 percent to GDP. Main agricultural export commodities are cocoa, cocoa butter and sugar as well as bananas and pineapples.

B. Mango sector

Commercial farming of grafted mango varieties has been increasingly adopted by Ghanaian farmers since the late 1990s, mainly due to programs on food security sponsored by the United States Agency for International Development (USAID) and efforts of the Ministry of Food and Agriculture (MOFA) and other Ghanaian government programs. Over the past seven years, because of increased demand for mango on overseas markets, the mango sector has captured the attention of farmers and traders.

⁹ Information dated March 2010.

¹⁰ Anthracnose is a disease caused by fungi.

Ghana has three main production zones, namely:

- the southern belt around the capital Accra (+/- 2400 ha of planted orchards at early stage of development)
- the Brong Ahafo region
- the Northern Zone, spearheaded by the Integrated Tamale Fruit Company's (ITFC) organic mango production program with at least 1200 outgrowers

Mangoes from Ghana have different destinations: firstly, the local urban market of Greater Accra, usually traded through a network of wholesalers and retailers; secondly, export markets for fresh fruit, primarily to Europe, including the fair trade and organic niche markets. To facilitate these exports, public and private investors have undertaken efforts to set up cool storage facilities at the harbour. Finally, a large share of mango is sold to processing firms. Fruit processing has developed into a competitive industry in Ghana. The country successfully exports fresh-cut fruit (through BlueSkies Ltd.), and produces juice and pulp for domestic, regional and international markets (e.g. through Sunripe Ltd.).

Ghana has a comparative advantage over neighbouring countries because it has two harvest seasons in the south (peak and minor season). Several producer associations have emerged over the past decade, each of which federates more than 100 farmers, for whom they sell collectively, organize farm services such as pruning and spraying, and in some cases establish a pack house. The mango associations in the south and outgrower schemes in the north have a strong focus on exports, whereas other organizations in the Brong Ahafo region aim to improve household welfare by promoting local marketing of the fruit.

3.4 Summary

Table 2 summarizes some key characteristics relevant to the mango sector in the three selected countries:

Table 2. Key features of the mango sector in three countries

	Area under mango cultivation (Ha)	Location	Level of processing	Cooperative action of producers	Public support to mango sector
Benin	2400 ¹¹	Sea-bordered	Low	No	Low: -No NGO programs -Not selected by Gov't as focus crop
Burkina Faso	13,500 ¹²	Landlocked	Medium/High	Yes	Medium/High: -WorldBank /Gov't subsidy program PAFASP -In portfolio of national extension and research institutes -Many NGO programs with producer organizations and exporters
Ghana	4,208 ¹³	Sea-bordered	High	Yes	Medium/High - USAID and gov't program to promote exports. -NGO programs to establish trade linkages, certification and Good Agricultural Practices (GAP)

¹¹ Source: FAOSTAT (2008). Estimation; reliable statistics are not available.

¹² COLEACP (2010) http://www.coleacp.org/fr/system/files/file/COLEACP/LE_2010_05_ENG.pdf.

¹³ Source: TIPCEE.

4. Typology of value chain models

Gereffi *et al* (2003) used the governance structure of value chains as a tool to categorize different types of global value chains. The classification of governance structures is based on 1) the complexity of transactions, 2) the ability to codify transactions and 3) the capabilities in the supply base. This results in five types of value-chain governance systems, varying from high to low in explicit coordination and power asymmetry between the chain actors.

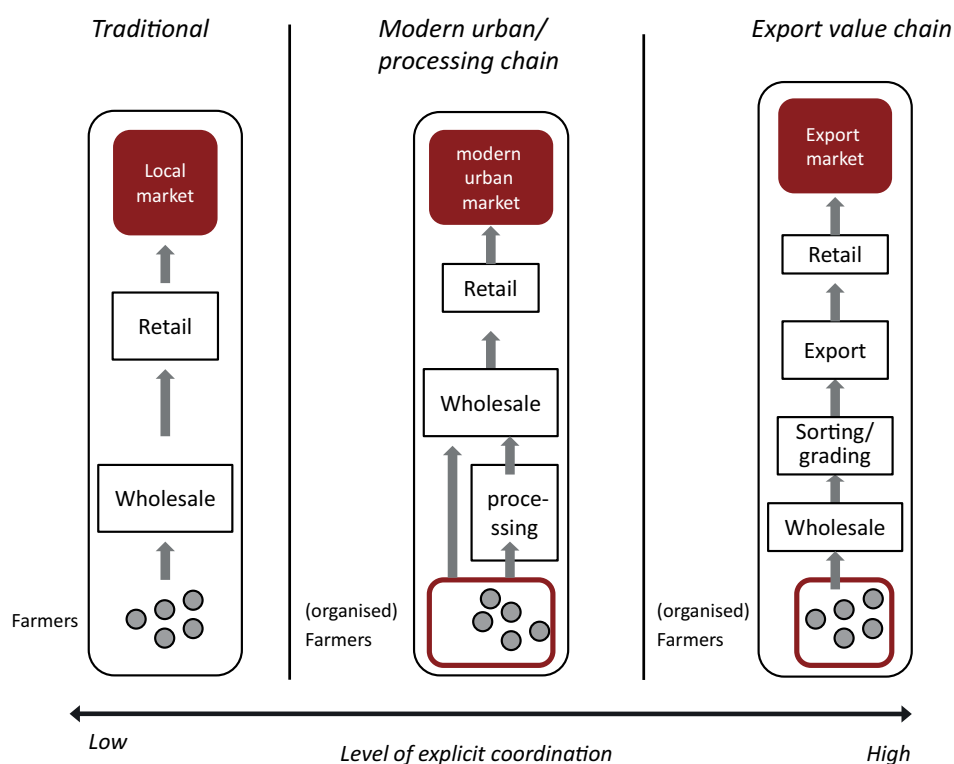
To make a classification of mango value chains in West Africa we have used this approach and have selected the targeted end-market as the main characteristic to define a typology of mango value-chain models. This characteristic encompasses an indication about the complexity of the transaction and degree of coordination needed in the chain. We can broadly distinguish three different types of end-markets, varying from a low to high level of quality requirements for the smallholder producers.

- Local markets: The fruits that are sold on local markets have no stringent quality requirements and consumers on local markets do not prefer certified or highly homogeneous supplies of mangoes.
- Processing/modern urban end markets: Some smallholders predominantly produce mangoes to be sold on domestic/regional modern urban markets, or to be used for processing into juice or dried mango. The quality requirements for their mangoes are usually less rigorous than for export fruit, especially with respect to visual fruit appearance, and certification is not a prerequisite.
- Export markets: Mango is a highly perishable fruit and vulnerable to pests and diseases, such as fruit flies (a quarantined pest) and anthracnose. In order to deliver to exporters of fresh or fresh-cut mangoes (especially in the EU and the United States), farmers need to comply with stringent quality norms and standards and typically require certification of their mangoes.

Table 3. Three categories of mango value-chain models

	End-product/market	Chain model
A	Fresh mango for local markets	Traditional value chain
B	Fresh mango for modern urban markets or processed mango (dried/ juice) for export markets	Modern urban/Processing value chain
C	Export value chain (fresh/fresh cut)	Export value chain

Figure 2. Schematic representations of three mango value-chain models



The level of explicit coordination varies from low in the traditional model (no fixed buyers) to high in the export value-chain model, which usually includes formal and informal contracts between the lead firm and the producers.

Within these three broad types of value chains, there are additional explanatory factors which explain differences in the development, structure and performance of value chains. The most important factors are discussed below.¹⁴

4.1 Degree of external interventions

Smallholder producers and other actors often lack the necessary resources to be included in value chains and access emerging markets, and the markets may fail to efficiently provide or allocate goods or services. Public actors such as governments, donors and NGOs can become involved by trying to remove these constraints that hamper the development of value chains. Some common constraints and related external interventions in the mango sector are listed in Table 4.

4.2 Level of internal resource exchange

Besides of the interventions from outside the chain, an actor can be supported by other actors within the chain through the provision of resources such as information, skills or inputs. We call this internal resource exchange where we define resources as all capabilities, inputs assets and services which can be used by the smallholders in their farming business. Usually it is the buyer who provides these resources through

¹⁴ Factors such as the production system and capabilities at the supply base (e.g. training mango production), were not included as explanatory factors of the chain model, since these often result from the value-chain model rather than creating it (intrinsic growth).

contractual agreements in order to be able to control the supply of mango at the required quality and quantity. An example of a value chain model with a high level of resource exchange is an outgrower scheme, which usually results in a high degree of risk-taking and investment by the lead firm.

Table 4. Common constraints and external interventions in mango value chains

Common constraints in mango sector	External interventions to remove these constraints
Poor production, harvesting and marketing skills	Capacity development, technical advice, farmer field schools, entrepreneurship education, research and development
Asymmetrical information	Set-up market information systems, knowledge of consumer preferences, access to information and communications technologies (ICT)
High transaction costs	Improved infrastructure (roads, railway, storage facilities), improved transportation, reduction of informal taxes, more efficient custom practices
Low investment capacity of chain actors	Access to (micro-) finance, subsidized access to agricultural inputs, exemption from taxes for agribusinesses
Poor quality performance	Access to (biological) control methods for pests and diseases, appropriate storage facilities, training farmers on good agricultural practices, packaging technologies

4.3 Level of smallholder cooperative action

The level of cooperative action of smallholders varies between value chains. Some farmers prefer to operate individually whereas in other cases they have formed strong cooperative structures. The motives for the level of smallholder cohesion are diverse, varying from socio-cultural reasons to the business orientation of the farmers. It should be noted that a high level of smallholder cooperation can be an intrinsic development resulting from the value chain to which the farmers belong (e.g. when farmers want to certify their produce, being grouped as farmers can be a pre-requisite).

5. Case studies in Benin, Burkina Faso and Ghana

5.1 Case studies selection

Our case studies were carried out in Benin, Burkina Faso and Ghana. The three countries are located within an elliptical-shaped belt across West Africa, located in the Sudano-Guinean agro-ecological zone, optimal for mango trees due to the agroclimatic conditions (Vayssières *et al*, 2008).

Based on the three types of chain models, we have looked at the models that typically occur in the mango sector in each country. In Benin only the traditional model is common, whereas in Burkina Faso most mango smallholder production has developed into types of value chains with a higher degree of coordination (see Table 5).

Table 5. Most common chain models in Benin, Burkina Faso and Ghana

Chain model	End product/market	Benin	Burkina Faso	Ghana
Traditional value chain	Fresh mango for local markets	✓	✓	✓
Modern urban / Processing value chain	Fresh mango for modern urban markets or processed mango (dried/juice) for export markets		✓	✓
Export value chain	Export value chain (fresh/fresh-cut)		✓	✓

For each of these models we have chosen a representative case study in one or more of the countries. For each case study we selected respondents for semi-structured interviews using a specialist sampling technique, called non-probability sampling. The most important factors have been the respondents' availability to answer the questions. Before starting the surveys, we verified whether respondents would meet the sample criteria, as presented in Section 2 above. In Table 6 the key characteristics of the value-chain models are depicted for each selected case study. Table 7 provides an overview of the sample size.

Table 6. Overview of five mango chain models

Selected Case	Model	Country	Degree of external interventions	Degree of internal resource exchange	Level of small-holder cooperative action
<i>Traditional</i> Individual mango farmers around Parakou	Traditional value chain	Benin	-	-	-
<i>Intensive contract farming</i> Integrated Tamale Fruit Company (ITFC) outgrower scheme	Export value chain	Ghana	++	++	+/-
<i>Dangwe West Producers Association</i>	Export value chain	Ghana	+	+	++
Cooperative Agricole de Kenedougou (COOPAKE) Association	Modern urban/ Processing value chain	Burkina Faso	+	+	++
Semi-intensive contract farming Smallholders selling to Dafani SA	Modern urban / Processing value chain	Burkina Faso	+	+	+

Our final research sample is as follows:

Table 7. Sample selection of mango producers for the five case studies

Cases	Number of structured interviews with smallholders	Number of focus group meetings with smallholders	Participants in focus group meetings
Individual mango farmers around Parakou	26	4	10,10,12,12
<i>Integrated Tamale Fruit Company outgrowers</i>	4	2	15,10
Dangwe West Producers Association	15	1	8
Cooperative Agricole de Kenedougou (COOPAKE)	42	1	6
Smallholders selling to DAFANI	16	1	22
Total	103	9	93

5.2 Description of the case studies

In the following section we will briefly describe the five case studies by summarizing the main characteristics of the producers and the value chains. A short description of the main distinctive features of the value chain organization and the relationship between the chain actors will provide insight into the differences between the five value chain model cases.

A. Case study 1: Traditional market chain model – Benin

As an example of a traditional chain model, we visited the mango producers in the commune of Tchaourou in Benin. This commune is located in the south of the mango production zone in Benin, 200 km north of the capital, Cotonou. The selected smallholders have their orchards in and around one of the main towns in the commune, which is located along the main road that connects North and South Benin. A total of 26 producers were interviewed, and four focus group meetings were held in the villages of Boukoussera (10 producers), Kooro (12 producers) Tchatchou (10 producers) and Goro (12 producers).

Characteristics of the producers

The majority of the interviewed producers (all male) have agriculture as their main source of income (70 percent); however the contribution of mango production to the total revenue from agricultural activities is less than 20 percent. The main other crops produced in this region are cashew nuts, maize and yams. None of the farmers has received formal training in mango production; however, they have received technical advice from other producers or retired extension agents in the area. The orchard size ranges from 0.25 to 7 ha and averages 1.9 ha. The majority of the producers have trees between 9 and 20 years old. All producers perform basic maintenance activities on their fields (fire belt, weeding, pruning), but none of them applies pesticides or has a certification for their mangoes.

Characteristics of the value chain

The farmers are not organized into producer organizations, and they market their mangoes individually. The mangoes are bought by tradeswomen in their fields or along the roadside and transported to urban centres, mostly in the south.

In general, public sector intervention and support is slow and unobserved along the chain, since mango is not one of the country's focus crops. The national extension service, Centre Régional pour la Promotion Agricole (CeRPA) does not have mango in its portfolio. Generally, the public and private institutions in Benin have not developed the necessary competences and equipment to facilitate accreditation and certification procedures, which further supports the notion that Benin has no comparative advantage in mango production over Burkina Faso or Ghana.

Both from the interviews and the focus group meetings it became obvious that producers are not satisfied with their revenues from mango production. The main reason for this is quality constraints (especially fruit flies) lowering the value of the fruits, as well as the poor negotiation position with the tradeswomen coming from urban areas or bordering countries. Because of the fruit quality issues and the lack of a guaranteed market or contract, producers often have to accept the low price imposed by the buyers coming to their orchards. The producers suspect that traders exaggerate the quality problems to lower the price, or to refuse payment for fruit sold on credit.

Despite these constraints, about 80 percent of the producers plan to continue mango production. Mango-growing has become a part of their lifestyle, the orchards required high initial investments and farmers consider the orchards to be a part of their retirement plan. The hope is that one day the mango value chain will be developed in Benin, and revenue will be comparable to current initiatives for cashew and pineapple.

Around 20 percent of the mango producers are convinced that if quality issues continue to be a problem, they will cut their trees and use the land to grow other tree crops. Some farmers are also considering replacing their improved varieties with local mango trees, since these seem to be less susceptible to fruit flies (even though this variety is in less demand on the market).

During the focus group meetings, transportation to the urban south of Benin emerged as a major constraint; for several years the railway has not been operational, although recently investment in the rehabilitation for the rehabilitation of the infrastructure have been initiated. Currently all mangoes are transported by trucks, vans and cars. The poor packaging materials and road quality result in high losses during transport.

B. Case study 2: Intensive contract-farming model – (ITFC) Ghana

The Integrated Tamale Fruit Company (ITFC) is located in the northern region of Ghana, 45 km north of Tamale. The company was incorporated in 1999, its main activities being the cultivation of organic grafted mango, nursing of seedlings and promotion of indigenous tree species. At the nucleus farm (155 ha of certified organic mango), a micro-irrigation system has been set up (one sprinkler per plant). The company has received high amounts of financial support (loans and grants) from donors to set up an outgrower scheme, in order to contribute to household food security in the region.

Characteristics of the producers

Since 2000, ITFC has been working with 1300 outgrowers in villages surrounding the nucleus farm. ITFC supports the farmers with long-term loans, paid out in the form of inputs that are needed to farm one acre of organic mango, holding 100 trees. The farmers produce exclusively for ITFC as set out in a contractual

agreement. The costs of all inputs are paid back once harvesting and selling of fruit commences (after approximately five years), by repaying a maximum of 30 percent of the farm's income until all debts are paid.

ITFC also provides training and technical advice, establishes irrigation systems or provision of water, and assists with record-keeping for compliance with the organic certification requirements (98 percent of the farmers are illiterate). ITFC has maintained constant intensive monitoring and training of farmers for ten years. In the view of the company, short-term projects cannot teach skills and change mentality. The farmers themselves are responsible for the maintenance of the fields. ITFC markets the mangoes for farmers, using its bulk-marketing advantage. The farmer groups are all united in the Organic Mango Outgrowers Association (OMOA), although the independence of this organization from ITFC can be questioned. The farmers are obliged to sell 100 percent of their quality fruit to ITFC until all debts are cleared. At the start of every season, OMOA and ITFC negotiate the price, which is then communicated to the farmers.

A significant difference from the other cases in our study is that these smallholders were not traditionally growing mango but started from scratch under the ITFC program. Previously they were mainly growing subsistence crops; farm size in all cases is 1 acre. Farmers had to provide one bag of maize as a commitment fee, and then ITFC planted the seedlings and provided tools such as water tanks and equipment and other inputs (e.g. manure) on a loan basis. All farmers have been trained in the agronomy of mango-growing as well as in pest and disease control. In case of a problem, farmers can call a field assistant. OMOA organizes regular meetings with the producers, especially to continue encouraging the farmers and to urge producers to be patient.

Characteristics of the value chain

ITFC exports fresh fruit, but it also has a drying facility, set up in recent years, for which they are sourcing additional fruit from the south of Ghana. The drying facility has a capacity of 140 tonnes/month.

ITFC believes it is constrained on the international market because of the bad reputation of Ghanaian products. ITFC management blames the seaport in Tema as one of the main causes of quality problems because the infrastructure is not up to standard for handling perishable goods like mango.

The contract-farming scheme implies high long-term investment and risks for ITFC, and an estimated additional ten years is needed before the company will be profitable. However, ITFC indicated that it sees signs of the benefits for the smallholders who have sold their first harvests, since many of them have now, for example, made improvements to their houses. However, a risk is that ITFC has planted only one variety of mango (Kent) in the fields of the smallholders, which indicates that production risks are not widely spread.

This chain model provides a great opportunity for resource-poor farmers in the region, and can result in an improvement in incomes. However, the system is relatively young, and the sustainability of the chain model has to be demonstrated over time. One of the current challenges is that producers are dependent on the lead firm and do not upgrade into independent business-oriented producers.

C. Case study 3: Dangwe West mango producer association – Ghana

The Dangwe West association has 124 members who have a total of 890 ha under mango cultivation. The association places agricultural extension agents, trained by the District Agricultural Development Unit, in the villages. The association has received support from development organizations, mainly the Dutch development organization SNV.

Characteristics of the producers

Members of the association reported mango losses of up to 40 percent, but a market study revealed that processing companies in Accra were looking for mango as raw material. The farmers were trained in the requirements of the processing companies so that they could deliver the right quality. In 2008, the association signed its first one-year contract with a processing company (Sunripe), one of the largest processing companies in Ghana, to sell at least 1000 tonnes of mango (from total production of 2500 tonnes).

Characteristics of the value chain

The association is not ready to start selling fresh fruit on the export market, since it does not have the resources to make the necessary investments for compliance with norms and standards. The association does sell to other exporters in the region, albeit at a low price. Efforts are underway to form a national mango producers association.

Through the contract, the association was able to arrange a trade finance scheme with the Dangwe West Rural Bank and Sunripe. This enabled it to purchase its own truck for mango transport, as well as its own office. Sunripe and donor organizations paid for training and local government provided human resources. The farmers themselves do not pay anything for capacity building activities. The Trade and Investment Program for Competitive Export Economy (TIPCEE)¹⁵ paid for the GlobalGap certification. Given the intensive donor involvement, sustainability of this approach is questionable. So-called "market queens" (women who buy mangoes from the farm) still come to buy mangoes but at least now these buyers do not dominate the market anymore, and usually pick only the lowest quality mangoes.

The association has an internal control team, which assists the farmers with record-keeping. This year auditors will come to audit 60 farmers, an increase from 40 farmers last year. If one fails, the whole group's certification will not be renewed. If all are certified, the association will start targeting the export market as well, which may result in higher incomes.

D. Case study 4: Strong base model - Burkina Faso (COOPAKE)

COOPAKE is a cooperative of smallholder mango producers in the province of Kenedougou in the department Orodara, located in the western part of Burkina Faso. The cooperative was created in 1963 with the goal of improving profitability through collective sales. In 1994, the association was restructured in line with the new Law 14 regarding associations in Burkina Faso.

Characteristics of the producers

Currently COOPAKE has 164 members of whom 54 currently have organic certification; the majority of them are GlobalGap certified. The producers each have between 2 and 20 ha of mango trees. In this area, mango contributes up to 80 percent of total income. The varieties produced are Amelie, Kent, Keitt and Lippens. The primary constraints experienced by farmers are quality issues (mainly fruit flies) and lack of irrigation infrastructure.

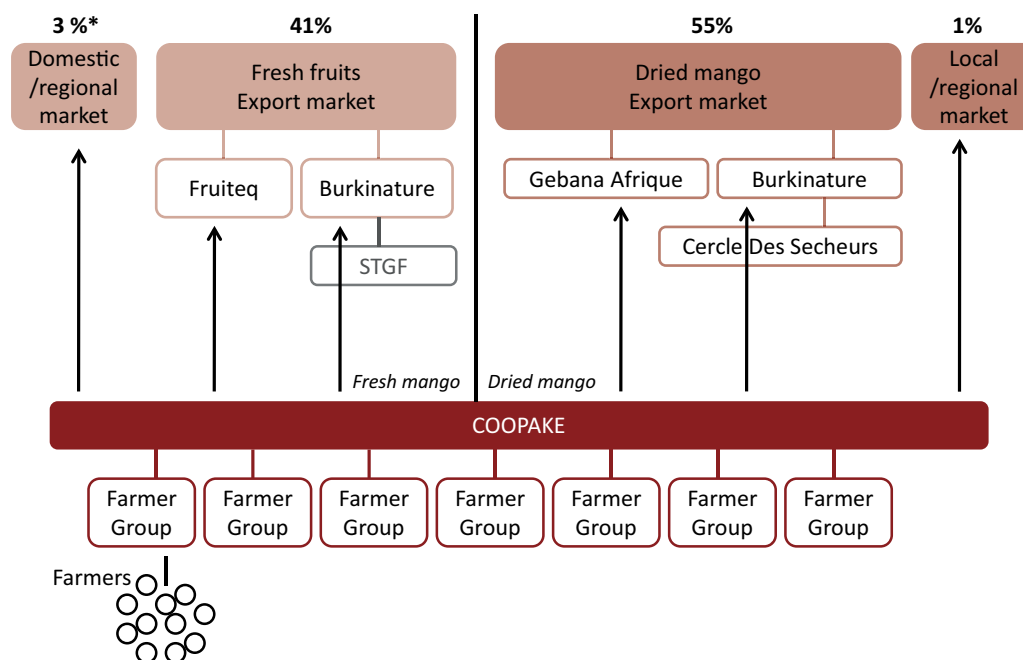
Description of the value chain

The main objective of the cooperative is to ensure effective marketing of the fruit, either in processed or fresh form. In addition, training is facilitated, using a demonstration and experimentation site. The main activity of COOPAKE is drying of mango; a drying unit with 13 gas drying ovens has been installed,

¹⁵A recently terminated USAID project to support exports of selected crops.

which has a capacity of 40 tonnes of dried mango per season, and employs six permanent staff and 45 seasonal employees. The second business activity is to sell fresh fruit, mainly to exporters Fruiteq and Burkinature (see also Figure 3).

Figure 3. Schematic overview of COOPAKE sales structure



* = % of total fresh fruit yield

COOPAKE does not have long-term formal contracts; however long-term relationships with their buyers do exist. Prices for the certified products are mostly fixed; for conventional products conditions are negotiated before the season.

The association has its own team of mango harvesters. One of the agents is responsible for taking stock of the expected production and quality before the season. When harvesters pick the fruit (together with the producer), COOPAKE agents present a voucher to the producer. Two weeks later the producer comes to the COOPAKE office to receive payment. At times COOPAKE faces difficulties in paying the farmers, since pre-financing from their buyers can be small or absent (depending on the negotiations it can go up to 50 percent).

COOPAKE has received substantial external support from development organizations, World Bank (subsidies through PAFASP), governmental structures (e.g. research and trainings by Institut National pour l'Etude et la Recherche Agronomique (INERA), FAO (training on production practices), buyers (e.g. hygiene during processing by Gebana) and certification bodies (ECOCERT for organic certification requirements).

E. Case study 5: Semi-intensive contract farming – Burkina Faso

DAFANI SA was established in June 2007 by a group of Burkinabe investors in Orodara, for processing mango and other tropical fruit into juice. The production in 2008 was 3000 litres of juice per hour, employing 73 permanent staff as well as 149 seasonal workers. The pulp is exported in 200 litre barrels to France and Germany. The juice, which is the main product, is mostly sold on the domestic market, with a small part sold in Côte d'Ivoire and Togo. The factory has made a good start and the product has become appreciated and well-known and is now in demand in the domestic market. The juice for direct consumption is packaged in cartons, and is a price competitive with other soft drinks and sodas. Unfortunately, however, at the beginning of 2010 the factory had to stop operating because of necessary equipment repairs and lack of inputs (packaging material). In May 2010 the government of Burkina Faso announced its willingness to assist the management of DAFANI to re-start activities. At least for the 2010 mango season, many farmers who used to sell to DAFANI were obliged to search for other buyers.

Characteristics of the producers

The interviewed smallholder producers (all male) are selling non-certified mangoes, and their orchards are located in proximity to the DAFANI factory. DAFANI has begun to build relationships of trust: the company currently signs one-year contracts with around 300 producers per year, buying 4.5 tonnes/ha. The contract includes an agreement that both the producer and DAFANI have a two-week notice period (before fruits are ripe) to cancel the transaction.

The producers indicated that the two main problems are:

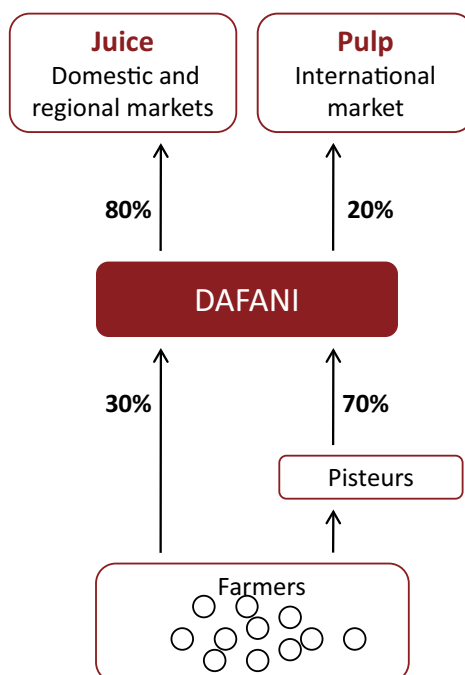
- water management (there is not enough water to properly irrigate the fields);
- quality issues (fruit fly infestations, as well as anthracnose).

Characteristics of the value chain

The volume of mango provided by contracted producers provides 30 percent of the volume required by DAFANI; the remaining 70 percent is bought through mango wholesalers. An agent is appointed in every village to coordinate the harvest of the contracted producers and traders.

DAFANI has offered training to a selection of producers in field and nursery maintenance, as well as training and inputs for treatment of their fields against fruit flies using organic pesticides. Most producers are illiterate and from the interviews and focus group meetings it appeared that most of the producers selling to DAFANI are members of a farmer group. The volume of mango which they cannot sell to DAFANI is sold to other processors and local traders.

Figure 4. Schematic picture of DAFANI input and output markets



6. Assessment of the chain models

In this section we present results from the assessment of the socio-economic position of the smallholder in the five case studies. The outcomes of the proxies of market efficiency and business performance of the smallholders, as described in section 2.3, will be presented and discussed.

6.1 Market efficiency

The results on fruit losses (see Table 8 below), show that practically all farmers in the case study samples have reported losses of mango fruit. Based on these figures we can see that the producers in Benin estimate the losses to be more than 65 percent of their total production, whereas most other farmers indicated losses of around 30 percent of their production. The farmers in the case of intensive contract farming in Ghana reported losses of only 1 percent (confirmed by focus group meetings). Some of these losses can be attributed to natural circumstances, since it is normal that some of the young fruits drop.

When we asked the farmers about the reasons for loss, we could see that fruit quality issues are ranked as the main cause, except by the Dangwe West Association in Ghana. We have two comments regarding the interrelation between absence of buyers and quality issues.

Firstly, from our observations in Benin we have learned that in the absence of buyers, the fruit will remain on the trees until fully ripe. At this stage the fruit is much more vulnerable to pests such as fruit flies. If market efficiency were high enough, fruit would be harvested before it is ripe and at the point where it is not yet attracting insects. Therefore, the actual extent to which quality issues affect marketing efficiency might seem higher because of the lack of marketing opportunities.

Secondly, if the market were operating efficiently, more resources would be available to control quality issues (e.g. by collaborative action of chain actors or investment of the lead firm in provision of control methods). Therefore, to a certain extent high loss due to quality constraints does indicate market inefficiency.

Taking all this into consideration, we have ranked market efficiency as indicated in Table 8 below.

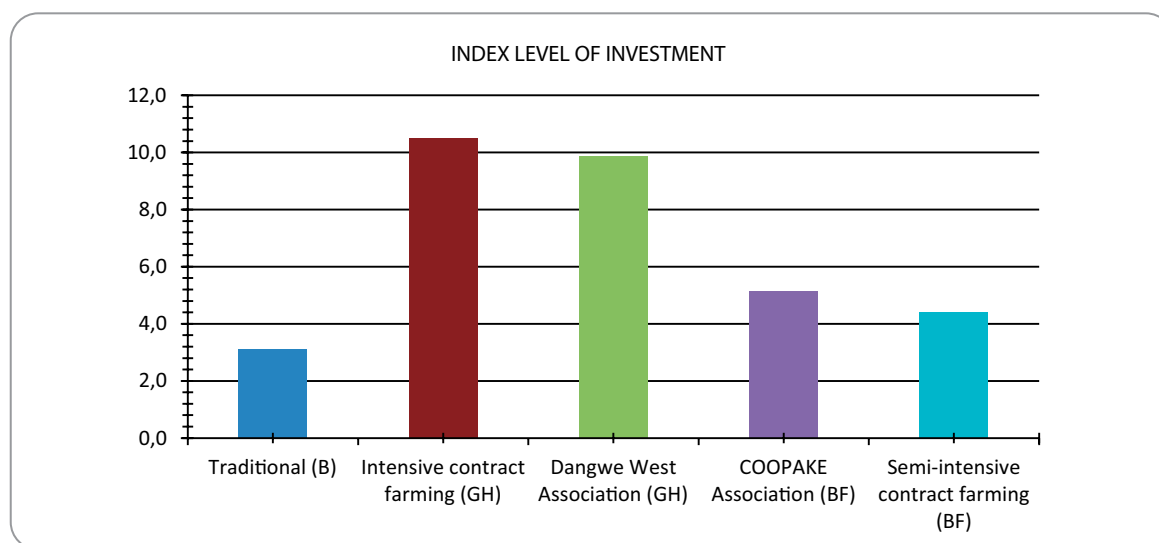
Table 8. Market efficiency of the chain models

Case	Farmers indicating fruit losses (% of total)	Estimated losses (% of total production)	Reasons for losses		Market efficiency
			Buyer	Quality issues	
Traditional (B)	100.0	66.9	3.7	96.3	-
Intensive contract farming (GH)	100.0	1.0	NA	0.0	+
Dangwe West Association (GH)	100.0	30.0	63.6	36.4	+/-
COOPAKE Association (BF)	97.6	30.3	30.0	70.0	+/-
Semi-intensive contract farming (BF)	93.8	26.1	20.0	80.0	+/-

6.2 Business performance

Figure 5 below presents the calculation of the index on level of investment as a proxy for business performance. The first figure indicates the gross index of investment and shows, as expected, a high level of investment by the smallholder farmers in intensive contract farming case¹⁶ (more than 10 on a scale of 12) over the past five years. Smallholders in the Dangwe West Association in Ghana are also investing at high levels with an index of almost 10. The farmers in Benin using the traditional model have made minimal investments for maintenance of their orchards.

Figure 5. Gross Investment Index of smallholders in different chain models

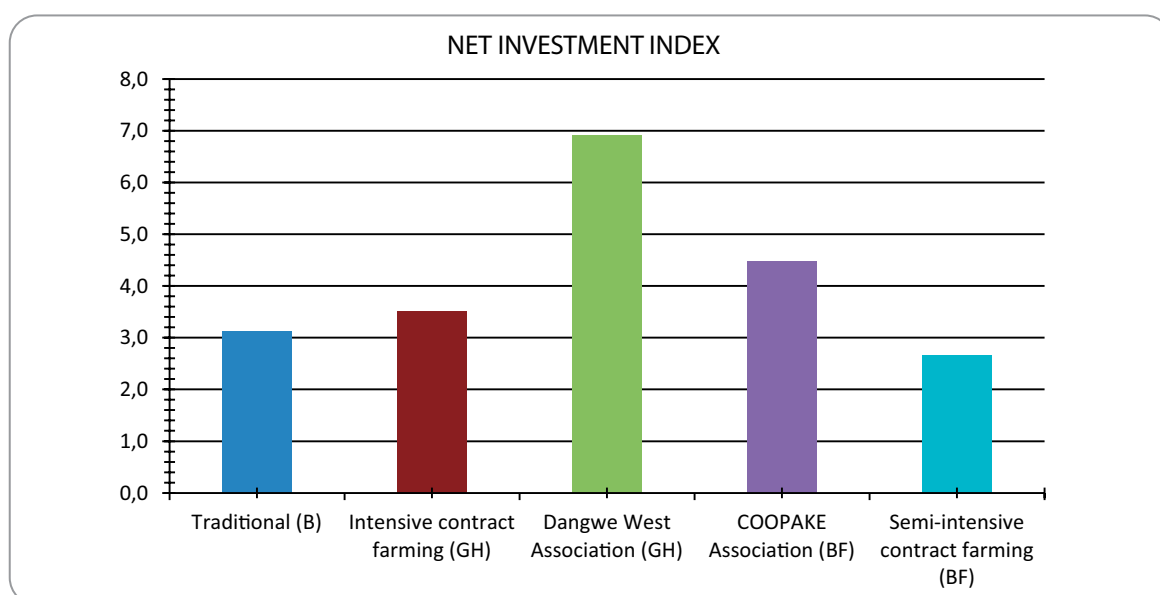


¹⁶ We can use the data from the small sample of contract farmers, since they all had an identical package of investments supported by the lead firm.

By taking into account whether the farmers received financial support to make these investments (no=0, partly=0,5 and yes=1), we were able to calculate the Net Investment Index for smallholders in the different case studies. Figure 6 below displays the results. Effectively it shows that the net investments made by the farmers in the intensive contract farming case are lower since a large part is paid for by the lead firm. For the traditional model in Benin, the net investments are not different from the gross investments, which demonstrates that the farmers do not receive any support that is external or internal to the chain.

The producer associations in both Ghana and Burkina Faso appear to be making the highest net investments, compared to the other models. This can be explained by the positive effect of the co-operative structure on the risk assessment of the producers. Membership in the association reduces business risks, for example by more assured marketing of produce and higher access to training and new technologies, as well as economies of scale and opportunities for collective investments such as certification. In contrast to the outgrower scheme, the initiatives lie with the producers themselves. We expect that this higher level of ownership results in a higher net investment and consequently a more sustainable effect on the mango businesses.

Figure 6. Net Investment Index of smallholders in different chain models



The second proxy we selected to measure business performance was the contribution of mango farming to total income. We measured the contribution of mango to total income, relating this to the mean area under cultivation. Based on these data we can make an assessment of the importance of mango production relative to the income of smallholders.

As Table 9 shows, under the intensive contract farming scheme, farm income accounts for most of the total income. This is because these farmers engage essentially in subsistence farming and not much cash crop farming. The relative increase of their income is therefore higher compared to producers who are already selling their mangoes on the market.

The results also show that the producers supplying processing industries (COOPAKE Association and semi-intensive contract farming) have a slightly higher mean area under mango cultivation compared to the other cases.

Table 9. Contribution of mango farming to total income

Case	Income from agriculture (% of total income)	Income from mango (% of total income from agriculture)	Income from mango production (% of total income)	Mean area under mango cultivation (Ha)	Contribution of mango farming to total income
Traditional (B)	70	19	13.3	1.92	-
Intensive contract farming (GH)	100	48	48	0.4	+
Dangwe West Association (GH)	55	80	44	5.04	+/-
COOPAKE Association (BF)	67	59	39.53	5.67	+/-
Semi-intensive contract farming (BF)	83	49	40.67	5.69	+/-

Finally, the proxy we used to measure business performance is the level of satisfaction of smallholders with their current situation and their perception of the future.

Figure 7 depicts some of the answers of the different groups of smallholders to this question. It shows that, except in Benin, all producers indicate that the general situation of their families has improved over the past years because of increased income from mango farming. The smallholders in the intensive contract farming chain are the most positive, which could be a result of the income level of these farmers before entering the chain, as we have mentioned above.

Reports of farmers' subjective perceptions of security about mango sales for the next year are generally positive; however, farmers in the traditional model are relatively indifferent. Finally, all farmers agreed with the statement that they would continue mango farming for the rest of their lives. Even the producers in the traditional model answered this in a positive way, which can be explained by the fact that mango farming has been a part of their farming style, and in some cases it is an inheritance they feel obliged to take care of.

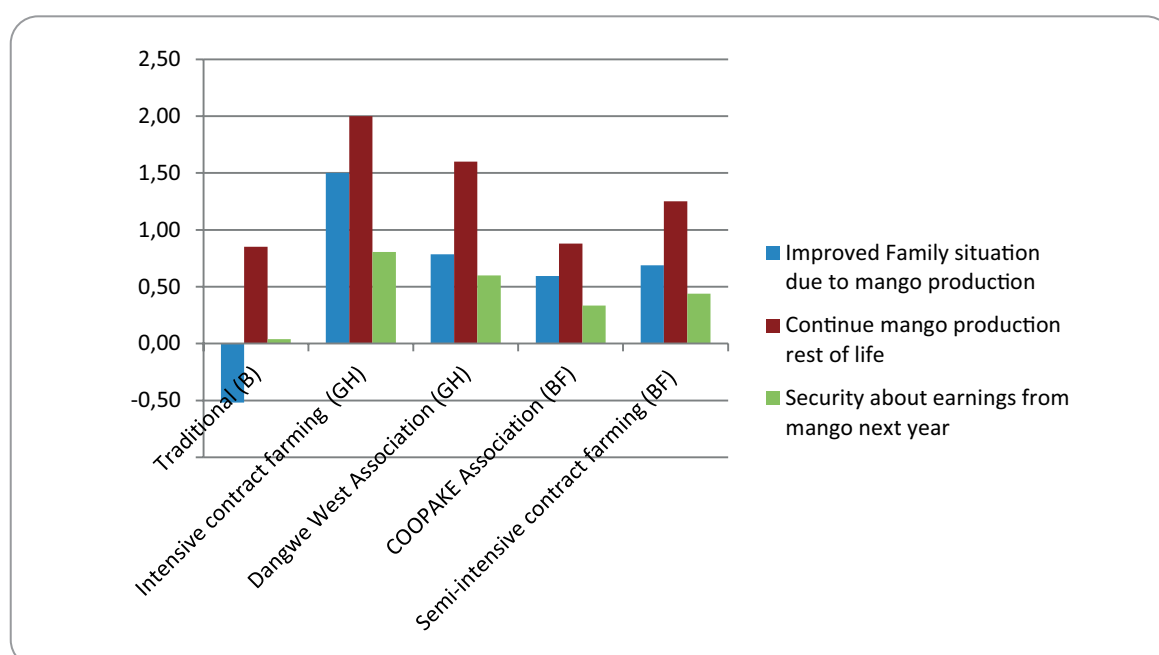
Figure 7. Perception of smallholders on current situation and current trends

Table 10 summarizes the comparative ranking of results from our assessment of the case studies and presents an overall ranking of the position of the smallholder in these chains based on the selected indicators. Studies of two cases with strong producer associations, in Ghana (Dangwe West) and Burkina Faso (COOPAKE), are perceived as having the best total impact on the socio-economic position of the smallholder farmers. We conclude this based on the results from our assessment and it was confirmed by information from the key informants and focus group discussions.

Table 10. Overview of results chain model assessment

Case	Market efficiency	Net investment index	Contribution of mango farming to total income	Smallholder satisfaction	Overall ranking
Traditional (B)	-	-	-	-	5
Intensive contract farming (GH)	+	-	+	+	2
Dangwe West Association (GH)	+/-	++	+/-	+	1
COOPAKE Association (BF)	+/-	+	+/-	+/-	3
Semi-intensive contract farming (BF)	+/-	-	+/-	+	4

7. Conclusions and recommendations

The objective of this study was to analyse the mango value chains in Benin, Ghana and Burkina Faso.

First, we made an overview of the value chain models that typically exist in these three countries, based on literature and interviews with key informants. Based on the main targeted end-market, we have found three different categories of value chain models that are most common for mango in West Africa. In addition, we have used the following as explanatory factors for the performance of the value chains: the degree of external interventions; the level of internal resource exchange; the level of smallholder cooperation. For each country, we have assessed the typical models for mango, and we have selected five case studies (see Table 11 below for an overview of the models and case studies).

Table 11. Net investment index for the analyzed case studies

Case study	Model	Net Investment Index
Individual mango farmers around Parakou (Benin)	Traditional value chain-Benin	3.1
Intensive contract farming: ITFC (GH)	Export value chain	3.5
Dangwe West Producers Association (GH)	Export value chain	6.9
COOPAKE Association (BF)	Modern urban/Processing value chain	4.5
Semi-intensive contract farming (BF)	Modern urban/Processing value chain	2.7

Second, through in-depth interviews with actors and informants, we identified the main characteristics and limiting factors, especially for the smallholders in the chain. The most important findings were that smallholders are constrained by the following factors:

- **Quality issues:** The main issue is increasing fruit fly infestations which are causing high losses. Farmers with a fixed buyer usually had increased access to control methods;
- **Poor negotiation power:** The case studies in Benin and Burkina Faso indicated that the smallholders feel that the price set by the traders is too low. However, farmers have little choice due to the remoteness of their orchards and the perishable nature of the fruit. To overcome this issue, the Strong Base model case in Burkina Faso has introduced its own harvesting team;
- **Transaction costs:** Remoteness and bad quality of roads and transport facilities create high post-harvest losses as well as difficulties in accessing markets;
- **Lack of irrigation infrastructure:** This is mostly a constraint in Burkina Faso, which requires high investments.

Third, the current and expected impact of these value chain models on the position of smallholders has been assessed by measuring market efficiency and business performance of smallholders.

The case studies demonstrated that the modern urban market/processing model with a high level of cooperative action proved to be most beneficial for the smallholders, because it showed a high level of Net Investments in the farming business over the past five years. This indicates that the external interventions are actually strengthening the farming business in a sustainable manner by increasing ownership, reducing risks through collective action and increasing opportunities to upgrade activities. The case in Ghana showed the highest Net Investment Index (50 percent higher than the other models), which could be related to the relatively good business environment in Ghana compared to Burkina Faso.

The intensive contract farming model was also assessed as having a positive impact on the position of smallholders in terms of market efficiency, smallholder satisfaction and contribution of mango to total incomes. However, Net Investments are lower, suggesting a high dependency on the lead firm and a weak position for the autonomous farmer. For these smallholders an increased level of cooperative action among producers could reduce this constraint.

Finally, with respect to institutional innovations and policy interventions in support of smallholder market participation we recommend the following:

- **Focus on strengthening of farmer cooperatives:** From our assessment the smallholders operating in strong cooperatives showed a high Net Investment Index. In addition, the cohesion of smallholders can lead to increased negotiating power with traders, and increased opportunities to build long-term relationships with buyers.
- **External support mechanisms:** As shown by PAFASP in Burkina Faso, when farmers can make partly subsidized investments it has a strong catalytic effect on upgrading and Net Investments of smallholders, which are expected to have an impact on sustainability.
- **Increased focus on domestic and regional markets:** These markets are growing and, as they demand less stringent quality requirements, they are easier to access for the smallholder farmer. Smallholders indicated that the investments needed to target high-end niche markets are often not in balance with the price premiums received. Although results from the assessment of market efficiency did not demonstrate a significant difference for the value chains targeting modern urban markets/processing industries, the study did reveal that quality issues are an emerging constraint. Therefore we can conclude that more feasible upgrading strategies might be to target regional and domestic markets with less stringent norms and standards.

Table 12 presents some recommendations in more detail. The explanatory factors for inclusion of the smallholders in the value chain models, will serve as a basis to suggest possible interventions.

Table 12. Key characteristics and possible interventions by case study

Chain model/Case	Key characteristics	Possible interventions
Traditional model –Benin	<ul style="list-style-type: none"> • No government policy towards mango sector, national extension services do not have mango in their portfolios • Low comparative advantage over other countries because of fruit quality/variety and seasonality • Low level of cooperative action between smallholders • No government support 	<ul style="list-style-type: none"> • Take stock of area under cultivation, varieties and volumes produced (GIS mapping), market assessment • Invest in small and medium-sized agro-businesses for increased processing and domestic demand • If potential assured, offer training on Good Agricultural Practices • Lobby government to include mango in agriculture policy • Promote model farmers who can function as drivers of change
Dangwe West Association (GH)	<ul style="list-style-type: none"> • Access to external support mechanisms • Conducive general business environment • High dependency on external support • Recent start of mango farming • Quality issues more difficult to manage in the south of Ghana • Average level of explicit coordination, although buyer assists in trainings • Proximity to market 	<ul style="list-style-type: none"> • Provide continuous support of cooperative action, phasing out external support • Promote marketing to regional processing industry, instead of targeting high-end European market • Provide market information system
COOPAKE Association (BF)	<ul style="list-style-type: none"> • Access to external support mechanisms • Average level of explicit coordination between chain actors • High dependency on external support • Mango farming practiced for a long time 	<ul style="list-style-type: none"> • Provide continuous support of cooperative action, phasing out external support • Focus external support primarily on capacity-building and less on assets and finance • Explore the possibilities for value-chain finance/trade-finance systems with fixed buyers to allow upgrading of production system.
Semi-intensive contract farming (BF)	<ul style="list-style-type: none"> • Targets local processing company which copes with risks in continuity • Average level of cooperative action 	<ul style="list-style-type: none"> • Offer market information for increased insight into other market opportunities • Continue support of farmer cooperation
Intensive contract farming: ITFC (Ghana)	<ul style="list-style-type: none"> • Mostly subsistence farmers • High need for irrigated production because of erratic rainfall • Recent start with mango farming • Total dependence on contract-farming scheme and low net investment. 	<ul style="list-style-type: none"> • Promote intensification of cooperative action between smallholders • Increase capacity-building in general business and skills

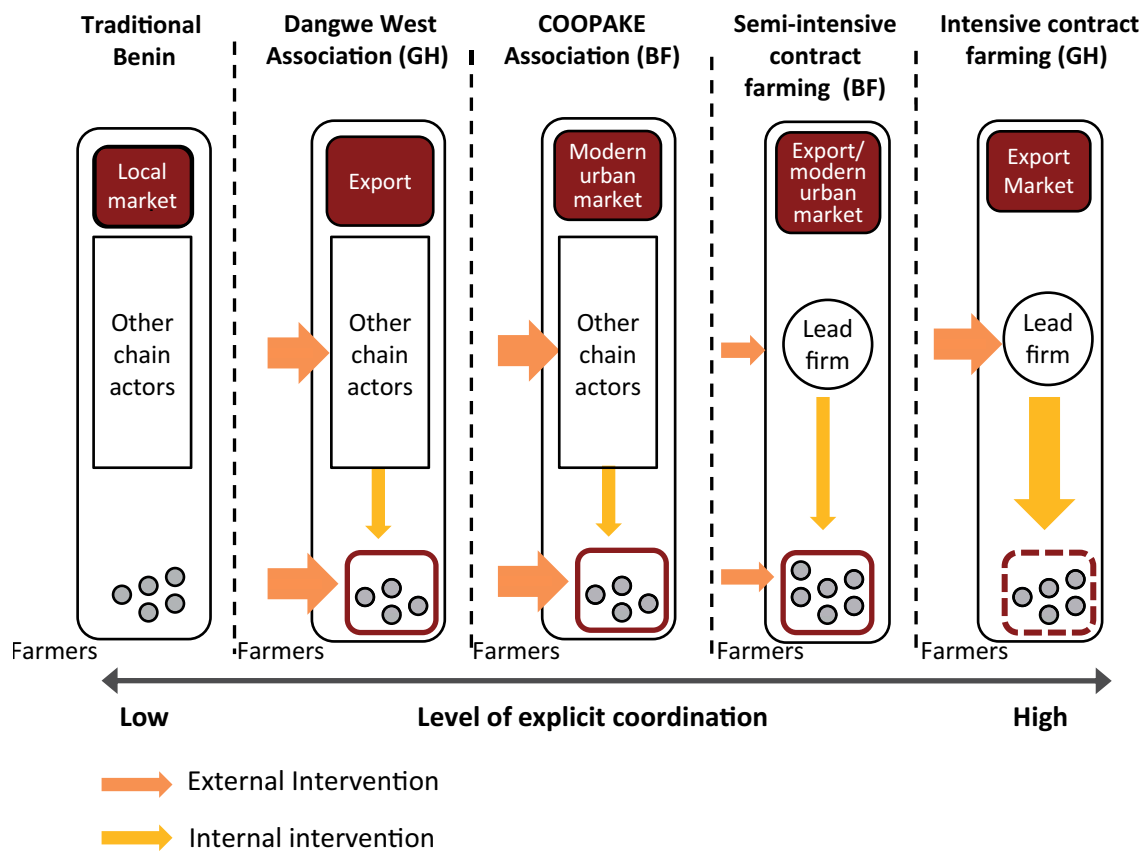
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Annex

Schematic Representation of The Five Value Chain Case Studies



Chapter 11

Oil palm industry growth in Africa: A value chain and smallholders' study for Ghana

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1. Introduction and motivation

Oil palm is native to West Africa. The West African region – especially Côte d'Ivoire, Ghana, Nigeria and Sierra Leone – is a major producer of both palm oil and palm kernel oil (PKO). However, because of internal marketing and supply-side constraints, as well as subsidies for commercial and food aid imports of competing vegetable oils, domestic availability of palm oil has not always been reliable. The consumption of palm oil and other palm products is expected to increase in West Africa and in other parts of the continent as the population grows. In many countries, the palm oil sector has a significant economic impact. In Nigeria, the palm oil industry employs millions of workers, while in Guinea, Liberia and Sierra Leone it is a major source of income and trade along the common border districts.

Oil palm serves as a raw material for industry and a source of foreign exchange. Production of palm oil now accounts for 37 percent of the total global output of oilseeds, overtaking soybean oil as the leading vegetable oil. Malaysia and Indonesia dominate world production and trade with 90 percent of global output, while West Africa accounts for a negligible 3.5 percent.

Given a per capita edible oil consumption of 10-11 kg, and if all edible oil were supplied by crude palm oil (CPO), the population of West Africa would require about 2 million metric tonnes (MT) of CPO to be self-sufficient. However, total supply is currently 1.4 million MT, leaving a demand gap of 600 000 MT, which is currently filled by imports. The global palm oil industry has recently witnessed unprecedented growth, with a cumulative annual growth rate (CAGR) of 8 percent, although West Africa's CAGR is at 1.5 percent. The competitive landscape is dominated by Southeast Asian producers who have better production efficiency (higher productivity at comparable costs of production, hence able to capture larger shares of the world market) and ideal climatic conditions, resulting in loss of revenue opportunity for producers in West Africa.

Many West African countries (and countries in other parts of Africa) have plans to expand and develop oil palm plantations. Buoyed by rising producer prices, strong international demand for vegetable oil and the large demand potential within Africa, as well as demand from biofuel markets, several West Africa countries have formulated national programs to encourage both national and foreign investments in new oil palm plantations.

There appears to be a continuous diversion of crops away from citrus, formerly a major tree crop in the region. Citrus trees are being cut down by producers in order to replant the land with oil palm because there is a lack of ready market for citrus and very little profit margin at the end of the year, compared with oil palm.

The oil palm industry is characterized by various types of agro-systems, ranging from large agro-industry plantations to small-scale farmers, who may or may not be organized into cooperatives. Several supply models also co-exist, from fully integrated agro-industry companies with oil mills which procure from their own plantations, to outgrower schemes, to small-scale producers – primarily women – who either sell fruit to processors, or produce oil for their own consumption or for sale to local markets. The local industry contends with a number of constraints, including little demand-driven research, limited access to land and finance, high production costs, low levels of technology, low extraction rates and poor quality CPO, and lack of adequate government support.

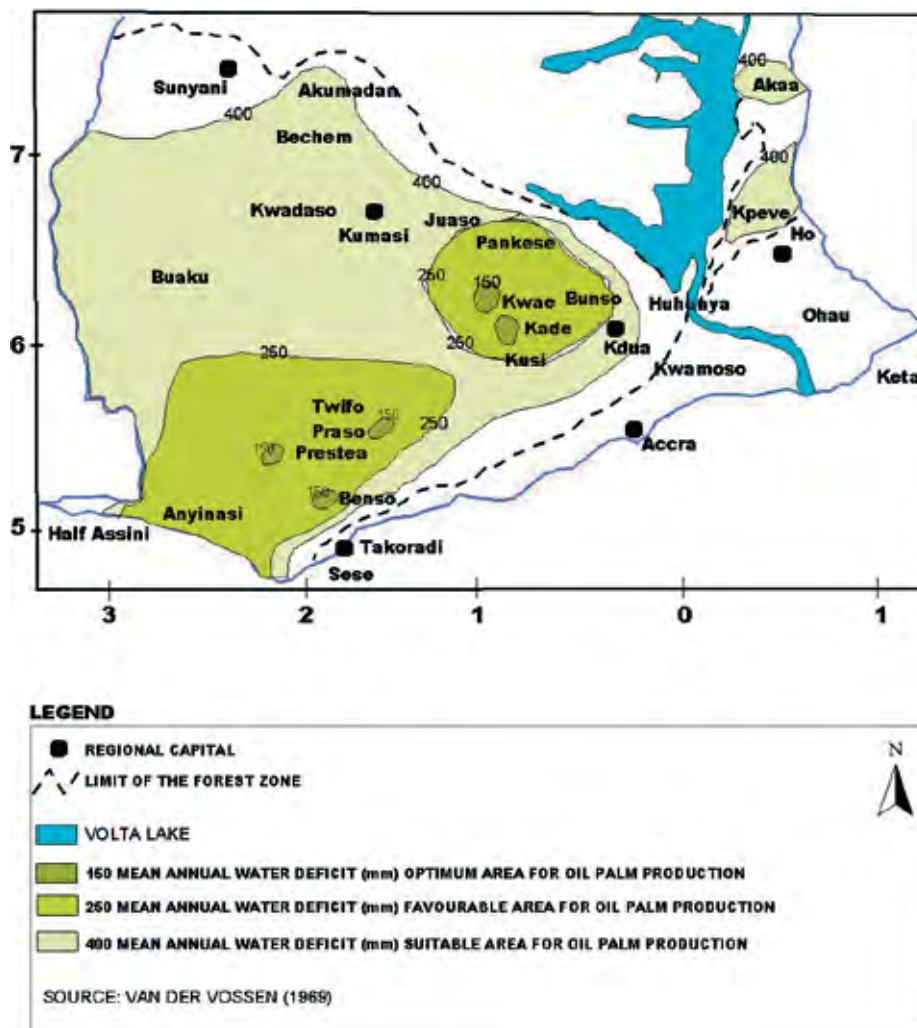
Some African governments are targeting oil palm as a key sector for agricultural growth and to address rural poverty. However, the sector's current expansion is driven largely by large-scale agro-industry and

favors large plantations for economies of scale, which raises the question of whether and to what extent small-scale farmers, including women, can successfully compete, capture a share of the value addition of the growing sector and improve their incomes.

Oil palm is grown in the forest belt in Ghana, where the rainfall amount is greater than 1200 mm/annum and distributed in a bimodal fashion. The most suitable areas for oil palm cultivation in Ghana are in the Western, Central and Eastern Regions. Large oil palm plantations (nucleus estates and outgrowers) and processing mills are located in these regions. Some of the large-scale plantations are Benso Oil Palm Limited (BOPP) and Norwegian Oil Palm Ghana Limited (NORPALM) in the Western Region, Twifo Oil Palm Plantation Limited (TOPP) in the Central Region, and the Ghana Oil Palm Development Company (GOPDC) at Kwae near Kade in the Eastern Region (see Figure 1).

At present, it is estimated that Ghana has more than 150 000 ha of wild groves of (*Dura*) oil palm, as well as approximately 140 000 ha in private, unorganized small holdings, and some 40 000 ha in estates with smallholder and outgrower schemes. The total estimated area of oil palm in the country is 330 000 ha (MoFA, 2010).²

Figure 1. Map of Ghana Showing the Oil Palm Growing Areas



² MoFA (2010). MASDAR: Master Plan Study on the Oil Palm Industry in Ghana. November, p. 1.2.

In areas where the crop grows well, oil palm production can ensure food and livelihood security for many farmers and communities. In addition, it offers a livelihood to other value chain players, such as transporters and agro-input sellers who are outside the production areas. There is a wide variation in the productivity of oil palm reported by various sources. The level of productivity in the small scale sector is about a fourth of the productivity on estates, and a third of the productivity on the outgrower farms. Large estates achieve a productivity level of 10-13 tonnes/ha; smallholder outgrowers produce about 7-10 tonnes/ha and private small-scale producers obtain about 3 tonnes/ha. The key factors responsible for low productivity on private small-scale farms include old, low-producing tree stock, poor maintenance, lack of application of fertilizers and often lack of establishment of cover crops.

Ghana's CPO output of 242 130 MT is less than 1 percent of global output of 46 million MT. World price of palm oil has improved from USD 350/MT in the 1990s to a high of USD 1 020/MT by December 2011, making it profitable to cultivate oil palm even at a production cost of USD 350/MT for Asian producers and USD 400-450/MT for Ghanaian producers, who were expected to obtain a margin of USD 70 million in 2010.

Ghana's palm oil industry is characterized by large-, medium- and small-scale operators engaged in production, processing and marketing. The industrial use sub-sector consists of medium and large scale oil palm plantations and mills. It has more efficient technology, economies of scale, higher productivity on farms (in terms of yields of oil palm bunches) and in mills (in terms of quantity of oil extracted), and by its better quality of CPO, as well as further refined palm oil products, which are sold to companies for use in manufacturing. Large plantations use 20 percent of available land to produce 55 percent of national CPO output, while medium-scale producers use 5 percent of land to produce 5 percent of CPO. Small producers, on the other hand, use 77 percent of land to produce 39 percent of national output.

The main objective of this study is to conduct a value chain and smallholders' study on growth of the oil palm industry in Africa, with a particular focus on Ghana, and its implications for small farmers.

The key question in this chapter is whether an expanding oil palm sector can be inclusive of smallholders. The answer requires examining policies and investment strategies, as well as the types of institutional and contractual arrangements between processors and producers/suppliers, including the role of small farmer groups.

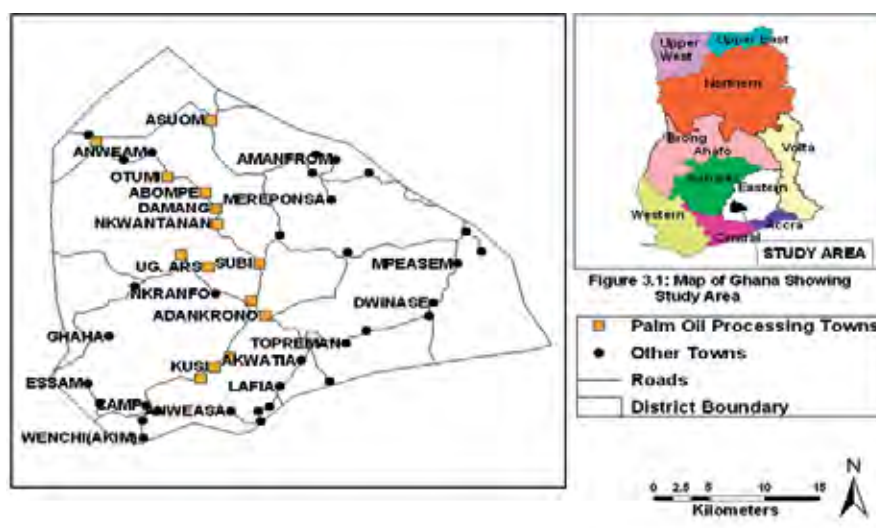
2. Methodology and data collection

The Kwaebibirem District in the Eastern Region of Ghana was the focus of the study. Ghana Oil Palm Development Company (GOPDC) owns and manages approximately 20 500 hectares (ha) of oil palm plantation in this district, divided between Kwaie and Okumaning estates. The Kwaebibirem District includes both large-scale, outgrower schemes linked with large producers/processors and smallholders selling onto the local market. For example, about 6 500 ha of oil palm production in the district is directly run by GOPDC staff (approximately 280 people), while 14 000 ha is cultivated by a body of 7 000 outgrowers who own land located within 30 km of the oil palm mill at Kwaie estate. GOPDC assists outgrowers in the development of their plantations and they sell their fruits to the company.

To understand the household production and market structures for smallholder oil palm producers, five focus group discussions (FGDs) were held with producers and two FGDs with processors in five oil palm producing communities at Damang, Nkwantanang, Kwaie, Anweam and Otumi. In addition, about 60

individual smallholder farmers, processors and marketers were interviewed in nine communities in the district, using structured questionnaires and interview guides/checklists. The study also held detailed focused discussions with individual producers, processors and marketers, as well as with one large-scale oil palm estate and one palm kernel processor in the district: GOPDC (Kwae) and WAML Industries Limited (Nkwantanang), respectively. See Figure 2 for the detailed locations of smallholders interviewed for the study.

Figure 2. Map of Ghana Showing the Study Area in the Oil Palm Growing Zone



Source: MofA (2010)

Additional information was gained through a review of literature and existing policy documents and the analysis of secondary information.

Data from the survey questionnaires were edited, coded and entered into the Statistical Package for Social Science (SPSS) and analysed quantitatively. Data from observations and interview recordings were analysed using qualitative data analysis methods (content analyses).

3. Significance of oil palm in Ghana and West Africa

3.1 Importance of palm oil and derivative products as sources of vegetable oils for consumers and industries

The oil palm is the second most important tree crop in the Ghanaian economy after cocoa. It is therefore one of the leading cash crops in the rural economy in the forest belt of Ghana. Oil palm, an essential oilseed, produces many products both for domestic consumption and as inputs for the industrial sector. The structure of the palm oil industry in Ghana has been shaped by the presence of two different markets: home consumption and industrial use in domestic manufacturing. As a result, Ghana's industry has two sub-sectors which are largely separate.

The industry provides income for many rural people who work in large and small scale mills, especially women engaged in small scale palm oil processing. The small-scale sub-sector consists of private smallholder oil palm cultivators, who largely sell their fruit bunches to small-scale mills or to household (largely manual) processors. This sub-sector is characterized by low-yielding oil palm varieties, low productivity of farms and mills, and low quality CPO, which is sold in the village or at small town markets.

The principal product of oil palm is the palm fruit, which is processed to obtain commercial products including palm oil, PKO and palm kernel cake. Palm oil and PKO have a wide range of applications. Recently, CPO has emerged as biofuel, an alternative source of energy. The processing of CPO gives rise to three different products: food products (cooking oil, margarine, etc.); manufactured/industrial goods (cosmetics, soaps/detergents, etc.); and fuel (biodiesel).

Among the food uses, refined, bleached and deodorized (RBD) olein is used mainly for cooking and frying oils, shortening and margarine, while RBD stearin is used for the production of shortening and margarine. RBD palm oil (unfractionated palm oil) is used for producing margarine, shortening, vegetable ghee, frying fats and ice cream. Several blends have been developed to produce solid fats with a zero content of trans-fatty acids. In the production of ice cream, milk fats are replaced by a combination of palm oil and PKO. A blend of palm oil, PKO and other fats also replaces milk fat for the production of non-dairy creamers or whiteners.

Palm oil is the largest natural source of essential vitamin E, and is high in vitamin K and dietary magnesium. Palm oil and PKO are also ingredients for the production of specialty fats, which include cocoa butter equivalents (CBE) and cocoa butter substitutes (CBS) and general purpose coating fats. CBE and CBS have physical properties that are similar to cocoa butter and are widely used for production of chocolate confectionery.

Non-food uses of palm oil and PKO are for the soap, detergent and cosmetic industries. They are also used in the chemical industry for plasticizers and coatings. A recent trend is the usage of by-products, as well as CPO, as energy sources for electricity plants and increasingly as biofuel and biodiesel. By-products include palm kernel cake, fruit chaff, mesocarp fibre, palm kernel shells, empty fruit bunches and palm oil mill effluent.

Ghana exports, as well as imports, various kinds of vegetable oils, which are used for both industrial and domestic purposes. Import volumes have been generally increasing over the years compared with export volumes; groundnut oil, for instance, has seen substantial decrease in exports over the year.

Table 1. Share of Palm Oil Related Products in Total Demand: Ghana and West Africa

Product	Share of product in Ghana demand (%)	Share of product in West Africa demand (%)
Laundry Soaps	34.5	32.1
Personal wash	4.6	4.3
Fat & Margarine	8.0	8.8
Refined Cooking Oil (Ind.)	12.3	17.1
Edible Palm Oil	40.6	37.7
Total		

Source: Percentages computed from PSI Annual Report (2009).

The demand for oil palm derivatives in Ghana and the sub-region is shown in Table 1. Palm oil as vegetable oil (fat and margarine, refined cooking oil and edible oil) constitutes almost 61 percent of the palm oil-related product demand in Ghana, and about 65 percent of the total demand in West Africa. There is an insufficient supply of palm oil products in Ghana and the sub-region to meet demand requirements. Ghana currently has a total of 305 758 ha of oil palm, more than 80 percent of which is cultivated by private small-scale farmers. It is estimated that 243 852 tonnes of palm oil is being produced and that Ghana currently has an unmet demand of 35 000 tonnes of palm oil.

There are two main oil palm varieties cultivated in Ghana: the *Dura* and the *Tenera*. The bulk of the smallholder holdings under oil palm are the *Dura*. However, the high level of unsaturation in the *Dura* makes it nutritionally preferable to the *Tenera*. The oil from the *Dura* is therefore more preferred for food. It is indicated that palm oil from red *Tenera* has higher palmitic acid content than red *Dura* palm oil (RDPO), while oleic acid content is higher in the red *Dura*. Significant differences are observed between palm oils from the red and yellow fruits of the same variety and the mean total fatty acid content of the *Dura* is richer in unsaturated fatty acids than the *Tenera* varieties.³ Since the level of saturation is affected by the environment where the oil palm is grown, a careful selection of planting location is necessary, if a high unsaturation to saturation ratio is desired. In addition, there are reported significant differences in free fatty acid (FFA) content of palm oils from the red and yellow *Dura* and *Tenera* fruits. The FFA is higher in the *Dura* red palm oil than in the *Tenera* red palm oil while essentially equal amounts have been recorded for the yellow fruits of the two varieties.

3.2 Palm oil and other oil palm products demand in Ghana and the Sub-region

In 2010, Ghana imported about 112 000 MT of vegetable oil, of which almost 45 percent was palm oil (crude and refined). (See Table 6 for Ghana exports and imports). At current population projections, about 260 000 MT were needed for consumption in 2011, of which about 160 000 MT “were estimated to be produced locally, giving a shortfall of about 100 000 MT.

Table 2. Sub-regional Production and Consumption of Palm Oil in 2007

	Production	Import	Total Supply	Export	Food	Other Utility	Waste	Consumption	GAP
Benin	40	210	250	198	42	10	0	52	-12
Cameroun	172	28	200	0	95	99	6	200	-28
Côte d'Ivoire	289	6	295	121	180	5	0	185	104
Ghana	109	170	279	92	62	135	0	197	-88
Guinea	50	29	79	0	61	18	0	79	-29
Liberia	44	16	60	0	49	11	0	60	-16
Nigeria	1 300	390	1 690	15	736	890	50	1676	-376
Sierra Leone	36	9	45	0	44	5	0	49	-13
Togo	7	15	22	2	22	22	0	44	-37
TOTAL	2 047	873	2 920	428	1 291	1 195	56	2 542	-495

Source : FAOSTAT, 2011

³ Ekpa, O. D., Fabara, E. P. and Morah, F. N. I. (1994) Variation in Fatty Acid Composition of Palm Oils from Two Varieties of the Oil Palm (*Elaeisguineensis*) J. Sci. Food Agric. 64 483-486;

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Table 2 shows an estimated sub-regional gap of 495 000 MT of oil palm between consumption and production⁴ for 2007 (TOR oil palm, 2011). These countries imported about 873 000 MT of palm oil and exported 428 000 MT in the same period. The only country that produced more than it consumed was Côte d'Ivoire in 2007.

Table 3. The Importation of Palm Oil in the Sub-region (2008)

Targeted countries	Quantity (1000 tonnes)	Value (million USD)	Unit value (\$/tonne)
Benin	225	202	900
Nigeria	464	539	1160
Côte d'Ivoire	0	0	0
Cameroon	43	25	579
Liberia	14	12	911
Sierra Leone	9	11	1258
Guinea	22	9	405
Togo	64	20	321
TOTAL	841	818	

Source : FAOSTAT, 2011

In 2008, the countries in the sub-region spent over USD 818 million to import 841 000 tonnes of palm oil (Table 3). Nigeria alone spent as much as USD 539 million to import palm oil in 2008. Table 4 shows that Nigeria's imports of palm oil in 2011 were not significantly different from 2008. All these oil palm producing countries in the sub-region exhibit shortfalls in meeting demand from domestic production, with Nigeria imports alone exceeding the exports of Ghana and Côte d'Ivoire.

Table 4. Palm Oil and PKO Demand in 2011: Ghana, Nigeria and Côte d'Ivoire (1000 MT)

	Ghana					Nigeria				
	Total Supply	Exports	Imports	Food Use Domestic consumption	Industrial Domestic consumption	Total Supply	Exports	Imports	Food Use Domestic consumption	Industrial Domestic consumption
2011										
Palm Oil	304	100	150	180	174*	1388	18	440	1050	235
Palm kernel oil	18	10	2	8	0	310	4	0	215	86

Source: Index Mundi (www.indexmundi.com/agriculture: accessed June 2012)

Notes: * Estimated from data on total supply, exports, imports and food.

Nigeria provides a huge domestic market for PKO. There is therefore a growing demand for CPO, not only in Ghana but in the entire sub-region. In West Africa alone, there is an intra-region market close to 2 million MT a year. For instance, it is reported that Malaysia has installed CPO silos in Ghana to export to the Nigerian market. The Food and Agriculture Organization indicates that in the medium term (2005-2015) world vegetable oil demand will rise to 30 percent of the vegetable oil market. A major part of this world demand will be for palm oil. Ghana thus has the opportunity to explore this versatile sector by further developing its oil palm industry to meet the growing market interest in oil palm products and derivatives, both domestically and internationally.

⁴ The target countries (Terms of Reference) are: Benin, Cameroun, Côte d'Ivoire, Guinea, Liberia, Nigeria, Sierra Leone and Togo, but Ghana is included in this figure to have complete data.

Although they produce substantial amounts of palm oil, Ghana and the West Africa sub-region are not self-sufficient in meeting their requirement for oils and fats (see Table 5).

Table 5. Demand and Deficits for Palm Oil Related Products: Ghana and West Africa

Product	Ghana (Mt) (Demand)	Ghana (Mt) Supply	Ghana (Mt) Deficit (palm oil needed to meet demand)	West Africa (Mt) (Demand)	West Africa (Mt) Supply	West Africa (Mt) Deficit (palm oil needed to meet demand)
Laundry soaps	90,000	36,000	54,000	620,000	247,000	373,000
Personal wash	12,000	3,500	8,500	84,000	26,000	58,000
Fat & margarine	21,000	4,000	17,000	170,000	36,000	134,000
Edible palm oil	106,000	0	106,000	730,000	0	730,000
Total	261,000	21,000	240,000	1,934,000	134,00	1,800,000

Source: PSI Annual Report (2009), based on assumptions about trends in population growth.

Ghana exports, as well as imports, various kinds of vegetable oils, which are used for both industrial and domestic purposes. Import volumes have been generally increasing over the years compared with export volumes; groundnut oil, for instance, has seen substantial decrease in exports over the years.

Table 6: Exports and Imports of Vegetable oils (MT), Ghana (2000-2010)

Vegetable oil	2000		2001		2002		2003		2005	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
Soyabean oil	50.9	1094.0		4624.5		7825.9		7240.7		2235.3
Groundnut oil	72.1	35.7		275.2		327.4	52.4	9.5	3.1	34.4
Olive oil	1.1	283.2		97.2		175.6	11.4	256.5	18.1	172.8
Palm oil (crude)	12624.6	3461.0	6696	3698.7		14677	2776.2	13599		15392.5
Palm oil (refined)	580.9	1695.0	1066	2038.8		7524	2689	12783	4311.2	12768.1
sunflower	6.0	1712.0	19.4	1629.8		1989.8		2348.3		55.7
Coconut oil	8.0	212.4		212.4		150.1	108	4.5	10.4	19.6
Palm kernel (crude)	441.0	1501.0		0.2		629.9	5.4	450	38.6	0.2
Palm kernel (refined)	0.2	0.5	41	65.7		0.002	321.3	0.6	175.3	344.5
Maize oil		38.9		38.9		86.2	0.004	4	0.1	17.1
Margarine	77.9	5101.0	713.2	4431.6		7625.1	1680.1	13254	2592.1	6519.6
Other vegetable fats	751.0	2959.0	1439	5362.4		16088	131.6	25529	4702.2	8825.9
Total	14614.0	18093.0	9975	22475.4		57099	7775.2	75478	11851.1	46385.7
Total veg. oils	15076.6	19979.0	10251	30383.2		66498	9438.3	75603	11868.4	47013.4

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

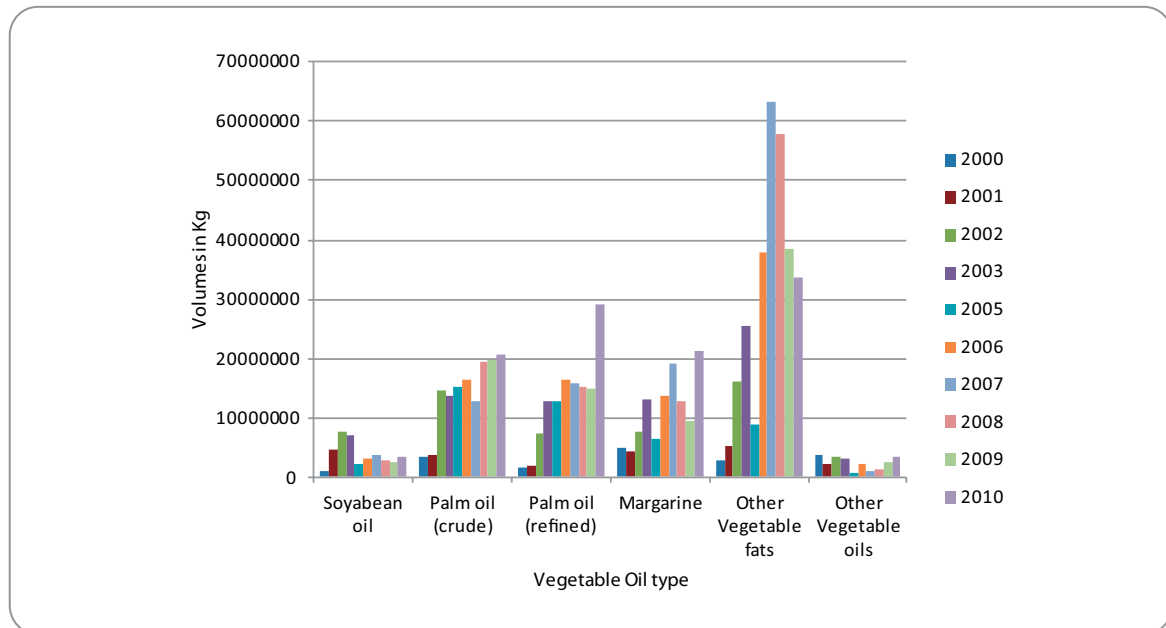
Table 6. Exports and Imports of Vegetable oils (MT), Ghana (2000-2010) Cont.

Vegetable oil	2006		2007		2008		2009		2010	
	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP	EXP	IMP
Soyabean oil		3156.4		3653.4		2759.1	0.5	2465.6		3369.5
Groundnut oil	17.8	6.5	4.8	3.1	110.4	5.4	1.4	946.4	47.7	6.6
Olive oil		295.4	4.3	409.5	1.2	419.6	8	371.9	0.2	419.2
Palm oil (crude)	823.2	16489.5	940	12962.8	398.6	19523.6	5370.1	19890.7	10723.6	20729.8
Palm oil (refined)	1105.8	16324.1	1175.5	15751.4	1619.2	15306.7	1416.7	14950	910.2	29010.6
sunflower		1302.3		72.5		96.3		84.9	20	326.3
Coconut oil	37.5	141.4	0.4	1	536.4	0.9	446.1	1.8	754.9	0.8
Palm kernel (crude)	8.7	40	243.7	40.1	23.2	110.1	2229.7	2.6	1003	1921.8
Palm kernel (refined)	18.5	344.5	140.7	494.5	517.4	641	297	1000.3	709.9	774.2
Maize oil	4.8	4	0.013	32.3		12.5		19		8.2
Margarine	0.7	13841.5	115.1	19299.6	992.6	12789.8	6402.4	9525.7	7373.6	21355.7
Other vegetable fats	373.3	37907.6	9342	63306.1	2453	57947.3	2799.6	38502.5	13526	33545
Total	2390.4	89853.3	11966.4	116026	6652	109612	18971.5	87761.3	35069	111467.4
Total veg. oils	2536.7	89948.2	13259.1	116108	7497.1	109665	19222.2	102611	35238.7	111544.1

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

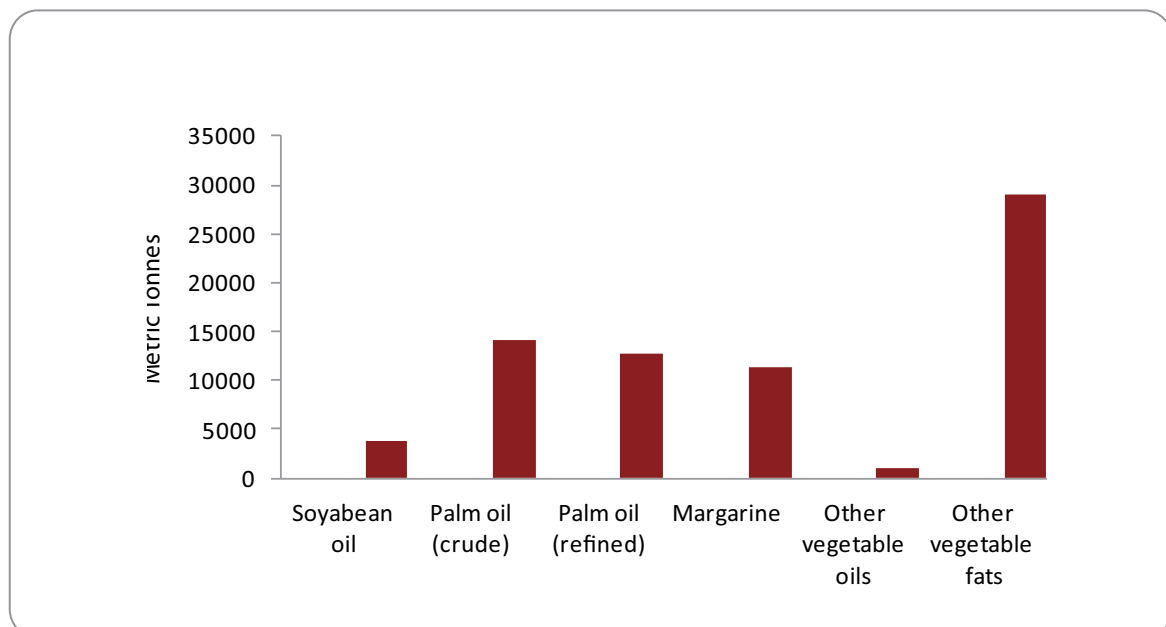
Palm oil, which has seen a steady increase in exports, has also seen a steady increase in imports at the same or even more rapid rate. From 2006 to 2010, there have been substantial imports of CPO to meet domestic industrial demand. Imports of CPO reached 20 730 MT in 2010 (see Table 6). These figures show shortfalls of CPO to meet domestic industrial needs. On the other hand, imports of refined palm oil (RPO) have exceeded exports over the period 2000-2010. Imports of crude palm kernel (CPK) have declined but there was an increase in exports of this product.

To meet the demand for cooking oil for food and for industrial use, Ghana imports different types of vegetable oils (see Figure 3). Because the supply of CPO is inadequate to meet domestic food and industrial needs, Ghana imports CPO, refined palm oil and other vegetable oils. Figure 3 shows that, between 2000 and 2010, the import volumes of CPO and refined palm oil increased, relative to the other competitive vegetable oils such as soybean oil, groundnut oil and margarine.

Figure 3. Volumes of Vegetable Oil Imports to Ghana, 2000-2010

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

Figure 4 shows the prominence of specific palm oil products relative to other specific vegetable oil imports to Ghana in 2000-2010.

Figure 4. Average (2000-2010) Volumes of Vegetable Oil Imports (MT)

Source: United Nations Statistics Division. International Commodity Trade Statistics Database (COMTRADE)

4. Oil palm production structure, value chains and business models

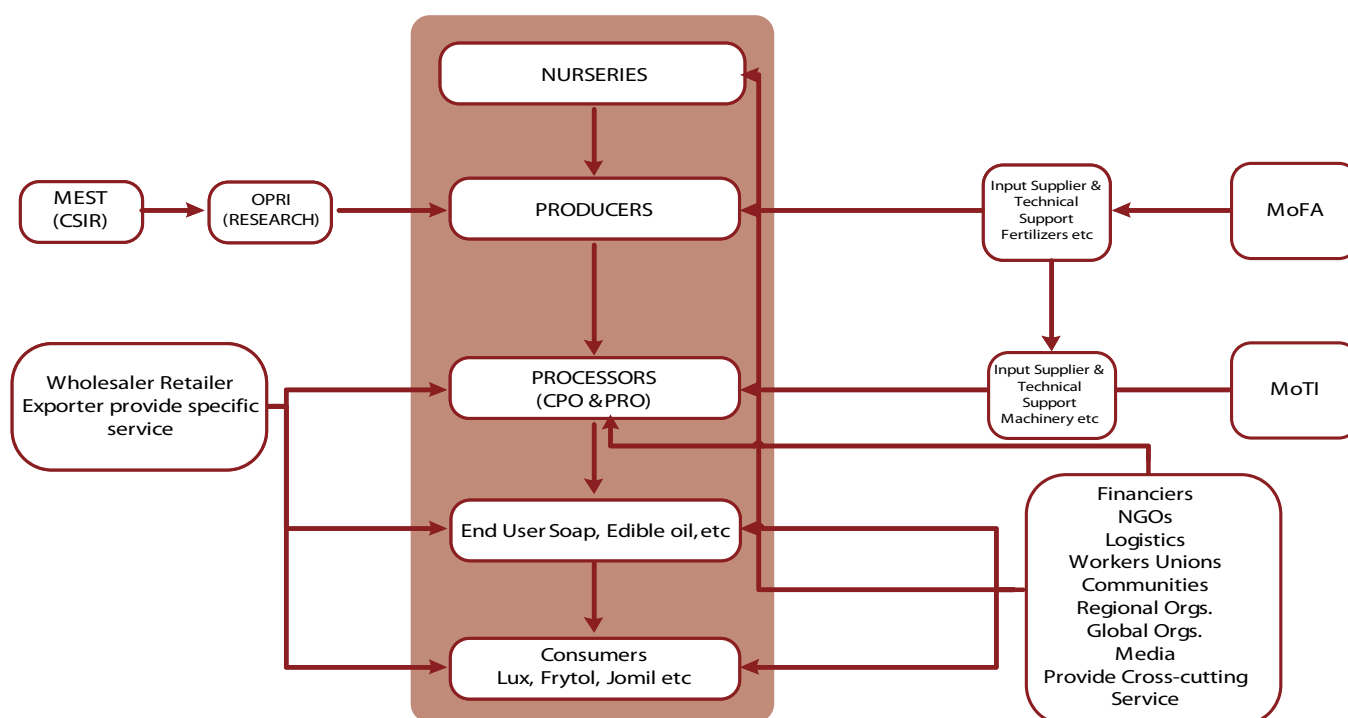
4.1 Oil palm and derivative products value chain, from plantation to final consumption/utilization

The *oil palm* supply chain consists of the following series of activities: producing raw material, linking with processing, obtaining the final product, marketing and selling to the end user. The availability and quality of support services, in the forms of transport, storage and/or finance can have an effect on costs and returns at every stage and ultimately defines the profit margins as production moves along the chain.

The main actors in the system are the producers (nurseries, smallholders, medium and large private farmers, estate plantation owners), processors, traders/wholesalers, retailers and consumers (household, commercial and industrial users). The supply chain is illustrated in Figure 5. The oil palm production system in the chain is carried out in two main production systems: (a) large estate plantations; and (b) smallholder private farms intercropped with food crops during establishment of the oil palm crop.

To a large extent, availability and affordability of inputs determine the productivity of the smallholder oil palm farms. Inputs for the oil palm supply value chain include sprouted seeds and seedlings, fertilizer, herbicides and insecticides (chemicals) and are provided mainly through the open market for the smallholder, private farmer. Inputs in the form of oil palm seeds are provided by government agencies, through the Oil Palm Research Institute (OPRI). Technical support and extension services are provided by the Ministry of Food and Agriculture (MoFA). Financing is a major link in the supply chain; this is mainly provided to the smallholder farmer through non-governmental organizations (NGOs) and micro-financing groups.

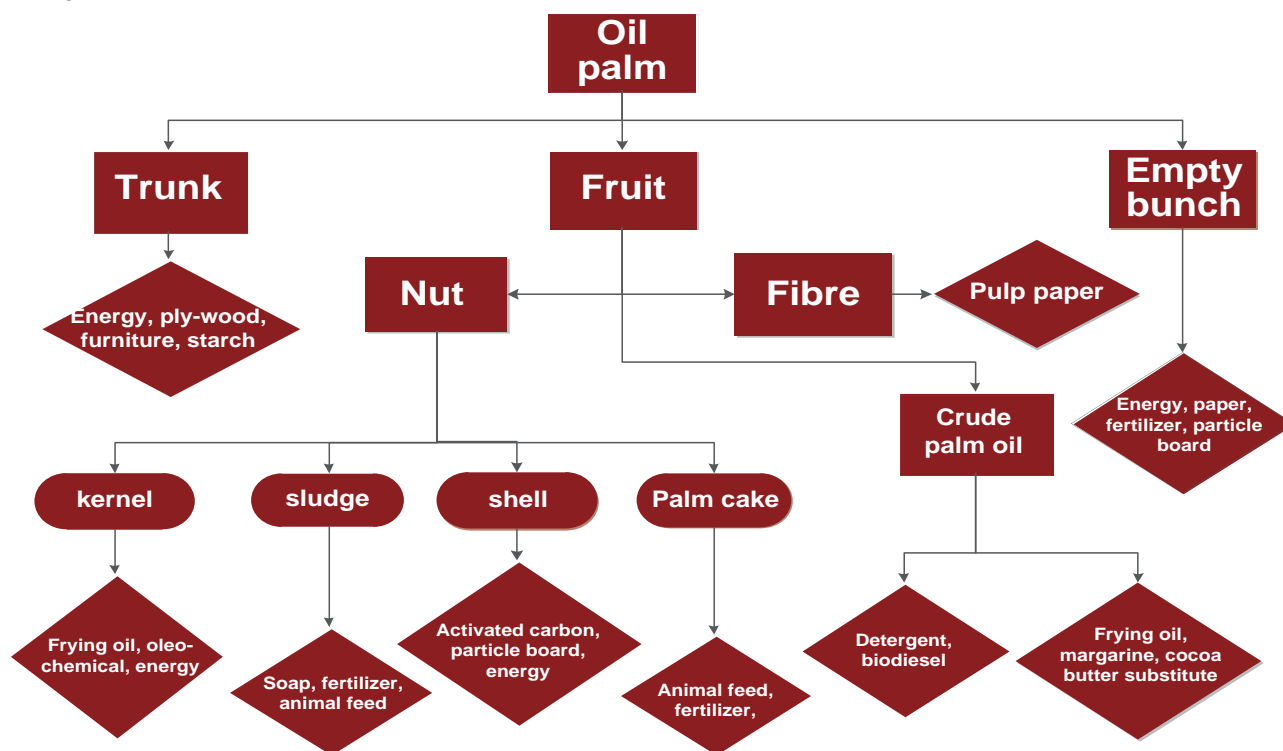
Figure 5. The Oil Palm Supply Chain



Source: MofA (2010)

The *oil palm* product value chain can be divided into three segments: value addition from the trunks, the fruits and the empty fruit bunches. The fresh fruit bunch (FFB) is perhaps the more important element in the value chain. It yields the nuts and the CPO. The CPO provides a popular cooking oil in West Africa and it can also be further processed to yield other industrial and food products (see Figure 6). The empty fruit bunches can be used as fuel, in particle board and as fertilizers in plantations.

Figure 6. The Oil Palm Product Value Chain



Source: MofA (2010)

Palm oil, palm kernel and PKO are the main products of the oil palm; however, the trees and the processing wastes generated when the fruits are processed to obtain palm oil and palm kernel also have several uses. The sludge is used in making traditional soaps and fertilizer and the palm kernel cake is used widely as an input in the feed industry and for fertilizer. In addition, the palm tree, particularly the trunk, can be used as fuel or converted to plywood, and the palm branches and leaves can be used for fibre in basket weaving and for brooms.

4.2 Prevailing Business Models and Contractual Arrangements for the Different Products and Production

In Ghana, crops produced under various forms of contract arrangements include cotton, oil palm, pineapple and, to a lesser extent, mango and citrus. In the oil palm industry, the prevailing business models currently linking smallholders in the industry in the investment strategy are: (a) the nucleus-smallholder; (b) outgrower farmers who sharecrop, rent or own their land outside the confines of the estate; and (c) independent smallholder farmers.

The nucleus-smallholder model involves smallholder farmers cropping on the land that belongs to the estate after acquisition of the land. The farmers are structurally bound by contract to a particular oil palm

estate. They are obliged to sell what they produce to a particular estate and they are often not free to choose which crop they develop, are supervised in their planting and crop management techniques, and may be organized, supervised or directly managed by the managers of the estate or scheme to which they are structurally linked. The smallholder farmers receive technical advice and inputs and are under permanent contract to sell their output to the estate.

The outgrowers cultivate oil palm outside the nucleus estate, on their own land or as tenants on a third party's land, usually adjacent to the estate farm concessions. The outgrowers receive planting material, fertilizers and other production inputs from the estate, under agreement. The contract between the estate and the outgrower farmer stipulates that the estate provides inputs on credit to the farmer (at cost), and the farmer in return supplies all his production output to the company. A percentage of the value of the supplied crop is used for loan servicing. The contract is on a share-financing basis: farmers put up a portion of the investment cost at planting time and the remaining part of the investment is a loan. Farmers enjoy a grace period on their loans, and start repayment when the trees are in full production. Outgrowers have access to very high-yielding seedlings, fertilizers, organic pest management and training in good agricultural practices. Outgrower farmers remain under the agreement until their loans are repaid, and are therefore obliged to sell their produce to the estate at an agreed price; the loan is gradually deducted from the produce sent to the estate until the loan payment is completed.

The outgrowers' dependence on the estates for inputs provided over the period under contract, among other factors, limits the farmers' decision-making control over the property and may lead to accusations of price manipulation. The outgrower contracts involve the right of the estate to take over management of the outgrower farm if the farmer fails to honour the terms of the agreement until the loan has been cleared. Because of lack of transparency in the loan deductions, farmers tend to renege on the scheme.⁵

In contrast, the independent smallholder farmers have the freedom to choose how to use their lands, which crops to plant and how to manage them. They are self-organized, self-managed and self-financed and not contractually bound to any particular estate, although they do receive support or extension services from government and private agencies, when sought. They have the freedom to crop and market their fruits on the open market and to source their inputs from the open market. They are relatively less productive, however, (using low-yielding planting materials, less fertilizer, etc.) because of the higher open-market input costs and limitations in access to other services due to their lack of access to finance.⁶

The nucleus-smallholder/outgrower model is the prevailing model in the oil palm industry and premised on the incorporation of agribusiness into traditional agrarian systems under mutually beneficial arrangements. It is seen by the nucleus/estates as a resource-providing contract to access land for production in a way that can get around land disputes and provide management specifications to ensure quality produce (growers follow recommended production methods, input regimes, and cultivation and harvesting practices). Currently, outgrowers represent the majority of the planted area easily accessed by estates.

⁵ The Estate Manager of GOPDC during the field work (9th March, 2012) indicated that their outgrower scheme has collapsed, despite it being claimed as among the most successful World Bank supported schemes. This collapse has affected the company's output negatively. The outgrower had been supplying about 60 percent of FFB and they have not been able to meet their outgrower target since the beginning of the year (2012). "We have no contract with anyone to supply us with FFB. The outgrower currently supplies 5 percent of our FFB. More than 45 percent is coming as private. But we know that those are outgrowers who come as private farmers. Total output for the whole year (2011) is 13,000 tons FFB; 40 percent of that was from the estate and the rest was supplied by others. Our target for 2011 was 140,000 tons FFB".

⁶ AduAnkrah (2008) concludes in his study that productivity and income levels of outgrowers were significantly higher than those of non-outgrowers.

Under the Corporate Village Enterprise Companies (COVE) scheme, for instance, land is acquired through landowner equity shareholding in the plantation's development companies. The plan seeks to consolidate and rehabilitate new estates from mining lands and adjacent lands vested in the COVE. This model is a resource-providing contract and the oil palm estates use contract farming to access land for production. Contract farmers are provided with inputs on credit for the establishment of the crop. The loan is recovered over a number of years as farmers sell palm fruits to the nucleus estate for processing.

Land consolidation is emphasized in this model, which tends to increase production at lowest cost on large tracts of land. It is estimated that existing low-yielding farms of about 230 000 ha will be rehabilitated and some 70 000 ha has been planted under improved seed material supplied by OPRI in the last decades. Given the production capacity of OPRI, it is estimated that it will take the next two to three decades to replace the old low-yielding farms with new stocks. This development model usually involves a large number of growers, tight central control from the estates and provision of services.

4.3 Main production structures, agro-systems and gender roles

The most suitable areas for oil palm cultivation in Ghana are in the humid agro-ecological zones in the Western, Central and Eastern Regions (see Figure 1).

The oil palm production in Ghana is organized along three main systems: (a) a nucleus-smallholder system (approximately 2 percent of all smallholders); (b) outgrower farmers (approximately 28 percent of all smallholders); and (c) independent smallholder farmers (private farmers, approximately 70 percent of all smallholders). As described above, the nucleus-smallholder system involves smallholder farmers cropping on land that belongs to the estate; the outgrowers rent or own their land outside the confines of the estate, and the independent smallholder farmers (private farmers) have the freedom to crop and market their fruits on the open market. In Ghana, the Ghana National Interpretation Working Group (GNIWG) (2011) defines the smallholder oil palm producer as: "Farmers growing oil palm, sometimes along with subsistence production of other crops, where the family provides the majority of labor and the farm provides the principal source of income and where the planted area of oil palm is usually below 40 hectares in size."

Palm oil production in Ghana consists mainly of plantation (estate) farms (currently about 25 percent of cultivated land) and private smallholder farms. The production structure of the nucleus estates links outgrower and smallholder farmers in the supply of FFBs.

Table 7. Major Oil Palm Companies and Areas Cultivated

Company	Nucleus (Ha)	Outgrower/	Unit value (USD/tonne)
GOPDC (Ghana Oil Palm Development Company Ltd.)	8,000	14,352	22,352
TOPP (Twifo Oil Palm Plantations Ltd.)	4,234	1,690	5,924
BOPP (Benso Oil Palm Plantations Ltd.)	4,666	1,650	6,316
NORPALM GH. LTD.	4,000	-	4,000
JUABIN OIL MILLS	424	1,100	1,524
AYIEM OIL MILLS	250	-	250
GOLDEN STAR (a mining company)	-	720	720
TOTAL	21,574	19,512	41,086

Source: MofA (2010)

GOPDC assists outgrowers in developing their plantations so they can sell fruits to the company. Approximately 300 ha within the concession area are cultivated by smallholders – farmers who are permitted to develop temporary plantations within the estate and sell their FFBs to GOPDC.

Table 8. Major Oil Palm Companies and Areas Cultivated (by Scale)

Company	Land Under Cultivation			
	Estate	Outgrower	Smallholder	Total
	(ha)	(ha)	(ha)	(ha)
Large Scale Mills:				
Benso Oil Palm Plantation	4,666	5,000	1,650	11,316
Twifo Oil Palm Plantation	4,500	8,000	2,800	15,300
Norpalm	4,500	8000	100	12,600
GOPDC	4,650	13,000	350	18,000
<i>Total for Larger Scale</i>	<i>18,316</i>	<i>34,000</i>	<i>4,900</i>	<i>57,216</i>
Medium Scale Mills:				
Ayiem Oil Mills	126	0	798	924
Juaben Oil Mills	424	1,100	8,636	10,160
Obooma Oil Mills	430	0	2,437	2,867
WAOPP Oil Mills	0	0	0	0
<i>Ashanti Oil Mills</i>	0	0	0	0
Adansi Oil Mills	0	0	0	0
AhwiaNkwanta Oil Mills	0	0	0	0
Anyinase Oil Mills	0	0	0	0
Others		0		0
<i>Total for Medium Scale</i>	<i>980</i>	<i>1,100</i>	<i>11,871</i>	<i>13,951</i>
Small Scale Mills:				
Small holder	232,833	0	0	233,933
<i>Total for small scale</i>	<i>232,833</i>	<i>0</i>	<i>0</i>	<i>233,933</i>
GRAND Total	252,129	35,100	16,771	305,100

Source: MofA (2010)

The large estates are currently a blend of either private/public shareholding entities or private enterprises. For example, GOPDC as a state-owned enterprise was divested in 1995, with SIAT (Ghana) Ltd (agro-processing group) acquiring a majority stake (80 percent) in the new company. Currently, GOPDC and NORPALM are inherently private while TOPP and BOPP are private/public shareholding entities.

There is a wide variation in the productivity of oil palm production in Ghana among these different farm structures. Average yields of about 1-3 MT FFB/ha are reported in the wild groves of (Dura) oil palm, 3 MT FFB/ha in the private, unorganized smallholdings, and 10 MT FFB/ha in the estates with smallholder and outgrower schemes. The large estates achieve productivity levels of between 10-15 MT/ha. In general, the highest productivity levels of 20 MT/ha have been recorded by plantations in valley bottoms.

Gender roles are clearly delineated in the oil palm sector. Studies of oil palm farmers in the Kwaebibirem district conclude that there is an imbalance between the sexes and that stakeholders in the oil palm industry would do well to encourage women to go into oil palm production in the district. However, MoFA (2010, p.7.8) indicates that in the large estates up to 60 percent of workers on the plantations were women.⁷

During the FGDs with producer groups (Damang, Kwae, Otumi), it was revealed that activities such as land preparation, carrying planting materials to field sites and transplanting, manual weeding, spraying of weedicide, pruning and harvesting are mostly done by men. Activities such as nursery management and fertilizer application are done by both men and women, while rodent control, aggregating and carrying of harvested fruits and collection of loose fruits are mostly done by women.

Decisions regarding planting, harvesting, hiring of labor and processing are mostly made by men, with women being in charge of marketing and receiving money from sales. The lands are owned mostly by men, and oil palm is commonly produced by individuals. Men usually engage in these production activities so the women can take care of the home or family. However, women may also be involved in other field activities to obtain supplementary income for the family.

The palm oil processing industry in Ghana includes large, medium and small scale processors, providing income for many rural people, especially women engaged in small-scale palm oil processing. Small scale palm oil processing is dominated by women, working either in groups or as individuals (see Table 9). The processing method is manual with improved technology processing equipment, locally manufactured.

It is estimated that the bulk of the CPO produced in Ghana is from smallholder holdings. However, the extraction rates among the smallholders are lower than the extraction rates of large estate processors, with averages of 11 percent FFB and about 20 percent, respectively.

Table 9. Number and Gender of Workers Involved in Artisanal Processing

Activities	Number of people involved	Gender usually involved
Carrying from the truck to the shed	2	Women
De-fruiting	1	Women
Removing fruits	4	Women
Loading into boiler	2	Women
Boiling	1	Women
Carrying boiled palm fruit to machine	6	Women
Pounding and squeezing	4	Men
Carrying to frying pan	1	Women
Frying of oil	1	Women
Total number of people employed	22	Women

Source: Processor interview, Nkwantanang, February 2012

⁷ The GOPDC estate has about 2 500 workers and women account for about 1 000, making up 40 percent, according to a manager during the field interview.

4.4 Production and marketing structures for small oil palm producers

A. Results from focus group discussions with smallholder producers

Producers generally operated medium (5-10 acres) to large scale (>10 acres) farms and were mostly private producers. There appeared to be some outgrowers and some private smallholder farmers at Kwae. The major agronomic differences between the private smallholder farmer and the outgrower are the types of planting materials they use and methods of weed control. Some of the private outgrowers use volunteer seedlings, while GOPDC supplied improved seedlings to their outgrowers. For weed control, the private smallholder farmers use cutlasses while some of the outgrowers use weedicides.

Improved seedlings are acquired from Kusi, where the Oil Palm Research Institute (OPRI) is located. OPRI is the only institution fully dedicated to research into oil palm. It is also the only institution that produces seed nuts in the country and is currently estimated to have the capacity to produce 5 million of palm seeds per year.

Seeds and seedlings are expensive, but farmers have access to fertilizers on the market at a subsidized rate. Almost all the agro-chemical dealers in the district are located in Kade, and thus all agro-chemical products are obtained from surrounding towns such as Kade and/or Nkwantanang. Some farmers indicated they obtain inputs from GOPDC. Nursery operations are carried out by individual oil palm producers. Men usually perform input sales and distribution roles because, according to the farmers, the men are more experienced.

Palm fruits are harvested every month; in peak seasons, as much as 30 tonnes per hectare can be harvested, while in lean seasons, only about 2.2 to 3.3 tonnes can be harvested. No type of harvesting service is provided by any government or private agency.

Women are mostly involved in palm oil processing and marketing, palm fruit marketing, and palm kernel processing and marketing. Children are seldom used as workers on the oil palm farms. The workers average age is around 20 years and percentage of household members involved in some typical oil palm activities are summarized as follows:

- | | | |
|----|----------------------|------------------------|
| 1. | FFB production: | (Male-75%; Female-25%) |
| 2. | Palm oil processing: | (Male-20%; Female-80%) |
| 3. | Palm oil marketing: | (Male-20%; Female-80%) |

In the marketing of produce, particularly processed palm oil, women are in the majority. The domestic palm oil market is dominated by private marketers of either women groups processing to selling directly to local markets, or to private marketers for distribution within or outside the borders of the country.

It costs between GHC 137-190 per harvesting cycle to maintain the oil palm average production per acre (see Table 10).

Table 10. Cost Estimate for Maintaining an Acre of Oil Palm to Fruiting (FGD estimates)

Activity (Ghana Cedis)	Kwae	Otumi	Pramkese (1)	Damang	Pramkese (2)
<i>(Ghana Cedis)</i>					
Leasing of land	150/acre/5 yrs				
Clearing	250	30	50	50	50
Felling	100	30	100	50	30
Burning and stumping (GHC)	150	10	33	150	20
Lining and pegging (GHC)	50	40		40	25
Labor cost involved in planting (GHC)	54	60	50	30	25
Cost of seedlings (GHC)	3.50*60 seedlings (210)	4ghc*60 seedlings (240)		4ghc*60 seedlings (240)	
Cost of nets (GHC)				60	
Weeding (GHC)	60	90	100	120	75
Fertilizer application (GHC)				30	
Farm Maintenance					
Pruning (GHC)	30	60	30	50	42
Weeding (GHC)	60	90	100	120	75
Harvesting (GHC)	47	32	36	20	36
Total Farm maintenance cost/acre	137	182	166	190	143

Source: Summary by authors from focused group discussions.

Oil palm producers in the district mostly sell their FFBs to open market processors and large estate mills such as *Obooma* and GOPDC. Currently, no formal contracts exist between the estate buyers and the smallholder oil palm producers. These producers used to sell to GOPDC but, according to the farmers, GOPDC promised to transport their produce from the farms and then did not fulfil this agreement. Due to low output, GOPDC was losing revenue, so GOPDC asked the farmers to bring their FFBs to the factory; however, this arrangement was not appealing to the farmers because they had to pay the cost of transportation. Interaction between the farmers and GOPDC has weakened because producers want to be paid immediately after harvest. The only way harvesters can get their money upfront is for the farmers to sell to the local buyers. In addition, sometimes the local buyers are able to advance some money to the farmers, in anticipation of a harvest. The farmers do not have this type of arrangement with GOPDC.

The main reasons why oil palm producers would want to belong to a group would be to obtain improved seedlings, fertilizers and agro-chemicals. Currently, the nature of interactions among FFB producers, between producers and input suppliers and between producers and processors is mainly informal, through individual contacts; there are no formal contract arrangements.

Box 1. A Smallholder "Large-scale" Producer at Pramkese

In detailed discussion, one private farmer described a total oil palm farm size of 79 acres (consisting of a total of 8 different farms), all fruiting. Currently the farmer harvests a total of 31 tonnes from his 79 acres each month (average productivity of 392.4 kg/acre or 0.4 tonnes/acre per month). See Table below. The estimated cost of maintenance and harvesting/acre is GHC 170 per season.

Monthly yield of farms

Farm size (Acres)	Yield (in tonnes)
27	5
5	3
3	3
20	5
4	2
6	5
9	5
5	3
Total size: 79	Total yield: 31

Other crops cultivated by the farmer are citrus (2 acres) and cocoa (10 acres). The farmer compared the estimated revenues from oil palm, citrus and cocoa. In a good season, he makes about GHC 1,200 from his citrus farm at an estimated production cost of GHC 679/acre. For cocoa in the 2011 season, he harvested 30 bags/10 acres. The price per bag of cocoa was GHC 205 for gross revenue of GHC 6150.

For oil palm, on average, he estimates an income of GHC 23,250 (31 tonnes x GHC 150/tonne x 5 months of good harvest). He provides the cost of establishment/acre of oil palm, cocoa and citrus as follows:

Activity	Cost (Oil palm)	Cost (Citrus)	Cocoa
Land clearing	30	30	
Tree felling	15	15	
Weed control ³	30 (3 times a year)	30	
Pegging	8	8	
Digging/planting	8	8	
Cost of chemical for spraying			10
Labor cost for spraying			30
Pruning	60		
Harvesting	20/tonne		48
Transport			60
Cost of seedling	110 (110 seedlings)	150 (60 seedlings)	24 (120 seedlings, each costing 0.2)
Land leasing/5 years	500	500	

Box 1. A Smallholder "Large-scale" Producer at Pramkese (Cont.)

The private farmer is quick to conclude that oilpalm production is currently very profitable relative to citrus and cocoa. The farmer has a household size of 6 and provides household labor use on his oil palm production as:

Production activities	Number of males/females involved in production activities			
	No. of males	No. of females	Total males in household	Total females in household
Fresh fruit bunch production	4	2	4	2
Palm oil processing	0	1		
Harvesting services	4	0		
Fresh fruit bunch marketing	4	0		
Palm oil marketing		1		

Source: authors interviews

B. Results from focus group discussions with smallholder processors

Detailed discussions on production and marketing were held with two processor groups at Damang and Nkwantanang. Given the similarities in their responses, only the Nkwantanang FGD will be discussed here. Members of the Nkwantanang FGD belong to a group called the Mmoa Kuo Processing Group, which was formed in 2004 with a total membership of 35 (10 male, 25 female). They describe their scale of processing as small to medium, with commercial orientation, and they sell in the local market and to traders who then sell in markets in Accra, Togo and Nigeria. The group's main products, in order of importance, are *Zoomi* (a specially prepared palm oil for cooking), palm oil for cooking and oil for soap.

The group sources their raw materials from the open market. Sometimes members who are also smallholder farmers, sell their produce to the group for processing. The group's processing extractor and mill equipment are ten and five years old, respectively, and their digesters and extractors are nine and four years old, respectively. They classify their method of processing as mechanical, and the technology as advanced. They acquired the engine for their machine from Accra, and when it breaks down local artisans are able to manufacture some of the machine parts for them.

Product (palm oil) quality is determined mostly by visual inspection. The group members use clean for cooking the palm fruits. Output quality is determined by observing the red colour during inspection. Overall, however, they classify the quality of their product as "medium". The group members readily admit that they need training to address their output quality and also on how to maintain sanitation quality.

Group members are optimistic about expanding in the future. They see the need for expansion in order to produce PKO and other products and therefore they intend to install seed crushers. Among the reasons to expand processing activities: (a) a high demand from exporters; and (b) increased income from processing. They plan also to expand and upgrade their processing by buying an improved processing machine that can digest and extract at the same time. Such a machine currently costs GHC 5 000 and they have not yet mobilized the required funds; they are appealing for external assistance in this regard.

There are divisions of labor by gender in the processing chain of activities. Men perform mostly stripping of fruit, extraction and digestion. Women undertake boiling the fruit, putting the boiled fruit into the machine and carrying firewood for processing.

The group faces multiple challenges in processing, which include the following:

- (a) Frequent mechanical breakdowns occur as a result of inferior materials. The thread (a component of the extractor) often gives out because the metal used in the manufacture is not strong enough to withstand long periods of use. The appropriate metal is quite expensive and when processors give artisans money to buy it, they are not sure if the genuine metal is used by the artisans.
- (b) The competition level is high. There are many processors around so the farmers are able to sell the palm fruits at high prices. This increases processing costs.
- (c) Land for cultivation of oil palm is gradually becoming quite scarce. This will have an impact on potential volumes of fruits that can be supplied.

Table 11 summarizes the estimated oil palm processing costs and revenue per tonne FFB/week, as described in the FGDs. In general, it appears that the larger the volume of FFB processed per week, the higher the margin on processing, conferring economies of scale to the processors.

Anticipating future challenges to small scale processing, the group members indicated that their business is at risk of collapsing because the large scale mills, which benefit from economies of scale and can process efficiently, are able to offer lucrative prices to farmers for their fruits. For instance, the larger mills offer farmers GHC 195/tonne of fruits (covering both sale and transport) whereas the medium sized mills don't pay the transportation costs for the farmers. Another challenge is that prices of palm oil are not stable. Buyers of palm oil from the group set the prices and the major reason they give for offering low prices is that "the market is not good". The large mills are able to process fresh fruits and therefore produce better quality palm oil. For all these reasons, the small mills see the larger ones as a threat to their survival. The group has appealed to the government both to help them acquire more machines and to help them market their outputs.

Table 11. Oil Palm Processing Cost and Revenue

Cost/revenue items	Kwae	Nkwantanang	Pramkese
Cost of one tonne of fresh fruits GHC	160	150	140
Total tonnes of fresh fruit processed per week in 2011	1	10	30
Cost of processing per tonne of fresh fruit GHC/week	Total =56/tonne	GHC 50/tonne	40
Labor			
Water		GHC 20/tonne	1.67/tonne (Total electricity bill is GHC 200/month. Total processing per month is 120 tonnes). Firewood GHC 20/tonne
Energy (electricity/firewood) GHC			
Total cost (cost of fresh fruits + processing cost + transportation cost/week)	160 + 56 (216)	(150*10)+(50*10)+ (20*10) = 2200	(140*30) +(40*30) + (1.67*30) +(20*30)= 6,050.1
Total cost/tonne/week (GHC)	216	220	202
Volume of oil extracted per tonne FFB	150 litres	150 litres	150 litres
Price per drum of 225 litres (GHC)	280	360	280
Price per litre of extracted palm oil, 2011 (GHC/litre)	1.24	1.60	1.25
Revenue (price/litre of palm oil x extraction rate of FFB/tonne x total tonnes processed) per week	1.24* 150* 1 186	1.60*150*10 2400	1.25*150*30 6750
Revenue/tonne/week (GHC)	186	240	225
Margin / tonne of fresh fruit processed per week	186-216 = -30	240-220 = 20	225-202 = 23

Source: Authors' calculations from surveys

Box 2. Joe's Palm Oil Mill and Farms - a "Medium-scale" Private Processor

Joe's Palm Oil Mill and Farms is a privately managed oil palm processing company located in Pramkese. The main product produced is oil palm and currently the company does not use the palm kernel. The farm is aware of the immense profits that could be derived from adding value to the palm kernel. The farm uses improved technology in palm oil processing and the company is currently involved in planting a 300-acre farm of oil palm, to be finished within three years. The farm seeks to expand current output by more than three times, as demand for palm oil is very high. At present, the farm operates a 100-acre farm and also supplements by buying from other farms. The processing machine's current rate of extraction is 50-55 percent (processing equipment is about 2.5 years old) which is inefficient. Using this machine, oil is extracted three times for every FFB. The second extraction yields about 20 percent of the first one; while the third extraction yields about 10 percent of the first one. Currently, there is a locally-made implement which combines pounding and squeezing which can improve efficiency to between 75 to 90 percent. It would currently cost around GHC 7 000 to install this machine.

Box 2. Joe's Palm Oil Mill and Farms - a "Medium-scale" Private Processor (Cont.)

The quality of the palm oil is determined by visual assessment, taste and smell. The farm sells the majority of its product to traders who take it to Nigeria and Togo. The product is also exported to Italy, where it is used as a biofuel. Due to the varying qualities demanded in the local markets, marketing locally is quite difficult since the oil produced locally is of low quality for food. There is no formal contract between the producer and the buyers. Access to credit is a limiting factor to progress of the business, as are the hurdles of bureaucracy in governmental agencies that frustrate assistance to farmers.

By-products are handled by burning and use as manure or fertilizer on the farm. The company sees demand increasing for the product more rapidly than supply. In response to this increasing demand, expansion plans include: (a) the 159 hectares of oil palm farm, out of which 100 acres has started fruiting; (b) expansion of the business, when there is more FFB supply, by using more efficient machines; (c) a goal of increasing the production per week to 60 drums (from a current 20 drums); and (d) acquisition of a tractor to aid in transporting fruits from the farm to the mill.

Source: Authors' surveys

C. Household production and market structures: in-depth interviews with smallholder palm oil marketers

There are several individual traders in palm oil, marketing within the country and outside, particularly to Togo and Nigeria.

The field study conducted an in-depth interview with a woman private palm oil marketer located in Pramkese who markets within the country. This marketer has an educational level of primary class 5. She has a household size of 10 (6 women and 4 men) and 3 of the 6 women, as well as her husband, sometimes help her. She belongs to a group of about 22 women who buy palm oil from Pramkese to sell in Accra and Tema. To ensure that every one of them gets goods to sell, they have divided themselves into two groups; one group sells for a month and the other group sells for the next month. The marketer interviewed takes an average of 8 pig feet containers (1 pig feet container = 56.25 litres) of palm oil to Tema per trip; on average, each of the women in the marketing group takes between 5-10 pig feet containers per trip.

She buys the 56.25 litre of oil for GHC 85 (GHC 1.5/litre). For a total cost of GHC 8.5 spent on transport and offloading, she sells the contents of each container for between GHC 100-110. She determines the quality of the produce by being present during the processing to ensure that fresh fruits are used. When she has not been physically present, she uses her sense of taste to determine quality: she stirs the oil and tastes; if it "settles" on the tongue it's not high quality oil.

The field study also held an in-depth interview with an individual private palm oil marketer located in Damang who sells her oil in Togo and Nigeria. She is 52 years old with no formal education and has been in the oil palm marketing business for the past 15 years. She has a household size of 10 (6 women and 4 men) and 1 of the 6 women is involved in palm oil marketing. She does not belong to any group. She takes an average of 110 yellow gallons (2475 litres; 22.5 litres = 1 yellow gallon) of palm oil to Togo every week. She buys the 22.5 litre container of palm oil for GHC 27 (GHC 1.2/litre) and spends a total of GHC 3 on transport and offloading, for a total cost of GHC 30. She sells the contents of the container at her destination for between CFA 11 000-12 000 under differed payments (F CFA10 000 = GHC36.55). There is a very high demand for quality oil in Togo and Nigeria.

D. Results from in-depth interviews with large-scale processors

The GOPDC at Kwae and the WAML Industries Limited at Nkwantanang are large-scale processors of oil palm and PKO, respectively. Interviews were carried out with the company managers and touched on the industry outlook and the role of smallholder farmers in the industry.

(a) GOPDC

The capacity of the processing mill is 60 MT/hour but, due to a lack of fruit supply, the mill is unable to utilize 60 percent of its capacity. Processed fruits in 2010 amounted to 36 000 MT, but dropped to 29 000 MT in 2011 for various reasons, including less FFB supply because of low crop yield and small processing plants buying fresh fruits from farmers. About 5 MT of fruits are required to produce 1 MT of CPO, a conversion rate of about 20 percent. Most CPO contains high levels of free fatty acid (FFA) so it not very healthy to consume. The GOPDC estate processes fresh fruits so they contain less FFA. The CPO produced by the estate contains 4 percent FFA. GOPDC products include:

- 1) CPO, used mainly for making soap and currently being exported to Europe where it is being used as a substitute for cocoa butter;
- 2) Palm Kernel Cake, mainly sold as animal feed;
- 3) Refined Bleached Deodorized Oil (RBDO), used in making cream and biscuits, mainly sold to Senegal where it used for industrial purposes;
- 4) Refined PKO;
- 5) Palm Fatty Acid Distillate (PFAD), mainly used in making detergent;
- 6) Palm Olein, sold as cooking oil;
- 7) Stearin, used in making bakery products, margarines, quality soaps, "Maggi cubes", biscuits, milk and ice cream.

GOPDC currently employs about 2 500 workers. Women account for about 1 000 of these. About 90 percent of its refined oil is sold locally, with no branding and mostly sold in bulk. Some products are sold to Nestle Ivory Coast and Senegal. Plans are underway to do business with Nestle Ghana. FFBs are acquired from the plantation and supplemented by buying from local farmers, although GOPDC is subject to competition with local processors.

With respect to the environment, GOPDC has a 30 MT/hour boiler with a 2.5 MW turbine, producing 30 tonnes of superheated steam per hour, which runs a steam turbine to generate enough electricity to serve the mill, a refinery/fractionation plant and the estate 24 hours a day, 7 days a week. The huge amounts of organic waste produced (empty fruit bunches, fibres and nut shells) are burned as fuel in the boiler. The Environmental Protection Agency (EPA) usually comes to the estate quarterly to check for sound, air and water pollution. Equipment at GOPDC is able to filter to get good CO₂.

The company makes a point of using current technology in its activities. It has taken delivery of a bio-mechanization plant which is to be installed and operational by end of 2012. This plant will address effluent problems. The company also recently acquired equipment called the Bobcat, which performs multiple operations, such as pushing and lifting of the produce. Future plans are to increase the acreage under cultivation and have a processing target of 150 000 MT per year. The company has adequate workers to be able to achieve these goals and is prepared to meet local demand (industrial and food); it believes the government should reduce imports of CPO.

(b) WAML Industries Limited

WAML Industries Limited is a Free Zone Enterprise, begun in 2002 as a result of a survey which showed that 65 percent of oil palm processing was handled by local processors, and therefore demonstrated a need to take care of the nuts they produce which had very high demand in Nigeria. The company produces PKO. Two kinds of oil products are produced: premium, which has less than 5 percent FFA, and regular, which has more than 5 percent FFA.

The capacity of current equipment at Nkwantanang is 18 tonnes per day at a 38 percent recovery rate (although during three months of continuous test monitoring of the machines, a 44 percent recovery rate was achieved). The company employs 9 permanent staff and 15 casual workers. The raw material supply base (palm kernel) is regular and locally sourced, even though the company has to compete with buyers from Nigeria and other West African countries for this raw material. A strategy adopted by individual Nigerian buyers is to increase their prices for palm kernel.

WAML purchases their raw material by setting prices around 24 percent of world market price for the final product. Sixty kg of fresh nuts costs GHC 25-26. If they are kept for a longer period of time they reduce in weight to about 51 kg and the quality of the oil is not as good (the oil is mostly rancid). The company currently does not have any problem with raw material supplies. It has 1 500 agents (aggregators) who buy on commission; last year, they bought 5 000 bags of nuts within one month from Pramkese, Okumaning and Takorasi.

Being a Free Zone Enterprise, part of the company's obligation is to sell 30 percent of its product locally. As part of this arrangement it sells PKO to GOPDC and other local agents across the country. Premium oil is sold to GOPDC. This is mainly purchased during the low production season. Because the FFA in premium is relatively low (5 percent or less), it commands higher prices. Regular oil constitutes about 70 percent of the PKO produced by WAML. The main market for regular (5-7 percent FFA) is in Nigeria, with ROM and Gulf Impex in Nigeria, as major customers. This is because the Nigerian market price is always higher than the world market price by 20 percent. There are also unaffiliated individuals who purchase PKO from WAML to supply the local market, although such purchases are not very regular. Some of these purchases are sent to areas such as Kasoa (Central Region) and Obuasi (Ashanti Region). The quality of the PKO is determined by GOPDC. Palm kernel cake is also produced locally for the poultry industry. A 50 kg bag costs GHC 60. The palm kernel shells are exported to Norway and Germany. The company operates an integrated system, from cracking nuts to processing, and normally generates a 15 percent net profit margin.

Table 12 summarizes the profitability status of the company. Estimated gross margin per MT of processed palm kernel is GHC 60.87. Similarly, based on the estimated RCR of 1.56, large scale palm kernel processing appears profitable.

Table 12. Summary of Profitability Analysis of WAML Industries Limited

COST ITEM	Oil Extraction Rate (OER)	COST/ MT(GHC)	Total Costs (GHC)	Extracted Products (MT)	Local Sales Price (GHC/MT)	REVENUE (GHC)	World Market Price (NOV 2011) USD
Cost of one MT of palm kernel GHC		90	81,000				
Cost of processing one MT of palm kernel GHC							
Labor (per tonne of 900 MT)		4.96	4,464				
Staff cost (per tonne of 900 MT)		8.3	7500				
Utility		3.9	3500				
Fuel operations (per tonne of 900 MT)		1.33	1200				
Other cost (per tonne of 900 MT)		0.67	600				
Total cost of processing 900 MT per month			98,264.00				
Cost/MT			109.2**				
PKO	38%			85.5	1,640(\$1,050)	140,220	\$1,170/MT
CRR- Cake	50%			101.25	60	6,075	
Nut recovery rate (NRR)—Nuts	25%						
Shell recovery rate (SRR)—Shells	50%			450	15	6,750	
Total revenue (revenue from processing 900 MT per month)						153,045	
Revenue/MT						170.1	
Gross Margin / Month						54,781.00	
Gross Margin / MT						60.87	

Source: Courtesy of Factories Manager, WAML Industries Ltd.(1USD = 1.55) Estimated Revenue-Cost Ratio (RCR) = 1.56 ** USD 70.5.

WAML relies entirely on electricity from Electricity Company of Ghana for its operations. The company monitors energy consumption by taking meter readings before and after production. To keep abreast with technology, and also to be energy efficient, the company is acquiring a 10 MT/hour plant which comes with its own turbine and has the capacity to generate energy for the factory. Environmentally, the company's major problem is sludge. However, WAML is close to obtaining an EPA certification that solves this problem.

E. Results of field survey of smallholder producers

In Tables 13 and 14, about 64 percent of the respondents indicated they are small scale (<5 acres) producers, while 34 percent described themselves as medium scale (5-10 acres). Females constitute 32 percent and 22 percent of the small and medium-scale producers, respectively. Overall, female smallholder farmers constitute 28 percent of total producers.

Table 13. Gender and Scale of Production

Gender of respondent	Scale of production			Total
	Small-scale producers	Medium-scale producers	Large-scale producers	
Male	23	14	1	38 (72%)
Female	11	4	0	15 (28%)
Total	34 (64%)	18 (34%)	1 (2%)	53 (100%)

Source: Authors' own surveys

Table 14. Gender and Acreage under Oil Palm Cultivation

Scale (acreage)	2009		2010		2011		Total (2011)
	Male	Female	Male	Female	Male	Female	
Small (<5)	2	1	0	1	7 (58%)	5 (42%)	12 (100%)
Medium (5-10)	5	0	5	0	13 (72%)	5 (28%)	18 (100%)
Large (>10)	1	0	3	0	13 (76%)	4 (24%)	17 (100%)
Total					33 (58%)	14 (42%)	57 (100%)

Source: Authors' own surveys

Table 14 shows that, while the proportion of women with small acreages (42 percent) compares favourably with that of men (58 percent), a higher proportion of men than women have medium to large acreages (72-76 percent compared with 24-28 percent).

Table 15. Gender and Type of Production

Gender of respondent	Type of production		Total	Percentage of Private holders by Gender
	Private	Outgrower		
Male	37	1	38	69.8
Female	14	1	15	26.4
Total	51	2	53	96.2

Source: Authors' own surveys

Table 16. Gender and Smallholder Farmer Linkages with Buyers of FFBs

Gender of respondent	Linkage with buyers of fresh fruit bunches			Total
	Formally, through representative of buyers associations	Through personal linkages	No links with buyers	
Male	5	15	20	40
Female	3	2	7	12
Total	8 (15%)	17 (33%)	27 (52%)	52 (100%)

Source: Authors' own surveys

Almost all the respondents (96 percent) are private smallholder farmers, which may be a sign of the recent decline of the outgrower system in the district (Table 15). Most of the smallholder farmers (85 percent) are not linked formally (for example, through the outgrower system) to buyer entities (see Table 16). All the respondent farmers interviewed indicated they do not receive any form of extension, pruning, harvesting or credit services from GOPDC. Smallholder farmers have their own personal linkages with buyers (33 percent) or sell directly on the open market (52 percent).

Table 17. Gender and Quantity Harvested per Acre (2.5 acres = 1 ha)

Quantity (MT) harvested per acre (<i>productivity</i>)	2009		2010		2011		Total (2011)
	Male	Female	Male	Female	Male	Female	
< 1	1	1	1	1	1 (50%)	1 (50%)	2 (100%)
1-5	7	0	8	0	16 (84%)	3 (16%)	19 (100%)
5.5-10	5	0	2	0	8 (62%)	5 (38%)	13 (100%)
> 10	1	1	1	1	10 (77%)	3 (77%)	13 (100%)
Total					33 (58%)	14 (42%)	57 (100%)

Source: Authors' own surveys

Productivity levels (quantity harvested per acre) of the respondent smallholder (selling to plantations) oil palm producers are low, compared to the estimated 7-10 tonnes/ha produced by smallholder outgrowers and about 3 tonnes/ha by private small-scale producers (selling to open market). The estimated productivity of the majority of the respondents is about 5 MT/acre (2 MT/ha) (see Table 17).

5. Public and private role in oil palm industry in Ghana

5.1 Past government policies in the oil palm industry

Ghana's international trade in oil palm started from wild palm harvesting in 1820; oil palm evolved into an agricultural crop, and plantations were established by 1850. Plantations did not have a significant impact on volumes of palm oil, which continued to be based primarily on private small-scale peasant production in the oil palm belt. Palm oil, however, became the principal export from what was then called the Gold Coast. It is estimated that by the 1880s, palm oil accounted for 75 percent of export revenue.

Post-independence, state-owned and state-operated plantations were favoured through policy directives involving greater emphasis on oil palm and rubber. After Ghana became independent, large scale state farms, were established and an Agricultural Development Corporation (ADC) was set up to promote agricultural modernization and development through the state farms. One goal was diversification away from cocoa and timber to include oil palm and other tree crops. Under the Second Five-Year Development Plan (1959-1964), the ADC's role expanded (Khor and Hormeku, 2006). Emphasis was placed upon import- substituting industrialization, mechanized agriculture and direct public intervention in production. Small scale independent farmers were organized to pursue mechanized agriculture through cooperative efforts.

However, as a result of capital constraints, political interference, poor planning, mismanagement and the rigidity of the centralized control system, these state-owned farms became economically unviable. State

farms were therefore gradually phased out as the economy became increasingly privatized. Attempts were made to reorganize the remaining plantations into viable economic units under decentralized state control.

GOPDC was initiated by the Government of Ghana (GoG) in 1975 in the Kwaebibirem District in the Eastern region as an alternative crop to cocoa and timber. BOPP was established in 1976 as a joint venture between GoG and Unilever at Benso in the Western Region. TOPP was incorporated as a limited liability company in 1977 by GoG, government institutions and foreign investors.

Since the trade liberalization policy that started in the early 1980s, the GoG privatized the state-owned plantations and mills, including divestiture of GOPDC in 1995. The government, with the assistance of multilateral donor institutions, has sought to promote oil palm plantations through private enterprise, foreign-aided government ventures, and joint government-private projects, such as:

- (a) GOPDC, privatized in 1995 and wholly owned by SIAT since 2008;
- (b) TOPP, with GoG as the major shareholder (80%) but managed by Unilever;
- (c) BOPP, which is currently owned by Singapore-based Wilmar International; and
- (d) NORPALM, formerly the National Oil Palm Limited.

The sector-specific policy for the tree crop sector including oil palm under the Food and Agriculture Sector Development Plan (FASDEP) has been to promote oil palm production based on comparative and competitive advantages of agro-ecological zones and the availability of markets and to commercialize through linkages to industry. Research is to be pursued to identify genetic material with desired qualities and to improve productivity along the oil palm value chain. Emphasis is placed on the following: cultivation of improved hybrid variety; expansion of the nucleus outgrower scheme with an aim to increase production through area expansion and intensification of cultivation; and the upgrading of artisanal processing.

As already indicated, diversification away from cocoa and timber to include oil palm and other tree crops has been a focus since 1975. In October 2002, the GoG under its President's Special Initiative (PSI), focused on oil palm as one of the key strategic pillars of agricultural and industrial-led growth and poverty reduction because of its potential to become the next biggest export commodity after cocoa. Given the estimated 100 000 MT shortfall in domestic production to meet domestic demand (food and industry), as well as the need to take advantage of the huge export potential within the sub-region, the objective of the PSI has been to increase the country's oil palm production to meet domestic demand and satisfy regional exports (PSI, 2002). The main thrust of the PSI is to help OPRI produce improved planting materials to develop nurseries for expanded acreage production mainly by the private sector.

The initiative set an ambitious target of bringing an additional 10 000 ha under oil palm production by 2003, raising that to 100 000 ha by 2007 and further raising it to 300 000 ha in the long term under the nucleus-outgrower-smallholder estate development model. The PSI so far has achieved some successes including:

- (a) establishment of nurseries – 12 nurseries are currently operational, established through private operators in the Western, Eastern, Ashanti, Central and Brong Ahafo regions;
- (b) production of high-yielding and quality seedlings – a total of 2.84 million seedlings, worth about GHC 4 269 994, were produced from 2004 to 2006;
- (c) establishment of plantations – under the PSI, 19 237 ha was planted from 2004 to 2006 ; and
- (d) farmer mobilization and support – a total of about 11 000 farmers have been supported.

However, at this time, the PSI oil palm project is in turmoil. What began as a well-funded plan to launch Ghana into a new era of stunning growth in the oil palm sector has been stagnating and deteriorating for the past three years in the almost total absence of funding. Most farmers are disappointed and angry, as they have been left to their own measures in maintaining their palms, contrary to what they were promised. They

had been promised a great deal of support and they originally had great confidence that their palms would mature properly and yield in abundance. These smallholder farmers feel it is unreasonable for them to be required to pay back the value of the palms when they have been unable to look after them or fertilize them throughout their short lives. In addition, it will be much harder for the farmers to repay the amount owed to PSI for their palms when the yields will be much lower than anticipated.

In conclusion, the PSI programme was a successful, well-conceived project in its early years. There were problems along the way, but a number of good quality hybrid Tenera oil palm seedlings were planted, to the long-term benefit of the individual farmers, the economy and the nation. There are now 22 active nurseries compared to the original 12, with another 11 in various stages of development. Given that the number of nurseries has more than doubled, the budget demand will increase proportionally. However, the status of PSI funding support has changed dramatically. Curiously, it seems that a huge capital investment was made in setting up the new batch of nurseries just prior to the complete collapse of operational funding. It appears somewhat inadvisable to make this level of capital investment without firm arrangement for an operational budget over the following five years or more.

The question now is what to do next? Is the continued operation and development of the PSI oil palm project something the GoG is passionate and confident about? Is it something the government has both the will and the means to properly fund on an ongoing and open-ended basis? Or has the project already served its purpose sufficiently to seek an honourable withdrawal? The stated long-term target was to plant 300 000 ha across the palm growing areas of Ghana, but does this have to be done by the government?

The initial planning called for establishing Corporate Village Enterprise Companies (COVES), each consisting of landowners, farmers, and a milling company. The basic idea was to secure land for a nucleus estate of 5 000 ha, then boost fruit supply with smallholders' schemes and purchasing from outgrowers. Central to each COVE was a 20 TPH [tonne per hour] palm oil mill. A number of these COVES were planned around the country. However, for whatever reason, none of these materialized. What has evolved is the installation of a large number of independent nursery companies that supply seedlings to farmers in their localities but that are sited in a widely spaced manner in order to cover as much of the region as possible. The only areas where significant clusters have formed are around Kade, and north of Takoradi in the Western Region, and in both instances there are plenty of large commercial mills already operating there.

Unavailability of high-yielding planting material, poor agronomic practices, and cultivation by smallholdings still characterize the oil palm industry and these are the main constraints to oil palm production. These constraints have been the focus of policy interventions, including the medium-term objective of enhancing smallholders' access to credit, improved planting material, extension on improved agronomic practices and capacity to expand farm size, through vigorous promotion of the established outgrower-nucleus farmer linkages. Recently, the government's policy on fertilizer subsidies has been a major intervention for increasing productivity on oil palm farms. Other recent major government interventions in the oil palm industry include:

- (a) the Buabin Oil Palm Outgrowers Project (BOPOP), covering an area of 3 000 ha for 500 outgrowers;
- (b) the Ghana Sumatra company that specialises in palm oil seeds increased palm oil seed production capacity of OPRI from 2 million to 5 million seed nuts per year under the World Bank-sponsored Agriculture Services Sub-Sector Investment Programme (AgSSIP); and
- (c) the development of a master plan for the oil palm sector under Agence Française de Développement (AFD) with government-secured funds, including development of policy, strategy and implementation manuals for tree crops.

BOPOP was started by MoFA in 2007 as a five-year project. The objective of the project was to develop 3 000 ha of new plantation, based on an outgrower scheme for 500 growers. The project covers two areas, Buabin and Jukwa, in the Central Region of Ghana, with TOPP as the technical operator. The planting of oil palm in the Buabin and Jukwa project areas started in 2007 and 2010, respectively. So far, BOPOP has developed 3 297 ha and the farmers developed 547 ha. The Council for Scientific and Industrial Research (CSIR) and OPRI provide consulting services for the implementation of the applied research component of BOPOP. The GoG is contributing euros 2.12 million while international financiers AFD and KfW (German development bank) are together contributing euros 13.41 million to the fund. A total of euros 4.12 million is allocated to the oil palm plantation project. Other components of the project include loans to farmers and construction of project sites. A tripartite agreement has been signed between the farmers, the banks and the technical operator.

5.2 National plans for development of the oil palm industry: Evaluation of public and private investments

Supporting the key role of the smallholders requires concerted government and private business coordination. The current national plan for development of the oil palm industry is premised on the private sector-led initiative facilitated by the government through outgrower schemes. The main strategy is to link outgrower schemes through technical operators such as TOPP and BOPOP.

A new large scale development plan for Ghana's oil palm industry, the Oil Palm Master Plan, is being prepared to raise the nation's competitiveness in oil palm production. It is expected to boost the industry's competitiveness in the global commodities market and also enable it to meet the rising local demand for consumption and manufacturing.

The Plan focuses on access to finance, certification, land-use policy, technology transfer, and infrastructure development from the farm to the port, as well as pricing mechanisms and marketing. The policy document seeks to outline a set of projects and programmes to be executed within the next 15 years and it will become the blueprint for the sector's growth. This Plan aims at maximizing development outcomes for communities while supporting smaller businesses as well as alleviating poverty. There is a need to assess the role of the smallholder farmer in the Master Plan.

With respect to the trade regime governing palm oil imports, Ghana is among the countries that have fully implemented the free-trade area component of the Economic Community of West Africa States (ECOWAS) Trade Liberalization Scheme, which started in 1997. Like other ECOWAS countries, Ghana does not impose any tariffs on eligible imports originating in other ECOWAS countries. Imports from other ECOWAS members are duty-free.

The ECOWAS Common External Tariff (CET) is one of the instruments for harmonizing member states and strengthening the common market. The ECOWAS-CET draws on the basic West African Economic and Monetary Union (UEMOA) CET; it is composed of four tariff bands, or rates of customs duty with the rest of the world: zero, 5 percent, 10 percent, and 20 percent. At a summit meeting, the heads of state adopted a Supplementary Act to create a fifth band of the ECOWAS CET at 35 percent, for "specific goods for economic development" as well as adopting common eligibility criteria for this band among all the ECOWAS member states. The eligibility criteria include product vulnerability, economic diversification, integration, sector promotion and high potential of production.

Ghana's applied tariff consists of the four original tariff bands; this structure applies to all goods except for 13 petroleum products, which face specific tariffs. Oil seeds, fats, oils and their products (including CPO) have a tariff range of 10-20 percent. Most Favoured Nation (MFN) rates on agricultural products, as defined by the World Trade Organization (WTO), are generally higher, averaging 17.5 percent, with the highest rates applicable to dairy products and tobacco.

Nigeria, however, has a 35 percent tariff on CPO, having invoking the fifth band as a protection measure for their oil palm industry, under the "infant industry" argument. Recently, there has been pressure on Nigeria from the industry players to reduce this tariff rate.

The Common Effective Preferential Tariff (CEPT) scheme for the Association of Southeast Asian Nations (ASEAN), however, has fallen between zero and 5 percent for all products. On exports, specifically for palm oil, Indonesia has lowered its maximum export tax on RBDO to 10 percent to boost exports, while the rate for CPO remains at 22.5 percent. Indonesia is a major palm oil exporter. With a lowering of that country's export tariffs on refined palm oil, it is likely that a lowering of tariffs in the West Africa sub-region could promote an influx of imported palm oil, given the current situation of shortfall in the supply of this commodity in the sub-region.

5.3 Private sector role in the oil palm industry

The key private sector stakeholders in the oil palm industry's value chain include the input/seedling producers, agricultural equipment manufacturers, farmers/farmer groups, NGOs, financial institutions, transporters, processors, retailers and end-market users. All these actors must play a collective role in enhancing and ensuring area expansion and increasing productivity per ha on existing oil palm farms and ensuring quality produce through collaboration with various tiers of government to execute and operate major programmes and projects in the industry.

Given the prominence of the private sector in driving the supply and product chains, strengthening management of the chain actors is the responsibility of a private sector umbrella. Strengthening contracts and ensuring the success of existing linkage arrangements must be a high priority.

Private sector actors, although driven by profitability motives, must ensure effective management of their agribusinesses to enhance sustainability. Most successful private oil palm estates have invested in research with the objective of controlling their most fundamental input: planting materials. Joint asset ownerships with farmers (nucleus-outgrower schemes, for instance) are likely to commit both parties to the linkage partnership because economic returns from that asset depend on the success and sustenance of the linkage. Several large oil palm projects have been established by several private sector entities in West Africa (Table 18, Figure 7).

Table 18. New Large-scale Oil Palm Projects in West Africa

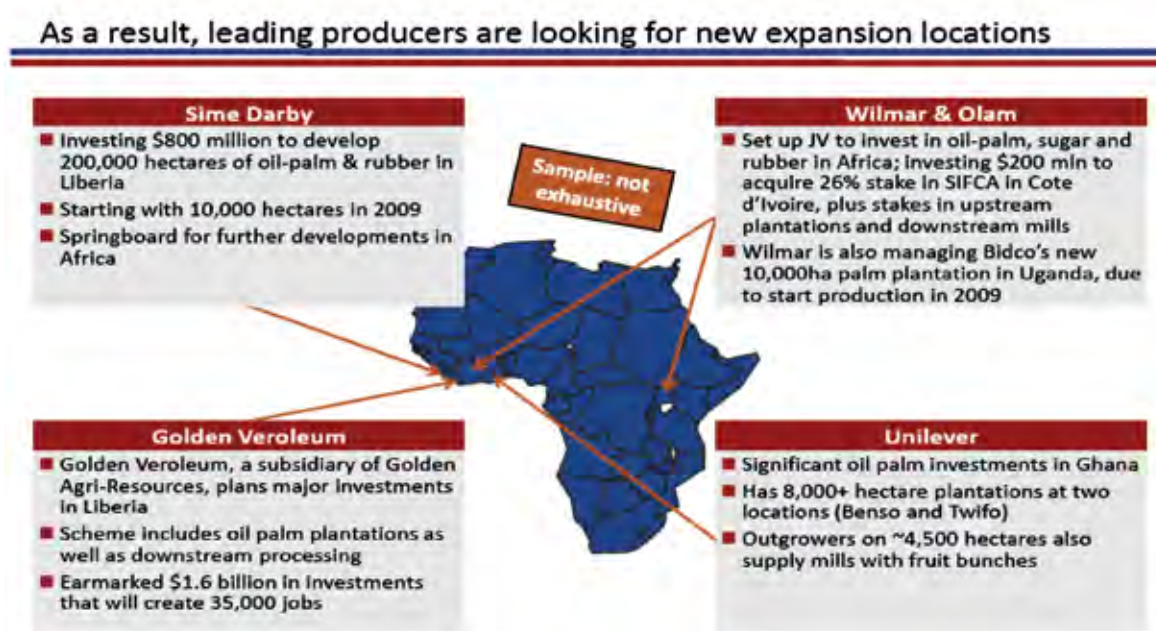
Countries	Project Name/Investor	Area (ha)	Investment Amount
Nigeria	Fri-El Green Power (Italia) extension of plantation	100 000	-
Nigeria	Wilmar to invest in oil palm plantation	30 000	-
Côte d'Ivoire	Wilmar and Olam joint venture to invest in palm oil and other commodities		USD 200 million for acquiring stake in SIFCA group plantation
Cameroon	Sime Darby (Malaysia)	300 000	

Table 18. New Large-scale Oil Palm Projects in West Africa (Cont.)

Countries	Project Name/Investor	Area (ha)	Investment Amount
Sierra Leone	Sierra Leone Agriculture (UK-based company)	30 000	-
Sierra Leone	Gold Tree (UK group)	planned	
Sierra Leone	QUIFEL	planned	
Guinea	National policy of palm oil development objective 2015	government plan	
Liberia	Sime Derby (Malaysian company)	180 000	USD 20 million
Liberia	Equatorial Palm Oil	169 000	USD 50 million ⁸
Liberia	Golden Agri Resources	240 000	USD 1 600 million ⁹
Liberia	SIFCA (West Africa groups)	8 800 and 6 000 (outgrowers)	USD 64 million ¹⁰

Source: Compiled by the authors from various sources.

Figure 7. New Project Maps in the Region



Source: Compiled by the authors from various sources.

⁸ Source: <http://www.afriqueavenir.org/en/2011/02/15/uk-company-commences-us50-million-oil-palm-investment-in-liberia/>

⁹ Source: <http://allafrica.com/stories/200912010009.html>

¹⁰ Source: <http://www.netnewspublisher.com/liberian-government-and-sifca-sign-64m-oil-palm-oncession-agreement/>

6. Competitiveness and inclusiveness in the oil palm sector

6.1 Competitiveness and drivers of the oil palm sector

The competitiveness of Ghana's oil palm sector can be described as the sector's ability to sustain trade against the competition in the global market. High domestic costs of production could weaken the sector's export drive and elicit imports. The economic sustainability of the Ghanaian oil palm industry is therefore highly dependent on its trading performance, relative cost structure and internal factors (such as the role of government and private firms in enhancing performance) and climatic factors that confer competitive advantages for the oil palm industry expansion.

Table 19 presents comparisons of production costs, plantation productivity and percentage oil extraction rates (OER) within the sub-region and relative to the world's major palm oil producers, Indonesia and Malaysia. The cost competitiveness of Ghana and the sub-region producers has been assessed, relative to the producers of Indonesia and Malaysia.¹¹ It is estimated that the Asian producers derive economies of scale through their large-scale production; this is reflected in the current production cost of USD 350/MT, as against USD 400-450/MT in West Africa. Within West Africa, Ghana had the lowest cost of production, at USD 270/MT (2004), compared with USD 293/MT and USD 303/MT in Nigeria and Côte d'Ivoire, respectively. However, this position has been lost as costs have risen to an average of USD 400-450/MT across West Africa. Ghana's cost of production for processing is varied and reflects different elements represented in the cost composition. The large-scale operators have production costs of USD 500-700/MT of CPO (Unilever, 2010). Medium-scale operators have a relatively lower cost of USD 536/MT, while small scale operators have the lowest cost, at USD 85/MT. These discrepancies are the result of flow overheads, administrative costs, pensions and other cost elements that feature in production by large and medium operations.

Assuming the current cost structures, Ghana and the sub-region's production structures are relatively competitive, but the oil palm sector needs to further cut the costs of production. The small-scale palm oil producer in Ghana appears highly competitive, unless quality standards become too stringent placing smallholders out of competition. Ghana's estimated CPO output is less than 1 percent of total global output, in contrast to Indonesia and Malaysia's combined share of 70-80 percent. The drivers of the oil palm industry in general can be seen in the expanding market and increased demand for oil palm products worldwide, for food, industrial processing and biofuel, as a consequence of population increases and the high cost of coal fuel.

To improve its competitiveness (through lower costs and enhanced internal factors), it is suggested that Ghana compete on the basis of cost and quality in the CPO markets of the south-north corridor of the West African sub-region, in order to gain further opportunities and cost advantage over the Asian countries.¹² The data on cost tend to suggest that small-scale producers, with CPO production costs of USD 85/MT, can compete most successfully against the Asian producers, but CPO quality must be improved to realize this potential.

Lowering the costs of production also requires increasing productivity. There is a wide variation in the productivity of oil palm production in Ghana among the different farm structures. Productivity increases must be driven by several factors: (a) government support of the palm oil industry through clear and proactive government policy stimulation and private sector collaboration and the provision of basic infrastructure such as access roads, schools, hospitals and recreational facilities to attract investments.

¹¹ Oil palm study (ADVANCE 2010)

¹² ADVANCE (2010) report

Table 19. Comparison of Production Costs, FFB Yield and % OER—Ghana and Major World Producers of Oil Palm

COUNTRY	Area Under Cultivation (ha)	FFB production (MT)	Plantation Productivity (FFB Yield) MT/ha	Oil Extraction Rate (OER) (%) (average)	Average Production Costs/MT (USD)*
GHANA**					\$270
GOPDC				0.23	
Nucleus Estate (MT)	4 650	41 386.8	8.9		
Outgrowers (MT)	13 000	54 223.1	4.2		
Smallholders (MT)	3 500	7 397.2	2.1		
Okumaning (MT)		3 508.4			
Private Farms (MT)		2 177.7			
<i>Twifo Oil Palm Plantation</i>				0.19	
Nucleus Estate (MT)	4 500	52 153.5	11.6		
Smallholder FFB (MT)	2 800	12 927.6	4.6		
Purchased FFB (MT)	8 000	31 317.9	3.9		
<i>Benso Oil Palm Plantation</i>				0.19	
Estate FFB (MT)	4 666	41 631.3	8.9		
Smallholder FFB (MT)	1 650	16 647.8	10.1		
Purchased FFB (MT)	5 000	26 574.8	5.3		
<i>Juaben Oil Mills</i>				0.20	
Outgrower	1 100	2 776.4	2.5		
Nucleus	424	968	2.3		
<i>Ghana: Private Smallholder</i>	232 833			0.10	
Large-scale					\$536
Medium-scale					\$85
Small-scale					\$500 - \$700
NIGERIA***	2 5140 90				\$293
Wild grove	2 300 00		1.5	0.1	
Smallholder	117 25				
Estate	96 65		5.0	5.0	
CÔTE D'IVOIRE	250 00				\$303
MALAYSIA			30-35		\$350
INDONESIA			30-35		

Sources: * Oil Palm Study (ADVANCE, 2010) ** Average figures (2000-2007) *** Oil Seeds Association of Nigeria (2003)

6.2 Assessment of the role of smallholders in the oil palm sector

A. Role for the smallholder in a private sector-driven industry

Smallholder farmers in the oil palm industry need to empower themselves through training, facilitation, and networking. Formation of groups and ensuring that these groups are facilitated and sustained are crucial steps. Smallholder farmers need to share knowledge (local and accessed) in farm and agronomic management through linking with "expert farmers", who provide a rich source for identified technologies in input use and the sharing of experiences.

Group formation is also important for farmers to foster communication links, to develop independent activities and to build social solidarity about their activities and networking by holding farmer workshops with the support of NGOs. Researchers and NGOs can build farmers' capacity through structured, on-going dialogue with farmers through farmer groups to identify priority problems, suggest and try out possible solutions, and disseminate technologies and information judged useful by both researchers and the farmer groups.

B. Role of government in promoting smallholder farmers in a private sector-driven industry

Clarifying public and private roles in improving support services, including improved delivery of agricultural research, extension, training, regulation, information and technical services and finance is critical to increasing smallholder farmers' production and productivity. Increased private sector participation in the oil palm industry in general requires the creation of a favorable climate for commercial activities. This includes ensuring a stable macroeconomic environment and strengthening the institutional framework that links the value chain actors for managing the industry in the country.

In the FASDEP II, government strategies for rubber, oil palm and coconut identify such constraints as: (a) unavailability of high-yielding planting material; (b) poor agronomic practices; and (c) cultivation of small holdings. Government is addressing these constraints through collaboration between MoFA and the Ministry of Trade and Industry (MoTI), private sector development and PSI to attract private sector investment in these industrial crops and to promote the outgrower-nucleus farmer linkage as a way of improving smallholders' access to credit, extension on improved agronomic practices and capacity to expand farm size. These organizations, in collaboration with external research institutions, will also encourage the building of research capacity for these industrial crops.

At the moment these linkages appear weak, as demonstrated by the uncoordinated roles of the various actors in the chain. In particular there is a need to define what government, at the central and local levels, can and cannot do with respect to the role of the private sector in the development of the industry, keeping in mind that smallholder, private farmers dominate the sector and need to be promoted. Strengthening the capacity of actors in the chain and improving their coordination will play a key role in the development of the oil palm industry.

Improving net farm returns for smallholders in the short term and intensifying the oil palm industry's commercializing structure in the medium and long term both require attention to marketing inputs and outputs. These tend to be facilitated by government entities. For instance, MoFA's input subsidy on fertilizers and MoTI's inter-ECOWAS trade facilitation are both important for pursuing these goals.

Agricultural diversification and enhancement of rural livelihoods in the oil palm districts are also strongly influenced by deliberate public policy. Smallholder oil palm farmers' access to input and output markets is facilitated by improved access to infrastructure, including health facilities. It is crucial to have public policy that incorporates planning for agricultural development in other sectors, so that due attention is paid to issues such as rural infrastructure development, the impact of HIV/AIDS and malaria, youth migration and environmental management.

Strategies to address gender mainstreaming in the oil palm districts must be wide-ranging and based on public/private sector collaboration in appreciating and understanding gender issues. The public sector will have to lead in devising strategies that target female farmers for specific activities through intensive gender sensitization. For example, the relative level of participation by women compared with men in decision-making and in access to and control over resources and benefits has not been adequately addressed. A lack of conscious planning to address these imbalances may result in men and women having unequal access to the resources and benefits of the industry.

To ensure increased control over resource use efficiency and benefits for the smallholder female farmers in the oil palm industry, one option may be for extension agents/researchers to ask their male farmer contacts to include their wives during visits, demonstrations or farmer meetings, and to skew a greater percentage of their time to working with women's groups in the industry to find solutions to technical problems specific to women farmers' production systems and to promote farmer-to-farmer exchange among women in the industry.

C. Policy initiatives to enhance productivity of the smallholder farmer

Policy initiatives targeted at the smallholder include the encouragement of estate-outgrower schemes to enhance farmer access to best practices in oil palm agronomic management. GOPDC, TOPP and BOPOP are examples of programs that have enhanced the productivity of the smallholder farmer.

In addition, schemes undertaken under the PSI are still in place for the smallholder farmers. Several nurseries are currently operational, established through private operators in the Western, Eastern, Ashanti, Central and Brong Ahafo regions. It is estimated that a total of 2.84 million seedlings have been produced from 2004 to 2006 and farmers have been mobilized and supported. However, the PSI scheme requires strengthening; its impact has been limited as a result of failure to link farmers through a technical operator, and lack of proper supervision.

The government's subsidy on fertilizers has led to an increase in productivity and production at reduced costs per unit area. Ready markets for the smallholder farmer in terms of sale of FFB have been facilitated by the private oil palm estates. For example, it is estimated that BOPP alone purchased 11 933 MT of fresh palm fruits valued at GH¢11.8 from 438 smallholder farmers in 2010.

7. Conclusions

In conclusion, we return to the key questions as to whether and to what extent an expanding palm oil sector can be inclusive of smallholders and how to ensure that the sector's growth is climate-smart and environmentally sustainable.

The future of the palm oil production in Ghana rests with the smallholder productivity increase as estate farms currently comprise about 25 percent of cultivated land. Smallholder producers and processors are optimistic about expanding in the future. They see the need for expansion to produce oil palm and other products. Their reasons to expand their production and processing activities are to meet the high demand from exporters and to increase their income from processing.

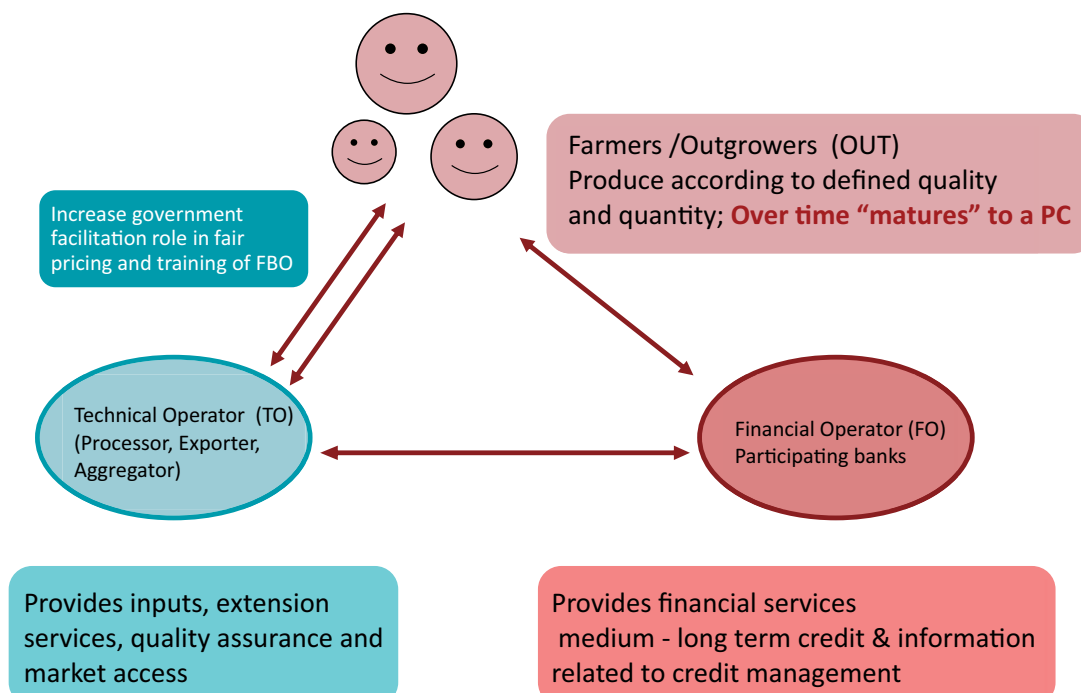
Analyses from the field work on inclusion of the smallholders, however, suggests that management and governance in the nucleus-outgrower model are not strong. There are no viable farmer-based organizations (FBOs) that interact with an estate on a sustainable basis and no sense of belonging to the estate, because they have no strong motivation to participate. Smallholders complain of increasing costs of inputs supplied (fertilizer) and the erosion of profits. It is also an issue that there is no platform for fixing of FFB prices along with arbitrariness in fixing the percentage of FFB income for loan repayments.

Pressed as to why their interest in this model had diminished, the smallholder farmers, particularly the former outgrowers, explained that their contract was on a co-financing basis. It was unclear what should occur once their loans were paid. They indicated that the number of palm oil mills has increased, a competitive market for smallholder produce has developed and many smallholders now sell their produce to mills offering the highest price even though they may be under a legal obligation to sell to the nucleus estate.

A major focus of the agribusiness chain actors in the oil palm industry for smallholder farmers in Ghana is on providing inputs and increasing productivity through enhancing farmers' knowledge and skills and their access to local and international markets. However, there is a growing awareness that smallholder farmers face particular constraints that need holistic support to be successfully addressed. Mechanisms that assist smallholder farmers in decision-making, understanding and accessing markets, agricultural knowledge and information systems, science and technology and equal opportunities for gender participation in the industry may transform the role of the smallholder for the rapid expansion needed.

The government recognizes that the key role of the smallholders requires concerted government and private business coordination. The current national plan for development of the oil palm industry is premised on the private sector-led initiative facilitated by the government through outgrower schemes. The main strategy is to link outgrower schemes through a technical operator (TO) such as TOPP and BOPOP (see Figure 8) to enable smallholder farmers to sustain their production. Figure 8 provides a model that is likely to meet aspirations of all the stakeholders. Outgrowers (OUT) are enabled by government facilitation, which is key for meeting the public objective of capacity building of farmers. The technical operator (TO), who is simply the nucleus/estate, is guaranteed continuous supply of FFB through facilitation by a financial operator (FO).

Figure 8. A Model Inclusive of Smallholder Farmers for Oil Palm



Source: Adapted from OVCF

The farmers' participation in the chain is enhanced and they are offered a fair deal for the supply of FFB. This concept has long term development and sustainability prospects as the two main parties (TO and OUT) feed off each other. With the TO's inputs and technical/management, the plantation company (PC)/OUT) sustainably increases plantation area and increases yields. Given the competitiveness of the market (e.g. diversion of FFBs) the FBO requires training and skills development to attain the PC capacity level to enhance negotiation, lobbying and market research.

Thus the focus on policy interventions, including the medium term objectives previously described, is worthwhile and needs to be promoted for smallholder inclusiveness. Smallholder farmers and processors in the oil palm industry may need to play critical roles in decision-making that can build their social capital and hence influence policy decisions, understanding markets, acquiring agricultural knowledge and information systems and accessing science and technology.

The recommendations derived from the analyses and conclusions in this chapter are as follows:

- (a) The nucleus/estate smallholder oil palm project development must emphasize principles of participatory development, in which the farmers are the subject and not the object of development initiatives, by ensuring that the smallholder farmer becomes a viable, progressive, and self-reliant farming entity;
- (b) The concept of joint asset ownership should be enhanced. (In a competitive market, many smallholders sell their produce to mills offering the highest price, even though they may be under a legal obligation to sell to the nucleus estate. Joint asset ownership may commit smallholder farmers to the linkage partnership because their economic returns would depend on the success and sustenance of the linkage.)
- (c) Smallholder farmers need intervention/assistance from all stakeholders to ensure environmental sustainability. (Farmers generally lack the capital and technical expertise required to recapitalize the low fertility status soils in degraded land where there are opportunities for oil palm development.)

Recommended Business Model

There are several possible configurations that could be adopted, but the one considered perhaps the most appropriate is a company formed along the following lines:

- a. Milling Investor (Lead Investor, TO) takes 85 percent equity share in consideration of the value of the installed mill, and full management control.
- b. Plantation company (Outgrower, PC), as a legally registered company, takes 15 percent share in consideration of the existing standing palms.
- c. Besides being paid cash at the going rate for their FFB supply, PC also takes a profit share of the company, up to a maximum of 20 percent of net profit. The actual percentage could be performance-based.
- d. The company takes full responsibility for repaying amounts owed by farmers for seedlings, and also for the value of the nursery operation.
- e. The company recovers the cost of seedlings from individual farmers on group terms.

The above format meets the needs of all three parties:

- a. The milling investor is guaranteed continuous supply of FFB for the mill;
- b. The farmers have real participation, and a fair deal for the supply of their FFB;
- c. The GoG (FO) partially recovers its investment funds

The concept has long term development prospects, especially with the nursery included as an essential element. With a continuous supply of seedlings being distributed and planted, the total planted area can continue to expand, along with the capacity of the mill, and of the business generally. The two main parties to the company feed off and support each other. The miller provides seedlings, credit facilities, field extension services, fertilizer and chemicals, while the farmers provide an increasing quantity of FFB as a result of increased productivity. Increased plantation areas will lead to increased yields, leading to larger mills and thus higher CPO production.

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Chapter 12

Smallholder participation in value chains: The case of domestic rice in Senegal

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1. Introduction

Since 1985, rice production in West Africa has doubled, but consumption of rice has increased even more rapidly. This has resulted in the increasing dependence of West African countries on rice imports (Seck *et al.*, 2010). Rice is the most consumed cereal in Senegal (about 1.1 million tonnes in 2009). However, only 45 percent of consumption is covered by domestic production; the rest is imported from India, Thailand, and Viet Nam (FAO, 2011). This large import dependency makes Senegal vulnerable to volatility in the international rice market (Seck *et al.*, 2010). In response to the 2008 food crisis, the government in Senegal has placed rice on higher priority for self-sufficiency and increased investments to boost production. However, to successfully achieve self-sufficiency, Senegal will not only have to invest in productivity (supply push), but will need to tackle the demand side as well (demand pull). One of the major challenges will consist of linking smallholder farmers to large urban consumption markets by: (i) increasing marketable surplus; (ii) consolidating supply; and (iii) adapting quality of rice to conform to urban consumer standards (Demont and Rizzotto, 2012).

In this chapter we analyse current and potential participation of smallholders in rice value chains in Senegal. We formulate policy recommendations to reduce the constraints for smallholder market participation, especially with respect to integration in the rapidly growing urban markets.

2. Overview of consumption, production and trade

Before starting a more detailed analysis of the value chain of rice, we give a short overview of the production and consumption patterns, the imports and the national policies in the Senegalese rice sector.

2.1 Consumption

Since the 1980s, rice consumption has surpassed the consumption of more traditional crops such as sorghum and millet and has become the main staple food consumed in Senegal (Table 1). In 2005 the consumption of rice was 68.5 kg per capita, compared to 42.3 kg in 1975.² More than 30 percent of the daily calorie intake in Senegal currently comes from rice.

Table 1. Consumption of cereals and share of total calorie intake in Senegal in 1975, 1990 and 2005

	1975		1990		2005	
	kg/cap/yr	% of kcal	kg/cap/yr	% of kcal	kg/cap/yr	% of kcal
Millet	89.3	28.4	58.3	18.4	21	6.4
Rice	42.3	19.7	62.1	28.5	68.5	30.8
Sorghum	23.6	8.9	17.2	6.4	10.2	3.7
Wheat	18.5	6.4	25.5	8.7	29	9.6
Maize	10.3	4	15.9	6.1	33.8	12.6
Total kcal/cap/day	2,109		2,135		2,199	

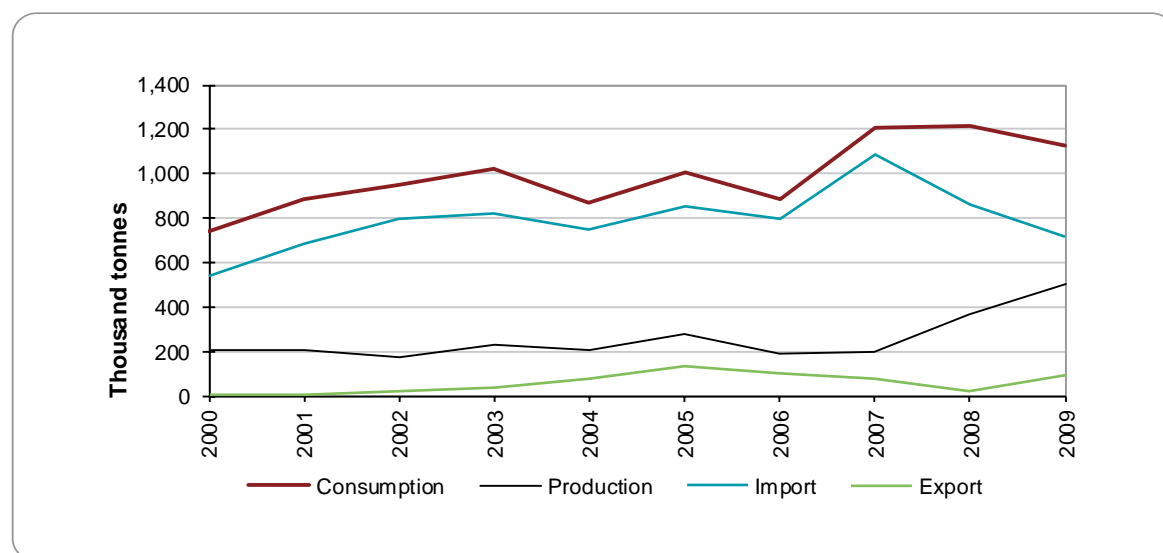
Source: FAOSTAT (2010)

² By 2013, these consumption rates have reached 86.6 kg per capita.

This shift towards rice consumption began with the large and cheap imports of broken rice from the French colonies in Asia during the period of the French administration. The low processing and cooking costs of rice and the popularity of street-vendor sales of rice dishes enhanced the preference for rice in urban areas (Reardon, 1993). However, the shift to rice and especially the preference for broken rice—which is considered an inferior product on the international market—is much more pronounced in urban than in rural areas. As population growth is especially strong in urban areas, it is clear that urban consumption patterns have had and will continue to have an important impact on national demand and trade.

Today, Senegalese rice consumption still largely exceeds domestic production, but important shifts are taking place (Figure 1). Up to 2007, rice demand and imports had been increasing because of population growth, increasing incomes, urbanization and the increasing share of rice in the Senegalese diet. However, since the 2008 food crisis, domestic production is progressively overtaking rice imports.

Figure 1. Consumption, production and trade of rice in Senegal, 2000–2009



Source: FAOSTAT (2011) and ANSD (2006–2009)

Note: Consumption is calculated as production plus imports, minus exports.

2.2 Production

During the food crisis in 2008, import prices of rice increased sharply. This led to high domestic prices for local rice and promoted important area expansion and increased double cropping.¹ Together with good weather conditions, these resulted in a boost to domestic production in 2008. Rice is produced almost exclusively by smallholder farmers. Senegal's rice production consists of two major rice production systems in two different ecosystems and yields vary significantly between these systems (Rodenburg and Demont, 2009).

First—and most important in terms of commercial rice—are the irrigated production systems which are situated primarily in the Senegal River Valley (SRV) in the regions of Saint-Louis, Podor and Matam (Figure 2). Seventy percent of national rice production is irrigated rice and yields reach an average of 5 to 6 tonnes/ha. Several public investment schemes have contributed to the development of large-scale irrigation schemes (GA – *grands aménagements*) and village irrigation schemes (PIV – *périmètres*

¹ Double cropping refers to the production of rice both in the rainy and in the dry season, resulting in two harvests per year.

irrigués villageois). In addition, after the disengagement of the government from the rice industry, private investors built private irrigation schemes (PIP – *périmètres irrigués privés*) in the Senegal River Valley.

Second, rain-fed lowland (*bas-fond*) rice cultivation is concentrated in the southern region of Casamance, and in the central and eastern regions of Fatick and Kaolack which together form the largest areas of rice cultivation. Rain-fed production contributes around 30 percent of national rice production and is based on very small plots (less than 0.1 ha). Average yields, at 1 to 2 tonnes/ha, are much lower than in the SRV.

Figure 2. Rice area harvested by region



Source: USAID (2009), based on harvest data from Centre Régional Agrhyment, 2000.

2.3 Import and export

Thailand used to be the main provider of rice to Senegal with some 42 percent share in 2010. Since then, Thailand's share has fallen to 11.5% in 2012. Brazil, India, Pakistan and Viet Nam account for smaller imports of rice. More than 95 percent of Senegalese imports are of broken rice. With 22 percent of the world market, Senegal is the largest market for broken rice worldwide (USAID, 2009).

Rice exports from Senegal are small; they mainly consist of the re-export of imported rice to neighbouring countries. In addition, there is some unreported export of rice to neighbouring countries, mainly along the border with Mauritania. The Senegalese government estimates that volumes of informal rice exports correspond to 20–30 percent of official exports (USAID, 2009).

2.4 National rice policies

In 1994, after a period of heavy state involvement, Senegal started to liberalize its rice sector as part of its Structural Adjustment Program. The state disengaged from processing and marketing activities in 1994. In 1995 the state discontinued setting support prices for paddy³ rice. The parastatal agency, SAED (Société

³ 'Paddy rice' (sometimes called rough rice) is the term used for rice that is obtained by threshing after harvest, but still contains the husk surrounding the rice grain. Through the milling process, the husk is removed and the 'paddy' is converted into 'milled rice.'

d'Aménagement et d'Exploitation des terres du Delta et des vallées du fleuve Sénégal et de la Falémé), which was responsible for management and commercialization of SRV rice in the pre-reform period, was converted during the mid-1990s into an independent organization responsible for technical assistance and the maintenance of irrigation infrastructure.

In 2000, the Senegalese government adopted a new vision for the development of agriculture, including the Strategy of Accelerated Growth (SCA - *Stratégie de Croissance Accélérée*) which aims to reduce poverty by 50 percent by 2015 and achieve the Millennium Development Goals. In 2005 the Senegalese president set a target of 1.5 million tonnes of paddy rice (equivalent to 1 million tonnes of white rice) produced by 2015 in order to reach self-sufficiency (PNAR – *Programme National d'Autosuffisance en Riz*).

In April 2008, the president launched the GOANA program (*Grande Offensive Agricole pour la Nourriture et l'Abondance*) in order to achieve this ambitious target. This program implements massive investments in the national rice sector, notably by irrigating and cultivating unused land in the SRV and intensifying production of rice through double cropping. The program reaffirmed the 1.5 million tonnes of paddy rice to be produced by 2015 (MoA, 2008). Additional components of the program include: (i) input subsidies; (ii) provision of certified seed; (iii) financing of production and post-harvest machinery; and (iv) creation of a private sector marketing agency responsible for collecting, processing and marketing local rice production.

Over the past decades, state involvement in the import of rice has also decreased, and trade policies have become more liberalized. While import of rice is now organized by the private sector, until 1995 the Senegalese government had a monopoly on imports of broken rice and all rice imports were subject to a quota. In 1994, when the currency was devalued, tariffs were reduced from 38 percent to 16 percent (Lançon and Benz, 2007). In 2000 the Common External Tariff of the West African Economic and Monetary Union was implemented; this consists of a fixed duty equivalent to a 12.7 percent *ad valorem* tariff (Masters, 2007). Given the large dependence on imports, it is not surprising that Senegal's import tariffs are relatively low. Compared to other major rice-importing West African countries, such as Nigeria and Ghana, Senegal applies much lower border protection. In response to the food crisis in 2007–2008, Senegal temporarily eliminated tariffs and even subsidized imports to keep prices low. Exports were prohibited and consumer prices were fixed (Aker *et al.*, 2009).

2.5 Farmer organizations

Rice farmers in the SRV region are organized into a structure of farmer organizations that are primarily involved in land management, provision and reimbursement of credit, purchase of inputs for rice farming, and management and maintenance of the irrigation infrastructure.

In order to have access to credit from the agricultural bank (CNCAS—*Caisse Nationale de Crédit Agricole du Sénégal*), farmers need to be organized in an Economic Interest Group (GIE—*Groupement d'Intérêt Economique*). A GIE can consist of several farmers or one larger individual farmer. These GIEs are usually part of village-level unions (UV - *Unions Villagois*), which are headed by a president and assisted by a secretary-general and a treasurer, and which - at their turn - are part of larger farmer organizations or federations.

The demand for credit is collectively formulated at the level of the GIE and transmitted to the UV, which submits the collective requirements to the CNCAS - after the submission is approved by the former parastatal SAED. The credit can be used for purchasing inputs (fertilizers, pesticides and seeds) which are distributed among the members.

Each year, CIRIZ (*Comité Interprofessionnel du Riz*), a committee of farmers, farmer organizations, CNCAS and SAED representatives, determines a reference paddy price for the reimbursement of loans. Based on this price, farmer organizations calculate the number of paddy rice bags they must recover from farmers in order to repay the loan. After harvest, each GIE collects the corresponding volumes of rice, which is sold to traders by the GIE itself or by the UV, either as paddy rice or milled.

Most GIEs and unions do not engage in any more advanced form of processing or storage of rice and most of them sell the rice as paddy immediately after harvesting. Even at higher levels, such as village unions and federations, involvement of farmer organizations in processing and marketing is limited. With some exceptions such as the well-organized union of female rice growers in Ross Béthio, a few strong village-level unions, and the PINORD platform (see below), these organizations do not engage in collective processing and marketing beyond the sale of rice for loan repayments.

2.6. Consumer preferences

Consumer preferences differ significantly across urban and rural markets. In both markets there are four rice types: broken, intermediary, whole and ungraded rice. Senegalese consumers have a high degree of preference for broken rice, but this preference is much more pronounced in urban markets than in rural markets (Rutsaert *et al.*, 2013). Especially in Dakar, consumers are accustomed to imported, aromatic broken rice. In semi-urban centres located in the SRV rice-producing region, such as Saint-Louis and Podor, consumers are familiar with local rice and most of them prefer it to imported rice. In these semi-urban centres, the preference for broken rice is much less pronounced than in Dakar, but still higher than in rural areas. In rural areas, whole grain rice is much more appreciated and only 10 percent of rural rice consumption is imported. Rural consumers often purchase ungraded rice, and do the sorting into broken, intermediate and whole grains at home.

The preference for broken imported rice among the large - and growing - group of urban consumers, clearly does not match the objective of reducing the import dependence by increasing domestic production. Fall *et al.* (2007) analysed the opinions of sellers, consumers and producers on the reasons for the weak position of local rice in urban markets. While producers mainly blame unfair competition from Asian rice as well as difficulties selling their surplus production, consumers and sellers emphasize differences in quality and poor marketing of domestic rice.

3. Supply chains of rice

The previous section shows there is a strong segmentation of markets, corresponding to different consumer preferences. This is consistent with the fact that the supply chains of rice in Senegal are organized separately for imported and domestic rice, with very little overlap; only a few actors - some large traders in the urban areas - are involved in both supply chains. In addition, domestic rice production systems are very different in the SRV from those in the southern regions.

In the following section we analyse the supply chains of imported and domestic rice, both in the SRV and in southern Senegal. For imported rice, we briefly describe how imports and commercialization are organized. For domestically produced rice, we describe the functioning of input markets, the organization of rice production and processing, and whether - and through which channels - rice is commercialized.

3.1 Import market chain

Given that 65 percent of rice consumed is sourced abroad, the import market chain is the most important one in terms of volume. Imported rice dominates the rice market in Dakar and in some of the other large cities.

In 1996, 43 importers were active in the Dakar market. After significant consolidation during the past decade, there are currently only about ten regular importers, and four of them are responsible for 66 percent of the imports (USAID, 2009). Large importers buy huge quantities (ships) of rice, while a number of smaller importers buy rice by the container. Rice is then sold to wholesalers in Dakar. An important share of imported rice passes through only four large wholesalers and is then distributed to semi-wholesalers and finally to retailers and small shops in Dakar and towns further inland. Often semi-wholesalers also own trucks and organize the transport.

3.2 Domestic rice channel: Senegal River Valley

As described earlier, virtually all of the marketed domestic rice is produced in the SRV. A state run monopoly supplies subsidized fertilizer, sold at 40 percent below the market price. A number of private actors are authorized to multiply seeds, which must then be tested by public laboratories and conditioned in Seed Sorting Centers (USAID, 2009). In order to obtain credit from the agricultural bank (CNCAS) farmers are required to be part of a GIE and to use certified seed. In addition to this system of subsidized credit through GIEs, private lenders may provide credit at substantially higher interest rates. While the organization of credit provision through GIEs facilitates farmers' access to credit, the monopoly of the agricultural bank, and of the state-run supplier of fertilizer and seed, along with the associated bureaucracy, results in an inefficient provision of inputs.

After the rice for credit reimbursement is collected by the GIE, each individual farmer chooses what to do with the remainder of his production. Overall, about one third of SRV rice is sold collectively for the reimbursement of credit, one third is sold individually to small traders and one third is kept for consumption (USAID, 2009).

Transformation of paddy into rice happens through two parallel processing systems. Small, informal mills, often at the village level, simply process paddy to rice by removing the husk of the grain. However, in response to higher prices and demand for quality from urban end-markets, larger semi-industrial mills are expanding capacity to produce processed rice. Both types of rice mills usually act as service providers. Farmers or (more often) traders bring the paddy to the mills and pay a fixed amount per tonne for milling.

Most farmers sell paddy or rice through small, informal intermediary traders (*banabanas*). These traders often buy small quantities of paddy at the field and process them through the small village mills. They sell the rice at weekly markets in the interior of the country, or to wholesalers in the cities. These intermediary traders are responsible for a large number of uncoordinated, small scale transactions. Traders selling in urban markets often buy higher quality rice at the industrial mills or buy larger quantities of paddy rice from intermediary traders or farmers and have it processed at the industrial mills themselves.

These different types of traders correspond to different markets. Less than half of the local commercialized rice reaches the urban and semi-urban markets. The other half is sold in rural areas further inland. While production systems are quite similar for these two markets - both originating from the same type of smallholder farmers in the SRV—the degree of processing and the marketing channels are different. Rice for urban markets is

purified and sifted into homogeneous size categories and sold to traders who buy larger volumes at the rice mills. For rice sold to rural areas, quality and sifting is less important. The marketing is less organized and consists of small volumes sold by producers or producer groups to small, informal traders.

3.3 Domestic rice channel: southern Senegal

In the southern regions of Senegal where rice production is rain-fed, yields are low, and the market chain of rice is not well developed. The system of GIEs providing access to credit (through the CNCAS bank) and inputs also exists in this region, but the volume of credit transactions is substantially smaller due to lower external input use and lower financial resources of farmers. Farmers generally use traditional rice seeds, although since 2009 improved rice seeds such as Nerica varieties are increasingly being adopted. In most of these regions women are responsible for rice cultivation and handle the primarily manual operations. The cultivation of rain-fed rice is labor intensive, which limits the cultivated area (USAID, 2009).

The processing of rice in these regions is usually done manually; small mechanical rice mills are rarely available. Households keep almost all of the rice for their own consumption. Rice production is considered a supplementary, non-commercial activity, although households might occasionally sell small quantities to local traders when they are in need of cash.

4. Constraints to smallholder market participation

In Senegal, as has been observed all over Africa, a large number of staple crop producers do not participate significantly - or at all - in the marketing of their produce. Many farmers produce mainly for subsistence purposes and only a small number often with larger farms, have a commercially oriented strategy. Of those farmers participating in commercial rice production, it is notable how little they participate in the urban markets, which contain the largest group of rice consumers.

We begin this section with a conceptual framework on the factors that determine market participation. Then we discuss two issues concerning the participation of Senegalese farmers in rice markets: (i) constraints for increased participation of farmers in commercial markets in general, and (ii) constraints for participation in the higher value rice markets in urban areas.

4.1 Conceptual framework

In many poor rural areas, many small farmers do not participate in markets at all. Several studies have looked empirically at determinants of market participation by African farmers in traditional export crops (e.g. Fafchamps and Hill, 2005; Poulton *et al.*, 2004) and high value crops (e.g. Minot and Ngigi, 2004; Humphrey *et al.* 2004; Minten *et al.*, 2009). Goetz (1992) has analysed market participation for coarse grains in Senegal.

For staple crops in general, researchers found that many producers purchase more food grains than they sell, and that only a small share of food grain growers sell anything to the market at all. Three groups of influential factors can be identified: (1) assets (2) household specific transaction costs, and (3) regional conditions (Barrett, 2008).

- (1). Those households that do participate in the market typically have larger land and non-land asset holdings. Larger land (and other productive) assets are associated with higher yields and a higher marketable surplus (Barrett, 2008). The positive link between land assets and market participation is found all over Africa: for rice markets in Madagascar (Barrett and Dorosh, 1996), for wheat in Ethiopia (Bernard *et al.*, 2008), and for maize in Kenya (Nyoro *et al.*, 1999).
- (2). Household specific transaction costs for market participation naturally lead some households to decide to participate and other households not to enter the market at all but to opt for self-sufficiency instead (De Janvry *et al.*, 1991; Key *et al.*, 2000). Transaction costs that are highly household specific include, among other things: experience and negotiation skills related to education level, gender or age; land assets and access to agricultural equipment; access to credit or liquidity availability.
- (3). Finally, commercial households are more likely to be located in zones with better market access, better physical and institutional infrastructure and higher potential agro-ecological characteristics. Regional differences in transport costs, costs of commerce, degree of competition among traders, etc., may also contribute to variation in the level of commercially-oriented farming (Fackler and Goodwin, 2001). More remote locations may be associated with bad road accessibility, limited information on market prices and demand, and low population density, which results in limited aggregate demand and poor integration with broader markets.

Which of these factors most inhibit market participation - geographic factors or household specific transaction costs - is mainly an empirical question. Especially when surplus production volume is limited, per unit transaction costs are high and market participation may be low.

Increasing productivity through technological improvement can contribute to increased marketable volumes, thereby reducing per unit costs and making commercially oriented farming profitable. However, Barrett (2008) points out that technology and market participation influence each other; technology adoption - for example, fertilizer use or the processing of paddy into rice - will only become profitable if there is a market for absorbing the surplus created. In poorly connected markets, increased production volumes might not reach broader markets, and local market flooding will cause adverse effects through rapidly falling prices.

Farmer cooperatives offer another opportunity for reducing farmers' individual transaction costs. Through joint input purchases, common storage facilities and collective marketing, fixed production or marketing costs can be divided over larger volumes, thereby reducing per-unit transaction costs and enhancing market participation.

In the remainder of this section we concentrate on market participation in Senegal. First, we look at market participation in general versus subsistence rice production. Following that, we discuss in more detail the specific constraints to rural versus urban market access.

4.2 Constraints to market participation for Senegalese rice farmers

Regional factors clearly affect the market participation rates for rice farmers in Senegal. The degree of market participation differs largely across regions. The rain fed lowland ecosystem in southern Senegal, is a net buying region, where virtually all rice production is consumed within the region and even within households. Hence, market participation is very low. The SRV is the main area of commercial irrigated rice production with about two thirds of rice produced being marketed. These regional differences are primarily due to the different production systems. The lack of commercial orientation in the southern regions is both a reason for and a consequence of poor access to credit, irrigation, inputs and consumer markets. These limiting factors work against increasing yields and surplus production which could be marketed, although this may change with the advent of higher-yielding Nerica varieties which are being increasingly adopted in this region. On the other hand, the return on investment in improving water management and input markets is clearly higher in the SRV, which explains the government's interest in investing in rice production in the SRV.

Apart from these large regional differences between the irrigated SRV and the rainfed lowlands in the south of Senegal, there are also important differences between households situated in the same region. Although the SRV region is on average much more commercially oriented than the southern regions, not all SRV rice farmers are involved in commercial rice production and the volumes of rice sold vary greatly among farmers. In order to identify household specific determinants of market participation among SRV rice farmers, we conducted a representative household survey in the Senegal River Delta in February 2006.⁴ The choice of a homogenous production area, well connected to the main road and close to Saint-Louis, largely cuts out market access as a source of variation, and makes it possible to isolate the household level determinants of smallholder market participation among SRV rice farmers.

Farmers who participate in the GIE system (including the majority of farmers in our survey area) are selling at least part of their production in order to repay the credit they obtained and so this system guarantees a certain minimum share of rice production being commercialized in the entire SRV region. But the GIEs do not collect more rice than is needed for reimbursement. Every farmer decides individually what he/she wants to do with the remainder of his/her produce.⁵ Some will keep it all for consumption, some will sell immediately to traders, while others will store some of their production to sell later. In the remainder of this section we will use the terms market participation and selling farmers for those farmers who decide to sell rice individually, meaning *in addition* to the rice which is sold collectively by the farm organization to reimburse credit. To account for the rice which is not consumed by the households, one should add both types of sale.

In what follows, we first give a general description of the characteristics of rice farmers in our sample. Then we discuss how these characteristics differ between farmers who are selling rice individually, and farmers who are not selling rice (apart from the collective sales of paddy rice for credit reimbursement). Out of the 245 farmers in our sample, 182 farmers are selling rice individually.

Senegalese rice production is almost entirely through smallholder agriculture, including in the SRV region. The average amount of land assets of rice farmers in our sample is 3 ha. The average area cultivated is 2.5 ha in the rainy season (Table 2), and more than half of the farmers cultivate an area of less than 1.5 ha. The average production of rice over the whole year was about 11 tonnes. Most farmers

⁴ The sample includes 245 rice producing households and is representative of the Delta region of the Senegal river (zone Gandon, Ross Béthio and Ronkh), the region of the SRV closest to Saint-Louis. More details on the survey can be found in the Annex.

⁵ Only in a few exceptional cases do GIEs go beyond the repayment of loans, by collectively organizing the processing and sale of rice.

produce in the rainy season only, but 14.5 percent of rice farmers produce rice both in the rainy and the dry season (double cropping).

Table 2. Area of rice cultivation, production, and distribution of production to different destinations by farmers in the Senegal River Delta, 2005

	Rainy season (July-Jan)	Dry season (Febr-June)	Total (2005–2006)
Area (average) (ha)	2.49	1.37	
Area (median) (ha)	1.5	1	
Production (tonnes)	9.8	6.3	10.8
Double cropping (%)			14.5
% sold collectively for credit reimbursement	57.7	38.0	55.2
% consumed	21.8	30.9	22.5
% sold	16.4	24.3	17.9
% donated	4.1	6.7	4.4
	100	100	100

Source: Authors' calculation based on own survey.

Overall, more than half of the production (55.2 percent) in 2005 was sold through the farmer organizations in order to pay back the loans.⁶ Apart from these sales for reimbursing credit, on average 18 percent of rice production was sold by farmers individually. Hence, total sales came to more than 70 percent. About 22.5 percent of rice production was consumed by the farming household itself.

In our sample, 75 percent of rice farmers were selling rice individually (Table 4). The large majority (62 percent) of these had first sold some rice collectively through the farmer organization to repay loans while 13 percent did not participate in the credit system of the GIEs and sold rice only on an individual basis. Most of these are larger farmers who could probably rely on other sources of financing. Of the 25 percent not selling rice individually, 3 percent sold rice through the farmer organization for loan repayment and kept the rest for subsistence. The other 22 percent of farmers produced purely for subsistence purposes and did not even sell rice collectively for credit reimbursement.

Because of the relatively high rice productivity in the Senegal River Delta and the relatively good road connection to the rest of the country, it is not surprising that the share of farmers selling rice individually (75 percent) in our sample is high compared to the rest of the country and compared to percentages of staple food sellers reported in other studies.⁷ Note that this is considerably higher than the one third of rice production sold for credit reimbursement that was estimated by USAID (2009), which might be related to our survey data corresponding to a year of low production.

Yet even within this commercially-oriented region, nearly one quarter of farmers are producing for subsistence. And also among farmers participating in the marketing of rice, there are large differences in the volumes of rice sold.

⁶ Note that this is considerably higher than the one third of rice production sold for credit reimbursement that was estimated by USAID (2009), which might be related to our survey data corresponding to a year of low production.

⁷ In East and South Africa, percentages of sellers among staple food producers vary between 10 and 40 percent (Barrett, 2008).

Table 3 illustrates some general characteristics of farmers selling (commercially oriented farmers) and farmers not selling rice. Sellers tend to have larger areas of cultivation and higher output and yields. There seems to be no difference in age or education level. Members of farmer organizations are more likely to be rice sellers, as are double cropping farmers. Commercially oriented farmers have a higher income and more land and non-land assets. A larger population corresponds to a higher percentage of sellers in the village. The insignificant difference in distances to a paved road and to Saint-Louis confirms our initial hypothesis that market access is fairly homogenous among farmers in the Senegal River Delta.

Table 3. Household assets and characteristics of farmers selling and farmers not selling rice

	Farmers not selling rice	Farmers selling rice	t-test
Area of rice cultivation (ha) ^a	1.40	3.53	***
Total rice production (kg)	4,538	12,920	***
Yield (tonnes/ha)	3.43	4.78	***
Double cropping (% of farmers)	6.3%	29.7%	***
Age	55.7	56.1	
Elementary education	7.9%	9.3%	
Female household head	0%	5.5%	***
Union member	38.1%	51.1%	**
Total land owned (ha)	1.94	3.32	***
Non-land assets	207.1	1125.6	**
Total income (FCFA)	719,723	1,233,208	***
Per capita income (FCFA)	136,487	169,877	*
Agricultural income (FCFA)	397,027	727,632	***
Village population	977.5	1287.4	***
Distance to Saint Louis (km)	59.3	57.2	
Distance to paved road (km)	9.6	7.9	
Number of observations (n=245)	63	182	
	(25.7%)	(74.3%)	

Source: Authors' calculations based on own survey.

Notes: Fixed exchange rate: euro1 = 655.957 FCFA. Significant differences (two-sided t-test) are indicated by *: p=0.10, **: p=0.05, ***: p=0.01.

^a Area, production and yield refer to total area and production, i.e. the sum of area and production of wet and dry season.

These descriptive statistics indicate that in areas with much commercial activity, household assets are an important determinant of market participation. This is in line with other studies showing that privately held assets impose important constraints to market participation (Boughton *et al.* 2006; Cadot *et al.* 2006; Minten and Barrett, 2006). We do find that a large village - reflecting larger local demand - increases the likelihood of selling rice. While distances to the road and to Saint-Louis are not found to be important within our study area, infrastructural constraints at the regional level are obviously very important in explaining major differences between the two main rice producing regions (Senegal River Valley and southern rainfed low-lands).

The majority of farmers in the Senegal River Delta (74.3 percent) participate in individual sales of rice, yet volumes traded are very unequally distributed. Only 2 percent of farmers account for 25 percent of total rice sales; 7 percent of farmers sell 50 percent of the total volume sold, and 26 percent of farmers account for 75 percent of rice sold. We refer to those in that 26 percent as large sellers.

Differences in household characteristics and assets between sellers and non-sellers are also found when comparing large sellers and small sellers.

Table 4. Characteristics of large and small individual rice sellers

	Small sellers (accounting for 25% of total sales)	Large sellers (accounting for 75% of total sales)	Total (2005–2006)
Area rice cultivation (ha)	1.84	5.98	
Yield in rainy season (tonnes/ha)	4.14	5.08	
Yield in dry season (tonnes/ha)	4.82	5.30	10.8
Double cropping (% of farmers)	26.3	40.0	14.5
% of total farm production sold	14.2	28.4	55.2
Average volume sold (kg)	952	8,840	22.5
			17.9
Average price (FCFA/kg)	99.4	101.2	4.4
% of farmers selling to intermediary traders	86.5	80.9	100
% of farmers selling to traders in urban market	2	6	
Number of observations (n=182)	137	45	

Source: Authors' calculations based on own survey.

Table 4 also indicates the importance of farmer organizations in the commercial orientation of farmers. Farmer organizations usually only oversee the demand for credit and the distribution of inputs and irrigation water. Without personal funds or individual access to credit, it is necessary to be part of a farmer organization in order to be able to cultivate a significant area. Through facilitating access to credit and inputs, and thereby increasing production, union membership can enhance individual market participation, even when the farmer organizations usually do not arrange for the commercialization of surplus production. The main reason for the limited commercial activity of farmer organizations is the heterogeneity of producers. While some farmers are in urgent need of cash at the end of the season

and prefer to sell the paddy rice immediately after (or even before) harvesting, others have the option to postpone sales and transform the paddy into sorted rice themselves and store it for a higher price season. The credit provided to farmer organizations can only be used for the purchase of seeds and inputs. Farmer organizations do not negotiate marketing credit which would allow them to collect, transform and store all surplus rice production and advance some of the total sales revenue to farmers. Moreover, farmer organizations often lack the management and marketing skills to perform these tasks.

PINORD (*Plateforme d'Appui aux Initiatives du Nord*), an Oxfam-funded platform of farmer organizations, is trying to improve the commercial activity of farmer organizations by providing credit and monitoring quality of a newly created rice brand, Rival®. However, while PINORD's model for the increased commercialization of quality SRV rice may be a good preliminary step toward competitiveness, the operational scale is currently too small to have a significant impact on the market. PINORD marketed 500 tonnes of milled Rival® rice, produced by 10 rural micro-enterprises (RMEs)⁸ in 2007, 1800 tonnes by 108 RMEs in 2008, 2 600 tonnes by 150 RMEs in 2009, and 6 200 tonnes by 350 RMEs in 2010. However, the product was only available as far as the milling factories in the Senegal River Delta (50 km from Saint-Louis) and did not reach the urban market of Saint-Louis. In 2011–2012, no Rival® was commercialized due to discontinued external funding (Demont *et al.*, forthcoming).

4.3 Constraints on access to local and urban markets

Not all farmers who produce a marketable surplus of rice and are willing to sell it have access to the same market channels. In the rain-fed zones there is hardly any commercial activity at all, even locally. In the SRV, local rice markets are better developed - more so in the Delta region than further inland - although transaction costs are still considerable and markets are highly fragmented. The organization of input and credit provision by farmer organizations results in a minimum volume of rice being sold in order to repay loans. Usually farmer organizations sell to local intermediary traders (*banabanas*) who sell the rice on local or regional markets further inland and (less frequently) to traders in urban markets. Sales made by farmers individually are often smaller, more irregular transactions. Most farmers sell a part of their production to *bana-banas* after harvesting and store another part for consumption or for sales at a later time. Farmers and farmer organizations usually do not have long term relationships or agreements with these traders, and transactions are ad hoc. These irregular, small sales keep transaction costs rather high and reduce market efficiency.

Transactions with traders who are active in urban markets concern larger volumes but are less frequent. Some *bana-banas* have connections with traders in urban markets, but these transactions are also fragmented and irregular. Some retailers or larger urban traders buy directly from producers, but the total volume of SRV rice reaching urban markets remains small.

The data from our survey in the Senegal River Delta confirm this picture. In our sample, 85 percent of rice farmers selling individually market their produce through intermediary traders (*bana-banas*) and only 8 to 9 percent sell to traders in weekly markets (Table 5). Only 3 percent (8 percent in the dry season) sell directly to traders in urban markets, although the price those traders pay is 15 to 20 percent higher.⁹

⁸ These rural micro-enterprises refer to various actors in rice production, such as farmers, service providers and input suppliers.

⁹ Note that our sample concerns the zone of the SRV that is best connected to urban markets and where farmers' commercial orientation is higher than in other parts of the SRV region. Hence, overall percentages of farmers selling their produce to urban markets will be even lower.

Table 5. Share of farmers and prices by type of trader for the rice sold by farmers individually

	Rainy season (July-January)		Total (2005–2006)	
	% rice farmers selling to	average price (FCFA/kg)	% rice farmers selling to	average price
Intermediary traders	85.1	103.5	80.3	98.6
Traders in weekly markets	8.5	91.3	9.2	91.4
Traders in urban markets	2.8	123.8	7.9	111.7
Sold directly on the market	2.8	95.5	-	-

Source: Authors' calculations based on own survey.

There are two reasons for the low penetration of SRV rice in urban markets. First of all, as documented earlier, urban consumers prefer broken rice, sorted into categories of homogenous size and they value the cleanness and visual presentation of rice (Fall *et al.*, 2007; Demont *et al.*, forthcoming). In contrast, most of the local paddy rice is only transformed into milled rice at a small informal mill, but not cleaned and sorted (which rural women usually do at home) and it involves mainly intermediary and whole grain rice. Although studies show that urban consumers are willing to pay a higher price for good quality local rice, consumers in Dakar generally believe that local rice is of inferior quality (Fall *et al.*, 2007). There clearly is a mismatch between the product demanded by the majority of Senegalese consumers and the product characteristics of domestic rice that is supplied to them.

Second, transaction costs related to getting local supply to urban consumers are very high. Road infrastructure and transportation should not be major constraints. A national road runs parallel to the Senegal River, where irrigated rice production is concentrated. In fact, limited information and unreliable quality and quantity are the main problems. Traders in Dakar have little information on the marketable volumes of local rice, its quality and prices. The most important constraint is probably the fact that transactions in local markets pass through a high number of small intermediary traders and there are very few actors in the chain who collect, store and sell rice in large volumes. Neither farmer organizations, rice millers nor local traders succeed in concentrating transactions into larger volumes.

As we have seen, farmer organizations have not been successful in collectively processing or storing rice in order to market better quality rice in larger quantities. The diversity of farmers makes it difficult to develop common marketing strategies.

Industrial rice mills could potentially serve as places to store larger volumes of rice which could then be sold in large quantities to traders further down the chain. Currently both small village level mills and industrial rice mills act only as service providers. Industrial rice millers do not have sufficient working capital to purchase paddy rice and they have very limited access to commercialization credit. This is in part because local branches of the national bank for agriculture are not allowed to provide credit above a certain amount without agreement from national headquarters. An earlier attempt to provide government supported loans to millers failed because millers could not sell the rice within the period of credit reimbursement and trust has not been restored since that experience.

Local traders do not have the means to buy larger quantities. The small informal traders buy very small quantities and focus on trading low quality, unsorted rice to the rural markets. The lack of coordination between the different actors, combined with the small transaction volumes, significantly reduces

marketing margins for local rice, which reduces their incentive to invest in facilitating the flow of SRV rice to urban consumers. However, the recent price volatility and concomitant business risk since the food crisis in 2008 have led some Senegalese importers to begin gravitating toward SRV rice (Demont and Rizzotto, 2012).

5. Implications, policy recommendations and perspectives

Senegal is extremely dependent on imports of rice, its main staple crop. National programs to promote self-sufficiency, such as GOANA, are investing in the expansion of irrigated plots and technology improvement in order to increase domestic rice production and reduce import dependency.

However, the issue is not merely how to increase production, but how to increase the market participation of smallholders and especially how to integrate rice produced in the SRV into urban markets. Our main policy recommendations start with the recognition of this mismatch between the characteristics of local rice and the preferences of urban consumers. Below, we offer recommendations to address the main constraints related to the development of rice value chains in Senegal.

5.1 Focus on demand and private sector involvement

The current set of strategies put forward by the Senegalese government in the GOANA program emphasizes production and fails to include significant efforts to involve private sector actors. The government's focus is on production and farmer organizations, with very little attention to creating an environment to assist private actors in post-harvest activities and marketing.

Improved commercialization of rice will require establishing conditions that are more favorable to the private sector. A stable investment climate, transparent policies, large infrastructure investments such as irrigation, and guaranteed access to resources such as land and water, are necessary to attract private investment and encourage risk-averse producers to engage in commercial rice production. More transparent criteria for land concession could motivate more commercially-oriented farmers to invest in land preparation and irrigation infrastructure themselves.

The most successful new development models start from the perspective of demand rather than supply.¹⁰ Sustainable incentives for investing in increased supply will exist only if there is enough demand to absorb the product and if the product characteristics fit the demand preferences (Demont and Rizzotto, 2012).

Given the large demand for rice in urban markets, there should be considerable opportunity for the increased development of the rice supply chain in Senegal. The potential market is much larger than the current level of domestic production and an increased supply of rice should therefore easily be absorbed by the large number of consumers in urban areas.

¹⁰ See, for example, the successful approach of the European Bank for Reconstruction and Development (EBRD) in its lending operations in Eastern Europe and the former Soviet Union.

However, there are two important problems: (i) the quality of locally-produced rice currently does not correspond to what consumers want to buy; and (ii) transaction costs to bring locally-produced rice to the urban markets are high, which reduces marketing margins and makes it difficult for domestic rice to compete with the price of imports. So the main challenges are: (i) to upgrade the quality of domestic rice and (ii) to organize production, processing and marketing of domestic rice more efficiently so as to reduce transaction costs.

5.2 Quality upgrading

The first challenge is how to produce the quality and type of rice that urban consumers want to buy. Problems related to improving quality seem not to be insurmountable, as they are not inherent to the country or the production system as such. Rather the main problems are due to poor processing, which does not conform to consumer preferences. Currently the largest share of local production passes through small informal mills at the village level, which are unable to sort the rice mechanically or to remove foreign matter. Policies should stimulate private investments in improved processing and sorting of rice. Another way to improve quality is to speed up the drying process of paddy rice. Due to poor storage facilities, rice often is not dried quickly enough, which reduces quality or may even cause the rice to rot.

Recent evidence from experimental auctions in the urban markets of Dakar and Saint Louis confirms that there is a willingness among urban consumers to pay a price premium for local high-quality rice (Demont *et al.*, 2013; forthcoming). Under experimental conditions, the majority of Senegalese consumers were willing to pay an 18 percent price premium for imported Thai 100 percent broken rice relative to conventional, ungraded SRV rice. However, they were willing to pay an even larger price premium, 35 percent, to obtain enhanced-quality SRV broken rice. Conventional, ungraded SRV rice is a mix of varieties, has a mediocre grain quality, and is commonly available on the market. Imported Thai 100 percent broken rice has a grain quality somewhere between the conventional and the enhanced-quality SRV broken rice and contains some impurities. Enhanced quality SRV broken rice is purified and homogenized through one or two sifting operations. On top of the price premium of 35 percent for enhanced quality SRV broken rice, the majority of Senegalese consumers were willing to add another 6 percent for a branded rice product, paying an overall price premium of 41 percent for PINORD's Rival® (see Box 1) relative to conventional SRV rice. These findings suggest that Senegalese consumers are willing to pay for intrinsic food quality attributes and that SRV rice is able to compete against imported rice if post-harvest quality is tailored to consumer preferences.¹¹

But also breeding currently plays a role in tailoring quality to urban consumer preferences. In 2011, three fragrant rice varieties bred by AfricaRice (Sahel 177, 328 and 329) have been introduced in the SRV. Given that an important market segment of urban consumers (particularly in Dakar) prefers imported fragrant rice, this introduction opens the door for the development of domestic value chains of fragrant rice and further replacing imports with domestic rice.

¹¹ Enhancing quality in the context of a food insecure country may seem counterintuitive at first, but is consistent with similar findings in Asia revealing that even the very poor have more income elastic demand for food quality than for food quantity (Shah, 1983).

Box 1. Recent initiatives for quality upgrading of SRV rice

The quality upgrading of rice might create opportunities for the development of a certain degree of coordination over the value chain. Recently, SRV producers have combined their efforts to supply a new enhanced-quality SRV broken-rice brand *Rival@* (*Riz de la Vallée*). Governance of quality (processing, cleaning and packaging) and provision of micro-financing for rural micro-enterprises in the rice sector are conducted by the Oxfam-funded platform PINORD. Since its inception, PINORD recognized that absence of marketing for local rice was a major obstacle to the mobilization of quality SRV rice onto the market. PINORD's promotion strategy is fourfold: improving packaging, improving transport, increasing market share and points of sale in urban markets (especially in Dakar), and multimedia publicity surrounding the label *Rival@* (PINORD, 2007).

Although this initiative still faces several obstacles, and the establishment of strong relations with traders is still a challenge that must be addressed, it's clear that it is possible to produce domestic rice that is perfectly acceptable to urban consumers. However, as hypothesized earlier, successful governance of value chains may have to come from downstream stakeholders closer to the demand side. Recent developments confirm this hypothesis. On 25 November 2010, 14 Senegalese rice importers officially launched a joint venture with producers and processors under the name SPCRS (*Société de Promotion et de Commercialisation du Riz Sénégalais*). The SPCRS aims to buy the entire SRV paddy rice production, mill it and market it to Senegalese consumers by governing quality along the chain through quality contracts with milling factories and farmers (Mohapatra, 2011). Two other smaller scale value chain initiatives have emerged, targeting different consumer segments in important urban end markets. Since 2010 importer Marieme Diouck, in partnership with USAID, has contracted with SRV farmers to market high quality SRV rice – branded *Bourou thieb yi* (the king of rices) – on the Dakar market, and the Belgian investor Durabilis is currently contracting with SRV farmers and millers to market medium quality SRV rice, branded *Terral*, through its local subsidiary, Secosen. These recent developments clearly illustrate the interest and potential of the private sector to play a lead role in the development of rice value chains in Senegal.

5.3 Vertical linkages

Industrial or semi-industrial processors of rice can play an important role in improved storing and processing of rice. But industrial rice mills can only operate efficiently at a large scale and therefore a significant part of rice production needs to pass through the industrial mills.

While there is probably insufficient value in a staple food market such as the current rice market, and too much competition from local traders and alternative uses to make extensive vertical coordination possible, there should be some room for supply chain-based financial innovations in the chain (see Box 2). Supply chain-based financial instruments, such as reverse factoring – which transfer the credit risk of small suppliers to their more credit worthy customers – might offer a solution. A focus on lending and co-financing of rice processors and traders might stimulate vertical linkages.

Box 2. Can the supply chain governance of high-value agricultural products be used as a model for the development of supply chains of staple food?

In a context of imperfect markets such as in Senegal, where smallholder producers have limited or no access to inputs and credit, rice traders with better access to credit could solve this constraint by providing the farmer with a contract: the buyer would provide the required inputs (e.g. certified seed of a particular rice variety) and in turn the farmer would sell a specified quantity of the product to the trader at an agreed price. There are two different models possible: either the trader purchases rice already milled or buys paddy rice and processes it into milled rice using a miller as service provider. Because establishment of the contract would now allow the farmer to produce more and/or to produce higher quality, the contract creates a surplus. This type of chain governance model has been very successful in high value chains, such as the export of fresh fruit and vegetables in Senegal. The development and organization of these supply chains are described in detail in Chapter 9 of this volume. The question is whether this chain governance model could also be successful for the Senegalese rice sector. A number of constraints present in the rice sector make it less likely for these governance structures to be established.

When contract enforcement is costly, there are risks of contract breach. The farmer may decide to divert the inputs to other uses or he may sell to another buyer at a higher price (since this buyer does not need to recover the credit that was provided). On the other hand, the buyer can breach the contract by paying a lower price than was agreed on. If the contract creates enough surplus, compared to the situation without a contract, then none of the parties will be better off by breaching it and a credible commitment can be established. Only if enough value can be created in the chain will it be possible to develop interlinked contracts between traders or millers and farmers.

Staple crops such as rice are characterized by low value and the potential for quality upgrading is limited. In addition, the low perishability of rice makes it possible for a farmer to store his product, anticipating higher prices in the future, rather than respecting the contract. The large number of small intermediary traders gives farmers multiple selling opportunities and reduces potential reputation costs of contract breach. These factors make it less likely for chain governance to arise spontaneously. However, the chance of successful vertical coordination is likely to increase with enhanced quality and demand.

5.4 Reducing transaction costs

When investments in quality upgrading and vertical linkages have been stimulated, it is important to focus on improving the supply side of the market by reducing transaction costs. Aggregation points need to be established, where rice can be collected such that transaction volumes in the chain are sufficiently large and per-unit transaction costs can be reduced. Several approaches could be taken to address this need. Investment in physical market infrastructure could lead to the emergence of larger traders. Aggregation points could be established, either at the level of producer organizations (which would require better coordination) or at the level of industrial mills. This would allow traders to transact larger volumes, thereby reducing trading costs. Investment in transport infrastructure could reduce the cost for small traders to bring rice to the mills, thereby increasing the volumes of adequately processed rice.

5.5 Promotion of domestic rice

Once a sufficient supply of clean, quality rice at a competitive price is ensured, investment in promoting Senegalese rice would be one possible strategy to stimulate the demand for local rice (see the case of *Rival®* above). However, local production must offer the characteristics demanded by consumers and the major transaction costs must be addressed. Data from recent experimental auctions point to an increased likelihood of consumers purchasing quality SRV rice when they are aware of it (Demont *et al.*, forthcoming). The most promising channels for promotion campaigns are television and radio (Demont and Rizzotto, 2012), but marketing strategies based on word-of-mouth, i.e. buzz and viral processes that exploit influential existing social networks (female networks, tontines, trader associations, religious and social networks, etc.), can also have a large impact (Demont *et al.*, 2013).

5.6 Increasing productivity in southern rain-fed rice production areas

A different set of policy recommendations is needed for the very different production system in southern Senegal. In the rain-fed rice production areas, the first concern is to increase productivity. In contrast to rice farmers in the SRV regions, farmers in the southern regions have very limited access to input and credit. If better seeds and appropriate fertilizer can be provided at an acceptable price, farmers may be willing to invest more in rice production than they do now. Increasing the efficiency of private suppliers who supply inputs for other crops could improve the accessibility and lower the price of inputs. Rain-fed rice production is labour-intensive so labour availability and competition for labour with other crops may also pose constraints to increasing production.

Finally, improving the ability to cope with risk could stimulate farmers to invest in strategies to increase productivity. Risk-averse households are reluctant to make investments such as purchasing inputs. Investment in inputs and techniques for increasing productivity requires a willingness to cope with risks. Building up savings and insurance mechanisms can help to stimulate more risky investments, including productivity enhancing strategies for rain-fed rice production.

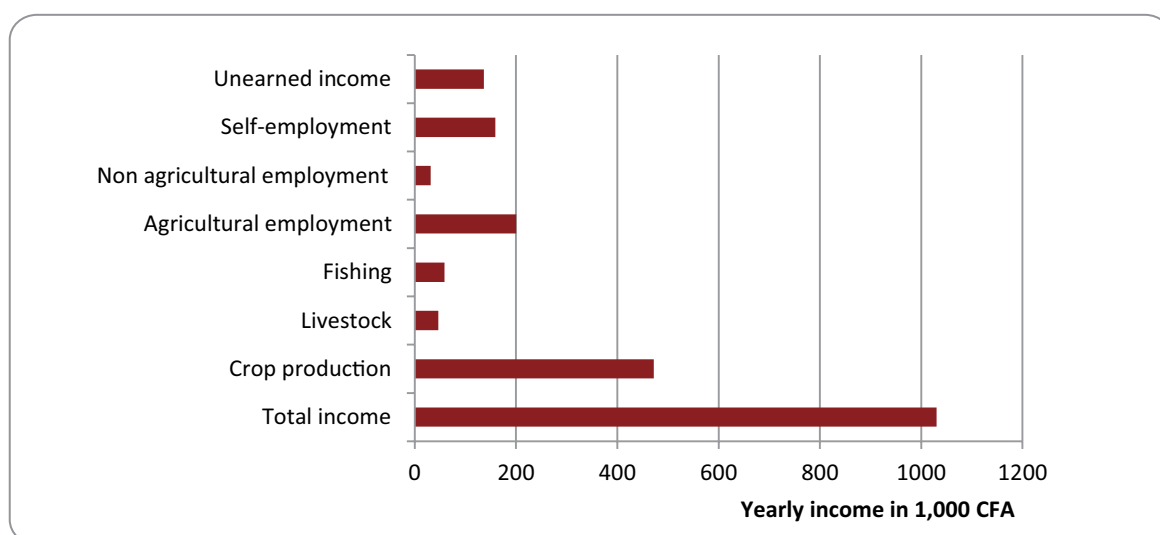
Since the introduction of improved rice varieties, such as Nerica, productivity is dramatically increasing in the Casamance region to the extent that rice production systems are progressively generating marketable surpluses. Moreover, consumers already prefer local rice in that region. Recent experimental auctions carried out by AfricaRice and USAID have shown that Nerica not only boosts productivity, but is also preferred by consumers in urban markets (e.g. Kolda) relative to imported rice. The more these production systems evolve from purely subsistence to surplus-based, the more attention will need to be given to value chain upgrading.

6. Annex: Description of the survey and interviews organized in the Senegal River Delta in 2006

From February to April 2006, a representative household survey was organized in the delta area of the SRV region. The survey covers 400 households living in the rural communities of Gandon, Ross Béthio and Ronkh. The sample includes 245 rice-producing households. Survey data include demographic characteristics, land and non-land asset holdings, agricultural production and inputs, off-farm employment, non-labor income, credit and savings.

The average household income in the region is around 1 million CFA, or 179 000 CFA per capita. The poverty rate in the area is 56 percent, which is comparable to the national average. Households in the region have diversified income portfolios. More than half of the total household income is derived from agriculture, mainly from crop production. Income from fishing and livestock is limited. Other main income sources are agricultural employment, self-employment and unearned income (Figure 3).

Figure 3. Income sources for households in the survey region (authors' calculations)



In addition, stakeholders from the different levels of farmer organizations, traders, importers, government representatives at SAED, and researchers at the Africa Rice Center in Saint-Louis were interviewed.

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Chapter 13

Rice in Mali: Enhancing competitiveness and promoting policies for inclusive value chain development

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1. Introduction: an overview of rice production in Mali

Mali is a landlocked country in West Africa with a population of 14.5 million unevenly distributed over an area of 1 241 300 km². Its economy is predominantly rural and the agricultural sector employs about 75 percent of the population (including crops and fishing), while livestock is the main occupation for 10 percent of its inhabitants.

Mali has been strongly affected by the brunt of variations in the international price of cotton, one of its major cash crops. The structural vulnerability of the country is also due to the difficult agro-climatic conditions: 65 percent of the country is made up of arid or semi-arid lands. These constraints, along with deteriorating terms of trade and variable production volumes due to climate hazards, have negatively affected the balance of trade.

While other food and cash crops tend to be affected by rainfall variations, rice cultivation may be considered an exception. Its undeniable advantages in terms of its irrigation potential can minimize issues linked to the lack of water prevailing in the region. Local authorities have undertaken irrigation development projects, following the serious drought of 1973. Ambitious programs have been launched to increase farmers' income and strengthen the fight against hunger through rice production.

Joint efforts at all levels have resulted in technical pathways and varietal choices that seek to reconcile productivity requirements and consumers' organoleptic demands. Mobilizing the nation around food security has decreased the grain deficit. In Mali, arable land is scarce and rice has gradually become the most produced cereal, as it is grown on wet marginal lands not suitable for other crops. The two other main cereals are millet and sorghum.

An extensive institutional and organizational system has been set up around potential watersheds in the country, with the main ones being the 1 700 km long Niger River, the 900 km long Senegal River and their numerous tributaries. The opportunity to take advantage of the many areas irrigated by gravity offers real opportunities for agricultural development. In Mali, agricultural land covers 12.2 million hectares (ha), and floodplains 2.2 million ha; only a quarter of these are cultivated. The Inner Niger Delta alone represents an area of 30 000 km², making it a world landmark recognized by the Ramsar Convention on Wetlands.

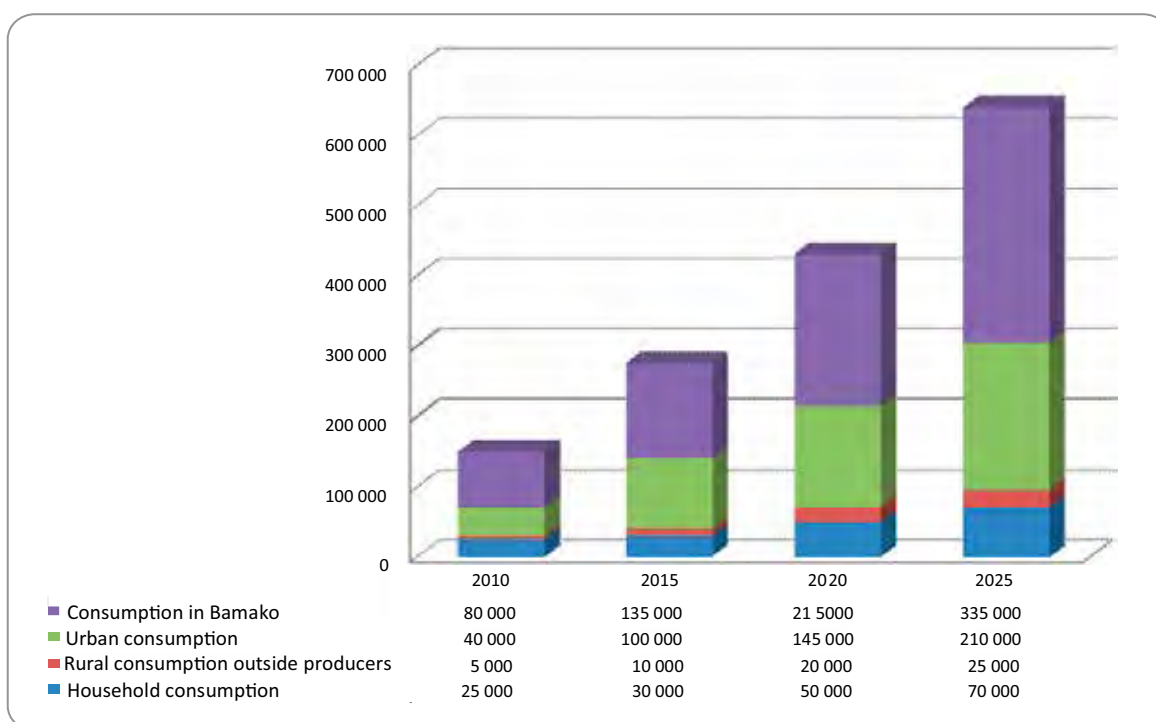
Very early on, Malian authorities had a clear objective: transform Mali into the rice granary of the sub-region by increasing the amount of agricultural land, as this would substantially improve the country's productive capacity. Encouraging leaders to aim for this goal was the priority as long as the tariff protection to third party producers warranted this kind of agricultural policy. However, the World Trade Organization (WTO) strongly recommends, within a set timeframe, removing tariffs at state borders. Tariff preferences are also being questioned and will probably decrease in the future. Malian rice is facing challenges to remain competitive in the new global context characterised by foreign competition. Mali needs to consider whether it can dominate the African market with its own production and also whether its rice value chain can successfully take on the current global liberalized market.

There are different viewpoints. Since the global food crisis of 2008, some neoliberal paradigms have stalled. Food sovereignty and self-sufficiency issues have reappeared. They counter the comparative advantage theory that focuses on countries becoming extremely specialized by confining themselves to their most productive sector when weighted against other partner nations. This would provide food at the lowest cost for the whole planet and ensure individual and collective wellbeing throughout the world. The food crisis has shown that this does not guarantee food security. Moreover, subscribing to such a paradigm would result in acquiring competitiveness *ad infinitum*, with irrevocably fixed derived market shares. Some

are now defending the thesis of food security through self-sufficiency and dispute the limitations of the comparative advantage theory. However, the usefulness of food transfers from most competitive to less competitive areas is not questioned by these diverging voices. They simply argue in favour of mitigating the extreme dependence of fragile states in relation to the outside world and reinforcing self-protection mechanisms from exogenous shocks. Therefore, agriculture's strategic purposefulness, often opposed to a certain "economic rationality", has been restored following this food crisis.

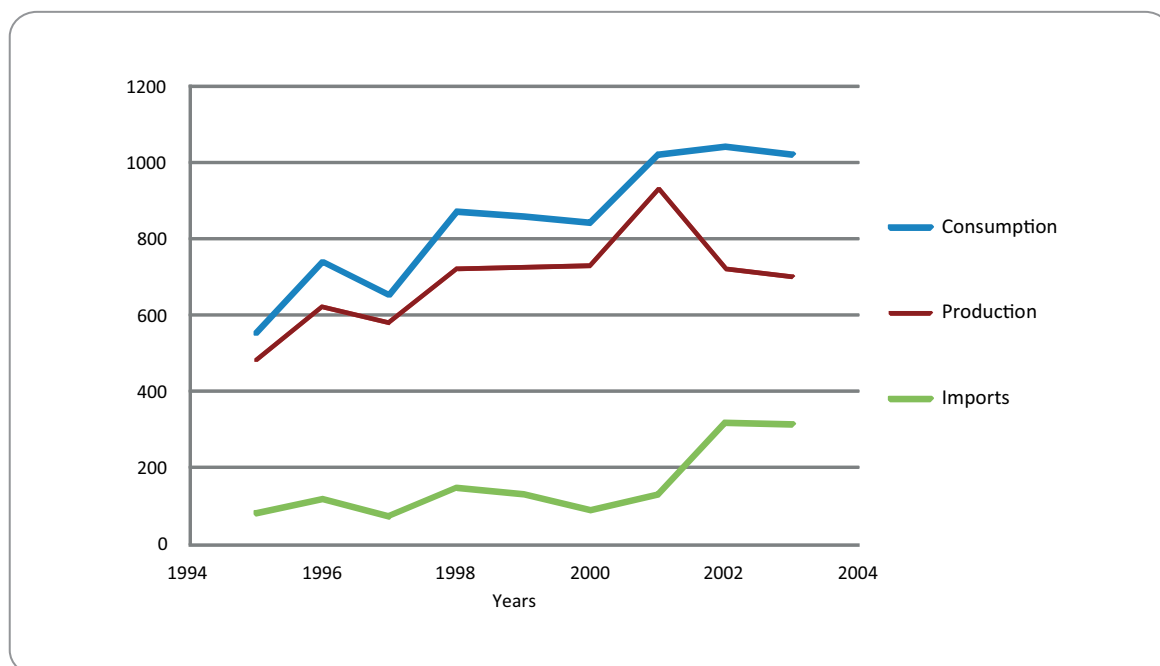
The above reasons validating the choice of national policymakers to support rice production are reinforced by the following factors. The population of Mali is a sustainable solvent clientele, with a known and constant price and income demand. The fact that domestic yields are not meeting an important part of the demand at consumer level shows that focus should be given to improve productivity rather than to marketing opportunities. According to the AFD (Baris *et al.*, 2005), national requirements, which are already well above domestic supply, have been growing at a robust rate of 7.5 percent per year since 1995, due to both demographic growth and changes in dietary habits. Figure 1 illustrates AFD projections for new demands. The increment of the gap between local demand and availability creates constant increases in rice imports: 300 000 tonnes or more were regularly imported since 2002 – six times less in the preceding decade (Figure 2).

Figure 1. Estimated level of new requirements for rice in Mali (rice quantity in tonnes)



Source: AFD-CIRAD-FIDA (2011)

The current trend of increases in imports can partially be explained by the sharp decline in domestic rice supply and the surge in demand.

Figure 2. Illustration of the disconnect between domestic supply and consumption in Mali

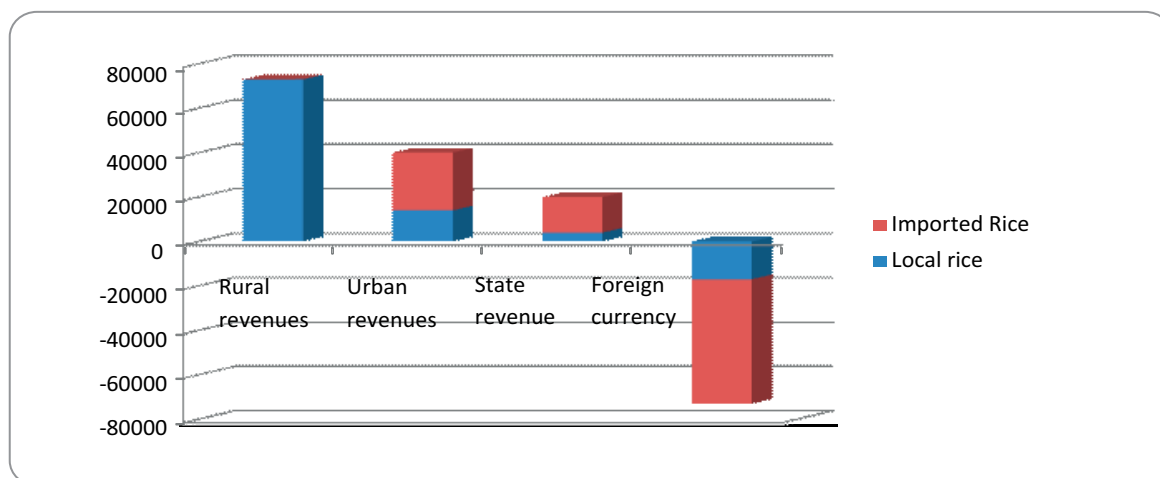
Source: FAO Stat (2012)

Unless national production is revitalized, the gap is expected to continue to become larger as imports increase. Malian producers not only face the challenge of meeting new demand, but also of reducing imports. As the world rice market ceases to be a residual market, this dual need becomes more urgent.

The proportion of quantities traded on international markets compared to global quantities of rice produced is low, between 7 and 8 percent. This will increase in the coming years according to projected current domestic demand in major producing countries.

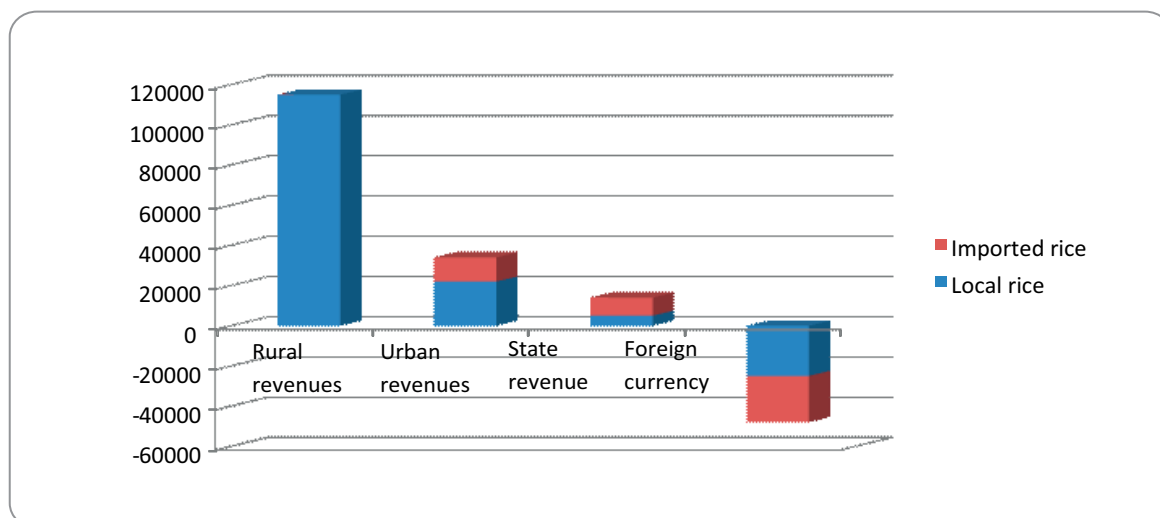
In this structurally characterized international context, the Malian government may consider focusing on new production, processing and marketing strategies to better meet consumer's preference for rice over other cereal crops. The close link with food security and poverty reduction at national level renders this cereal particularly important. Each year, the different sectors of Malian rice generate more than 100 billion XOF of income, including 70 billion for rural people and 4 billion in revenues for the state. In comparison, rice imports in 2003 only rendered 16 billion in revenues, which were mainly urban, and 6 billion in tax revenue. The increase in revenue for the state is tied into an exchange value in foreign currency with a cost that already exceeds 23 billion. This also irreparably increases the gap between the urban and rural populations as the latter have been recognised as those most in need. Moreover, this option goes against the Millennium Development Goals (MDGs) objectives, which aim to halve, between 1990 and 2015, the proportion of people living on less than a dollar a day. Figures 3 and 4 summarize the macroeconomic results of a comparative study between the two "import" versus "cultivated land expansion" options to meet new demands by 2015.

Figure 3. Macroeconomic “imports” option outcomes in millions of CFA francs



Source : AFD-CIRAD-FIDA (2011)

Figure 4. Macroeconomic “production” option outcomes in millions of CFA francs.



Source : AFD-CIRAD-FIDA (2011)

Given its effects on macroeconomic stability, food security and poverty, the development of Malian rice appears to be fully justified. It will be especially beneficial if it can substitute imported rice. But the stakes of Malian rice are also sub-regional; West Africa has an overall need of approximately 7 million tonnes of rice, and the 3 million tonnes deficit (40 percent of the demand) is met through imports. The two other producing countries, Côte d'Ivoire and Guinea, have a production system that is mainly rainfed and can only increase their production by deforesting which would further disrupt the frail ecological balance. To stifle competition from overseas in the sub-region, preferential tariffs could be implemented with the collaboration of Mali's dual membership in ECOWAS and WAEMU. To a lesser extent, the fact that imports are concentrated in the hands of a few private operators increases consumer prices of imported rice, as their main aim is to make profits through high margins. This oligopoly, who seems to cast off the option of increasing market shares through price reduction, is motivated by the characteristics of the demand: inelasticity of rice as a basic necessity, people increasingly preferring rice and a demographic pressure boosting demand and consumer surplus.

Malian rice benefits from several factors that derive from the expected outcomes of the regional integration agreements on the free movement of rice within the Community and imports that have been largely constricted following the devaluation of the CFA franc (XOF) in January 1994. This positively resulted in cancelling out the effects of the 1980 competitive trade liberalization and was reinforced by the recovery of tariffs and other quantitative restrictions on imports (Dupressoir, 2001). More recently, transaction costs, including ocean freight, inherent in the increased volume of trade and the soaring price of oil, have made Malian rice more competitive. This is reinforced by the intrinsic financial costs and delays in land transit, which must be taken into account in Mali as it is a landlocked importing country.

The context around Malian rice is beneficial regardless of whether the international environment changes significantly or not. Moreover, the major constraints it faces are essentially endogenous and flexible. These can be reduced through a large national project that would encompass the magnitude of the challenges sustained by strong political will.

This value chain generates millions of jobs directly and indirectly and depends on the capacity of national actors to transform its constraints. At present there is an opportunity to take advantage of these favourable indicators to transform potentially productive assets into real ones while addressing weaknesses and removing threats. This is only possible when the value chain is strong with stakeholders that maintain synergistic activities and dynamic functional links in all equity, under the arbitration of a state acting in accordance with principles of good governance.

It is important to better understand the present conditions of the rice sector in Mali, and more specifically its productive, economic and operational substructures before putting forward recommendations.

2. The rice value chain in Mali: productive capacity and economics

2.1 Production potential

In the central delta of the Niger River, the history of Malian rice dates back more than 1 500 years before Christ. During colonial times, initiatives were launched to modernize agriculture and thus prevent recurring famine. The Office du Niger was created in 1932 primarily to promote the cultivation of cotton, along with facilitating an increase in rice production. At independence in 1960, less than 50 000 ha were developed, and the potentially irrigable land was estimated at 960 000 ha - including 510 000 ha for cotton and 450 000 for rice.

Over the years, the rice sector in Mali has acquired its current configuration and reflects the reforms that have taken place since that date. Post-independence it is characterized by the rapid development of paddy production. Between 1961 and 1965, rice represented 16 percent of the total cereal production, and by 2001-2005 it had increased to reach 30 percent. The liberalization of the cereal sector in 1980 gave it a boost and it multiplied by seven in 20 years, leaping from 100 000 tonnes to 700 000 tonnes in the late 1990s.

The rice sector is built around its main activity, production, and continues to spread throughout the country in different and varied conditions. Cultivation practices include a host of technical pathways ranging from rainfed rice to irrigated rice and multiple intermediate systems of natural flooding in river deltas. Systems identified to date are classified according to criteria related to water. They are:

- The rainfed rice system, entirely dependent on weather conditions,
- The natural fluvial flood rice system, dependent on flood / deflood and requiring hardy varieties with a high adaptability,

- The controlled flooding and lowlands rice system, with partial control of water through the erection of seawalls, and
- The irrigation system with a total control of water through irrigation schemes.

These production methods reflect water availability in the country as a major constraint to rice production.

A. Water resources in Mali

Rice production requires large quantities of water. Most of Mali's water comes from rain that provides each year on average 415 billion m³ of water. There are large interregional disparities in rainfall, the south of the country being relatively well off with 1 200 mm of rainwater per year, and the north receiving less than 100 mm.

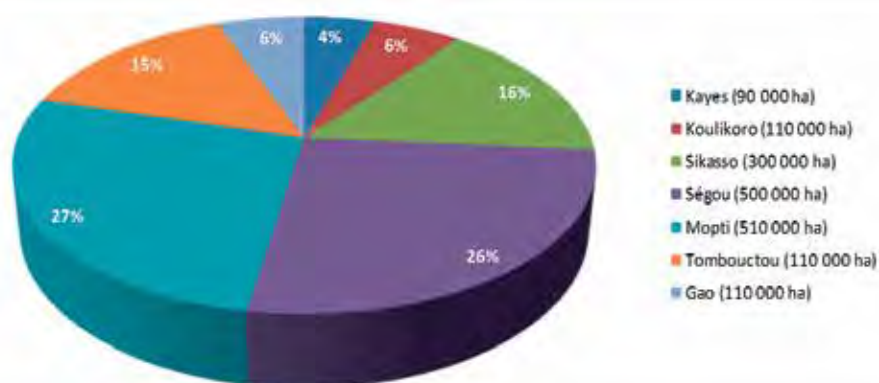
In addition to rainwater, the country has two rivers with a high irrigation potential, the Niger and the Senegal. They alone drain an annual average of 70 billion m³ of water, with 110 billion m³ in a wet year and 30 billion m³ of water in a dry year.

The other major production factor that needs to be taken into account is the agricultural capital.

B. Land availability in Mali

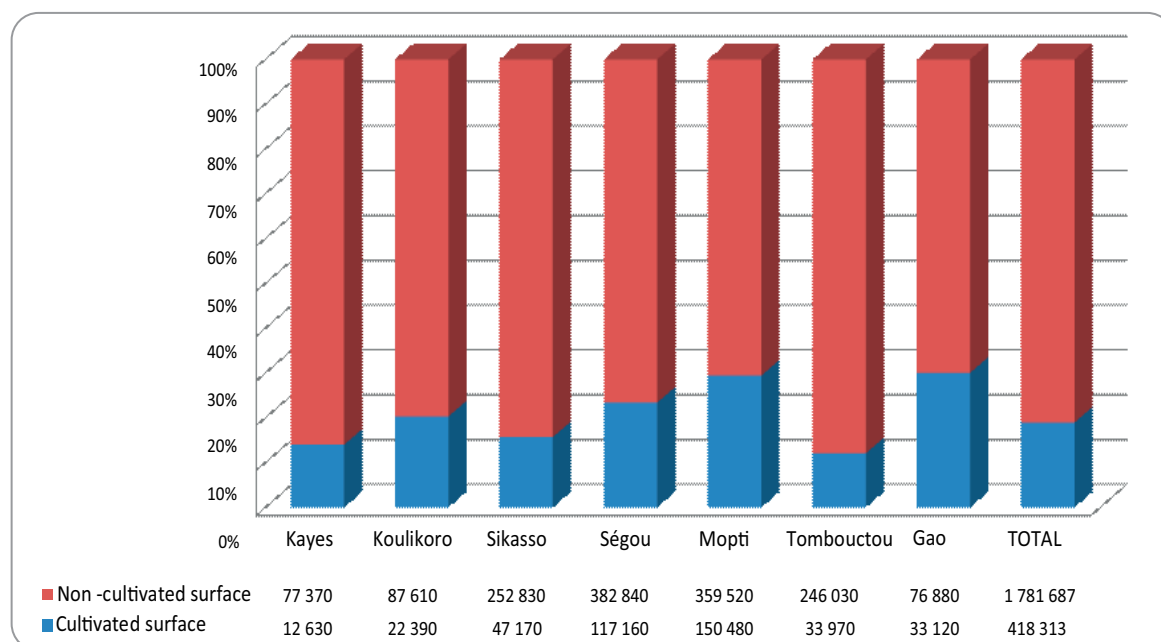
Areas suitable for irrigation are estimated at nearly 2.2 million ha, with 20 percent already cultivated. Some of this land is suitable for gravity flow, which reduces production costs. Table 1 shows the distribution of the land and is illustrated in Figures 1 and 2.

Figure 5. Regional distribution of 2.2 million ha of potential irrigable land in Mali



Source: National Agricultural Directorate, 2009

Figure 6. Percentage of cultivated land in Mali, by region



Source: National Agricultural Directorate, 2009

Table 1. Distribution of land suitable for irrigation by region

Regions	Irrigation potential (ha)	Cultivated areas	
		(ha)	(%)
Kayes	90 000	1 263	14
Koulikoro	110 000	2 239	20
Sikasso	300 000	4 717	16
Ségou	500 000	1 171	23
Mopti	510 000	150 400	29
Tombouctou	280 000	3 397	12
Gao	110 000	3 312	30
TOTAL	2 200 000	418 313	100

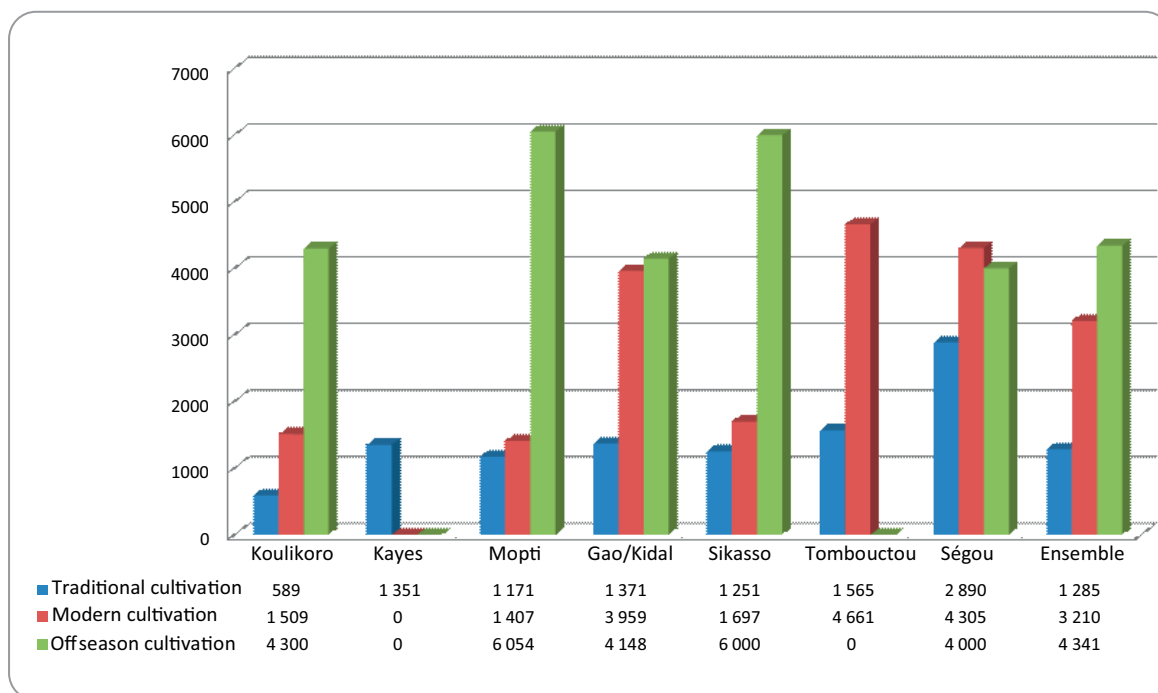
Source: National Agriculture Directorate, 2009

Notwithstanding the rice land potential in Mali, the average area per farmer has sharply declined: from 7 ha in 1980, it went to 4 ha in 1990 and is less than 3 ha today.

C. Rice productivity

Malian rice yields are closely related to cultivation methods, seasonality and elements such as the know-how of the producer, how much s/he has access to inputs, and therefore to credit. Figure 7 reflects productivity statistics by region and cropping patterns.

Figure 7. Levels of performance according to regions and production systems in Mali (kg/ha)



Source: DNGR, 2009

It may be noted that off-season returns far outweigh those of winter rice production. Several hypotheses could explain this, including predominating controlled water production, more labour availability, smaller planted areas, better supervision, good off-season epidemiology.

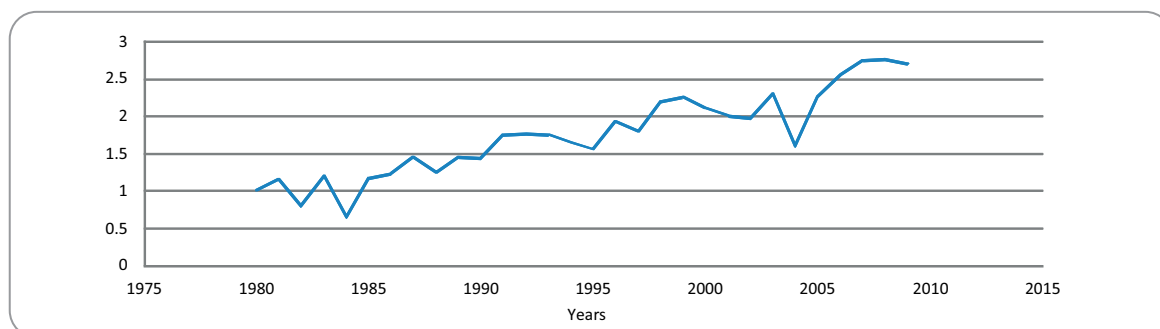
In addition, modern² rice production appears to be more productive than the traditional³ one and covers 70 percent of the total national production. However, traditional production accounts for more than a quarter of a million tonnes of rice. Figure 7 also illustrates the significant disparity in performance between different regions, regardless of the mode of production.

In terms of land distribution, the traditional and modern sectors occupy respectively more than 47 percent and 49 percent, while off-season production occurs on less than 3 percent of the land, which is attributable both to seasonal water deficit and competition from vegetable crops.

Over time and at national levels, yields are changing gradually, as shown in the chart below.

² Modern rice production: controlled flooding, irrigated rice, total water control methods.

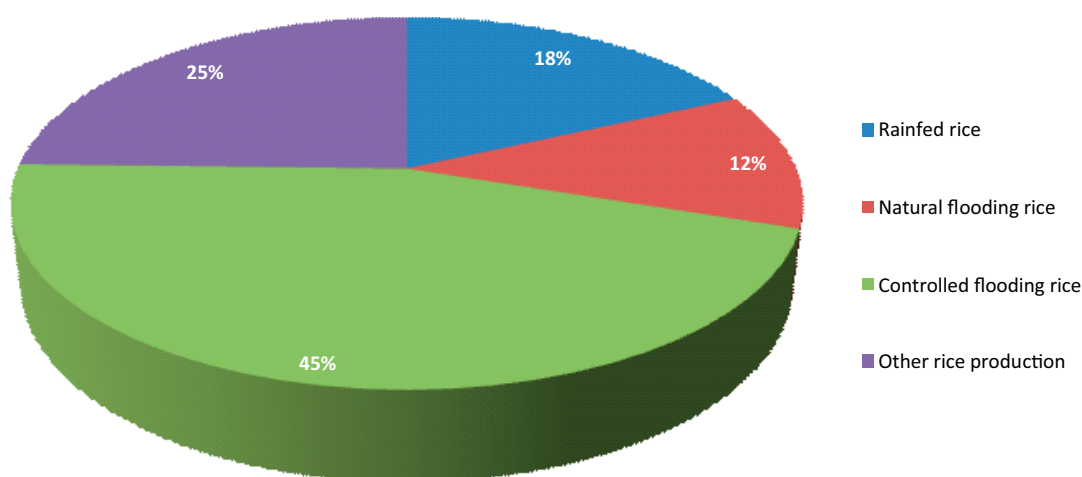
³ Traditional rice production: rainfed and natural flooding methods.

Figure 8. Evolution of rice yields (tonne per hectare) in Mali

Source: FAO stat

However, agricultural intensification in paddy fields with high yields as seen in Ségou and Tombouctou, have made significant strides with possibly smaller growth in the future. Improved farming techniques have already been demonstrated with possibly slower push in the future. This leads us to propose to expand production by developing new agricultural land that would not only satisfy the growing demand for rice, but also would respond positively to the many requests for land to cultivate rice.

Limitations of national production can largely be explained by relatively low yields, which characterize production systems other than the irrigated one. Land allocation is primarily made for the benefit of controlled flooding rice production, as shown in Figure 9.

Figure 9. Allocation of rice land according to production methods

Source: National Agricultural Directorate, 2009

Production, which is a variable explained through yields, thus through production methods, has a relatively slow evolution compared to needs. Figure 2, which illustrates this, also shows how production began to increase at the end of the 2000s especially in 2008. This reflects the efforts of the government to give a boost to the rice sector in the aftermath of the global food crisis.

2.2 Rice sector actors and policies

The study of the economic aspects of the rice sector in Mali comprises trade, pricing competitiveness, non-price competitiveness as well as the market and comparisons between supply and demand. Segmentation terms of this market, price formation and the distribution of the added value should also be referenced. Production and consumer preferences, and resulting consequences will inform the determinants of supply and demand.

Understanding which parties are involved in this sector is essential before getting into the complexity of the economic analysis centred on the value chain.

The rice sector in Mali is comprised of institutional actors and professionals whose interests are not always convergent. Given the sensitive nature of the sector and its multiple links with macroeconomic stability, food security and the fight against poverty, the state and its satellite structures also play an important role.

A. Public role in the rice sector

After independence, the Malian government controlled the production and marketing of rice. In 1981, the implementation of structural adjustment programs resulted in a certain liberalization of the sector following the opening of borders and elimination of customs duties. The decline of the role of the state resulted in imports soaring to 100 000 tonnes in 1985. Between March 1987 and June 1988, the state resumed an intervention policy by first banning imports to then allow a return to twinning and restoring tariffs. Imports then dropped to 20 000 tonnes. In 1990, a special import tax (TCI), which stabilizes imports, came into force until the devaluation of the CFA franc (XOF) in 1994. The event was accompanied by a fall in imports, which then rose very quickly thanks to the combined effects of lowering tariffs to 11 percent and expanding sources of supply. Increases were moderate until 2002-2003, when imports boomed due to the state's intervention in lowering the VAT⁴ on 40 000 tonnes of imported rice. This was done to avoid soaring prices on the cereals market, because of poor grain and domestic rice harvests, and re-exports to the north of Côte d'Ivoire where the military-political crisis cut off access to the ports in the south.

In addition to the tax, customs and trade policies, the Malian government supports a national production policy. The last major action recorded in this area, *Rice Initiative*, dates back to the global food crisis of 2008. According to the Ministry of Agriculture in charge of its implementation, the goal of *Rice Initiative* has been to double production during the 2008-2009 campaign by bringing it to 1.6 million tonnes of paddy to then reach more than 2 million tonnes the following crop year. The state is involved in this project at two levels, firstly with production assistance through agricultural input (seeds, fertilizers, pesticides) subsidies, pre-financing of equipment, strengthening agricultural extension services, secondly with building and developing new irrigated areas. This should result in extending rice production areas to about 770 000 ha. At the moment, the results of this endeavour remain controversial, although they have been widely publicised.

Before 2008, authorities undertook storage operations to counter food insecurity threats. The Food Security Commission (CFS) was created in 2003 for this purpose and the many supporters in the highest ranks of the state led to the creation of cereal banks in all 703 municipalities of Mali. There are also two national stocks, the National Food Security Stock (NSH) and the Government Intervention Stock (EIS). Communities manage the cereal banks through a management committee, while national provisions are in the hands of the government. The NSH, totalling 35 000 tonnes of cereals including 10 000 tonnes of rice, is funded

⁴ VAT: Value added tax. Internal tax, with a reputed neutral effect. Paid by the final consumer.

jointly by the state and donors, which include Japan and the European Union. Its purpose is to alleviate poverty and respond to food crisis emergencies, pending the arrival of imports and / or external assistance. Stocks are renewed by a third every year, according to a procedure that preserves grain quality by avoiding a prolonged stay in warehouses. Their recovery is through local purchases, which allows them to regulate the market.

The EIS has about 15 000 tonnes of cereals with a financial value estimated at 3 billion XOF. Two thousand of these 15 000 tonnes are awarded annually to the most needy, while the rest is reserved for extreme situations such as loss and other cases of force majeure.

This stock management through public intervention is linked to mechanisms promoting information on production and markets, and early warning systems. Thus, the market observatory (AMO) that succeeded the OPAM⁵ market information system (MIS) in 1989, collects, processes and disseminates statistical, regulatory and general information on all the factors that influence price formation in the agricultural market. In doing so, it contributes to regulating the market, stabilizing and levelling prices between regions that have surplus and those that have structural insufficient production. In the wake of this prerogative, the Early Warning System (EWS) has the role of watchdog regarding food crisis symptoms. The EWS is required to keep public authorities and development partners informed to ensure that appropriate actions are triggered.

Following the failure of self-sufficiency strategies, the new awareness in government and the injunction of donors in terms of aid conditionality led to a more liberal vision of food security management, where the market and private operators are given more responsibility. However, a good balance between these professional actors and the state is challenging. The constant change in the domestic and international environments explains the permanent readjustment of the rules of the game by the state. Currently, a series of formal and informal actors, whether constituted or not, make up the structure of the rice value chains.

B. Private sector actors

Contrary to appearances, the rice sector does not start with producers, although their central role is crucial. Service providers (repair workers) and other suppliers of materials and inputs, the latter being more or less informal traders, are upstream of production operations.

Downstream production, there are several families of actors grouped under the single term of intermediaries. Intermediaries are persons or organizations involved in the purchase and sale channels between the producer and the consumer. Although their activities overlap to varying degrees, the observatory of the agricultural market differentiates a number of categories. They are classified below in the sequence order of their interventions:

1. Collectors: they buy cereals with producers in periodic street markets or in the villages. Many of them work on a seasonal basis because they are primarily producers;
2. Aggregators: they represent the traders who collect quantities of grain to be stored or to move towards large collection centres or regional capitals. There are three major categories of aggregators:
 - Aggregator wholesalers who are based in large collection centres, and personally go to production markets to buy and then resell to wholesalers in major cities. These wholesalers have networks of collectors who get most of their supplies from weekly fairs.
 - Independent fair aggregators who are based in large collection centres or regional capitals. They

⁵ OPAM: Office of Agricultural Products in Mali. In charge of regulating the market, prices and managing the national security stock.

buy grain with their own means in production markets to sell in large collective centres or regional capitals.

- Commissionary aggregators, working on behalf of large wholesalers located in collection centres or regional capitals. They are the ones who go to the production market to buy grain and transport it to the wholesaler's city.
3. Wholesalers and semi-wholesalers: they are based in an urban centre or in a large consolidation centre and buy through their own collection and consolidation network. Their financial means are substantial, with transactions on large grain quantities they can hold in their storehouse. They are the only intermediaries who actually have working capital. When they offer credit downstream and upstream, the system works; without their capital, the system stagnates.
 4. Retailers comparable to traders who buy small tonnages of cereal from semi-wholesalers, fair stallholders or even wholesalers and then retail them to consumers. Their margins are higher than those of other actors in the marketing chain given the low volumes and the high risks involved;
 5. Retail commission agents who retail grain entrusted to them by producers for a commission. They provide direct intermediary contact between producers and consumers.

There are other actors who are not directly involved in the operations of rice purchase and sale such as transporters and processors through the provision of services that ensure the sector's viability:

6. Carriers: they offer leases on their vehicle or a price per transported bag. Given the rising price of oil, the age of their fleet and poor road conditions, this link represents more than 50 percent of the products' final gross margin.
7. Transformers: they are the link in the chain responsible for husking and parboiling. Husking paddy rice turns it into white rice, while parboiling is a kind of soft cooking of fresh paddy previously soaked in cold water (for one to two days) or hot water (a few hours). Hot soaking prevents the rice from having a fermented smell, but its fuel consumption is higher. Parboiling not only responds to market demand, but it also allows for a much better husking than non-parboiled rice. Less rice grains break, and it is possible to recover the paddy that cannot be milled. In addition, it increases the nutritional value of rice as soaking and cooking permit nutrients contained in the husk to migrate to the center of the kernel.
8. Consumers are the final beneficiaries of production. They include households, street food vendors and restaurant and hotel chefs. They are mainly urban and their number is growing quickly. The increase in urban population due to rural migration and urbanization strongly influences rice consumption, which is at 70 kg per capita per year in some urban areas, while the national average is estimated at 57 kg.

Producers are fundamental in this whole chain and complete the list of professional actors.

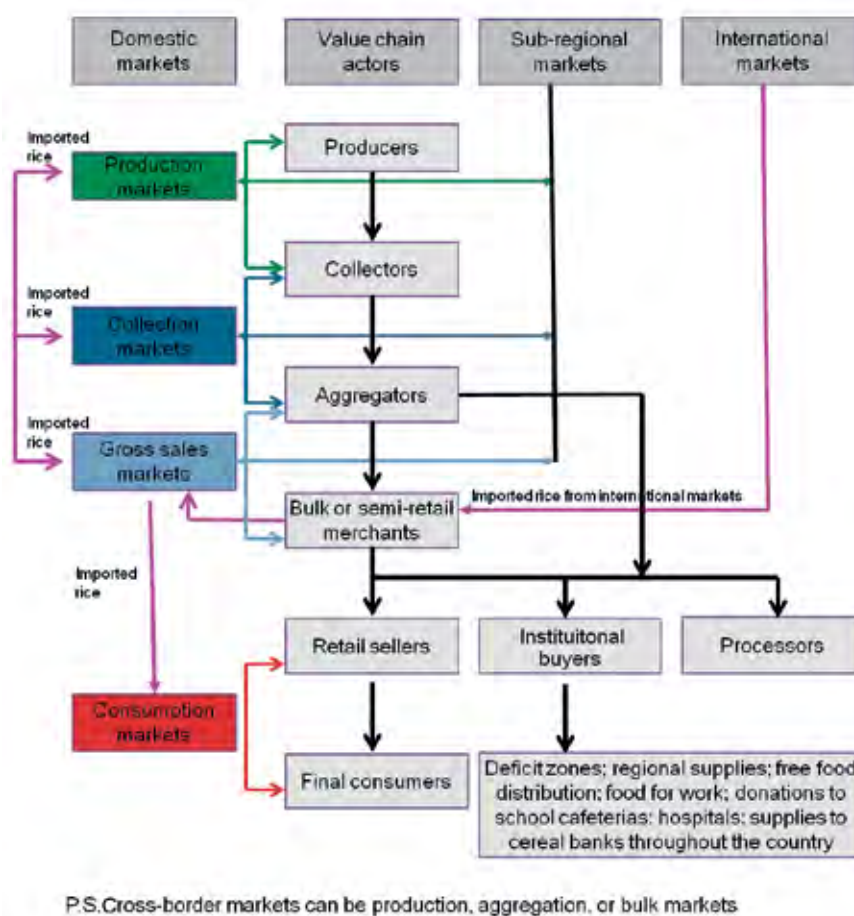
9. Producers are the linchpin of the value chain. Domestic supply and imports depend on their production and they maintain close relations upstream with input and credit suppliers and extension services.

All these private actors interact to different degrees on markets of varying importance, linked to one another according to Figure 10. Four cardinal axes govern the commercial circuit: the west axis that leads to Senegal, the central and northern axes that join Niger and Burkina Faso, the south axis that leads essentially to Côte d'Ivoire. Each route includes several types of markets and exchange points where collection, consolidation, storage, transport and retail operations take place. This is detailed in Table 2.

Table 2. Typology of rice markets in Mali

Market type	Characteristics
Small production markets	Primary collection markets, difficult to access; Main actors: producers and commissioners / collectors large collection centres.
Large production markets	Consolidation focal points before transport in consumption centres; Located along tarmac and dirt roads; Main actors: producers from nearby villages and collectors / aggregators bringing goods from small production markets;
Wholesale markets	Located in urban centres; Run by relatively prosperous operators who also invest as in import channels; Supply many retailers with locally and imported rice; System based on highly concentrated trade; Supplied by a large number of intermediate who often play multiple roles within the sector; farmers / vendors, processors / traders, merchants, and who often only have virtual stocks.
Retail markets	Consumer markets, interface between wholesalers and consumers with rather small profit margins ranging from 10% to 15% between wholesale and retail.
Cross-border markets	Generic term for all kinds of markets located near national borders

Source: Diakit  (2006)

Figure 10. Functional links between actors and between different rice markets in Mali

Source: Diakit  (2006)

Over time, marketing costs have experienced little change, despite the overall increase in transport, bagging, storage and handling costs. End intermediaries, whose business has become very competitive over the years and opportunities, have endured this margin erosion.

Essentially, the marketing sector is still very informal, and many transactions are in cash. The system is based on the speed and the multiplication of trade transactions. Resorting to bank credit is limited, except for important traders and residual processors.

C. Other institutional actors

These essentially have a humanitarian and / or food security role, ensuring that strategic stocks are in place so that they may be redistributed when appropriate in a timely manner. In doing so, they interfere with trade flows and prices. They include the World Food Programme (WFP) and Non Governmental Organizations (NGOs).

Professional producers try to organize themselves into groups, cooperatives and unions as they now have a broader awareness of their vulnerability in power relations with other actors. This movement is growing throughout the country, and is organized at the village level in cooperatives and at municipal level in cooperative unions; these are then grouped into larger platforms at national level. It is estimated that more than 90 percent of the rice farmers belong to an organized and operational group in their area. More than 2 million producers are thus organized and represented, broadening the landscape of actors.

The PAO's main role is to negotiate loans by establishing themselves as credible spokespersons with microfinance institutions. They also aim to add more value after the harvest by directly handling processing and marketing. In addition they have an advocacy role when dialoguing with the state.

2.3 Economics of the rice value chain in Mali

A. Price formation

In these commercial networks, flows and marketing volumes depend on production surpluses⁶, linked to how successful the crop year is, producers' cash needs, the number of traders and the demand for rice. Prices stem from these commercial quantities, the rice quality and the production area.

More generally, the formation of consumer prices, which influence the added value's outcome, is also based on many other factors: the international price of rice, the importance of imports, tax exemptions, import market concentration, special import taxes, domestic rice supply, supply of other domestic dry cereals – that is rainfall – the importance of institutional buying, or in contrast destocking of strategic provisions, atomicity of the collection market, etc.

⁶ Surplus production: production obtained by deducting the fraction consumed on farm from total production. Commodity production is estimated at about 70 percent and consumption on farm at about 30 percent of the total production.

When the CFA franc (XOF)⁷ was devaluated in 1994, international prices soared abruptly. This event has shown that the price of local rice increases in a similar fashion to that of imported rice. During the 1990-93 and 1995-98 periods, prices for both rices rose in the same proportion, that is to say 44 percent. The average annual price ratio between these two rices remained generally between 0.9 and 0.95. During these periods, the increase in consumer prices seems to have benefited producers, leading to several others. Higher margins, which could have benefited only traders, were distributed all along the value chain. Since the devaluation, the narrowing of margins upstream plays a buffer role in limiting the effect of paddy price variations on consumer prices in Bamako. The phenomenon reoccurred when rice prices soared in 2008. While the price of local rice for consumers increased by 33 percent between May 2007 and September 2008, the producer price appreciated by 53 percent. In nominal terms, transmission on the producer price was 109.9 percent, indicating that the increase was fully transferred to the Malian producers.

As stated above, transportation costs strain the final gross margin of products more than 50 percent. These high costs are due to timeworn transport vehicles, roadblocks and the bad state of the roads. In addition to the direct transport costs, the producer also supports indirect costs related to non-compliance with delivery dates.

During the months following the harvest, the abundance of supply strengthens the price differential between imported and local rice, as most of the production is put on the market. Local rice at this time of the year is at least 20 to 25 XOF/kg cheaper than imported rice. But if we take into account the years 2003 and 2004 when the price of local Gambiaka⁸ rice outperformed the freely imported rice, the determinism of real local price may be questioned. Poor harvests during those years increased bidding on local rice, supported by customers having access to rice surpluses and unwilling to give up their this favourable position. This demonstrates that the massive presence of imported rice has less of an effect on the sale price of local rice than its own seasonal post-harvest overabundance.

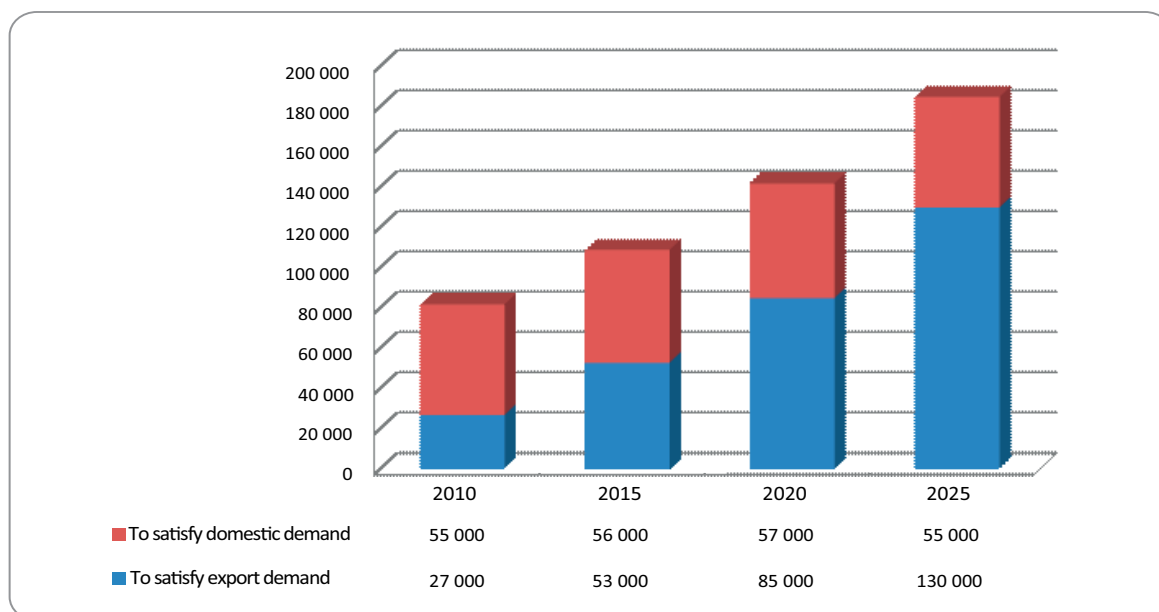
In any event, imported rice has no inhibitory effect on local price rises following poor harvests or during the lean season. Its contribution to the post-harvest abundance, which tends to drive prices down, is important. Thus, imported rice can supply the market and contain rising price attempts.

B. Import and competitiveness sub-sector

For the Malian consumer, imported rice has a stabilizing role because it levels local price variations during the lean season when its effect is combined with the one of destocking of strategic supplies. In doing so, the price of domestic rice is forcefully brought down, which does not benefit producers. The need for imports is evident when taking into account the domestic supply deficit. To remedy this, considering the current level of productivity, nearly 100 000 ha should be laid out for rice growing. Half of this production could satisfy the growing domestic demand and the other half could recapture the import market. Estimates for 2025 amount to 185 000 ha. This is risky when currently, the Office of Niger only covers 75 000 ha and the average rate of expansion in recent years is barely more than 5 000 ha per year.

⁷ Devaluation of the XOF: depreciation or sudden drop of 50 percent of the nominal exchange rate XOF occurred in 1994. (This currency is used in the eight WAEMU countries).

⁸ *Gambiaka*: scientific name Kogoni 91-1, results from crossing Gambiaka kokum and IR361. Has become the generic name for any rice resembling it : local, long, white, complete grain rice.

Figure 11. Estimated area to meet domestic and export demand

Source: National Agricultural Directorate, 2009

Studies carried out on the level of competitiveness of local rice in relation to imports lack structural elements that can adequately support their conclusion. The competitiveness of Malian rice cannot be considered as static. The dumping of Asian exports because of the depreciation of the dollar and the Chinese Yuan is one of the hurdles, but this is an ad-hoc phenomenon that can turn around at any time. Before the Yuan's depreciation, including the period that followed the devaluation of the CFA franc in 1994, local rice was considered competitive in Mali with the exception of the areas between Bamako and the imported rice ports of entry. Similarly, the elimination of export subsidies that distort fair competition could significantly change the situation, even if this is more hypothetical. The special import taxes that the country has used at times gave local rice a higher level of competitiveness in the market. But the community at large was bearing deadweight⁹ that has not been carefully considered by studies on the value chain.

In contrast to ad-hoc factors, the increase in ocean freight costs is more structural and has a positive influence on the competitiveness of Malian rice. The rising cost of oil and the rapid expansion in the volume of trade need to be taken into consideration. In Mali, as in the West African community space, these transaction costs allow the Malian rice to be more competitive. This is reinforced by the preferential zero-rate tariff in the sub-regional free trade zone.

Finally, the competitiveness of Malian rice remains dependent on external factors such as international rice prices, the dollar exchange rate, the cost of ocean and land freight and common external tariff regulations in the West African Economic and Monetary Union (WAEMU) and the Economic Community of West African States (ECOWAS). It also is influenced by some endogenous factors relating to production costs, production techniques, monitoring of technical pathways, and other factors that can ensure productivity or that may compromise when not taken into account.

Non-price competitiveness factors should also be considered when assessing the competitiveness of Malian rice. In this respect, the way consumers have responded to Gambiaka since its introduction, bodes well in

¹⁰ Deadweight: collective shortfall, following the introduction of customs duties or any other taxes with a similar effect. Change in surplus at the expense of consumers, but not recovered by producers.

terms of market prospects. Substantial consumer surplus may allow for this variety to stand up to the onslaught of imported rice. As a matter of fact, while the imported price was at 270 XOF per kg in 2001, 2003 and 2004, locally grown rice kept its market share despite the fact that it cost 20 to 25 francs more per kg. In those years, Gambiaka sold quite competitively despite the unrestricted lower priced rice imports.

C. Added value and market segmentation

In Mali, rice is one of the first three farming activities after livestock and cotton. It represents about 5 percent of GDP. Its share of domestic added value increases rapidly when applying trade flows to urban areas. Since 1995, the rice sector has taken over millet and sorghum, and is the leading cereal in the creation of added value.

Beyond competitiveness, partially underpinned by productivity and the exchange rate, the sustainability of the value chain depends on the distribution of the added value. In this regard, it is essential that the producer earn a fair income that guarantees no loss of revenue in favour of the intermediaries' interests. It is therefore necessary to understand what is the share of added value for each actor by disaggregating the overall wealth generated by the value chain¹¹ (Direction nationale du Genie Rural, 2009).

Generally, three post-harvest processing products are put on the market. These are: broken rice, parboiled rice and local Gambiaka rice. These products correspond to more or less differentiated market segments, with as many index value chains.

The three value chains commonly used by support structures and institutions because of their ability to create jobs, income and food security are: Gambiaka rice, parboiled rice and broken rice. In the absence of comprehensive data, the field of study is limited to a comparative analysis between two production sites respectively located north and south of the capital, Bamako.

- Gambiaka rice in Ségou: the overall added value obtained from production systems, that is to say, the collective wealth created from beginning to end of the chain is 217 XOF/kg of grain rice sold downstream by the retailer. As much as 82 percent of 217 XOF return to private actors in the form of total income, that is 178.5 XOF/kg. The producer receives 89 XOF/kg against 20.5 XOF/kg for collectors and processors.
- Parboiled rice in Ségou: the overall added value obtained from different production systems is 140 XOF/kg parboiled rice sold downstream by the retailer. Fifty percent of this amount, or 70 XOF/kg, goes to all the private actors. The producer makes 22.4 XOF/kg while collectors and processors emerge with 10 XOF/kg.
- Gambiaka rice in Sikasso: the added value of Gambiaka is 223 XOF/kg of rice sold downstream by the retailer. As in the previous cases, 79 percent of this money goes back to all private actors, which represents 177 XOF/kg. The producer receives 73.8 XOF/kg, while collectors and processors make 23.8 XOF/kg.
- Parboiled rice in Sikasso: the overall added value regardless of production systems is 152 XOF/kg parboiled rice sold downstream by the retailer. All of 57.2 percent goes to private actors or 87 XOF/kg. Producers capture 35.5 XOF/kg against 14.3 for collectors and processors.
- Broken rice in Ségou and Sikasso: broken rice produced in the region of Sikasso is sold for 100 XOF less than whole Gambiaka rice. Production costs are identical to those of Gambiaka, since the differentiation between these two rices occurs during the shelling. Thus, whenever the shelling leads to broken grains,

¹¹ The economic analysis of the three rice value chains reported in this report are derived from a report entitled: "Analyse économique des trois chaînes de valeur de la filière de riz au Mali", Programme d'Appui au Sous-Secteur de l'Irrigation de Proximité Ministère de l'Agriculture, Direction Nationale du Génie Rural, September 2009.

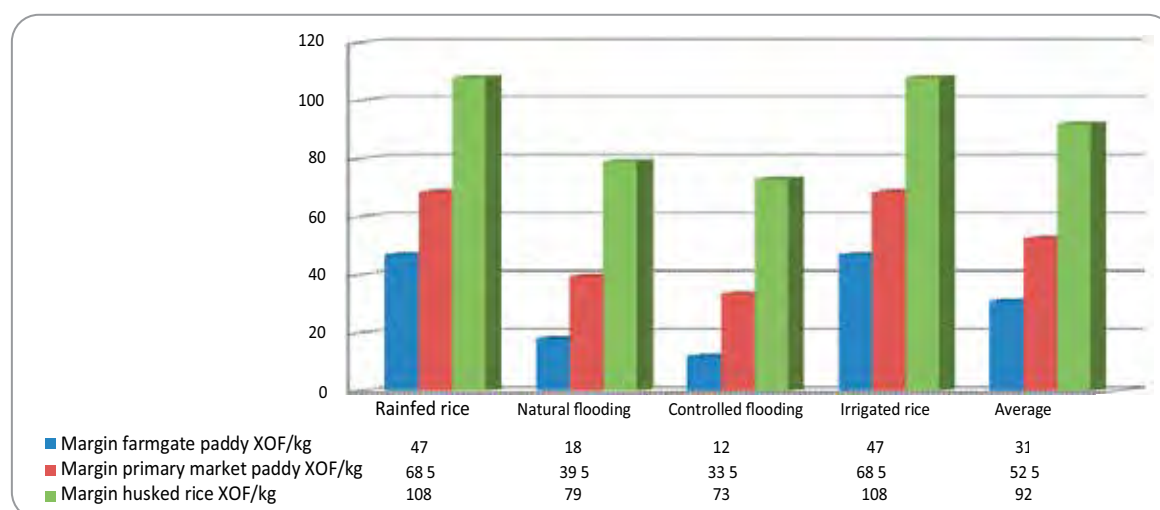
the processing brings the value per kg down by 100¹² XOF. This means that the producer obtains a residual value of 39 XOF/kg in Ségou and 31.5 XOF/kg in Sikasso; collective added values being 117 XOF/kg and 123 XOF/kg respectively. Thus, better than anywhere else these figures show the importance of processing in the shaping of the added value. The collective added value of broken rice is only 117 XOF for Ségou and 123 XOF for Sikasso.

These few detailed¹³ examples that may be extrapolated, subordinate the consistency of the added value to the product types that is to say the value chains. What about production methods?

D. Production system of and added value

When examining the studies on the 2007-2008 crop year, the rice sector as a whole seems quite lucrative. For example, in Ségou, the producer's average value added on paddy rice sold at farm gate is 31 XOF/kg, regardless of rice variety or production methods. When the paddy is sold at the primary market, it increases to 52.5 XOF and to 92 XOF for husked rice.

Figure 12. Value added per kg according to selling and production methods in Ségou



Source: DNGR, 2009

The study shows that rainfall and irrigated systems have the lowest production costs for paddy at 73 XOF/kg, while controlled or natural flooding systems incur costs of more than 100 XOF/kg. Assuming that the selling price of paddy is the same for all production methods,¹⁴ the mechanically calculated added value is higher for the actors, that is 47 XOF/kg for paddy sold at farm gate, 68.5 XOF/kg for paddy sold in the primary market and 108 XOF/kg for husked rice.

However, when integrating performance differences between the types of rice, the results are less ambiguous. Considerable differences in the added value per unit area can be observed between systems, ranging from simple to more than double yields¹⁵. Moreover, the producer's value added per ha on paddy sold at farmgate is

¹² Estimated consumer price 250 XOF/kg as opposed to 350 XOF/kg for Gambiaka.

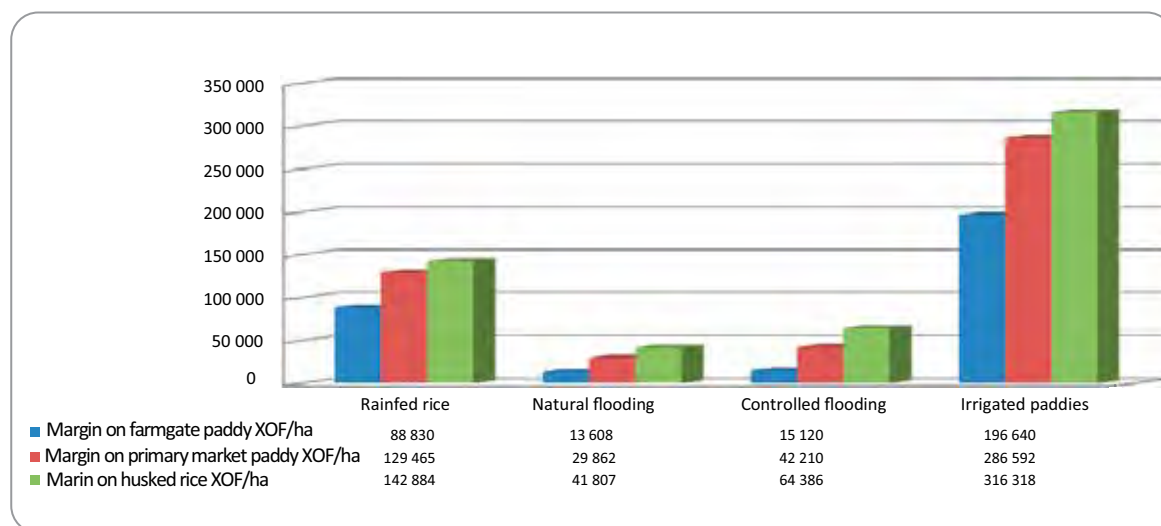
¹³ Data extracted from a GTZ study on the value chain.

¹⁴ The paddy selling price at farmgate is 120 XOF/kg. On the primary market, the paddy sells for 150, and when husked for 197 XOF.

¹⁵ Yield (kg/ha): 3 000 rainfed rice; 1 200 natural flooding rice; 2 000 controlled flooding rice; 6 641 irrigated rice.

88 830 XOF for rainfed and 196 640 XOF for irrigated rice. When the rice is sold in the primary market, these added values become 129 465 XOF and 286 592 XOF respectively. They are even more substantial for husked rice, 142 882 XOF for rainfed and 316 318 XOF for the irrigated one.

Figure 13. Value added per ha according to selling and production methods, Ségou



Source: DNGR, 2009

According to this DNGR (2009) study, natural flooding rice cultivation appears to be the least profitable, generating only about 13 600 XOF of value added per ha for paddy sold at farm gate and 30 000 XOF/ha for paddy sold in the primary market. Even after husking, the margin is only 41 807 XOF/ha, because of its poor yields (1.2 t/ha) and its very high costs (118 XOF/kg). Further research may be required to confirm these findings.

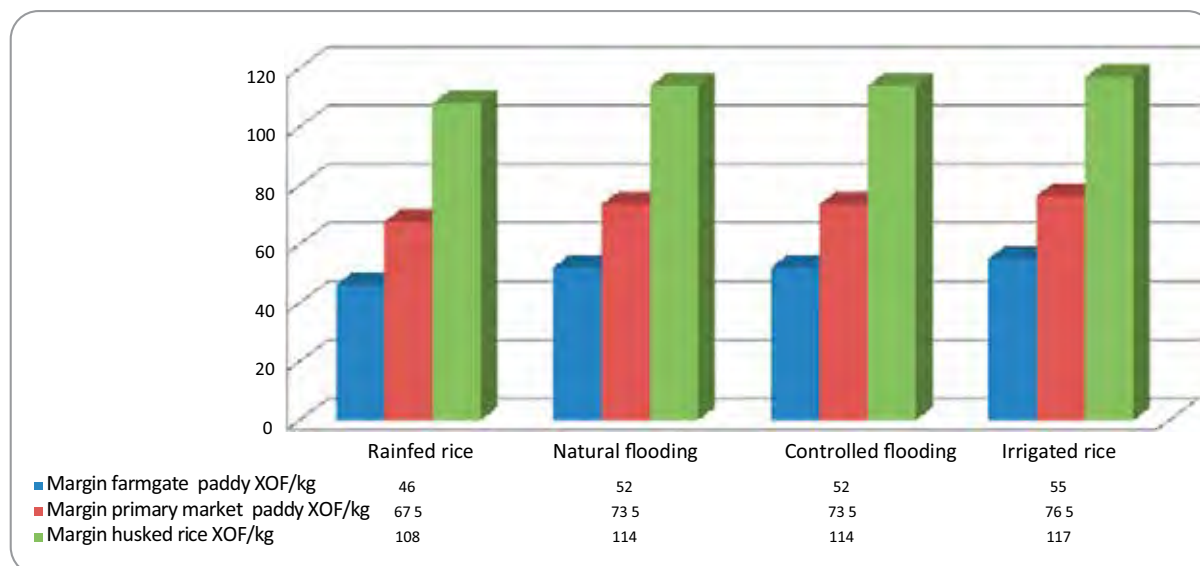
All of these results are to be taken into account in decisions related to food security strategies, soil distribution and choices in terms of agriculture. This also applies when designing programs to promote the well-being of farm households and the fight against poverty. 2009 Census figures allow a more in-depth interpretation. People involved in rice growing are not evenly distributed according to production methods. Thus the density for rainfed production is 24 person-days/ha, 8 person-days/ha for free flooding production, 10 person-days/ha for controlled flooding production, and only 4 person-days/ha for the irrigated rice system. This shows that beyond the inherent added value achievable per unit area, the density of the people directly linked to rice production can seriously compromise financial gains. Also, when linking demographic data with added values, spreads tighten between rainfed, natural flooding and controlled flooding rice systems.

Once again, farmers cultivating rice with irrigation are better off as they generate the most added value per unit area, while being the least numerous. Irrigation also offers the most opportunities for multiple crop seasons. By contrast, farmers practicing rainfed rice production are the worse off in terms of density and must make a choice between rice and other dry crops.

These figures have also revealed a significant margin differential between paddy rice sold at farmgate and husked rice sold at the primary market. This 33.4 XOF/kg difference on average is what a number of producers capture in downstream markets.

In Sikasso where the study was conducted, the results are quite similar. The average added value is even 20 XOF higher than in Ségou. This brings the price to 51.25 XOF/kg for paddy rice sold at farmgate, 72.75 XOF/kg for paddy rice sold in the primary market, and 113.25 XOF/kg for husked rice, regardless of the rice variety or production methods.

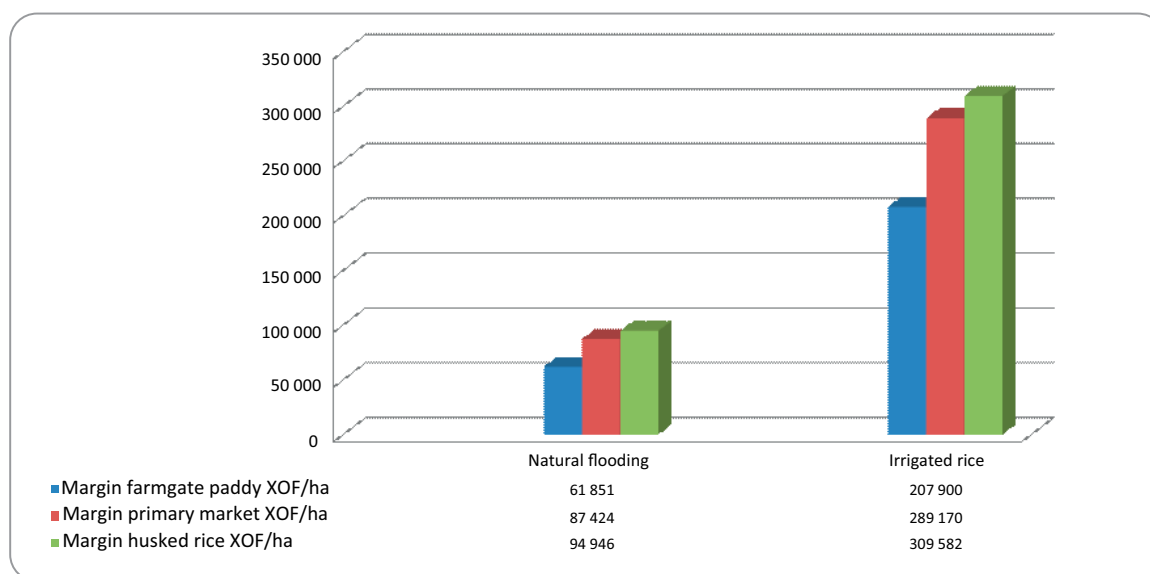
Figure 14. Value added per ha according to selling and production methods in Sikasso



Source: DNGR, 2009

The irrigated rice production method has the lowest overall costs amounting to 70 XOF/kg for paddy. It is followed by the two flooding systems, with costs coming to 73 XOF/kg for paddy. Not only the selling price of paddy at 125 XOF/kg is considered identical for the three production methods but so are post-harvest costs. However the advantage coming from lower production costs mechanically affects margins and makes the irrigated system the most lucrative activity with an added value of 55 XOF/kg for paddy sold at farmgate, 76.5 XOF/kg for paddy sold in the primary market and 117 XOF/kg for husked rice.

The natural and controlled flooding methods have identical margins of 52 XOF at the farm gate, 73 XOF at the primary paddy market, and 114 XOF at the husked rice market, respectively. Incorporating the returns does not change the rank of the irrigated rice whose operators make 207 900 XOF/ha when sold at farm gate, 289 170 XOF/ha when sold in the primary market and 309 582 XOF/ha for husked rice. It does not affect either the relative positions of the other systems: the natural flooding system generates 61 851 XOF/ha at farm gate, 87 424 XOF/ha at the primary market and 94 946 XOF/ha when husked. These added values expressed per unit area show considerable differences between the systems, with averages ranging from 81 407 XOF for natural flooding system rice to 268 884 XOF for irrigated rice.

Figure 15. Lowest and highest added value added per ha according to selling and production methods in Sikasso

Source: DNGR, 2009

Incorporating the actual number of people in farm households to these results leads to more nuanced conclusions. In Ségou, for example, the irrigated rice is the most profitable. Its 431 597 XOF/ha gain for paddy sold in the primary market suggests that after two annual crop seasons, rice farmers may have more than 215 000 XOF/person per year. This would allow them to overcome extreme poverty that has an absolute threshold of 162 000 XOF/person/year¹⁶ as set by the United Nations. However, further investigation should be conducted to determine what other sources of additional income producers might have in order to reach more robust conclusions.

3. Towards a sustainable rice production for Mali

The future of the rice sector in Mali depends on how the assets and opportunities described in the previous chapters will be employed. The impact of responses to the weaknesses and threats will be even more important. The current situation offers sufficient leeway and levers to boost the industry in terms of competitiveness, food security, fighting against poverty or economic development.

3.1 The sector's constraints

Constraints in the rice sector are many and varied and also represent challenges. They are classified into two categories, production and marketing. This section focuses on the obstacles faced by farmers in terms of adding value to their production, better integrating the market and what hinders their income growth. These objectives seem to be linked to marketing but they are actually rooted in the production domain.

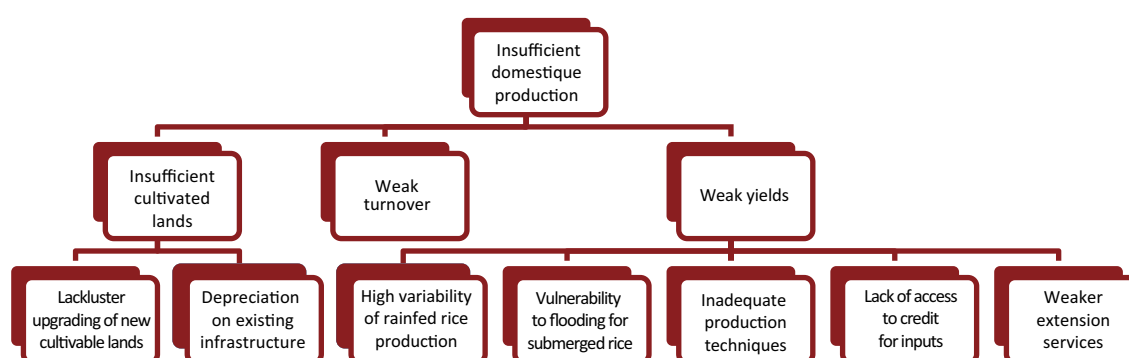
¹⁶ The 162 000 XOF were obtained by calculating the threshold of one dollar/day year (365 days), with an exchange rate of 450 XOF. They may therefore vary.

A. Production constraints

The basic assumption underlying this section is that production, as a dependent variable, is based on three variables, which are the traditional determinants. These are (i) the size of cultivated land, (ii) the land's productivity, that is to say, the production per unit area, commonly known as yield, and (iii) the speed of crop season rotation: the turnover.

Each of these determinants has been awarded its own determinants through a cause and effect relationship. The problem tree below, which follows this analytical logic, summarizes all of the identified problems and establishes the causality between them.

Figure 16. Problem tree of the productive component for the rice sector in Mali



It shows that the development pace of irrigable land is well below both the required level and expressed needs. This is confirmed by the decline in the average area allocated to rice households. Land fragmentation seems to be the formula found by national policymakers to meet the growing and urgent demand for land. Not only can it not curb the internal deficit in Mali, but it also causes losses for producers given that the economy of scale is eroded, as the areas under cultivation get smaller.

Figure 16 also shows that certain areas lack renovations. This hinders the productive capacity of the country, as, for example, the under-utilization of irrigation schemes. In fact there is a self-imposed limitation as how agricultural land is used in irrigated areas. Moreover, in the best-case scenario, the number of crop seasons is limited to two and this limits the annual production.

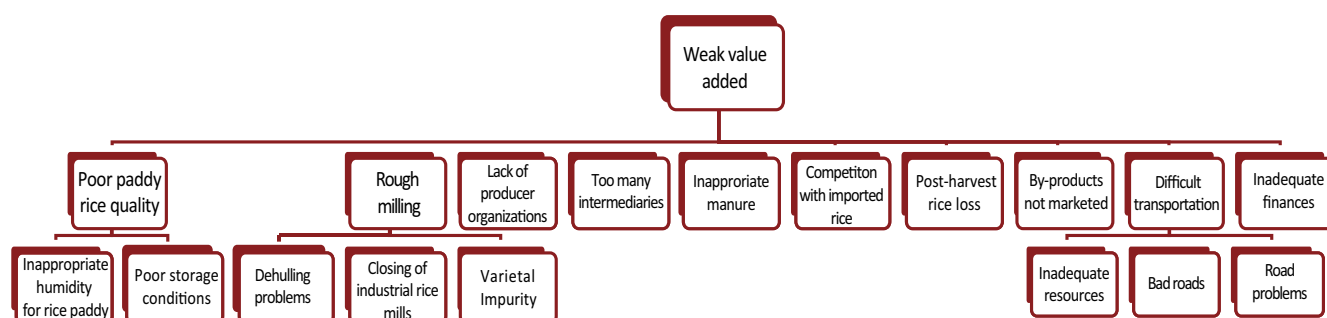
Low yields are due to a combination of factors such as hydro-climatic hazards and technical pathways. Production pathway choices are linked to the know-how of producers, but also to what physical and financial access they have to inputs. This highlights how access to inputs is linked to purchasing power and credit.

If at the national level, the lack of domestic production favours imports and overstretches the country's foreign exchange reserves, at the micro level, it affects the livelihood of farm households. The low income earned by producers, based on the number of persons per farm household shows that the achievement of the Millennium Development Goals remains a difficult challenge.

B. Marketing constraints

These take shape in the productive part of the sector, go through the processing stage and can also be found at the end of the value chain that is the market itself. This section focuses on the elements that devalue the producer's work and may seriously weaken its added value.

Figure 17. Problem tree of the commercial side of the rice sector in Mali



The second problem tree shows a series of immediate causes to which underlying causes may or not be linked. As mentioned above, the areas of production and marketing are intertwined. Poor paddy quality is also a key obstacle to profitability. It refers specifically to the moisture level of paddy, ideally set at 14 percent.¹⁷ If the rice is too dry when it is processed, it produces a lot of broken grains, which have a lower value. Conversely, when it is too humid, it sticks to the machine and generates a lot of flour; this reduces the amount of white rice and therefore revenues. Losses are also recorded when the paddy is poorly preserved or poorly parboiled, thus releasing a fermentation smell. In addition to this loss of quality, quantitative losses may also occur due to serious storage damage.

Rice milling is the second important passage between production and marketing. Its current coarseness is not only due to the closure of large industrial mills, but also to cultivation factors such as heterogeneous varieties. When the paddy is a mixture of different varieties, husking becomes difficult, as adjusting rollers for round varieties will prevent shelling of thinner varieties, while adjusting for thin varieties will cause round varieties to burst. Moreover, the varietal mixture poses important problems in determining appropriate harvest dates. As the physiological maturity of a mixture of different cultivars may not be synchronized, this will result in any harvest that is based on the early varieties containing paddy with immature and half-filled grains from the late varieties. Similarly, harvests based on late varieties will prolong the drying of early varieties, which will increase their breaking during husking and will depreciate the product.

The small transformers or huskers, with their high mobility and lower delivery cost are quite appealing but actually bring about a low husking quality. The apparent advantages of custom machining end up being costly in some way to the producer. This type of husking not only affects the turnover because it results first in a lower quality of white rice and, second, in more by-products of lesser value on the market. The sector's liberalization, which marked the end of the state monopoly on husking operations, was the starting point of the proliferation of small huskers. This led to the collapse of industrial mills, as quantities no longer allowed taking advantage of any economies of scale. As they had very heavy fixed running costs, they could only survive by acquiring rice at a cheaper price, which was impossible given the existing competition.

The fact that producers are disorganized allows intermediaries to step in and take a small part of the added value. Moreover, when producers operate through isolated initiatives, they become more vulnerable when negotiating with commercial partners.

Another major obstacle is the fertilizer formula in force; technicians and policymakers should give it careful consideration. It is not only expensive, hurting the producers' profitability, but it is also frozen, preventing them from dynamically adapting to the relative prices of inputs and rice sales. In this respect,

¹⁷ Humidity rate of 14 percent: 100 g of paddy contain 14 g (= 14 mL) water.

optimum agronomic yield differs from the economic optimum. The latter, which depends on the producer's added value is reached when the marginal revenue is equal to the marginal cost rather than when yield and production are at their maximum. The upward trend of ocean freight costs shows that prices of agricultural inputs will not diminish, and thus imported inputs may be less and less economically efficient.

Furthermore, imported rice evens out the domestic price of rice, especially in times of poor harvests or during the lean season. In these cases, it drastically reduces the ability of the producer to benefit from the potential turnover. Imported rice, important to Mali's food security, actually increases the amount of rice available in the market at post-harvest, and thus further decreases local rice prices. In addition, producers tend to dump their products on the market as they have urgent needs for cash.

The lack of use of by-products adds to the constraints linked to commercialization and competitiveness of local rice. Bran, husks, flour and broken rice generated by the transformation process of paddy to white rice have not yet found market niches that may increase their market value. They are still considered as waste and do not allow the producer to earn substantial additional income. As detailed above, high transport costs also negatively affect the final gross margin.

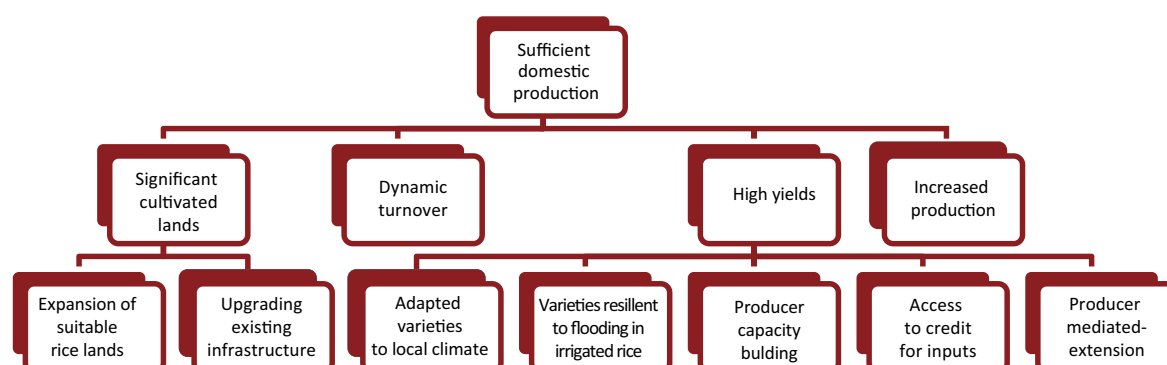
Finally, producers cannot recover the VAT from their intermediate input costs through their sales and this further reduces the already modest added value given the small amount of rice produced per cultivating household.

3.2 Recommendations

The solutions to address the obstacles faced by the rice value chain in Mali are derived from the two problem trees above and are summarized in two objectives trees dealing respectively with production and commercialization. The tops of these trees represent the overall objectives, while secondary levels represent specific objectives. Each of these can be associated with one or more intermediate objectives that will contribute to identifying what actions may be taken.

A. At the production level

Figure 18. Objective tree for the production component of the rice sector in Mali



There are three possible scenarios that will strengthen production. These can be implemented independently of one another, but concurrent actions will amplify results. The development of new irrigated areas as a means to overcome the insufficiency of planted areas could be implemented through double-contracting. Firstly, a public-private partnership would be set up with the private sector. The

concession contract seems to be the most appropriate form, as it is a *ex nihilo* creation that mostly requires investments, i.e. funding. These contracts can take the form of built operate transfer or even built-own-operate-transfer with the state, and then can be matched in a second phase with a concession type contract¹⁸ between the asset owner and the rice farmers.

With these revenues, the state could then rehabilitate existing facilities. However, this option requires prior clarification of land rights.

The second axis with respect to yields could be to boost professional agricultural organizations and identify within these relay farmers who would expand extension services on the ground. This is even more necessary as grassroots technical guidance is no longer fully guaranteed, following the advent of liberalization as the number of agents for this task has become insufficient.

Yields could also be enhanced by the wider dissemination of the new NERICA varieties stemming from hybridization between the African species *Oriza glaberrima* for its strong hardiness and the Asian species *Oriza sativa* for its high productivity. The National Seed Service should also ensure a better distribution of seeds to face shortages that occur from time to time. Capacity building for seed research technical services is needed to boost this sector and make it more operational. The National Agricultural Research's contribution is fundamental to develop varieties with a high adaptability to the various hazards that characterize rainfed and natural flooding varieties.

Issues related to credit access could be dealt with by strengthening PAOs to give them the status of genuine partners with microfinance institutions. Boosting PAOs will help promote the formation of solidarity groups, prevent asymmetric information (adverse selection and moral hazard) and reassure credit holders. This will also allow a better acceptance of idiosyncratic risks. The state must encourage financial institutions to extend credit given the numerous and inter-linked risks by creating a compensation fund in case of problems.

Meanwhile, issuing real land certificates could also contribute to waver credit acquisition. But this double-edged instrument should be used with extreme caution. It may have a negative effect, resulting in producers losing their capital, should they be unable to meet their commitments *vis-à-vis* their creditors. That is why it should be based on solid cooperatives and PAOs.

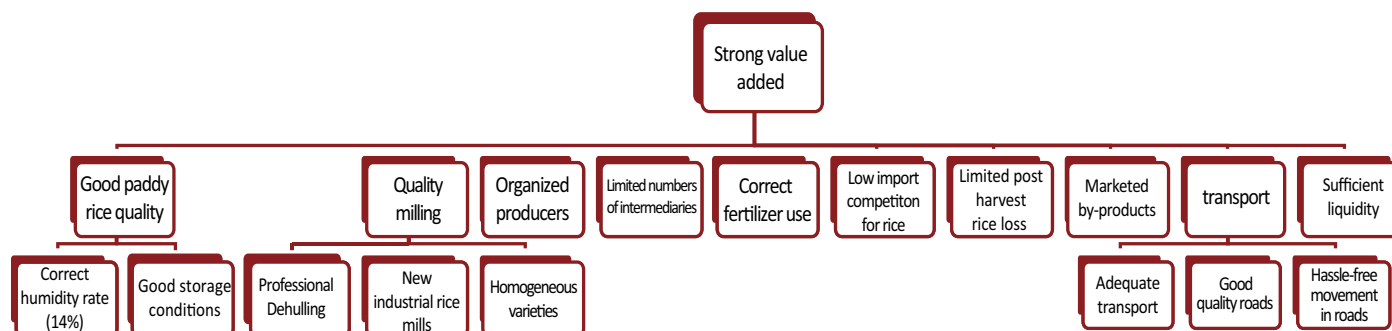
Another element that is likely to help having a loan endorsed is collateral stock, also known as warrantage. It is a mode of access to credit against a pledge of a certain amount of food. For example, it can enable the holder to purchase inputs without altering the meagre budget of the household. When applied to several members of a PAO, it also helps to structure the demand for inputs by making it solvent, predictable and grouped. This type of credit self-guarantee has other advantages that will be discussed in the section on commercialization.

Difficult access to credit has often been cited as a major explanatory factor for the poor performance of the rice production system. Prior to liberalization, state structures advanced seeds and inputs and were reimbursed later by deducting the amounts owed by each producer from the post-harvest sales. The system was balanced through the monopoly enjoyed by the state, which in turn had an interest in providing quality inputs and excellent extension services.

¹⁸ A type of contract in which an owner (the lessor) transfers to another party (the lessee) the enjoyment of a rural property against payment in cash or fixed value products for the rent. The lessor does not have, as such, the status of farmer. The lessee retains his independence and manages his operations as it sees fit. Products remain his property and he insures risks. rent is not the same as a contractual agreement between public and private partners.

B. At the commercial level

Figure 19. Objective tree for the commercial component of the rice sector in Mali



Regarding the market, increasing the producer's added value can be achieved through a series of preliminary objectives. The good quality of paddy - which refers to the conditions of harvesting, handling, husking and parboiling - and husking yields linked to the intrinsic performance of huskers are amongst the first conditions to be met. The custom machining has little potential for growth when facing the urban customers who are increasingly demanding vis-à-vis the quality of the rice they buy. The high mobility of processors is an advantage for producers wishing to increase their income by conquering a part of the value chain downstream. However, the deteriorating rice quality associated with large quantitative losses in by-products significantly reduces their efforts. This is where the experimenting with contestable markets appears as an attractive alternative, provided they are accompanied by substantial specifications, which may work for quality and labelling of local rice. Contestable markets may be considered as regional monopolies temporarily granted by tender.

In addition, they are subject to competition as the contracts that underlie them are periodically challenged, and may be cancelled or assigned to others. When established according to a wise zoning of the production strongholds, they could lead to the emergence of small mills where efficient suppliers - producers - could even participate in the capital. If this were organized to prevent duplication, these mills could compete between areas, which would further enhance their performance, reduce delivery costs and thus avoid repeating the problems experienced by large mills with the advent of liberalization. An adequate supply of paddy can be ensured for small mills and thus guarantee efficient rice processing.

On the other hand, the phased sale of paddy is expected to reduce the abundance of post-harvest offer and contribute to a better appreciation of domestic rice. Adopting warrantage for this purpose may be advisable. As producers have no regular income, may find themselves in an emergency and dump their produce immediately after harvest. Such a strategy would allow them to receive credit from microfinance institutions. They could thus better sell their production by holding it until prices rose again, or even keep it for home consumption for the lean period without having to buy it at high prices.

However, good quality warehouses located in production areas are required to implement this practice. Building these can be entrusted to local authorities, and to private operators to whom the state would provide incentives. Providing production areas with warehouses helps producers with no previous access to good storage conditions to stop them dumping their harvest on the market.

In addition to using warrantage to avoid dumping of harvests, it may be useful to look into building the volume of OPAM's institutional stock. This could raise post-harvest prices as it would increase the pressure of demand on local rice. Its primary purpose of food security is fully compatible with stabilizing producers' income.

Previous fertilization plans recommended by research have not been followed. Defining a formula for chemical fertilizers that could evolve depending on variables such as input costs and selling price of rice, would be beneficial for the producer. Moreover, formulating fertilizer made with apatite, a natural phosphate from Tilemsi, could reduce input costs and better respect the doses required to obtain satisfactory yields. Adam-Yéboua (2000)'s work shows that a similar apatite, the burkinaphosphate, used in the irrigated rice production method, can compete, in some cases, with chemical fertilizers. Ensuring that the agriculture soil reabsorbs crop residues can complement this solution. Veldkamp *et al.* (1991) state that for a yield of 5 t/ha of paddy, crop residues contain 97 kg/ha of nitrogen, 19 kg/ha of phosphorus and 115 kg/ha of potassium. This should save farmers having to buy at least two bags of 50 kg of urea per ha, equalling 50 000 XOF/ha. Similarly, NPK quantities could be lowered to two bags of 50 kg/ha provided that phosphorus doses are increased.

The straw and bran that result from paddy processing are not often used despite their potential economic value. Several possible uses may be considered and would add value for the producer and to the by-products. Benchmarking¹⁹ in major producing countries shows that rice bran can be turned into oil and flour can be used in the same way as broken rice when manufacturing beer, wine or pasta. Straw bales could be used as fuel. This is not only cheaper than petroleum, but more environmentally sustainable as it could largely replace firewood; this an important feature in Mali, a Sahelian country that faces desertification issues. It would be useful to explore how to make this change attractive for different users such as bakeries, transformers responsible for parboiling and households. All these suggestions can result in increased income for producers and / or processors if they are well accepted in the local context.

It is also important to pursue the research conducted by the Office du Niger on improving the palatability and nutritive value of straw in cattle feed in order to increase consumption and change the energy and nitrogen intake. However, this implies that crop residues would no longer have a fertilising action and that they should be replaced with animal manure. Currently, straw bales are sought and purchased by farmers at a price approaching that of bran. Their use in dairy production and cattle fattening could strengthen their market value allowing the producer to perhaps obtain a price similar to paddy.

Fattening animals and fertilizing rice paddies and other agricultural land brings about a first level of agricultural and pastoral subsystems integration. A second level would be to reconnect with the use of animal traction in agricultural work, already known and widely used in Mali in the past. The cattle population can facilitate the recovery and growth of this type of mechanization in the form of animal traction, with:

- An improved quantitative yield of labour, that is to say, a greater result with the same efforts,
- A higher quality result with better prepared soil, burying of organic matter, etc.,
- Less physical exertion, and
- Time saving for the producer.

Animal traction is especially suitable in Mali as households farm areas are less than 3 ha according to the latest statistics, meaning that they are very small. This type of mechanization requires a low initial investment and has low maintenance costs. In addition, as the lowland rice soil is often heavy, it could be more convenient than a tractor.

Renewing the fleet of vehicles for carriers would substantially reduce transport costs. As custom duty is an exogenous variable under the Common External Tariff (CET), a one-time internal tax relief should achieve this goal, while agricultural organizations whose restructuring is completed could use their credit access to invest in their own vehicles to transport their products. This should be accompanied by ensuring that local communities are responsible for periodically rehabilitating rural roads in their area. In addition, the

¹⁹ *Benchmarking*: process of finding, globally, the company or companies that most effectively undertake a process or task, and studying it to then adapt this process to one's own business.

state should establish and put an immediate end to eliminate the proliferation of road blocks and rampant extortion by certain members of the security forces; this reduces internal revenue by several billion XOF, lengthens delivery time for rice and generates false charges that affect the value chain upstream and downstream and artificially inflate consumer prices while compressing the production price.

Tax rates in Mali reflect price fluctuations for rice internationally and are frequently countercyclical to local rice production. This is often contradictory to trade policy objectives, which are to protect Malian producers so that they may ultimately fill the gap in domestic production, and poverty reduction. This levels local price variations during the lean period and reassures the consumer through its stabilizing role. But Malian taxation could go further, thanks to the PAO that have been established to facilitate credit access upstream of the value chain, and improve the balance of power between producers and downstream actors.

Today, the Malian government is faced with the choice of considering a transition compensatory tax of lower import earnings that would allow the development of its rice production.

Meanwhile, the dialogue between the different actors could lead to joint decisions and could be achieved by bringing together representatives of civil society, including trade union organizations of producers, agricultural cooperatives, processors, traders, consumer associations and the public authorities that would act as arbiter and custodian of market regulatory policy.

The agricultural orientation law provides for the establishment of inter-branch organizations in Articles 174, 175, 176, 178 and 179. The 31 December 2008 decree No. 08-793 lays down the rules for their set up and registration. A further step should be to bring the intent of the policy and legal framework into existence. In doing so, two fundamental points should be taken into account:

- Decentralization of representative bodies in the territory, and
- Majority votes granted to producers because they are at the base of the value chain.

Local consumption of Gambiaka and parboiled rice could be enhanced through communication campaigns. This promotion should be based on evidence of non-price competitiveness, such as the sensory quality, texture, freshness, nutritional value and benefits of eating local products. However, such initiatives must accompany efforts to improve the quality, hygiene and price decrease through lower production costs, as these are the aspects on which imported rice seems to have an advantage. The promotion will also aim to strengthen the position of local rice in niche markets for which the producer's added value and consumer surplus are relatively high.

The agricultural information dissemination system managed by the OMA should be strengthened because it gives farmers access to market information and has played a significant role since its inception in improving their bargaining position with traders. Despite its undoubted success, this system is facing such financial problems that it may be at risk of disappearing, having benefited from state subsidies and donors until now. Like any such system, it has high operating costs and a management contract or lease with the private sector should be encouraged.

In addition, farmers could set up their own data transmission network across different groups and cooperatives with the support of inter-branch organizations and chambers of agriculture. By continuing to develop communication tools (mobile phones, local rural radio, Internet) groups can share market price and buyers' purchase intentions. Various groups can set up a simple device located at the different market places, which discloses and groups proposals for demand of paddy and husked rice in terms of price, tonnage and variety. This would promote competition among buyers and could allow producers to sell at a higher price.

4. Conclusion

The value in developing Mali's rice production lies in its potential strategic role vis-à-vis global public goods such as food security, economic development, and the environment. It also can very much contribute to the MDGs by strengthening people's health and the fight against poverty, which is predominantly rural in the country and the region.

These multiple challenges imply that policy decisions regarding this crop should focus on improving it without giving it an exclusive status. The value chain analysis and recommendations ensuing highlight the producers' interest because of its contribution to their production's added value. The measures recommended seek to reconcile somewhat contradictory possible targets. For example, they do not suggest increasing consumer prices that would be expected to provide producers with dividends but reflect concern in terms of the low purchasing power of poor urban households.

Mali must strengthen this sector by responding promptly and decisively to the evolution of the international situation. However, the instruments allowing this have been limited due to the implementation of the Common External Tariff (CET) in the WAEMU. In addition, the WTO prohibits differentiated internal taxation on similar domestic and foreign products in the name of "national treatment" which calls for their equal treatment. In short, using VAT as a protective barrier for domestic production should be avoided. The same applies to taxes having similar effect, which, added to VAT, raise to 22 percent the extra protection on local rice in addition to the CET's 10 percent. Mali has little room to manoeuvre and with the changes in the price of rice on the world market, the rate of the dollar and the price of inputs, there is a need to react differently.

As the ultimate goal is to recapture the export market once new domestic demands are met, Mali must start to consider its tax transition by substituting tariffs with an internal tax. Indeed, the country cannot afford to let go of its customs revenues without replacing them with a substitute. By subjecting producers to VAT, the state would contribute to increasing farmers' incomes and thus to their access to inputs. Inputs would improve productivity, thus producers' added value. This would result in a beneficial circle of production that would also reduce consumer prices.

Outside of these purely fiscal measures, contracted private operators could develop new irrigation schemes. This requirement is justified for several reasons: new demands for land, stagnating yields for intensified rice production, a significant decline in domestic supply and the drastic reduction of the average farm size, limiting opportunities for modernization.

The sector can only function effectively if producer organizations are strengthened. Producers could position themselves as credible spokespersons to obtain credit from (micro) financial institutions. Revitalized PAO will also enable their members to speak unanimously in the inter-branch organizations or when policies regarding their activities are elaborated. Moreover, they are useful as they arise as an important substitute for many intermediaries who reduce the producers' added value. By pooling together their resources, they could easily invest in transport vehicles, as well as participate in investing in mills that could be implemented through a contestable again market mechanism. This would solve quality issues without increasing processing costs.

Developing warrantage is an option will avoid dumping rice due to the abundance in post-harvest periods and producers' urgent financial needs.

As production costs weigh heavily in the process of generating added value, revising the formula of fertilizers is essential in balancing the price of rice compared to that of inputs. Moreover, inventing and producing a fertilizer made with apatite, Azolla and manure could create new jobs in the country. This would limit the outflow of foreign currency linked to the import of chemical inputs and would also increase farmers' income and rice's competitiveness.

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Chapter 14

An analysis of Maize value chain and competitiveness in BurkinaFaso: Implications for smallholder-inclusive policies and initiatives

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1. Introduction

Maize is among the key commodities for food security in West and Central Africa. Maize value chain is also expanding due to demand pull from the poultry sector, brewery and other agro-industrial products. However, like cereal supply chains in general, maize value chain development is hindered by several constraints affecting productivity and competitiveness. This chapter examines the constraints and the opportunities facing maize value chain in Burkina and propose actions needed to enhance maize competitiveness in Burkina Faso.

Many studies have shown that dry cereals (maize, sorghum, millet) have a greater potential to serve urban markets than they do currently and can substitute for imports contributing to greater food security. Moreover, cereal value chains serve several market segments such as the growing animal feed market and agroprocessing (including beverages)

The maize value chain would benefit from better regional trade integration throughout West Africa. Increased intra-regional trade in maize would have several multiplier effects on maize value chain. Beside more remunerative prices for producers and improved standards, greater intra regional maize trade would stimulate public and private investments in research, marketing, agricultural services and infrastructures. Therefore, addressing the existing barriers to intraregional trade is a priority concern for maize value chain development.

A host of policy disincentives and institutional impediments ensures that investments in maize value chain are way below the potential for such strategic food security crop.

This chapter is divided into three main sections. Section 2 examines the demand factors affecting cereal and maize consumption patterns in Burkina Faso. Section three provides an in-depth analysis of the entire maize value chain starting from input markets, production, processing and marketing. This section offers an extensive review of the factors affecting the competitiveness of the maize value chain. Section 4 addresses the critical role of policy, regional trade and the important role of maize producer organizations as a central market agency required to ensure a more inclusive maize value chain development. Section 5 concludes.

2. Demand drivers for maize

2.1 Population, urbanization and economic growth

The main drivers of food demand, and especially maize in Burkina Faso, are the high rates of population and demographic growth and the sustained pace of GDP growth. Burkina Faso exhibits above-average demographic growth when compared with other sub-Saharan countries.

Burkina Faso has experienced a 5 percent annual average growth in GDP over the last two decades, with an average of 2 percent in per capita terms. Similarly, available data show an overall reduction in income poverty, with strong variations between countries. Poverty is relatively higher in Sahelian countries such as Burkina Faso.

Although average food availability per person has been increasing during this period, the access and quality dimensions of food security remain important challenges. Burkina Faso has managed to

reduce the share of undernourished people below 5 percent, but food malnutrition is still persistent (as measured by anthropometric studies in the young population).

Aside from the demographic and income effects, previous analyses of changing consumption patterns throughout the world have underscored the importance of a wide variety of ill-defined structural drivers that shape preferences and consumer purchasing behaviour. Exposure to new products through media, marketing (e.g. supermarkets) and trade affects culture, tastes and lifestyle – particularly for young populations –, and subsequently modifies their consumption preferences. Lifestyle changes have already affected the increased demand for food and meals outside of the home; this promotes increasing individualized consumption which has stimulated a growing informal restaurant sector serving more diverse and processed foods. New tastes for fermented products in large cities are one key aspect of those dimensions.

According to projected demographic trends, the domestic food market will continue to grow, mainly in urban areas. In addition, there will be growth in the demand for semi-industrial and industrial processed food and non-food products, which can stimulate the local agricultural sector if value-chain development takes place.

The simultaneous growth in the urban poor and middle classes provides many new challenges to domestic and regional food systems. One of the biggest challenges and opportunities in the region concerns the growing consumer preference for imported staples (e.g. rice and wheat) and diverse high-quality and safe food products (e.g. meat, dairy, oil, sugar, fruits and vegetables) that are not currently produced in sufficient quantities in the region.

2.2 Consumer preferences and maize consumption

The majority of farmers in Burkina Faso grow maize both for self-consumption as well as cash crop. According to agricultural surveys in Burkina Faso, maize represents about 3 percent of the total working time of the national labour force, contributes about 3 percent of gross domestic product (GDP), and represents around 10 percent of total consumption expenditures (in value terms). These maize shares are also rising.

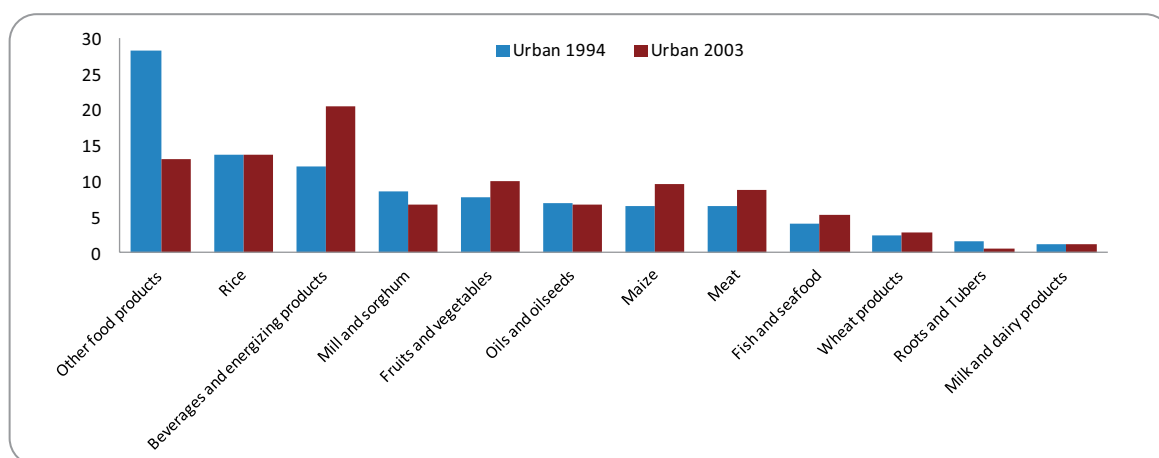
Maize consumption has increased for both rural and urban consumers, but the demand is shifting to higher quality products and processed products in urban regions. This has occurred along with the emergence of an urban middle-class in Ouagadougou, Bobo-Dioulasso, Sikasso and Bamako, for which local supply has not yet responded. Following the increased diffusion of mills and milling, using maize flour as a first source of starchy food has been time-saving for most urban households.

Food demand in urban markets favours imported staples, and this has been mainly driven by the rapid rate of urbanization, which has fostered import-dependency. Dry cereals, such as maize, sorghum and millet have a number of advantages (e.g. low perishability, storage) over other cereals and offer many diverse traditional consumable products and by-products, notably in rural areas. However, they need to be more adapted to the new consumption modes in urban centres and the evolving preferences of urban consumers. Traditional meals can be adapted to the urban environment if constraints to processing and marketing are overcome.

The most current form of maize is cooked paste. The cereal (hulled or not) is milled, and then the flour is cooked and consumed as a paste with sauce. Maize flour (whole flour) can be fermented and consumed as a paste or boiled. Tô, a paste of hulled cereals is the traditional meal in Sahelian countries such as Burkina Faso and Mali. Other meals (e.g. grits) are based on steam cooking hulled cereals and then consuming them as couscous or a mush. Flour can be rolled, cooked and consumed as a couscous (semolina). Maize can be germinated and floured into alcoholic and non-alcoholic beverages (lactic or alcoholic fermentations).

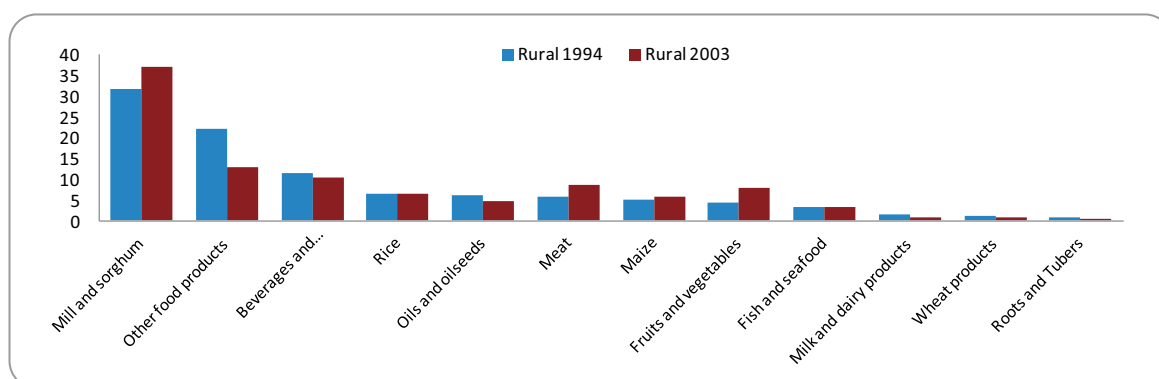
Food consumption in rural and urban populations of Burkina Faso showed contrasting patterns between 1994 and 2003 according to household surveys by The National Institute for Statistics and Demographics (INSD). Urban population showed a marked increase in consumption of meat, fruits and vegetables, maize and drinks; but reduced consumption for traditional staples such as sorghum and millet while rice consumption remained unchanged in percentage terms. For rural households similar patterns were observed for some food items (meat, fruits and vegetables, maize) but were reversed for others. Consumption of sorghum and millet actually increased in percentage terms while consumption of drinks declined. Consumption of rice remained unchanged while the proportion of households consuming vegetables oils slightly declined (Figure 1).

Figure 1. Expenditures shares in Burkinabe's households' food consumption



Source: National Institute for Statistics and Demographics (2003)

Figure 2. Expenditure shares in rural Burkinabe's households' food consumption



Source: National Institute for Statistics and Demographics (2003)

Today, the three main cereals (maize, sorghum and millet) account for 70 percent of consumers' cereal needs (including the needs for food and storage from institutions and poultry feed sector). Burkina Faso is largely food secure in terms of aggregate "dry" cereals needs, except for rice (which heavily rely on imports). The maize sector offers the greatest potential for food value-chain development and production increases because of its multiple food derivatives, especially feed use for poultry.

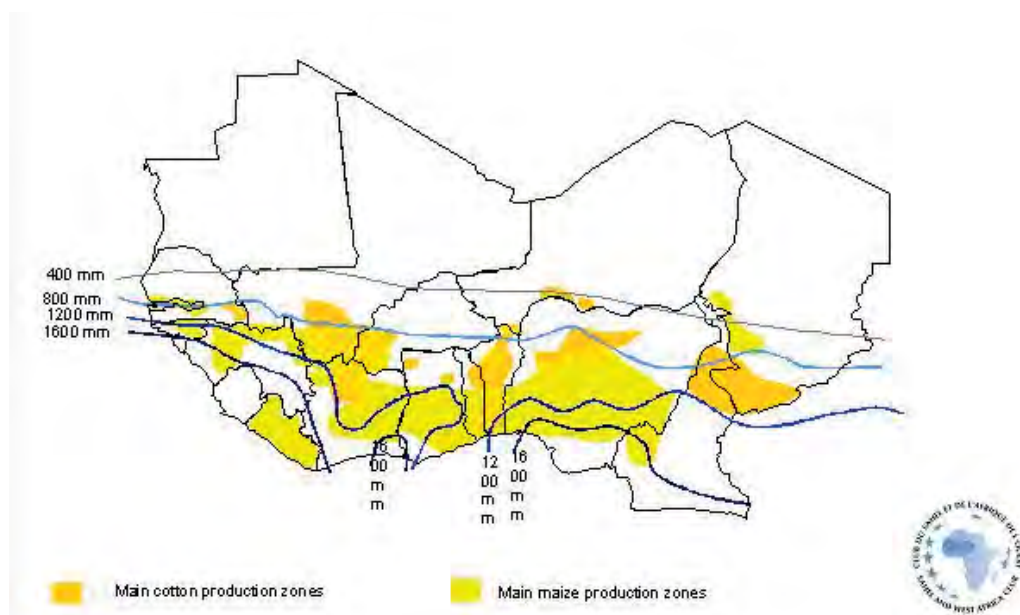
3. Maize value chain: status, constraints, and opportunities

3.1 Production

Maize is produced in much of West and Central Africa covering areas ranging from semi-arid Sahelo-Sudanian agroecological zones to sub-humid tropical areas. In Burkina Faso, maize is located in the cotton-cereal production basin of Burkina Faso. Maize is typically tied to cotton through rotations. In addition, maize also shares inputs (notably fertilizer) that provided on credit for cotton use. Besides maize, cotton is also grown in rotations with sorghum, niebe, sesame and peanuts. But maize remain the preferred staple food crop of choice in cotton growing areas whenever the agronomic conditions are favorables.

As long as cotton is profitable in the market, the cotton-maize rotation bring several agronomic benefits and market complementarities. For one thing, cotton-maize rotation improves soil fertility. The use of animal traction in cotton systems ensure a supply of manure which improves soil fertility. Also rotation allow a better labor allocation between crops. Cotton needs early soil preparation and input applications while cereals require most of the labour force later in the humid season. The same applies to the labour management during harvest (i.e. cotton has an earlier harvest than cereals and other field crops).

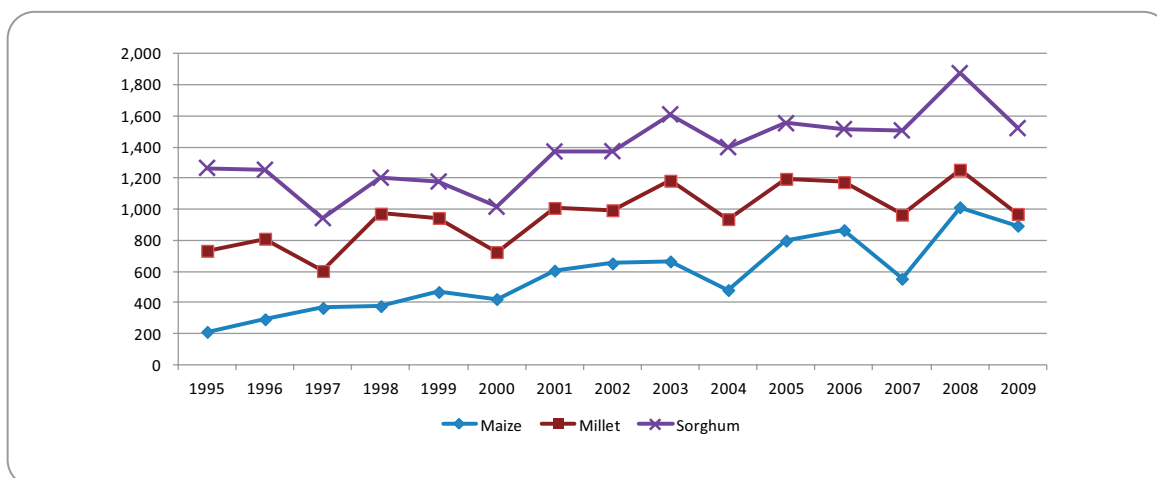
Figure 3. Juxtaposition of cotton and maize production areas in West and Central Africa



Source: Sahel and West African Club (2004), Atlas de l'Afrique (2000) and FAO (2004)

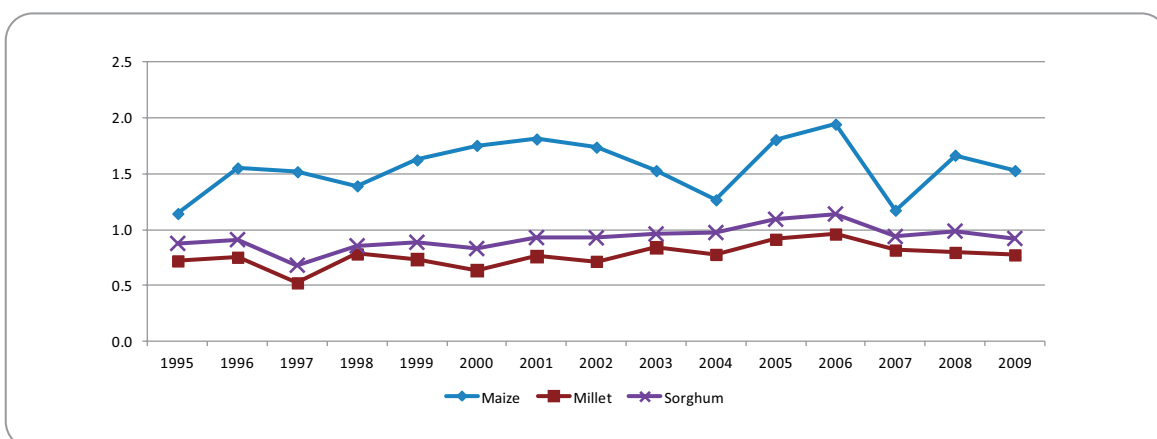
While sorghum remains the number one crop in Burkina Faso, maize has grown the most with a four-fold increase in the past 15 years (see figure 4).

Figure 4. Cereal production patterns in x1000 tons in Burkina Faso



Source: FAOSTAT 2012

Figure 5. Cereal yields patterns (tons/ha) in Burkina Faso



Source: FAOSTAT 2012

Cereal yields have shown no noticeable upward trend hovering around 1.5 tons per ha. As a result production increases has occurred mostly through acreage expansion which continue indefinitely.

3.2 Input markets

Modern inputs are not extensively employed directly in maize production because of a lack of access to inputs and because there are almost no viable contract farming schemes.

Resolving the perennial credit constraint

Badly-functioning input and credit markets result from high transaction costs, repayment and enforcement problems because of asymmetric information and low technical support; Lack of collateral from smallholders, high monitoring costs and informational problems make individual credit contracts unaffordable. This open the door for alternative second-best type agreements such as those

based on a contract between an exclusive buyer of output production who lends “in-kind” inputs in advance to a group of farmers who are jointly liable (individual liability agreements exist too) for their credit repayment. The joint liability provides a form of social collateral to the lender who also holds a guarantee on future production purchases.

Apparently, there are no effective legal ways to enforce contracts which are informal most of the time and which lack a credible legal framework. This specifically applies to the case of cereals in which trade is competitive and output value is low; therefore, there are high default incentives and the cost of monitoring and credit defaulting is too high for agribusinesses. Under weak institutions, contracts can only rely on informal agreements such as peer-monitoring, trust and reciprocity. They may refrain from financing cereal production, which maintains low productivity levels. Therefore, it is desirable to look for alternatives for input access, including via the warrantage system, or through microfinance lenders.

In Burkina Faso, as in the rest of West Africa, there has been dramatic growth in the number of new microfinance institutions in recent years, although their diffusion in the rural sector is still limited and many experiences have proven to be unsustainable and not very viable. The tight relationship between farmers' organizations and newly established rural microfinance institutions in the region provide some interesting examples (e.g. the mutual groups of *Caisses d'Épargne Villageoises*) which have helped farmers get a bank account (the “bancarisation”), secure their savings and access credit. Cereal banks (defined in box 2) have allowed better access to input credit, more remunerative output prices (with economies of scale and better bargaining ability than traders or millers), stabilization of local prices through inventory credit, more mutual learning, collective processing and sometimes self-marketing of miscellaneous products from the farms.

Box 1. Cereal banks and inventory credit in West Africa

Cereal banks are village organizations tied to local communities that buy, store and sell basic food grains to address food security and market access issues with village-level emergency food stocks and better marketing services for farmers and consumers. Inventory credit helps farmers benefit from temporal arbitrage and food price inter-annual variability to enhance food security and income/profits through good market prices in the lean season.

Cereal banks are created with a committee which supervises the construction of a warehouse or its rehabilitation for storage purposes. The non-governmental organization (NGO) generally helps finance this construction and provides training to the managers for grain storage and marketing techniques. A start-up fund helps the bank buy its first stock and treat it against pests.

During the lean season, grains stocks are sold within the community at a discount rate and in other villages at current prices. Grain credit can be provided to the neediest households and the revenues from grain sales are used as a revolving fund for subsequent operations. Inventory credit is often set up by an NGO which arranges a commercial credit facility between a newly formed cooperative and a lender. After harvest, the borrower deposits its grain under predetermined quality standards in a community storage facility. A quality control committee then supervises storage treatment and the issued certificate is presented to the lender. Then the loan is granted to the cooperative, pegged at 75 percent of the prevailing harvest time market price. Managers monitor market prices, quality of stored products and market supply to determine the best time to release the stocks on the market. Sales are used to pay back the loan with interest of 30 percent and to pay storage costs, and the net proceeds are given to the farmer.

Several experiences, notably in Burkina Faso and in Ghana, demonstrate the difficulties in making these schemes sustainable and work without the assistance of outside NGOs. The major bottlenecks involve: lack of management abilities for risky grain speculation and for spatial arbitrage; repayment strategies; governance issues (e.g. theft of cash or grains from warehouses, cash escape by managers). Nevertheless, inventory credit experiences suggest more promising results; members find marketing margins valuable for making profit and acquiring production tools and capacities to market their own production instead of relying on other traders or wholesalers.

Expanding adoption of improved varieties

Up until market liberalisation, maize had received significant attention in breeding and varietal creation because of growing urban demand and higher yielding potential. Throughout Africa, maize showed high yield response to breeding research.

The public sector's involvement in maize research, together with programmes conducted by international research centres,², in collaboration with national ones (including INERA) has allowed rapid expansion of investment. Almost 300 improved varieties and hybrids have been released from 1966 to 1996, which has enabled sufficient diversity in spite of having fewer maize breeders per cultivated area. Open-pollinated varieties (OPVs) are more developed for smallholders, while hybrids are used mostly by large commercial farmers as well as smallholders in some countries. Hybrids require that seeds be purchased every year, while OPVs allow farmers to save seeds for further use without large yield losses. Improved OPVs (e.g. germplasms from the *Wheat and Maize Improvement International Center* (CIMMYT) and the International Institute of Tropical Agriculture (IITA)) have been successful and widely adopted. The yield gains ranged from 30 to 40 percent from the dry areas to those more favourable for hybrids and from 14 to 25 percent for OPVs over local materials. However, breeding research has been severely curtailed after liberalisation leading to a stagnant productivity gains. Only in recent years, following the food crisis of 2007-08 have we observed increased maize yields which resulted largely from increased subsidized input use.

As shown in the literature, farms' adoption of technology is a result of households' internal trade-offs influenced by risk perceptions, expectations of benefits and costs, neighbouring and social effects and the institutional environment.

According to the Boserupian theory (Boserup, 1965), farmers will tend to increase their cultivated area when land is not a scarce resource before intensifying their production systems. Hence, profitability of technological change will be positively correlated with demographic pressure. The intensification process occurs when traditional inputs (e.g. labour, manure, crop residues and local varieties) exhibit an exhausted capacity for production. Following Abdoulaye and Lowenberg-DeBoer (2000), adopting improved technological processes is a gradual process; the first step is using improved varieties and chemical inputs towards new varieties (e.g. use of super-phosphate), and the second step is adopting a total package including urea and insecticides. Implications can be drawn to relax farmers' constraints so as to foster technological adoption. The transitional technical solution is the most likely to emerge, given the conditions of the maize smallholders' environment.

Ahmed *et al.* (2001) show that low rates of adoption for early cultivars in the Sahel built from lack of yield response for new cultivars if the harmony doesn't improve after the release of new cultivars. The adoption then relies on risk-avoidance strategies rather than true profitability reasons; also adoption is higher the lower seed markets' and private marketing institutions' performance. This could be because of inconsistent policies that aim to promote newly-created seeds but that somehow hinders the emergence of decentralized institutions.

New marketing strategies aim to increase technology adoption (by improving profitability); however, they become feasible only under sufficient market demand and according to both demand patterns and market conditions. For instance, technology introduction can be demand-driven for maize. But it can also be too risky if farmers are subject to fluctuations in the prices of imported food. Hence, the issue of market integration is important since it can help secure production and ensure technology adoption by enhancing price stability.

² Many programmes were held by CIMMYT and the IITA.

Public provision of agricultural services has not been fully filled by traders and agribusinesses after structural adjustment plans (Stringfellow *et al.*, 1996 and 1997). Local groups appear to bring the most useful scale economies for marketing, transport and processing, while being the most connected to traders and other wholesalers. It is, however, crucial that group mechanisms be successful for rural cooperation since groups are not always formed on a viable basis. So far, successful matching and farmers' cooperation seems to be influenced by management skills, governance, access to financial resources and markets and activity profiles. However, it is conditioned on the public sector's ability to support agricultural services with other activities to promote market integration and to pilot new institutional arrangements when agribusinesses seem reluctant at first glance. For instance, new credit schemes could be piloted by public agencies – under the assistance of local NGOs for training and improving business skills – when private firms fear that farmers' groups will have poor credit discipline. Public extension systems might also be involved to complement the poor private ones and to adapt project planning to the nature of farmers' cooperation. Agricultural services in Burkina Faso exhibit weak performance due to limited funding and lack of regional cooperation for both extension and research services.

Access to land and land rights

Access to land and land tenure rights and norms are a key driver of productivity, since they may affect incentives to invest in soil fertility and adopt new technologies or farming systems. In Burkina Faso, there is no market for land; it is viewed more as a social obligation than as a material good. However, accessing land has become problematic in the cotton-cereal farming systems alongside demographic pressure, especially for land tenants who do not have secured access to land, while property rights are neither well defined nor privatized.

Empirical evidence reveals that land rights—as interpreted and perceived by the local population—do not matter much in the allocation of factors and land investment among households (Sawadogo and Stamm, 2000) because local peasants, including women (except widows and female-headed households), do not feel insecure about their usage rights. With its population growth and migrants, southwest Burkina Faso has been subject to high demographic pressure on land. Gray and Kevane (2001) have shown that land scarcity results in more land rights uncertainties and lower soil quality. Farmers have intensified their farming systems and adopted more conservation techniques as a strategy to secure their land rights and improve soil quality, independent of their land status. However, this is not independent of ethnic origin, and all other things being equal, farmers from migrant ethnic groups are willing to invest more in soil quality. This process has significant social costs since villagers who cannot access inputs (e.g. fertilizers or manure) are gradually driven out of the process of land allocation. Claims over land from non-resident ethnic group members have led to less fertile soils, and new migrants are sometimes denied access to land.

3.3 Maize processing

The maize market is segmented in terms of end-products (e.g. floured, hulled, boiled, pasted, granulated, cornmeal) but also geographically centered around two major consumption areas: Ouagadougou or Bobo-Dioulasso.

In terms of end-products, the maize market is separated into 3 segments: (1) processed products for the food market; (2) packed and cleaned maize; and (3) poultry feeding and cattle (for milk production).

- Processed food for human consumption: This segment comprises mills which hull maize and make flour to serve most of the urban demand from household consumption, women's groups (i.e. for

prepared meals) and agro-industries (e.g. for biscuits and cakes). Hulled products are priced 30-50 percent higher than raw cereals. This segment is in gradual expansion and processed products are sold in every urban grocery and supermarket.

- Cleaned and repacked products: These cereals are not hulled; however, they are cleaned and repacked by downstream operators in the largest urban centres. Prices are higher to account for packing costs and weight reduction from processing.
- Animal feeding for poultry and cattle: Processing is carried out by poultry growers who directly buy maize from wholesalers in the production areas. The main problems relate to the quality requirements of this segment and arise from the heterogeneity of production conditions. More standardized processing and differentiated production for this market segment would help (e.g. through better horizontal coordination from contracting, such as producer-processor contracts). In response to growing demand and modernization of poultry production in the near future, such demand could increase by 20 to 30 times, and may become a major marketing outlet that could trigger an upstream modernization of the cereal farming systems.

Status of maize processing in Burkina Faso

Milling; The main maize mills are hammer mills, which operate almost everywhere throughout West Africa in villages, cities, markets and districts. Processing of food products, poultry feed and brewery inputs is done on scales ranging from artisanal to industrial. Most food consumers buy maize from a local retailer and send it to a hammer mill. Processing techniques are often manual in the production areas, and women spend a lot of labour and time to produce flour and prepare traditional meals (including *tô*, *couscous*, *bouillie* and *galettes*). This processing technology is a strong impediment to the development and promotion of the value chain. Most processing takes place in more urbanized areas (also including villages) with semi-artisanal district mills. There is a slow but significant shift from manual to semi-artisanal techniques. Industrial processing is also expanding, and is the area to focus on in order to scale up and add value throughout the entire value chain.

Brewing, animal feeding and processed food are developing industries, but are constrained by restricted access to capital markets. One major determinant of maize demand is the demand from the agro-industrial sector. Requirements are also different for the brewing sector, which uses maize and other cereals. Maize is mostly used by traditional brewers, but it is also used by the industrial sector which has focused on conventional sodas and beers. Other marketing outlets at the semi-industrial level are possible, but they will require different cereal varieties and cultivation techniques to gain value for their by-products. Here again, there is significant potential to increase value addition in maize value chain.

The poultry sector is one major outlet for maize flour and maize for the feeding sector. However, the quality requirements for maize in the feeding sector are different than those in the food sector. In most maize-processing industries for the poultry sector in West Africa, maize comprises about two-thirds of the animal feed. One limitation of the feeding marketing outlet for maize is the competition in the poultry sector from frozen imported chicken and fresh chickens from the informal sector (which are not fed with processed feed from maize).

In Burkina Faso, most semi-industrial poultry production is located close to Ouagadougou and Bobo-Dioulasso urban centres. This is an emerging dynamic sector which consumes processed food and medicines, but is geared towards egg production. According to the review of the Burkinabe sector (FAO, 2007), the sector is not well organized yet and little coordination/cooperation takes place (i.e. most production is still in the informal sector). Two industrial units in Bobo-Dioulasso deliver feed, but

most growers produce and use their own feed inputs and sell the other part. There are standardization issues for feed quality which have not been solved. Aside from maize, cotton cakes are used to feed chicks and hens. There is no fully integrated industrial poultry sector for broilers (most broilers are produced through traditional production systems) in Burkina Faso, contrary to Sénégal or Côte d'Ivoire. However, as income increases in urban dwellings, demand could emerge for more biosafety in broiler production, as in Dakar or Abidjan, and be conducive to an industrialization of that sector, which would increase demand for processed grains. This potential is rather significant, with more than 37 million poultry heads produced in Burkina Faso in 2008.

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Quality issues and standards

Processors have different requirements for maize depending on the end-product. For brewery, processors are interested in high-quality maize with high protein content (12 to 15 percent) and low fat matter (lower than 5 percent). White maize is favored for human food outlets and the dairy sector, while yellow maize is favored for animal feeding and for processing semolina. There are significant price gaps between white and yellow maize. Other processing criteria comprise: high degree of friability (i.e. flour production potential after removal of the panicle in both humid and dry processes); which increases the industrial yields of flour-making; uniformity; humidity degree (10 to 14 percent); and low composition of external matter (<7 percent).

There are three main problems with the quality of the raw material originating from maize production: (1) low degree of cleanliness; (2) heterogeneity in grains; and (3) unstable/insufficient quality. For traditional processors, problems of grain quality are even more important than grain heterogeneity. A high percentage of impurities (i.e. non-cleanliness) can be attributed to a lack of appropriate post-harvest handling techniques in storage and conservation and also to a lack of quality certification systems in domestic markets.

Ensuring consistency of product quality is fundamental to developing consumer and customer loyalty. One of the main difficulties for the processing business is to reproduce similar quality over time, since quality is affected by a lack of established standards, non-standardized processing techniques (e.g. a lack of control on ingredients' choices or the heterogeneity in raw materials) and a lack of measuring instruments (e.g. pH-meters, scales).

Fermentation is a major driver of the diversification in consumers' tastes in major cities in West Africa. In Ouagadougou, but even more in Cotonou or Abidjan, 30 to 45 percent of cereal products are fermented, and 85 percent of those are produced by artisanal processors. Chosen cereals are, however, often deprived of essential amino-acids such as lysine. Although fermentation is the most cost-saving technique to increase cereal value, nutritional value, taste and other functional qualities of cereal products, natural fermentations (uncontrolled) result in high variability of final quality. But natural fermentation is widely used in the observed marketed products (e.g. tchoukoutou, kenkey, dolo). Establishing controlled fermentation processes is thus a key challenge for agribusiness small and medium enterprises.

Diverse tastes, smells and colors is key in promoting local products' consumption. This can be achieved by designing new products in order to promote new consumption habits. Marketing specialists and sociologists can collaborate to study new products that will better respond to consumers' preferences for convenience, conservation and safety, while still being competitive.

National and regional norms and standards should be promoted and enforced. These should also be gradually aligned with international norms of production and sales. Numerous constraints continue to impede implementation of norms, including lack of information, as well as inadequate training and communication. The need to comply with quality standards requires not only time, but also human resources and capital, physical investments and the involvement of direct and indirect stakeholders. Capacity-building is essential in the areas of standardization, quality control and promotion of agricultural and agri-food products.

Table 1. Maize products characteristics depending on final uses

Criteria	Miller-processors				
	Breweries	Food processors	Animal feeding		
			Poultry	Dairy	Cattle
Humidity	10 - 14%	12% - 14%	10 -14%	10 -14%	10-14%
Friability-Grinding yields	48-75%	48 -75%	-	-	-
Protein content	12 -15%	12 -15%	12 -15%	12 -15%	12 -15%
Fat matter	≤ 5 %	≤ 5 %	-	-	-
Impurities	≤ 5 %	≤7%	-	-	-
Grain uniformity	Homogenous	Homogenous	-	-	-
Grains' colour	Yellow	50:50	Yellow	White	Yellow
Invasion de charançon	0	0	-	-	-
Mushrooms	0	0	-	-	-
White maize- favoured variety		SR 21 Massongo Obatanpa		Dembanyuman and SR 22	
Yellow maize- favoured variety	FB66 Espoir Sotubaka	FB66 Espoir Sotubaka	Sotubaka FB66 Espoir		Sotubaka FB66 Espoir

NB: "Espoir" et "Obatanpa" varieties own a high percentage of protein content/Variétés QPM

Source: ATP Surveys, Boone et Al., 2008.

Storage

In a post-liberalized market conditions, storage and drying facilities have shifted from open to closed stores that require the use of pesticides to protect against diseases and insects. This is particularly the case for hybrid maize, which is used both for trade and commercial milling. The fact that intra-annual price variations are still significant in both producer and consumer markets means that storage is not being effectively performed. Several incentives can function, however, such as the above-mentioned warrantage programs (i.e. inventory credit).

Following hulling and treatment against insects, it is better to bag the grain and store it in cribs or other improved storage facilities to protect against ground and rain water, pests, animals and heat. Storage's greatest benefits can be attained by a trade-off between storage costs and price differentials, but extension agents must ensure farmers that better prices will be possible as a result of reliable sale arrangements with traders, wholesalers or commercial mills.

Analysis of the maize agro-processing constraints

Maize processing faces many constraints. First, processing yields from mechanical hulling are rather weak (15 to 25 percent for several units), and low-quality processing of mechanic hulling has had bad effects on the overall quality of end products (e.g. taste, nutritional content and conservation attributes). Flour quality is sometimes inadequate as a result of grain size, metallic contamination and other impurities. Handling of the processing machinery may also be inadequate (e.g. choice of the machinery or lack of training of processors). Most manual techniques of second-stage processing are painful and lengthy; packaging is sometimes difficult; and the outputs may be highly perishable.

Processing options that would increase demand for maize include:

- substitution of wheat flour to sorghum and maize flour in several industrial and consumption goods;
- new types of broken grains/fragments, development of new tastes, blown products, crispy products and snacks, cakes and biscuits and instant-made flours; and
- other valuation and by-products with food and non-food uses (e.g. fodder, energy).

3.4 Maize marketing

Farm-gate sales

Most maize producers are small scale farmers typically cash-constrained which often force sales immediately after harvest, when prices are at their lowest level. Limited on farm storage capacity is a major constraint and prevent effective marketing options for farmers. Also from harvest to marketing time, around one-third of maize production is lost at the village level. Generally, farmers sell their production in local markets or directly to small-scale traders. At times, they sell to secondary markets through local traders.

Farmers who live close to a city or who have small quantities of production can sell directly to retail markets, but this is time-consuming and carries risks (e.g. theft or degradation if there is inappropriate storage). Alternatively, farmers can sell to retailers in the market for wholesale at lower prices, but with lower costs. They can sell to traders in town who own their stores close to larger markets, often at fixed prices, or sell to visiting traders in the village. While this last option is the easiest for producers, it nevertheless carries many difficulties such as: (1) prices could be much lower (but maybe not enough to compensate for transport costs); (2) traders may not have sufficient cash; and (3) farmers may wait for a long time to get paid.

Farmers could sell to a hammer mill or to a large-scale mill. Some consumers prefer to buy maize and take it to the nearest hammer mill for milling rather than buying already-processed grain.³ From hammer mills, little production is marketed, but this could change since the increase in the number of mills is associated with a decrease in profit for the owners of hammer mills. Commercial mills are another outlet for farmers provided

³ This has some cost advantages over large-scale mills and consumers often pay a fixed fee per bag.

larger quantities can be delivered and transport can be organized. This last option also requires meeting quality standards, which is another source of risk.

Local traders

Most trade is on an informal basis (i.e. no written contracts, lack of access to information services and poor infrastructures). Most traders collect staples at the village gate and sell to wholesalers who operate in main and secondary markets. Working in primary markets, traders are paid commissions by wholesalers and borrow trucks from them. They operate with cash and bags and receive instructions for pricing, quantities, quality, coordination of purchases and transportation.

Wholesalers

Wholesalers store staples for five to six months before selling them at much higher prices to retailers. Large-scale trade also takes place at the regional level, and at the national level with some transborder trade. Large-scale traders own or rent trucks and organize trade from surplus areas to deficit ones. They own the necessary capital to finance large trade operations, and they possess terminals and warehouses in key terminal and retail markets.

In Burkina Faso, large-scale traders have set up storage facilities that can handle from 500 to 25 000 tons, and they are able to negotiate and process provision contracts with millers and key institutional buyers such as the World Food Programme (WFP), the Army and schools. They also sell large quantities to wholesalers, retailers and small-scale traders. They can contract with producers' organizations (POs) and secure their maize purchases by financing PO members' inputs (outgrower schemes) with large-scale farmers and semi-wholesalers. Large-scale traders and wholesalers can invest in trade through large loans (50 to 100 million Frank CFA or 110,000 to 220,000 US\$) at 5 percent interest rates, which are much lower than typical banks interest rates for agriculture in general (currently averaging around 18 percent).

Retailers

In Burkina Faso, retailers only sell a few tons a month and have small liquid funds for purchases. Their marketing outlets mostly concern terminal and urban consumers, and they sell maize as well as some rice and sesame. Most retailers are supplied by wholesalers despite the fact that they can purchase at the farm gate. A few farmers also work as occasional retailers, according to their family and kinship ties, as do small-scale rural traders.

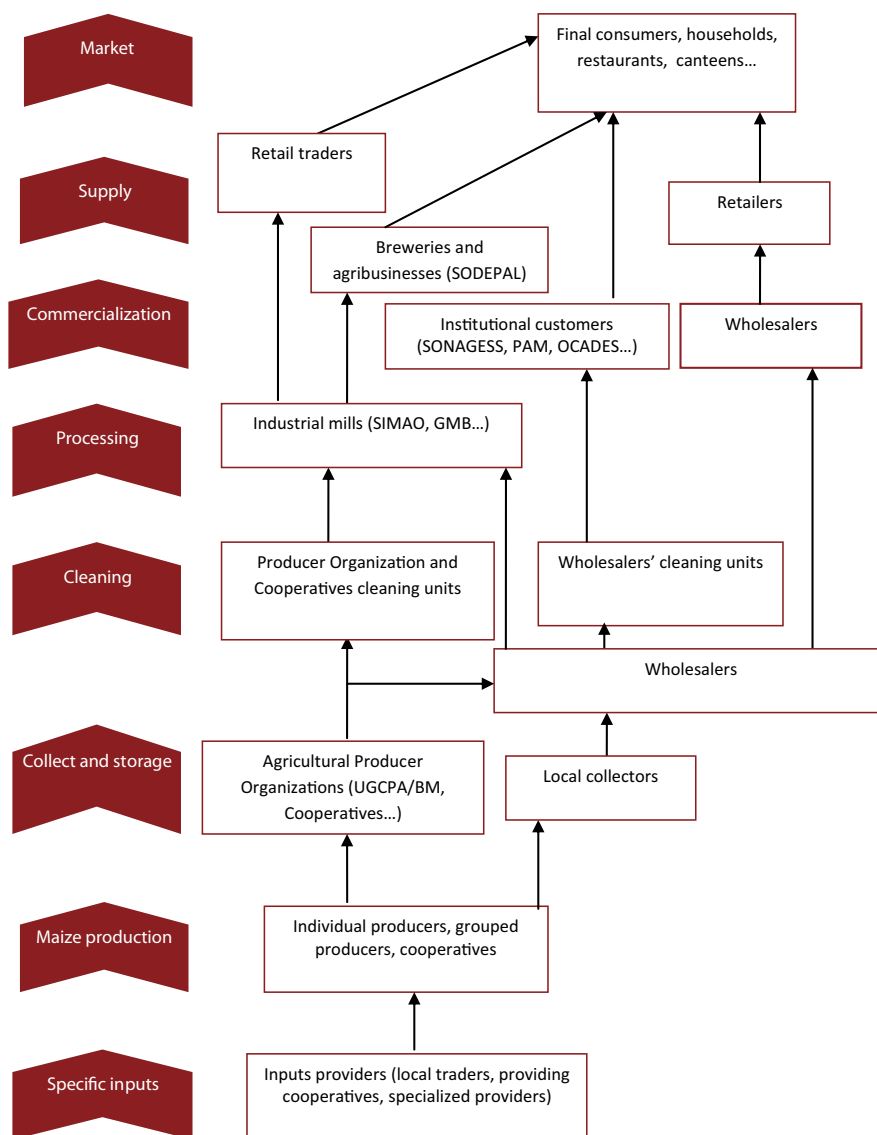
Value-chain relationships

Various nodes of a given marketing channel are composed of marketing networks led generally by the wholesalers and semi-wholesalers operating in wholesale markets. These networks have ramifications through collecting markets (grouping) and rural producers' markets, as well as through export regional markets. They are in general composed by stakeholders whose business relationships are based on trust, kinship or parental relationships. In Burkina Faso, maize production is becoming more of a commercial activity, and more contracting arises exclusively among the stakeholders of the marketing channels.

Wholesalers are the main funders of dry cereal marketing systems. They determine the nature and quantity of production to purchase and provide indications about prices, given their expectations for marketing prospects. But prices can be raised occasionally whenever wholesalers have additional contracts to implement. Wholesalers fund collectors who initiate orders on their behalf after having jointly agreed on price offers to make, based on export prices and prices observed on behalf of urban wholesalers and institutional customers. Thus collectors pay for cereals in producers' markets to supply them to wholesalers and groupers, which in turn supply and market the production to the other stakeholders of the marketing system.

Once purchased, cereals reach network heads (e.g. wholesalers or semi-wholesalers, retailers or exporters in wholesale markets) that take care of final marketing and sales. Then they reinvest money within their networks. In order to minimize risks, network funding is cyclical at all levels and reaches groupers as long as deliveries proceed at their level of the chain. Amounts invested increase if formal contracts are implemented. Otherwise, this is done according to demand conditions. For each delivery, several checks are performed to ensure that quality criteria (e.g. color, cleanliness, and impurities) are satisfied.

Figure 6. Maize supply chain



Source: Compiled by authors from different sources

Analyzing marketing constraints for maize

Transport unit costs - Cereals have a low value/weight ratio, often resulting in high transport costs. They exhibit large price variability at the producers' gate because of induced low market integration between surplus and deficit periods. This is also the result of well-known short-run low supply and demand elasticity. Hence, the transport cost component of cereal marketing is often substantial, which limits further market integration and increases transaction costs.

This problem is further accentuated since local grain production faces higher logistical disadvantages compared with imports: transactions costs, inland freight costs (which are two to three times the costs of ocean freight) and low quality infrastructures.

Infrastructures - Infrastructural constraints (particularly transport and communications) are a major cause of the low long-run supply response of farmers to price incentives. Cost-effective ways to provide infrastructure may involve user communities in maintaining existing infrastructures with their own-managed funds. Productivity benefits could be achieved by improving off-road transport and intermediate means of transport with capital-savings techniques for road construction, using labor-based techniques to overcome usual problems related to equipment use and availability in the region.

Market imperfections and market incompleteness - Deficiencies in extension services also explain the lack of viable input credit schemes and the possibility to scale them up with more thoroughly managed arrangements. Access to credit is also problematic when considering the few risk-mitigation strategies of rural entrepreneurs.

Finally, formal rural risk markets do not exist. And yet, since cereal market liberalization, farmers and other stakeholders have faced increased market and production risks. First, farmers have to choose their marketing channel, then they must decide when and how much to sell and when and how to store. The absence of insurance markets is often explained by high transaction costs, geographical remoteness and risk covariance at the local level. However, improving information about weather conditions will help set weather-indexed insurance schemes (which have been tried in southern Africa) and provide farmers with new producers' incentives. Although the development of such markets requires a strong financial framework, enhancing access to information through new technologies and communication could help spread these schemes.

4. Policies and initiatives for competitive and inclusive maize value chain

4.1 Cereal market liberalization and renewed policy support

In the early 1990s, the cereal sectors were liberalized in Burkina Faso, with the dismantlement of former parastatal marketing boards and cereal *caisses de stabilisation*. Before liberalisation, maize producers were able to access subsidized inputs and credit and to benefit from guaranteed prices and market outlets. Despite productivity improvements for maize through the late 1980s from research and extension programs, the pre-liberalisation marketing system offered low price incentives for farmers.

While cereal market liberalization improved to some extent the price incentiveness, this came at the cost of higher price variability and less access to inputs and technical assistance. Consequently the net impact of liberalization on producers was minimal.

While Burkina Faso fully liberalized its cereal markets, the accompanying measures did not provide sufficient incentives for investments in storage-related capacities. As a result, even if domestic markets became more integrated, they have also become less competitive due to increased concentration of traders, and rise in collusive behaviour through personal networks and reduced price information (see Toyi, 2002).

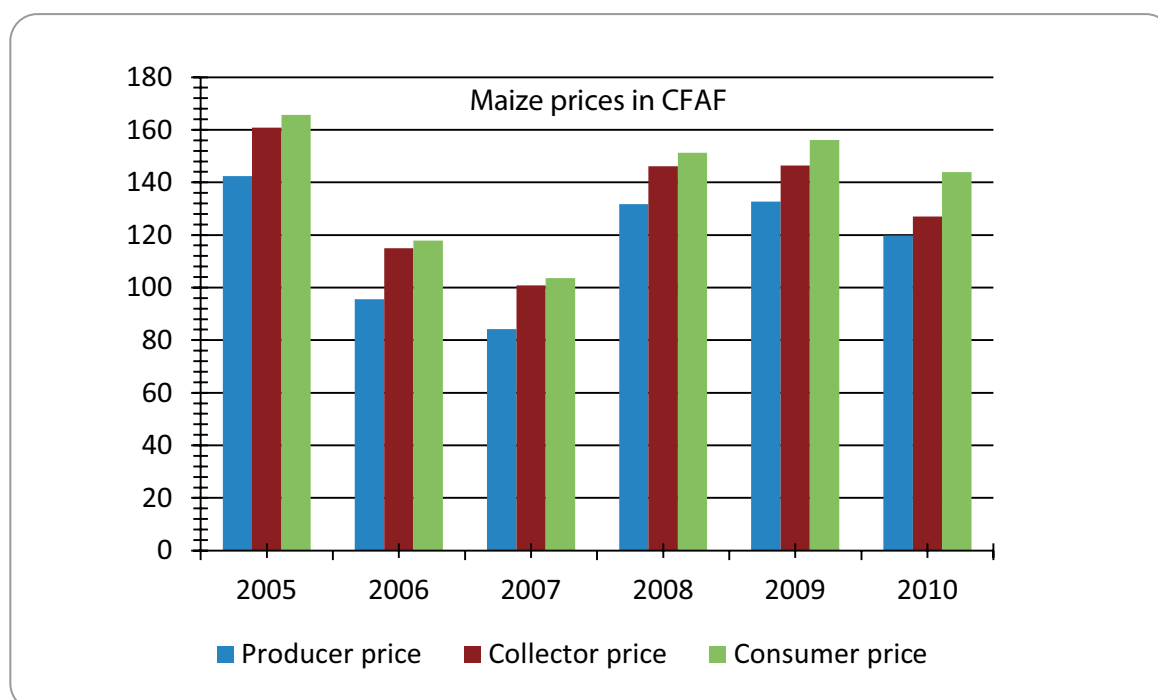
Currently, the role of the public sector is confined to regulation, implementation and control functions through ministries, market information services and systems and regulatory bodies. Research institutions, such as the Institut National de l'Environnement et de Recherches Agricoles (INERA), design and implement research projects for breeding and selecting cultivars, testing and processing techniques. Other external stakeholders (e.g. banks, donors, international research networks and other institutions that provide extensions, such as SOFITEX and development offices) provide supplementary support by funding research, providing needed expertise and technical knowledge. At regional level, national policies have been aligned with the Comprehensive African Agricultural Development Policy (CAADP) framework, which promotes harmonization at the regional level within the New Economic Partnership for African Development (NEPAD) framework. This notably involves common trade policies with the ease of circulation for commodity products and inputs.

Price dynamics

Cereal prices decreased in Burkina Faso from the late 1980s up to the late 1990s, following liberalization. Since then, prices in the maize production and consumption markets have been fluctuating (Diakit , 2006). Producers' and consumers' prices follow similar patterns across years (also within years, as discussed in next sections), but marketing margins are lower when producers' prices are low and margins increase together with maize prices. The relationship is therefore not exactly linear between both (producers and consumers) price series, but rather concave. Gross margins fluctuate from year to year, according to product types and geographic areas. In general, margins are low in larger production areas, and much higher in landlocked ones with low production, which thus reflects more competition and scale economies in the largest production areas. Since the 1994 CFA Franc devaluation, the overall competitiveness of "dry cereals" (i.e. maize, sorghum and millet) has improved in both local and regional markets⁴ in Burkina Faso. Demand from neighboring countries has scaled up, as have processing units (Diakit , 2006).

⁴ Diakit , L. 2006, page 136 : « after the devaluation, it is found that stallholders still receive positive margins in spite of a very sensitive increase in transport cost. This has been made possible thanks to the increase in competitiveness of national cereals-based products ». See also K b  *et al.* 2005.

Fig.7 Maize prices in Burkina Faso

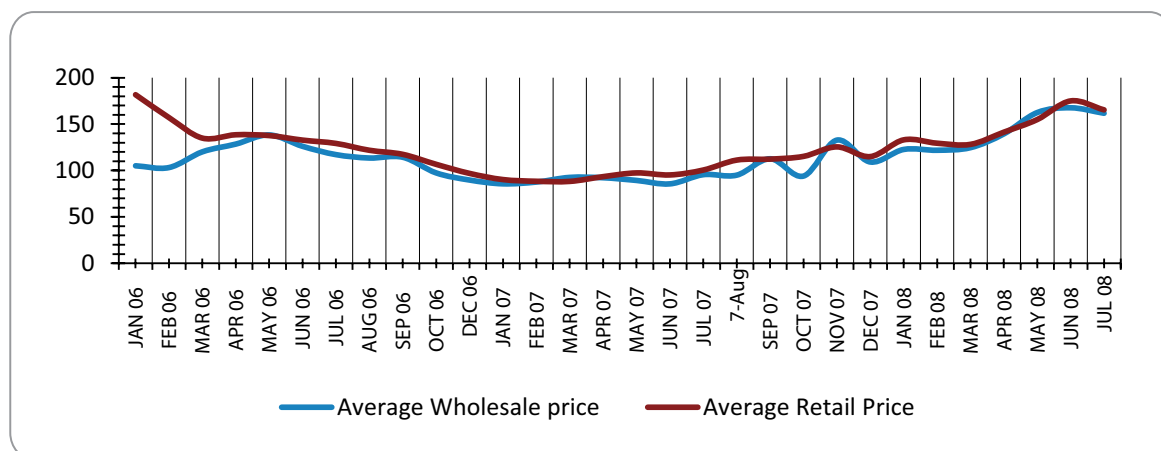


Source: Diakité, 2006.

Fully liberalized maize markets imply seasonal price variability, which is supposed to provide incentives for farmers to store crops; however, the carrying costs are often not recovered because of the variability in spot wholesale markets and bad infrastructures for storage. Many factors cause this failure of storage capacities: uncertainties about speculative storage profitability; the disposal of remaining public stocks and food aid; future policies and related expectations; weak systems of crop forecasting; no information on private stockholding (information problem); weak financial frameworks and banking sectors; infant warehouse receipt systems; shortage of creditworthy customers (e.g. no collateral, information problems, credibility problems); and farmers' cash constraints or risk-aversion towards storage losses because of insects, rodents or molds⁵.

Cereal prices follow a similar intra-annual pattern every season, beginning with low levels at harvest, increasing and reaching maximum values during the lean period and then collapsing during harvests. This behavior is attributable to production and supply conditions. The first has to do with climatic factors, while the second has to do with low levels of storage among producers. Storage by traders and wholesalers increases marketing costs, and, together with a decrease in supply, is responsible for the increasing pattern of prices over the season.

⁵ Mali offers one interesting counter-example, where there has been good recorded storage of millet and sorghum for several years.

Figure 8. Intra-annual price fluctuations in Burkina Faso (2006-2008)

Source: TradeNet, RESIMAO

Hence, cereal prices can multiply four-fold over the agricultural season. Parameters other than supply and demand influence the observed market prices. First, there is an effect from neighboring countries which have experienced under-production shocks, even if national production is in large surplus. Cereal markets are quite sensitive to world market shocks. However, the effect on the price of imported food is much larger than the effect on domestic markets for locally-produced cereals. This has to do with the substantial transaction costs of marketing and trade for local cereal production, which entails a competitive disadvantage (imperfect transmission effects). Agrofood processing can handle production surpluses and lengthen/improve conservation while adding value, and thus attenuate seasonal price variation on local markets by appropriately serving increasing demand in such processed products. To date, most of these domestic markets are still dominated by importers, which mean that there is a strong potential for value-chain development of local cereals, given their competitive advantages. Better market regulation, investment in processing facilities and reduction of marketing costs through appropriate investments in infrastructures would facilitate such promotion of local value chains through processing.

Table 2 presents the evolution of maize market prices on rural producers' markets and in Banfora markets (which are close to northern Côte d'Ivoire and thus potentially affected by maize imports from abroad).

Table 2. Monthly producers and wholesale prices

Periods	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Producers' prices	98	104	103	120	126	126	129	136	131	125	105	91
Banfora prices	125	135	130	124	132	139	153	142	132	104	97	114
% gap between production and wholesale prices	28%	30%	26%	3%	5%	10%	19%	4%	1%	-17%	-8%	25%

Source: Direction Générale des Prévisions et Statistiques Agricoles.

Marketing margins from local markets are achieved right after harvest in November, and while rural market prices increase gradually during the rest of the agricultural season, urban markets in Banfora exhibit a much slower increase because of cheaper imports from northern Côte d'Ivoire. This explains the reduction in the gap between the two markets. The period during which consumers' prices are lower than producers' prices corresponds to the harvest period when produced quantities are not

marketed. The Sourou maize study (2010) by AECOM and Desjardins (2011) shows that the Banfora markets, which are better linked to Ivorian wholesale markets, have a competitive advantage over the Bobo-Dioulasso markets where consumers' prices are much higher and follow the pattern of producers' prices more closely. Cereal banks also have directly affected local markets, and they represent additional competition for providers in local consumers' markets. It has been shown that heterogeneity in cereal banks' functioning is correlated with heterogeneity in local producers' markets (i.e. driving up prices before harvest and driving them down before, with an overall smoothing effect), independently from second and central markets such as Banfora.

4.2 Trans-border trade and necessity to remove trade barriers

In West Africa, maize is available during the post-harvest season, from November onwards. However, Sahelian countries such as Burkina Faso have a competitive disadvantage from July until November when prices are increasing at a time that coastal countries (e.g. Ghana), which have more precipitation, have a second harvest. However, the competitiveness of Burkinabe maize in regional and domestic markets (as compared with maize from Ghana or Nigeria) could be increased by scaling up storage and productivity increases (i.e. more capacities to invest in high-yielding seeds together with necessary insurance mechanisms).

Burkina Faso is one of the few maize-surplus producers in West Africa, and one of the main providers of maize exports to neighboring import-dependent countries. Target regional markets include Niamey and Tamale (Ghana). High regional demand also affects Côte d'Ivoire, Nigeria and Senegal. Burkina Faso also can increase its national demand if adequate marketing and processing options are further developed and promoted (see previous section).

Two main barriers to intraregional trade have been identified in the literature about market integration (and the lack thereof) in West Africa. The first barrier relates to costly transportation and high transaction costs, and the second arises from inconsistencies in trade policies (e.g. export bans for food security purposes that do not allow performing producers to benefit from remunerative prices) and non-tariff trade barriers.

Among the trade cost factors, the transport component is particularly important. Indeed, transport remains a key constraint for the expansion of intraregional and intra-continental trade in sub-Saharan Africa. Yet the continent has the potential to get the lowest transport prices in the world because of its low wage levels and because trucking is essentially a labor-intensive activity.

Costs to operate a vehicle and other indirect costs (e.g. license, insurance and tolls) are not seemingly high when compared with other regions. And yet, prices are quite high and service quality is often poor; this results from high profit markups and institutional failures. The regulation of the trucking industry includes market entry barriers (e.g. access restrictions, regulations, customs and cartels), and corruption in freight-sharing schemes favors the use large fleets and old trucks in poor condition. Old fleets persist because of the regulation of truckers' income (i.e. a revenue cap), which deters or postpones investment in new trucks. Truck overloading is the result of excess capacity and contributes to road degradation. Indeed, road conditions are the main cause of high variable operating costs, increasing fuel consumption and maintenance costs and reduced lifetimes of vehicles (Teravaninthorn and Raballand 2008).

However, in West Africa, wherever international corridor routes are paved in reasonable condition, transport costs cannot be reduced because there is little traffic. The main avenue for improving conditions is therefore paving additional corridors and maintaining good road conditions. Reduction of informal payments and fuel prices can help decrease transport costs, but overall, the main priority for

the region is institutional and policy content. Reforms in the regulations to reform cartels and break interest group coalitions must lead to a more efficient trucking industry (Teravaninthorn and Raballand 2008). Indeed, cartels are a preeminent factor in transport prices (notably in Burkina Faso).

Some key characteristics of transport systems in West Africa are non-tariff barriers which include cumbersome, slow trade procedures and informal taxation at the borders. Administration procedures also can be very costly (World Bank, 2009), and import/export procedures are more time-consuming and costly (i.e. with more documents) than in any other region in the world. There are many causes of this, including electronic breakdowns, poor coordination in inspection, delays in duty refunds and insufficient opening times. Another concern is the efficiency of the customs environment (e.g. governance, corruption) which is responsible for additional costs from border controls (irrespective of the distance covered). The predictability of trade and business administration is important and depends on the policy and regulatory environments. Modernization of customs is a clear avenue for enhancing intraregional trade (e.g. successful reduction of clearing time in Ghana airports).

Table 3. Transport costs in the main West-African corridors

S/N	City/country of origin	Market	Distance (km)	Quantity (t)	Mean transport cost (FCFA)
1	Bobo-Dioulasso Burkina Faso	Niamey-Niger	870	40	750.000
2	Bobo-Dioulasso Burkina Faso	Tamale-Ghana		40	550.000
3	Sikasso-Mali	Dakar-Sénégal		40	1.000.000
4	Sikasso-Mali	Niamey-Niger		70	1.500.000

Source: Boone and Al., 2008.

There has been a low political concern or willingness to rely on cross-border trade to smooth prices swings because of grain markets' characteristics, the fear of food deficit or political blaming, which has often resulted in trade restrictions (e.g. an export ban). In this configuration, a viable strategy of reducing transport costs and accessing urban markets with better logistical means (i.e. less costly) would help consumers to not suffer from import or domestic prices that are too high, and would offer an alternative to import-substitute food. Moreover, cross-border trade is mostly informal (i.e. parallel market) as a result of discouraging trade policies (e.g. highly distortionary taxes or bans, red tape in borders and weakness of custom offices), which inhibit long-term production planning and more formal marketing programs.

Box 2. Enhancing regional trade in cereals in West Africa: USAID/ATP experience

The USAID/ATP is a pilot project for information gathering and sharing. It is based in Accra and covers many producing countries in West Africa, including Mali and Burkina Faso. The project owns an Internet platform through which market information is gathered and disseminated about maize, shallots and cattle/meat. This project posts its own market agents who collect information about prices, marketing agents' characteristics, contracts and offers. This information is then released through mobile phones (SMS). Thanks to this platform, some market stakeholders cut commercial deals. Additional tests need to be performed to make these information systems useful for POs.

Most West African countries, including Burkina Faso, have long relied on regional trade to ensure the availability of staples. As shown by other evaluations conducted within the region, the main identified problems in the maize value chain concern the many trade barriers such as fictive/shadow costs and the harassment of procedures. Maize exporters interviewed by the ATP team in Burkina Faso have witnessed transborder-induced delays and additional (fictive) costs, which represent a significant bottleneck for regional maize trade. Stakeholders often report additional costs which amount up to 200 000 CFAF (USD 396.958) per loaded truck in bribes and other unofficial payments. Harassments and other expenditures are a significant constraint to regional trade since they increase the marketing costs of regional maize exports by 5 to 10 percent.

In 2008, three countries (Burkina Faso, Mali and Niger) decided on export bans of many cereals, including maize (and sorghum-millet). The political objective was to slow down price increases and to ensure adequate supply in domestic markets. According to producers and stakeholders interviewed by the ATP team, however, export bans may have negative long-term impacts on future investments in maize production-related, trade-related and storage-related capacities, because producers and traders would be induced to shift their future resources to unbanned crops or to move into informal sector when unable to shift to these unbanned crops. As a result, export bans may likely produce counterproductive incentives by reducing mid-term supply levels, instead of increasing them.

In addition, the Burkinabe government introduced price regulations by controlling/leveling cereal prices which entail price reductions around 5 percent in 15 provinces (out of 46). No one knows whether those price interventions have significantly affected local market prices as expected. Notwithstanding, this policy stance indicates that maize and other staples' prices are subject to increased interventionist measures – not only at the borders but also in domestic markets. Those measures are not facilitating value-chain development; they better serve politicians' self-serving motives behind food security.

4.3 Critical role of producer organizations as a market agency

Enhancing the value-chain process strongly relies on better horizontal and vertical coordination. The role of professional organizations (POs) is critical as they help reach the needed economies of scale to render new marketing relationships profitable.

POs act in the role of former public services, helping farmers coordinate their marketing strategies and driving farmers' participation in the market and inclusiveness within the value chains. According to Mercoiret (2006), the progressive transformation of village groups into more professional federations

has allowed farmers to participate in the public and policy debates about agriculture, but POs still fail to strongly defend their members or consistently represent their interests. Most of them lack sufficient bargaining power, expertise and access to information to be credible actors in the negotiation process. But a minority of them has gained crucial importance in the policy debate and emerged as an independent force in policy-making (e.g. (Réseau des Organisations Paysannes et de Producteurs d'Afrique de l'Ouest) (ROPPA) for West Africa, Union Nationale des Producteurs de Coton du Burkina Faso (UNPCB) for cotton in Burkina Faso or Association des Producteurs de Coton Africain (APROCA) for international cotton negotiations). POs are the preferred organization form through which the implementation of external projects is channeled.

Box 3. Examples of professional organizations active in maize in Burkina Faso

In Burkina Faso, many organizations exist and some of them are involved directly in maize and cereal commodities. Among these:

- **FEPPASI** (Fédération des Professionnels Agricoles de la Sissili) is a PO of the Sissili province which aims to support farmers through training, marketing and agricultural credit. Priorities for maize production apply to grouped marketing, maize storage and agricultural credit. FEPPASI receive funding and support from donors such as the Swiss Cooperation and they also have developed partnership with the USAID project ATP to develop fertilizers' funding opportunities, improved cultivars and storage capacities.
- **UPPAH** (Union Provinciale des Professionnels Agricoles du Houet), established in 1998, has 2 500 members in the outskirts of Bobo-Dioulasso. It supports maize producers through training, grouped marketing and agricultural credit. Some strategies with ATP are envisioned, and the organization functions much as does FEPPASI.
- **Professional associations of marketing, trade and processing stakeholders**, including UGCPA (Union pour la Commercialisation des Produits Agricoles)(grouped marketing and relationships between POs and traders);

In Burkina Faso, an interprofessional body was set up in the dry cereal value chains – the Comité Interprofessionnel des Céréales du Burkina Faso (CICB). The CICB was established to help public policies better reach smallholders and enhance coordination between smallholders and other stakeholders. The CICB is the main recipient of the PAFASP, Programme d'Appui aux filière Agro-Sylvo-Pastorales (program in support of agricultural and forest-derived value chains), a government-led project to support all stakeholders of the maize value chain in both production and marketing facilities.

Intra-level relationships are almost non-existent, although most stakeholders belong to the same association (e.g. CICB), and there are low levels of cooperation, which does not facilitate more vertical integration. It is possible to find several POs in the same localities, but without any significant relationship among them. Professional bodies of traders and retailers exist in several regions to ensure price collusion or information-sharing about availability of cereals, quality and prices. For maize, they even have their formal professional association, the UGCPA, within the CICB. No spontaneous formalization of relationships with producers arises, even in the maize sector, since the marketing stakeholders have difficulties enforcing provision contracts when prices are not favorable to producers.

Inter-professional associations are an interesting tool for the relationships between “insiders” stakeholders and other participants of the commodity chains, including labor unions, insurers, microfinance institutions, chambers of commerce, government agencies and donors. While outside

agencies can facilitate the establishment of associations when there is a critical bottleneck in communication among stakeholders, it is also more difficult to ensure a sustainable organizational structure with the acceptance of full cost participation. It is clearer, however that such associations should be “associations of associations” as it would be very difficult to ensure the participation of farmers, input suppliers or other agro-processors on their own (Shepherd, 2008).

The UNPCB, the cotton union, has recently attempted to expand its cotton model to maize and set up its own maize marketing program. It aims to propose new marketing schemes to its members by: fixing prices and providing more agricultural inputs to producers; establishing its own network of collectors and vertically related customers; targeting institutional customers and processors for value addition; saving on collecting costs so as to propose more remunerative prices to producers and harness possible economies of scale; developing business relationships with the main wholesalers; and maintaining business partnerships with other producers’ associations. UNPCB tries to reach economies of scale by grouping production surpluses and managing timing of marketing operations to benefit from the pattern of market prices and intra-annual fluctuations.

4.4 Toward a strategy for competitive and inclusive maize value chain

FAO studies show that maize production in Burkina Faso is competitive, meaning that it is more profitable to produce dry cereals locally than to import them, at reference prices, and from a social welfare standpoint. However, self-sufficiency in maize does not necessarily imply that quantities are available throughout the year and throughout the country. Further, trade restrictions for food security and underlying political purposes do not help in adding value and making farmers and traders benefit from higher prices. Better management of storage and safety nets policies also can be helpful in implementing more efficient food-security policies while facilitating trade and private development of the value chains.

Existing results show that local resources are efficiently used and allocated (20 percent of efficiency for maize). Value chains generate more than 150 CFAF billion (around 320 million US\$ equivalent) of added value before accounting for public investment and subsidies. However, without public transfers, the added value would be much less, meaning that social transfers to maize value-chain improve efficiency. Farmers and traders receive lower profits than their contribution to added value while processors receive more. It means that social transfers are first channeled through processors. Without such transfers, there would be less private investment in processing, and this would in turn reduce the profit prospects of farmers and traders. Hence, returns to social transfers are largely positive.

However, competitiveness can be scaled up significantly. Two nodes of the chain could benefit from scaled-up modernization techniques, a better market and business environment and better investment incentives. Two factors are key to enhanced competitiveness. First is farmers’ productivity. It has been shown that farm modernization through farmers’ adoption of more technologically advanced packages (e.g. early cultivars, fertilizers, manure, animal traction) together with appropriate extension services can lead farmers to increase their productivity significantly, and notably for maize which is the crop that reacts the most to these packages in terms of yields.

The second point is about agro-industrialization and processing, which can drive a two-fold increase in value addition. Institutional arrangements and policies could facilitate and enable more processing to take place within value chains, notably through regional strategies and complementarities (e.g. industrial poultry production in Côte d’Ivoire and Ghana and grain production surpluses in Burkina Faso).

5. Conclusion

In West Africa, maize is hugely important for agricultural transformation, intraregional trade integration and food security. Maize can serve multiple market outlets (food, feed and industrial applications) with significant opportunities for expansion and agroprocessing development. In the case of Burkina Faso, the authors examine the key obstacles facing maize value chain development and review the incentives required to transform maize from a predominantly self-consumed crop into a cash commodity serving the needs of several growing market outlets (processed food, animal feed, breweries). Driven by strong and multiple demand sources, incentives do exist for greater uptake of productivity techniques (fertilizers, seeds) and improved maize supply quality (including post-harvest).

The maize sector continues to be hampered by multiple market and institutional failures. On the marketing side, maize value chain actors confront large seasonal price variability and variation in supply and quality. Institutional obstacles include the lack of an effective legal system and weak commercial and market transactions, all of which limit the growth potential for the agroprocessing sector. Institutional-type reforms include support to credit schemes and incentives such as subsidizing collective storage for use in inventory credit (warrantage). As was pointed out for other commodities, successful institutional reforms hinge on the emergence of credible and business-oriented producer organizations able to mediate between producers and credit institutions to facilitate adoption of new technologies and to perform collective purchases and sales. Maize trade within West Africa is much lower than its potential. However, improving maize intraregional trade requires a better understanding of the economic and business costs of current barriers to trade, as well as better communication with policy-makers about the magnitude of the resulting costs to national food security.

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Chapter 15

An assessment of sorghum and millet in Mali and implications for competitive and inclusive value chains

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1. Introduction

Sorghum and millet are strategic crops for food security in much of the Sahel. Over half of the farming population grow sorghum and millet crops, which together account for 5-7 percent of all full time jobs in the country. Sorghum and millet also contribute 5 percent to the gross domestic product and account for about 15 percent of consumption shares (in monetary terms) in Mali.

These crops are highly adapted to the low rainfall and light soil types that prevail in the Sahel. Yet yields have remained very low, and output is significantly below its potential. Lack of policy support, not better technologies, are the prime reasons. In Mali, like much of the Sahel, sorghum and millet value chain remain relatively underdeveloped, weakly integrated, and only a small share (30 percent) of production is marketed despite a significantly larger urban demand.

This chapter examines the sorghum and millet value chain in the Mali case and draws conclusions and recommendations for rebuilding the sorghum and millet value chain potential. The same conclusions are largely applicable to other countries of the Sahel, given the large similarity in the overall development status of these two critical staple food crops.

The chapter is divided into four sections. The first one examines the characteristics and drivers of demand for sorghum and millet value-chain products. Section two focuses on the key impediments along the value-chain (input markets, production, processing, and marketing). Section three review policy, trade and institutional aspects relating to sorghum and millet value chains. The last section concludes.

2. Demand drivers for sorghum and millet

2.1 Urbanization and income distribution changes

In West Africa, population growth has increasingly shifted from rural into urban areas over recent decades. Between 1980 and 2010, urban populations grew 4.5 percent annually, compared with 1.8 percent in rural areas. This trend is expected to continue between 2011 and 2050, with urban population growth projected at 3.7 percent per year, compared with only 0.5 percent in rural areas (UNFPA 2010). By 2020, just over half of the people residing in West Africa are projected to live in urban areas (193 million) and urbanization is expected to reach 67 percent by 2050 (UNFPA 2010).

Urbanization is not limited to primary cities. There is an equally rapid expansion in the number of new smaller cities of 10 000 or more inhabitants, primarily along major axes and in the periphery of larger metropolitan neighborhoods (Denis *et al.* 2008).

Urbanization is also driving changes in consumption habits through: (1) increasing demand for prepared food and for convenient, ready-to-cook and ready-to-eat food products (e.g. rice, wheat, sorghum and maize flours), particularly for urban women who have less time to prepare meals; and (2) increasing consumption of food and meals outside of the home (i.e. "street consumption"). These evolving changes are creating an increasingly segmented urban market comprised of many recently-arrived, low-income consumers with evolving "urban" tastes and a nascent urban middle class. The increasing number of urban poor will require large quantities of cheap food, including both staple foods and lower quality imported food. Over the last 20 years, evidence shows that urban consumers have gradually substituted

regionally-produced coarse grains with imported rice and wheat (Singare *et al.* 1999). At the same time, a growing urban middle class creates additional demand for a diversified basket of higher value and processed goods, with preferences for high-quality imported products (FARM 2008).

Income growth and distribution of purchasing power (including poverty patterns and income distribution) are also powerful drivers that shape the structure and evolution of food demand. In Mali, between 1990 and 2001, GDP grew by 4.4 percent on average (2.2 percent for GDP per capita) (World Bank Development Indicators). According to estimates of poverty headcount ratios expressed in purchasing power parities, more than half of the entire regional population in West Africa lives on less than US\$1.25 per day and three-quarters have less than US\$2.00 per day at their disposal. Poverty is relatively higher in Sahelian countries such as Mali and Burkina Faso, but cotton areas generally exhibit lower rates.

Growing populations have contributed to a strong expansion of the regional market for food products. The value of total regional consumption of food staples (including farmers' own consumption) has been estimated at US\$20 billion, more than three times the value of West African international exports and 50 times the value of intraregional trade captured by official statistics (Hazell and Diao, 2005, cited in ReSAKKS, 2008).

2.2 Consumption of sorghum and millet

Because of urbanization and increasing evidence on growing rural urban income disparities, most of this market growth has taken place in urban areas. According to estimates from the international agricultural research center for development (*Centre International de Recherche Agronomique pour le Développement* – CIRAD), almost all wheat, two-thirds of rice and more than 40 percent of roots and tubers available in the region are consumed in urban areas. Even in the case of typical rural staples such as millet and sorghum, approximately 20 percent is consumed in towns and cities. The total value of food transacted in the markets of eight West African capitals is considerably larger than the value of agricultural export revenues achieved by these countries. According to projected future demographic trends, the growth of the domestic food market will continue to take place mainly in urban areas. In addition, there will be growth in the demand for semi-industrial and industrial processed food and non-food products, which can stimulate the local agricultural sector if value-chain development effectively takes place.

The rapid rate of urbanization has driven demand in urban markets for imported food staples, and this has fostered import dependency, while rural markets have continued to be served with domestic production such as sorghum and millet. New marketing strategies could make local production more accessible to central markets and meet the needs of urban consumers.

In Mali, food demand for cereals amounted to 2.6 million tonnes in 2008 (including maize, sorghum and millet), in addition to a growing feed market demand for the poultry industry (around 50 000 tonnes of maize per year).² There is a clear consumption substitution from millet-sorghum and maize toward rice and wheat in Mali. The three main cereals (maize, sorghum and millet) represent 70 percent of consumers' cereal needs. While the growing poultry sector is targeting maize, new marketing strategies for millet and sorghum are also developing and would contribute to the growth of these crops value chains. Key drivers supporting the development of sorghum and millet value chain include meeting consumers' preferences and quality requirements.

² Poultry being produced in modern industrial farms amounts to 1,5 million heads in Mali (most of which for eggs), which calls for additional demand of 50,000 tons of processed maize (could be partially mixed with processed sorghum).

Diverse consumption studies and budget consumption surveys provide some insights into the possible future size and structure of food demand by extrapolating observed differences in food consumption between population groups and income strata.

Evidence suggests that there are no inferior goods in the Sahel; as incomes grow, households' immediate concern is to increase quantities consumed. In this way, consumption preferences of rich and poor are similar (Camara 2004). An analysis of budget consumption surveys from Ghana, Mali and Senegal conducted during 1998 and 2001 revealed that notwithstanding changes in the structure and composition of food demand, absolute consumption levels of all food items tend to increase with rising incomes. This is evidenced by large expenditure gaps between the five income quintiles of households within each country. In Mali, both rural and urban households in the highest quintile spent more on millet (including processed) than households in all the other four lower quintiles. In Senegal, the average person in the richest household quintile spent almost three times more on sorghum and millet than the average household in the poorest income group. This empirical data point towards a significant growth in demand for all food staples if population and income growth continues as expected.

Poor households spend a high share of their food expenditures on basic foodstuffs such as coarse grains, roots and tubers (ReSAKSS 2008). When real household incomes rise and households satisfy their demand for basic staples, they will tend to gradually diversify towards consumption of non-staple commodities (Singare *et al.* 1999). As incomes rise in West Africa, households have tended to gradually spend a larger share of their disposable income on rice and wheat (ReSAKSS 2008). This preference for wheat and rice has become common in both poor and rich households. But products that are more adapted to the preferences of urban consumers and those that are processed from dry cereals can compete with rice and wheat (Boughton and Reardon 1997). Specific marketing strategies (such as the ones promoted by INTSORMIL - International Research Consortium on Sorghum and Millet) along with easier access to urban markets (e.g. decreased transaction, transport and marketing costs) offer a strong alternative for import substitution to rice and wheat.

Dietary diversification in urban areas, including increased consumption of meat, dairy products occurs when these non-staple foods are available and prices are low (Camara 2004). With further income increases, most of the incremental income is spent on livestock products, while the amount spent on grains also increases. This is in line with international experience and suggests high income elasticities for livestock products, whereas higher-value cereals play an intermediate role (ReSAKSS 2008). In other words, the relatively high income elasticities for food suggest that in the initial stages of growth, the demand for food will continue to grow rapidly, especially for vegetables and animal products. But this will also affect millet-sorghum and maize to the same extent, as a result of the potential linkages between livestock and cereal value chains. Therefore, demand for dry cereals might increase the most in response to marketing development, scaled-up processing and improved circulation of market and consumers' information between the upstream and downstream parts of the value chain.

The overall pattern is that demand growth for dry cereals is huge provided that processing is sufficiently stimulated for key value-chain outlets such as prepared food, animal feeding (poultry), breweries and blended flour for pastries and restaurants.

In this context, national and regional public and private actors will be challenged to address many key issues including:

- driving down the real price of food to consumers (a major determinant of wage rates, real incomes and food security in poor countries) as an input into sustained economic growth and employment in the rest of the economy;

- stimulating the growth of small-scale, peri-urban/urban processors with convenient value-added products;
- providing an enabling environment for large-scale processing industries in key sectors (e.g. rice, vegetable oil and dry cereals) to compete with food imports; and
- introducing and harmonizing adequate regional norms and standards for high quality, safe, traceable agricultural and food products.

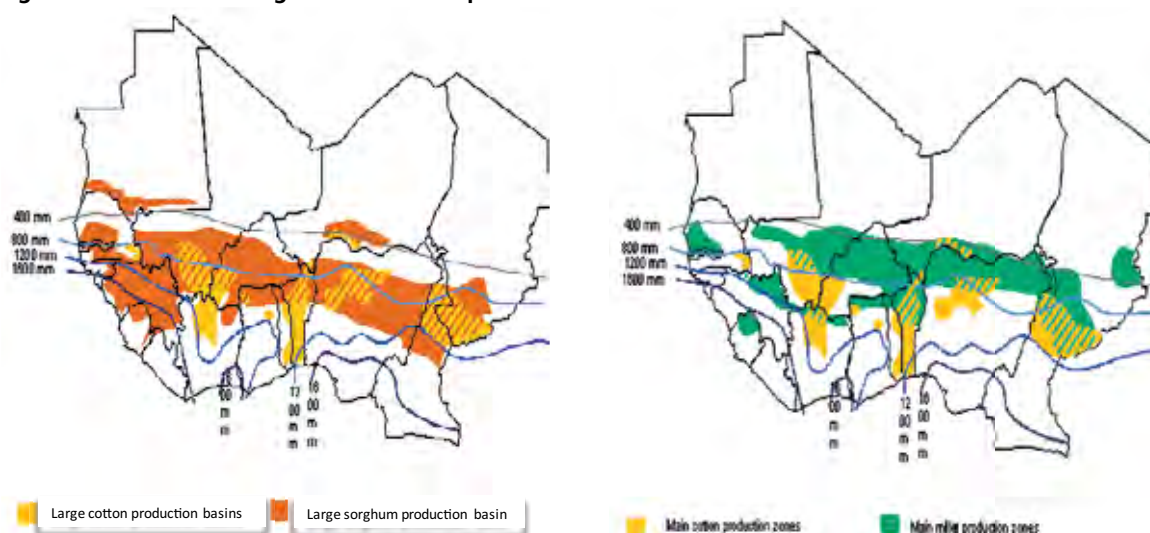
These challenges are especially applicable to dry cereals in Sahelian countries like Mali where enhanced productivity and closer food market integration can affect food prices and agricultural growth in positive ways. The next sections reviews the characteristics and the environment of the millet-sorghum value chain in Mali before looking at policy and operational interventions which are susceptible to spur value-chain development.

3. Sorghum and millet value chains: status, constraints, and opportunities

3.1 Production

Sorghum and millet are grown in the cotton-cereal production basins of Mali and belong to traditional cotton-cereal farming systems. In semi-arid West Africa, cereals (millet, sorghum and maize) tend to be grown in rotation systems with cotton. Sorghum is more closely tied in rotations with cotton than millet which is more tolerant to drought and can be found farther north than sorghum or maize (figure 1).

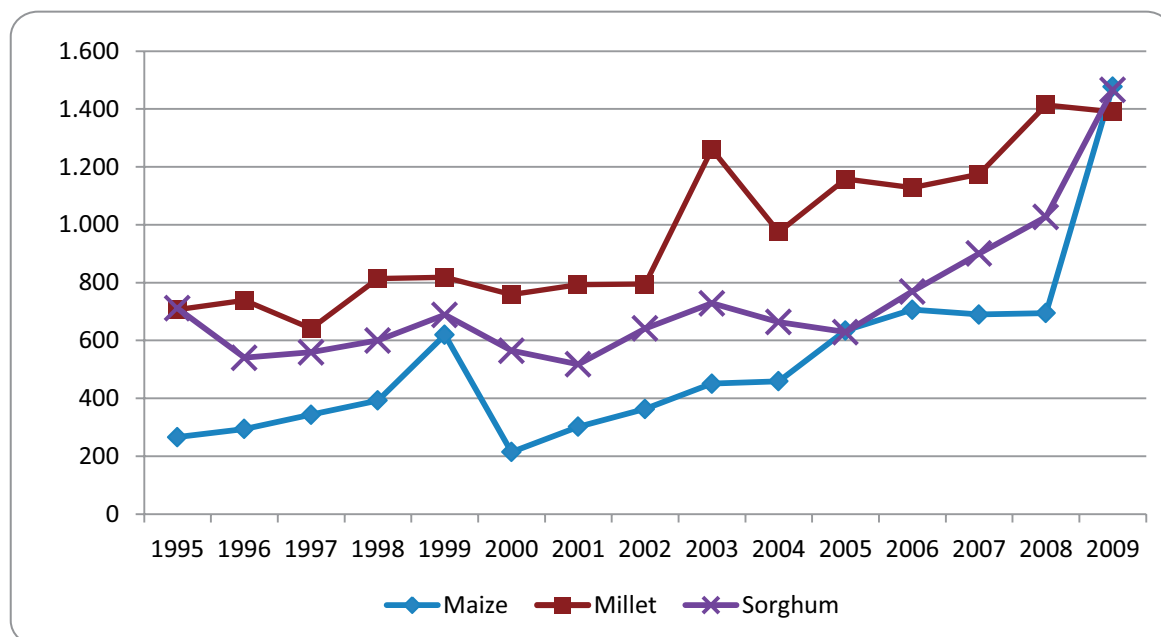
Figure 1. Location of sorghum and millet production basins in West Africa



Source: Atlas de l'Afrique (2000), SWAC (2007)

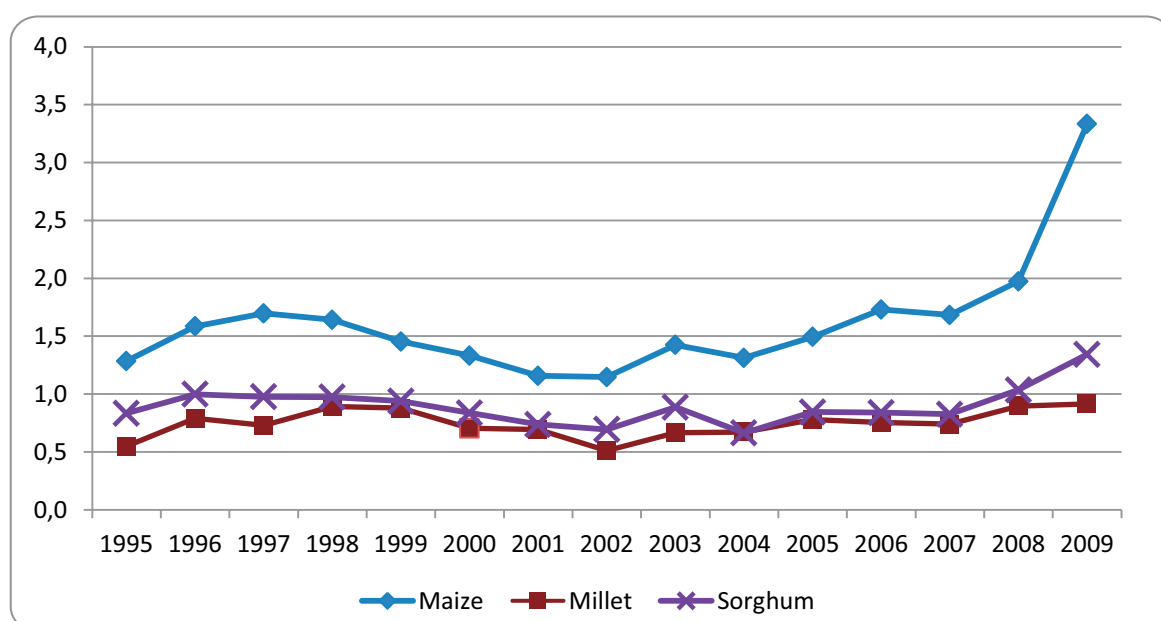
Both sorghum and millet production in Mali have been stagnant during much of the 1990s and began only trending upwards as areas for these crops increased at the expense of cotton (figure 2). There is no significant change in yields for these crops for the last 20 years. Low average sorghum and millet yields (between 0.5 and 1 tonne per ha) (figure 3) is symptomatic of the total neglect shown for these crops despite the existence of improved varieties and management techniques that can easily double or triple average yields. Microeconomic constraints for technology adoption, market failures, and the lack of public and private resources for more professional extension services are the main drivers.

Figure 2. Cereal production patterns in Mali in tonnes



Source: FAOstat (2011)

Figure 3. Crop productivity patterns in Mali hg/ha



Source: FAOstat (2011)

3.2 Input markets

The persistent low yields of sorghum and millet are primarily due to the lack of input use and the continued practice of traditional and minimum input production techniques. Producers face difficulties in accessing inputs due to liquidity constraints and a lack of accessible credit because of low yields, high weather and market risks and high variability in surplus production. This is especially true for cereals grown outside cotton areas where producers could use provided cotton inputs to benefit cereals. Even in the case of cotton, reforms have led to a reduction and rationing of input credit together with a rise in input prices and better control and monitoring of repayment issues. All of which made access to inputs more difficult.

Because of the limited marketability of sorghum and millet and lack of value chain linkages with agro-industry, sorghum and millet usually do not have access to interlinked agreements such as outgrower schemes nor under contract farming that would facilitate input access. Typically microfinance institutions (e.g. village banks and producer organizations (POs)) are very limited and do not meet the required needs.

Another key step in the development of sorghum and millet value chain is the presence of a thriving seed development program. Currently the seed market remain severely underdeveloped where few certified seeds are sold to farmers in local markets, and most farmers relying on one another or themselves for seed (Diakit  2006). The dominant source of certified seed is the national seed service. Certified seed is multiplied by contracted farmers and seed producer groups, and supplied to farmers through farmers' associations, development organizations, and extension services. The informal sector supplies farmers with non-certified seed directly and indirectly through village grain markets. There is no consensus about whether it is lack of effective demand or supply that constrains farmer use of certified sorghum and millet seed, but researchers generally conclude that the process of certifying seed is too lengthy, some mechanism must be established for production and trade of locally-adapted landraces, and Mali's highly structured farmers' associations could play an even stronger role in testing and promoting demand for certified seed. Recommendations have included the use of small packs and seed auctions where market infrastructure is sparse, and in more commercialized areas, involvement of agro-input dealers, shopkeepers and traders. Still, estimated adoption rates for improved millet (under 10 percent of crop area) and sorghum seed (under 20 percent of crop area) could be as high as can be expected in this challenging natural environment and institutional context (Diakit  *et al.* 2008).

Overcoming the perennial credit constraint for smallholders

Alternative finance and credit options are urgently needed. This includes microfinance institutions or involvement of village rural or development banks to step in to fill the void as they are more aware of rural farmers' specific needs. Further, new arrangements could also be applied to input providers and producers (e.g. barter schemes).

Poorly functioning input and credit markets are the result of high transaction costs, repayment problems due to asymmetric information and low technical support. Such roles could be fulfilled by extension services and more rural infrastructure investments (both hard - e.g. roads/electricity - and soft - e.g. market information services) but they lack the necessary funding following the state retreat in the aftermath of structural adjustments.

Alternative finance schemes have emerged in recent years to fill the credit gap. Interesting examples in the region are provided by the tight relationship between farmers' organizations and newly established rural

microfinance institutions (e.g. the Kafo Jiginew in Mali). These institutions have helped farmers obtain a bank account (the “*bancarisation*”), secure their savings and access credit for productive investments and input needs. Cotton farmers in Mali can now access input credit or equipment credit out of cotton firms’ outgrower schemes.

For cereals, an interesting approach comes from cereal banks that have allowed better access to input credit, more remunerative output prices (with economies of scale and better bargaining ability over traders or millers), stabilization of local prices through inventory credit, more mutual learning, collective processing and sometimes self-marketing of miscellaneous products from the farms.

Box 1. Warrantage as a viable instrument for credit facilitation

Inventory credit is often set up by a NGO which arranges a commercial credit facility between a newly formed cooperative and a lender. After harvest, the borrower deposits its grain under predetermined quality standards in a community storage facility. A quality control committee then supervises storage treatment and the issued certificate is presented to the lender. Then the loan is granted to the cooperative, pegged at 75 percent of the prevailing harvest time market price. Managers monitor market prices, quality of stored products and market supply to determine the best time to release the stocks on the market. Sales are used to pay back the loan with interest of 30 percent, storage costs and the net proceeds given to the farmer. The use of inventory credit (i.e. *warrantage*) has been shown to be an effective market and institutional arrangement that can facilitate farmers’ access to credit. Under *warrantage* farmers can sell their products later in the season and retain ownership of their harvested crops. *Warrantage* is also a way to improve communication and linkages with other stakeholders of the emerging value chain.

Analyzing constraints to adoption of improved technologies

Many studies have examined the causes of the lack of input uptake by sorghum and millet producers. Ahmed, Sanders and Nell (2001) reviewed the technology introduction experiences in Sub-Saharan Africa and witnessed few successful cases. Under the prevailing growing conditions, earlier cultivars that better resist droughts do not exhibit higher yields. Hence, better seed technologies have to be combined with higher organic and inorganic input use and irrigation schemes (such as the Gezira scheme in Sudan for the HD-1 variety). The low intensification of agriculture in the Sahel generally results in low, but significant, returns on variety creation, except for some cases³ with low rates of adoption.

Vitale and Sanders (2005) document the case of Mali, where new cultivars have been associated with animal traction and ridging, thus enabling water retention. The adoption of these cultivars together with mechanization was rapid, while fertilizers and ridging were not because of strong liquidity constraints and a lack of access to capital (i.e. a low-performing informal rural finance sector and low involvement of the formal sector).

Abdoulaye and Sanders (2005) identify the basic determinants of fertilizer use in Niger (but which are easily applicable to the case of sorghum and millet in Mali) with two stages of improvement: (1) moving from manure to classic inorganic fertilization; and (2) moving to micro-fertilization and side-dressing techniques. Controlling

³ See for example, the successful introduction of S-35 in Cameroon.

for the value-to-cost ratio for millet (price incentives), the authors show that learning and experience foster technological adoption according to risk-aversion and liquidity constraints. Demonstration trials have helped farmers turn to modern techniques. Incentives are poor for sorghum and millet because of low value-to-cost ratios, while they are high for maize, rice and cotton. The study also showed that constraints on incentives arise from high marketing margins and transaction costs while capacities are lowered by poor infrastructures and a lack of human capital (capacity constraints). Fertilizer use was also found to be covariant with roads and rainfall. The study concluded with a strong recommendation linking technology development with better extension services, quality control to foster fertilizer use on higher-value crops, and reduce risk for lower-value ones.

In a follow up study, Abdoulaye and Sanders (2006) show that adoption of improved fertilizer techniques can be fostered under different options. In the case of millet, they use the marketing strategies developed by the INTSORMIL project to raise the profitability of millet production and incentives for fertilizer use. However, without a clear policy framework that enables farmers to make profit during adverse years (when prices partly recover production losses), new incentives are unsustainable and investment in technical change remains unsecured. Indeed, assuming lexicographic preferences of farmers (with income and subsistence objectives), the marketing strategies of INTSORMIL that aim to reduce between- and within- year price variability – namely, the widespread use of inventory credit ⁴ and agro-processing of millet – would foster the introduction of technology. But this could be sustainable only if there is a change in public policy with a reduction in cereal export bans in adverse years that would dramatically increase farmers' revenues.

Box 2. INTSORMIL Project and improved sorghum and millet technologies

A breeding research program for sorghum and millet has been carried out through the International Research Consortium on Sorghum and Millet (INTSORMIL) programme – one of the most visible programs dedicated to sorghum and millet in the region. The successful program INTSORMIL enabled the development of a number of early cultivars as well as new improved techniques such as improved water-retention (i.e. organic fertilizers with manure or compost).

Beside technology development and testing production technique, the INTSORMIL project also seeks to foster technology transfer to producers to obtain clean millet and grain sorghum of good quality. This has been led by the food industry's increased demand for steamed millet in yoghurt, couscous, arraw, degue, sankal and thiackri, and the rising demand for poultry and poultry feed with sorghum. Sorghum is toxin-free, which is an advantage over maize for poultry feeding. A key component is to expand the links between producers and processors.

Marketing strategies intended to increase technology adoption become profitable only when there is sufficient market demand. Market alternatives have to be clearly elucidated under the pattern of local, regional and international demand. For instance, technology introduction is clearly demand-driven for cotton and, to a lesser extent, for maize and some niche crops, such as green beans, flowers and pigeon peas. Irrigated rice in Mali does not experience any problems with price collapses because of strong market integration and internal organizational arrangements; the production benefit is either from export, parastatal arrangements or local markets. Hence, market integration is very important since it can help secure production and ensure technology adoption.

⁴ Inventory credit is believed to have a within-year smoothing effect in the mid-term (i.e. 10 years) if it is widespread among farmers. Otherwise, it helps farmers benefit from higher grain prices later after harvest.

According to Vitale and Sanders (2005), the yield frontier is further from actual productivity levels for sorghum/millet than for maize or rice. Input use is not incentivized because of low prices, political bias against food crops and poor marketing performances and opportunities, sustained by discriminatory policies. Hence, allocation of inputs is inefficient because of distortive policies, and this is also combined with technical inefficiency because of low adoption rates of existing technologies.

3.3 Processing

Apart from milling, there is little processing for sorghum and millet. However, there has been new attention to the potential of millet and sorghum production in the Sahel recently. Some studies have shown that new marketing strategies (such as processed sorghum, animal feed or already-prepared millet meals) could be profitable and that there could be in turn an increase in farm productivity. The industrial poultry sector for broilers is not fully developed in Mali⁵, most production of broilers is artisanal.

Recently, there has been some development in agro-processing, especially around Bamako, with the emergence of small and medium enterprises (SMEs) many of which are run by women. Women play an important role in the small scale semi-industrial processing of cereals notably sorghum and millet based food products. Women are very active in various production-related capacities and income-generating activities in horticulture, bakeries, food processing, grocery, and more recently they have been involved in the promotion of millet and sorghum through marketing and processing. Among the processed food showing up in the market we find flours, broken grains, semolina and other by-products like fodder, straw and chaff. These are supplying urban markets like Bamako, but also Koutiala, Sikasso, Ségou, Mopti and Kayes. These are the first sorghum and millet derived food products that can play an important role in fostering demand-driven growth in the sorghum and millet value chain⁶.

There are three main problems with the quality of the raw material originating from sorghum-millet, in descending order: (1) a low degree of cleanliness; (2) heterogeneity in grains; and (3) unstable/insufficient quality. For traditional processors, problems of grain quality are even more important than their heterogeneity. A high percentage of impurities can be attributed to a lack of appropriate post-harvest handling techniques in storage and conservation as well as to a lack of quality certification systems in domestic markets.

Consistent product quality is necessary to develop customer loyalty. One of the main difficulties for processing is to reproduce similar quality over time, since quality is affected by a lack of established standards and non-standardized processing techniques, such as a lack of control about choice of ingredients, the heterogeneity in raw material and a lack of measuring instruments (e.g. pH-meters, scales).

⁵ The exception is the commercial poultry farm SODOUF, with 3 000 reproducing hens and capacity for more than 45 000 incubating eggs (but no slaughterhouse).

⁶ Dry cereals are consumed in many products and by-products, especially in rural areas. Traditional meals can be adapted to the urban background, provided constraints to processing and marketing are addressed. The most consumed form is the cooked paste. The cereal, whether hulled or not, is milled and the flour is cooked and consumed as a paste with sauce. Sorghum whole flour can be fermented and consumed as a paste or boiled. Tô, a paste of hulled cereals, is the traditional meal in Sahelian countries, especially in Burkina Faso and Mali. Other meals, such as grits, are prepared by steam cooking hulled cereals and are consumed as couscous or as a mush. Flour can be rolled, cooked and consumed as a couscous (semolina), and maize and sorghum can be germinated and floured into alcoholic and non-alcoholic beverages (i.e. lactic or alcoholic fermentations).

Fermented food products is a major consideration in consumers' tastes in major cities in West Africa. In Bamako, but even more in Cotonou (Benin) or Abidjan (Côte d'Ivoire), 30 to 45 percent of cereal products are fermented and 85 percent of those are produced by artisanal processors. Cereals, however, do not include essential amino acids such as lysine. Although fermentation is the most cost-saving technique to increase cereal value, final quality varies significantly as a result of nutritional value, taste and other functional qualities of cereal products and uncontrolled natural fermentations. But natural fermentation is widely used in the observed marketed products (e.g. tchoukoutou, kenkey and dolo). Establishing controlled fermentation processes is thus a key challenge for small and medium agri-businesses (SMAs). Diverse tastes, smells and colours are important for promoting the consumption of local products, and this can be addressed by designing new products to promote new consumption habits. Marketing specialists and sociologists can collaborate to study new products that will better respond to consumers' preferences for convenience, conservation and safety while still remaining competitive.

Box 3. A public-private partnership to develop biofortified sorghum for West Africa – Is it the best solution to food security in the Sahel?

The African Biofortified Sorghum (ABS) Initiative is a Private-Public Partnership that aims to improve the nutritional value of sorghum by enhancing the content of some essential nutrients (like zinc and iron) known to be deficient in this crop. The potential benefit for the West African population is enormous given the reliance on over 100 million of people on sorghum as a staple food crop, especially in the Sahel. The project has made substantial investments in R&D to develop new varieties with increased zinc and iron content and improved protein digestibility (not easily altered by cooking).

The partnership has initially involved the Bill and Melinda Gates Foundation for financing, the Kenyan NGO Harvest for managing and for leading the consortium, and the Pioneer seed company for seed development, technology transfer, and capacity building. Moreover, the initiative is expanding its scope with the support from Pioneer and the Howard Buffet Research Foundation to improve the content of Vitamin A as well as expand the consortium members (African universities and governments, and private industry), develop seed production and product dissemination through both farmer and commercial systems, and foster enterprise-driven product delivery through food and beverage processed products.

Yet the ultimate success and sustainability of the initiative hinges on resolving a number of potentially serious obstacles. There is first the acceptance of transgenic products- an issue that is still much contested at global level. Second the difficult task of ensuring strong biosafety safeguards in an environment known for weak regulatory enforcement. Another concern is how accessible such improved varieties will be to small scale producers who typically face difficult odds in accessing credit or inputs (fertilizer- or improved seeds) to improve their productivity. Access to credit is conditioned in part by reliable marketable surplus which is linked to high average yields. Yet these conditions are often not met by sorghum producers currently. Faced with this situation, the question is whether it would be better off for food security and population nutrition to double yields, generate marketable surplus and hence more income to buy more food, or go through the route of fortified seeds which may not be easily accessible to small farmers because of cause or lack of availability- at least at the scale required to make a difference within the region.

3.4 Marketing

Most sorghum and millet production units are small family farms subject to capital and assets constraints. These staple crops are largely self-consumed with only about 30 percent of production marketed in local and urban markets. Storage is mostly used for producers' own use, rather than for market. To address cash needs, farmers sell even in years where there is no surplus. Farmers are forced to sell at harvest to pay-off their debts or family obligations.

Marketing channels for sorghum and millet are varied and include direct sales to final buyers, sales to retail markets; sales to wholesale markets or to urban traders (often at fixed prices) or to visiting traders in the village. To get rapid payment, sales can also proceed through marketing relationships with small or large-scale mills. Commercial mills are a possible outlet, but farmers need to deliver large quantities and organize transport to get higher returns than if they sell to visiting traders. Furthermore, farmers need to ensure that their production meets quality requirements, which is another source of risk.

Beyond the farm gate, market coordination for cereal commercialization occurs through sales contracts between local traders and wholesalers in central markets (RURALSTRUC Mali 2008). More than 50 percent of wholesalers use written contracts with their customers, but they use oral contracts with their providers (e.g. local traders and collectors) because there is greater trust and fewer security problems. This is because most wholesalers use their own personal networks for purchases, while they contract with many different retailers and also institutional buyers on the sales side. For dry cereals (maize, sorghum and millet), most wholesalers (about 70 percent) and retailers (67 percent) have their own network of collectors (OMA 2008).

Quality standards and enforcement along the sorghum and millet value chains is highly uneven. At the production stage, quality enhancing techniques (i.e. varietal purity, post harvest techniques) are rarely practiced. Product quality (grain size, uniformity of products, purity, taste and odor standards, and water composition) seems to be handled mostly by buyers, especially industrial large scale or institutional buyers (World Food Program, or state agencies). But in general, quality assurance is not yet developed in local or even urban markets, giving the final consumer the task of upgrading the quality of the purchased cereal crops. This is a serious hindrance to the development of sorghum and millet value chain and a significant demand-suppressing factor.

Standardization and certification are necessary to promote the development of downstream sorghum-millet value chains. Standard setting should aim to satisfy international norms (e.g., aflatoxin) of production and sales. Several studies have pointed out numerous constraints which have to do with a lack of norms, information, training and communication. Compliance with quality standards requires time, human resources, capital, physical investments and the involvement of all direct and indirect stakeholders in the value chain. Capacity-building is essential in the areas of standardization, quality control and promotion of agricultural and agri-food products. Quality improvements (e.g. by using mechanical threshers to decrease the rate of impurities) in raw millet and sorghum enable producers to meet higher quality standards and thus set higher prices and enhance their profitability. An enabling business and market environment is essential for promoting high quality standards.

Distribution of margins among the main stakeholders always leaves a constant share for farmers, but the producers' share has decreased somewhat since 2005. The margins for intermediate actors between producers and consumers (e.g. traders, processors and retailers) have constantly increased; this can be attributed to marketing costs (e.g. transportation and credit rates) which have remained high.

Sorghum value chain can develop much further because of more rural demand, fewer required inputs, less costly processing and better suitability for the animal feeding industry. In Mali, given the high production potential for sorghum and millet, one potential market strategy is to increase capacities and market functioning in the sorghum commodity chain

In Mali, there are three phases in the commercialization and marketing of sorghum-millet throughout the year: from May to August, provision is slowing down and may stop; from September to November, there is a slow and careful revival of supply; and from December to April, there is a continuation/consolidation of supply/provision operations. The same timing roughly applies to maize (plus or minus one month in between each period).

Heads/chiefs of networks finance cereal purchases through their collectors/traders. They reach agreement with them about cereal quality and price levels at which purchases can be carried out in local markets (primary supply markets). Those prices are retained if and only if there is no competition among traders' networks or importers from neighbouring countries. Prices in local rural markets are influenced by the degree of competition between traders and marketing networks and by the relative weight of cereal demand. But in the largest rural markets (i.e. regional ones), opportunities for purchases from institutional actors (e.g. non-governmental organizations (NGOs), like the Food Products' Directorate (*Office des Produits Alimentaires du Mali* – OPAM) and the World Food Programme (WFP) or possible export outlets are key determinants of price formation. In general though, the influence of wholesalers is well-established on the market, through possible limited competition, personal networks and collusion.

Box 4. Cereal fairs (bourses aux céréales)

Cereal fairs bring together all major cereal stakeholders (e.g. POs, wholesalers, traders, technical partners, processors, transporters). This event is an opportunity for them to network by enabling the emergence of business relationships between given production areas and processing units. It is also an opportunity for wholesalers to gather information about the level of inventories, supplies and demands. Cereal fairs are of increasing interest and are known to all value-chain stakeholders.

Cereal fairs are organized by *Afrique Verte* network and APCAM (*Association Professionnelle des Chambres d'Agriculture du Mali* – *The Professional Association of the Chambers of Agriculture of Mali*). The success of the cereal fairs at local level prompted interest at scaling it up at country level. The scaling up initiative is co-organized by *Afrique Verte*, APCAM, the Union of Cooperatives (Faso Jigi), and Sasakawa Global 2000, a non-governmental programme.

The main advantages of such an approach lie in the concentration of supply and demand over a short period and more transparency in market transactions. Cereal fairs also offer opportunities for business contracts and more equitable prices and standardization of marketed products. Attendance by institutional operators contributes to stabilize markets. This approach also serves as a means to better record market prices and feed into market information services.

Transactions recorded during the fair of Ségou reached 12,000 tonnes in 2009 and 15,200 tonnes in 2010. Altogether, this amounts to 2-3 percent of all marketed production over the agricultural campaign. This has not had a significant influence on national prices, greater participation from public institutions could change this.

Box 4. Cereal fairs (bourses aux céréales - Cont.)

The fair consists of three main phases: (i) pre-fair organization at the local level in order to stimulate grouped marketing and collective supply from POs in order to increase their negotiation/bargaining power; (ii) preparation of the event which involves much promotion and advertising; and (iii) holding the fair with the participation of POs which hold large inventories, wholesalers, cereal transporters, public institutions (e.g. Office des Produits Vivriers du Niger, WFP) and official representatives and other involved organizations.

The fair lasts from two to three days. The first day is for disseminating information about the output realization of the campaign and for the stakeholders to observe one another and compare their bargaining power. Possible prices and quantities are discussed, but not decided upon. The following days lead to contracts and purchases between stakeholders, with POs providing the supply and other stakeholders, including cereal banks, formulating demand. While not mandatory, those contracts are recorded by *Afrique Verte* and overseen until their final execution.

4. Policies and initiatives for competitive and inclusive sorghum and millet value chains

4.1 Cereal market liberalization and renewed policy support

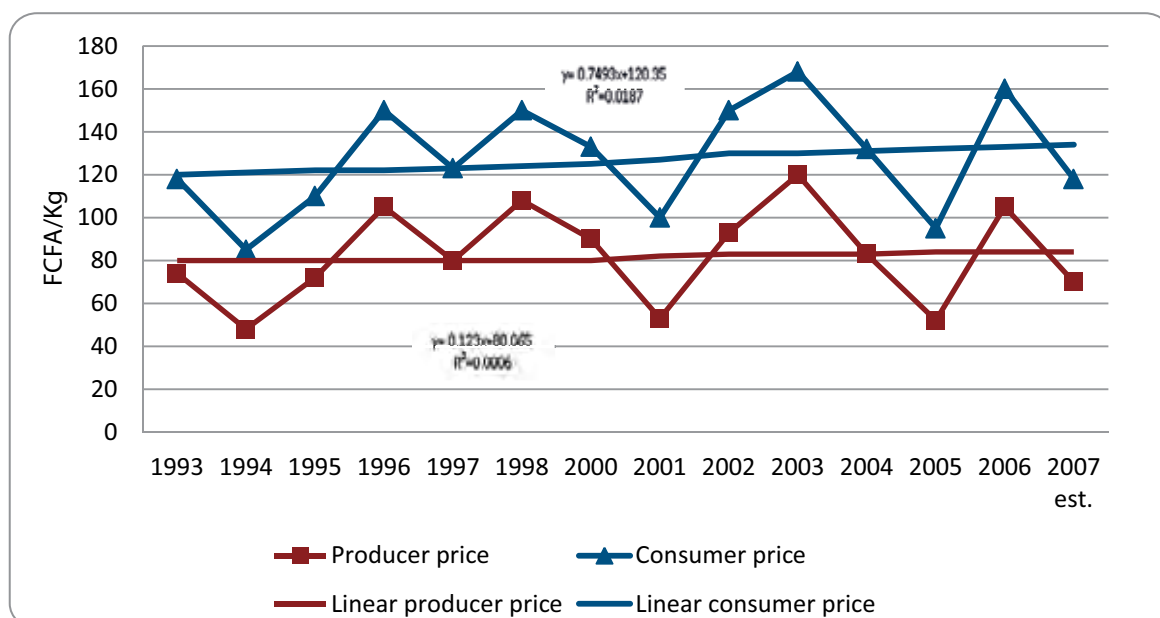
Cereal markets in Mali have been liberalized since the 1990's with the dismantlement of former parastatal marketing boards and cereal *caisses de stabilisation* (stabilization funds). With liberalization, private actors entered the cereal marketing, including large and medium size wholesalers, several of which were operating illegally before reform. Legalization of private traders which improved (private) storage infrastructure and helped reduce transaction costs for grain purchases. However, entry was still constrained by trade risks and a lack of working capital and the persistence of ineffective regulatory institutions to enforce contracts (See Staatz *et al.* 1989 for more details).

Following cereal market liberalization in Mali, prices exhibited on average a slow decrease from 1986 to 1999 (as evaluated from the impact of the *Programme de Restructuration des Marchés Céréalières* (Revamping Cereal Markets Programme - PRMC), both in nominal and real terms (Dembélé *et al.* 1999), but have since exhibited high interannual variability, without any significantly detectable trend. Figure 4 shows producers' and consumers' sorghum prices in the country while figure 5 shows producers' and consumers' sorghum prices along the Koutiala-Bamako axis. Co-movement between producer and consumer prices is clearly evident from the two series, with the producers' price accounting for a roughly constant share of the consumers' price in Bamako.

Gross margins fluctuate from year to year, according to product types and geographic areas. In general, margins are lower in high production concentration zone (due to more competition and scale economies) and much higher in landlocked ones with low production. Since the devaluation of the *CFA Franc* (*Communauté Financière Africaine- African Financial Community*) in 1994, overall competitiveness

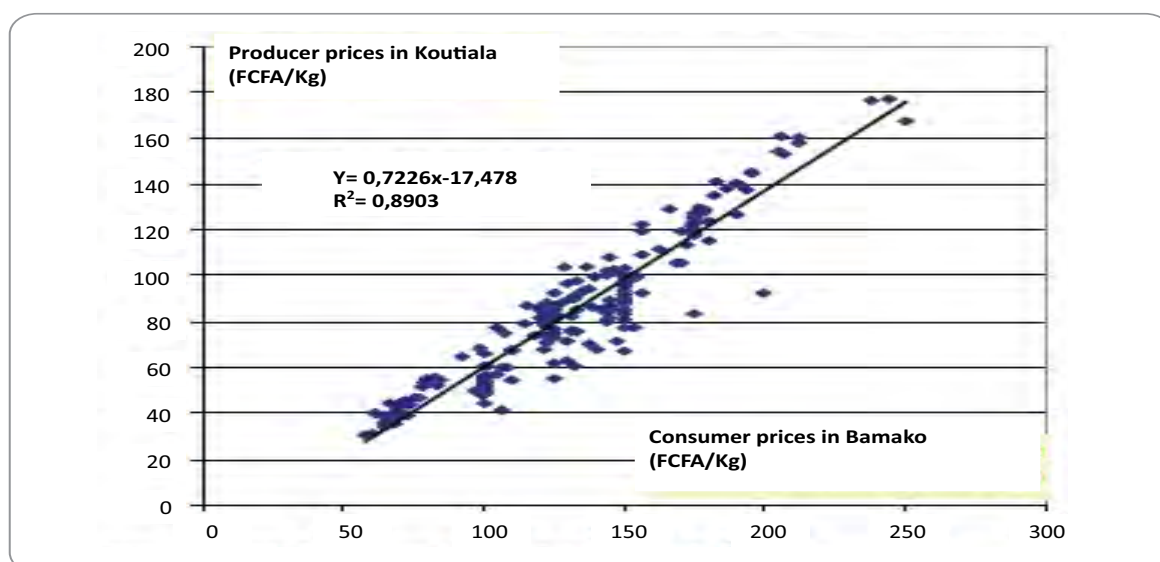
of “dry cereals” (i.e. maize, sorghum and millet) has improved in local and regional markets⁶ in Mali following liberalization. Demand from neighbouring countries and processing units have scaled up in both countries (Diakit , 2006).

Figure 4. Average monthly real sorghum prices FCFA/Kg, 1993-2007 (Base: 2000)



Source: RURALSTRUC Mali (2008) from OMA database and GDP deflator

Figure 5. Empirical relationship between producer and consumer monthly sorghum prices, in current FCFA/Kg value, 1993-2007



Source: RURALSTRUC Mali (2008) from OMA database

⁶Diakit , L. 2006, p.136 : « Following devaluation, the observation is that producers earn positive margins despite increase transport costs. This was made possible thanks to the competitive gains of national cereal products». See also K b  *et al.* 2005.

There are also seasonal price variations which are not shown in Figures 4 and 5. These have to do with variations of supply (mostly correlated with agricultural weather conditions) and availability, as well as with the state of inventories and storage. Cereal prices follow a similar intra-annual pattern every season: they begin at low levels at harvest and then increase, reaching maximum values during the lean period and collapsing during harvests. This pattern is attributable to climatic factors and low levels of storage among producers. Storage made by traders and wholesalers increases marketing costs and leads to increasing prices over the season (together with a decrease in supply). Hence, cereal prices can be multiplied four-fold over the agricultural season.

Most of the price fluctuations can be attributed to the drivers affecting production uncertainty (e.g. weather and other agricultural inputs), rather than to the functioning of liberalized cereal markets, according to several studies (see RURALSTRUC, 2008). However, some peculiarities of grain markets do play a role, such as narrow markets and significant transaction costs. Those factors have limited the liberalization process' impacts on price stabilization, given the fact that incentives for storage and conservation have not worked well. Even if cereal bank projects have been conducted in several villages, their aim has been to improve local food availability rather than better downstream development of the value chains. The latter would be essential to induce more incentives for storage and processing, and in turn, induce price stabilization (see the *Initiative Mil-Sorgho* (IMS) project in Mali for downstream development promotion). However, the Mali Cereal Marketing Support Program (*Programme d'appui à la Commercialisation des Céréales au Mali* – PACCEM) project has produced interesting results that need to be carefully characterized and scaled up.

4.2 Trans-border trade and the necessity to remove its barriers

Another source of demand growth for Mali sorghum and millet is the expansion of transborder trade through the removal of trade barriers. Potential exports of high quality sorghum and millet exist for Niger and Senegal from Mali. High transaction costs, risks and uncertainty continue to hinder greater trade possibilities in cereals in the region. A USAID study (CARANA corporation, 2011), shows that 57 percent of final market price is represented by transport and logistics costs (for sorghum and millet on the Sikasso-Dakar corridor, and for millet on the Koutiala-Bobo-Ouagadougou one). Moreover, approximately 33 percent of end market price is represented by "extra costs", or those costs considered as unjustified, inefficient or too expensive when compared with an optimized scenario. The main drivers of these high transport and logistics costs are found to be inadequate farm logistics and market logistics equipment and processes, as well as expensive and inefficient transport services. The USAID study also finds that cross-border flows of millet and sorghum are constrained by these high costs, and thus dependent on sufficiently high price differentials between regional markets to sustain traders' profit margins.

However, the potential exists to remove many of the inefficiencies and extra costs in the value chain system, improve economic incentives to trade, and increase regional price arbitrage. A number of interventions would be required to reduce trade costs including a uniform and transparent quality certification measures, open and accessible market information (including price, supply, quality requirements and other trade requirements), better provision of extension services, and enhanced producers' capacity for group marketing.

At the regional level, the guiding agricultural development strategy is the Economic Community of West Africa Agricultural Policies (ECOWAP) which derives from the CAADP framework, initiated since 2003 as part of the New Economic Partnership for African Development (NEPAD). The ECOWAP aims

to achieve economic integration including harmonizing trade policies to facilitate the circulation of commodity products and inputs within the ECOWAS region.

Transport costs are a real challenge, notably for landlocked countries such as Mali. This is related to trade issues. While domestic markets seem rather integrated (according to estimations performed by Araujo Bonjean *et al.* (2008) on price gaps between and among central and local markets) for millet, there does not seem to be regional integration, which points towards a transborder effect. Hence, there are specific transaction costs imputable to transborder trade, which are also a strong impediment to intraregional trade and the spatial efficiency of markets. Those problems are tackled in more detail in the following subsection.

Cereals have a low value/weight ratio, often resulting in high transport costs. They also exhibit significant price variability at the producers' gate because of low market integration between surplus and deficit periods. This is also the result of well-known short-run low supply and demand elasticity. Hence, the transport cost component of cereal marketing is often substantial, which limits further market integration and increases transaction costs.

Two main barriers to intraregional trade can be identified about market integration (and the lack thereof) in West Africa. The first one relates to costly transportation and high transaction costs, and the second arises from inconsistencies in trade policies (e.g. export bans for food security purposes that do not allow performing producers to benefit from remunerative prices) and non-tariff trade barriers.

Another avenue for further integration is the establishment of regional market information systems. The Market Information Systems and Traders' Organizations in West Africa (MISTOWA) project (FAO, 2007) is one of the main tools for the ECOWAS region to generate and disseminate market information. Under this program, market information is generated for use by trade partners to enhance production, handling, credit, trade and value-generating services such as processing, packaging or quality control.

4.3 Critical role of producer organizations as a market agency

Enhancing the sorghum and millet value chain competitiveness and insuring greater smallholder inclusiveness necessarily requires strong and functional producer organizations capable to liaise between producers and market. POs can play a critical role in helping farmers coordinate their marketing strategies and enhance farmers' participation in the market. In Mali, several producers' federations are being established or are repositioning themselves to become more market-oriented and to focus their efforts on providing economic services to their members. Many producer organizations specialize in marketing cereal, including rice.

Since the end of the PRMC, POs' financing of cereal marketing through the national agricultural development bank (BND – *Banque Nationale de Développement Agricole*) has been severely curtailed. Private banks lending to producer organizations including many risk-reducing measures including requiring a minimum of three years' experience in marketing, physical collateral under village collective responsibility and an annual 12 percent interest rate. These requirements are often too prohibitive for small scale farmers or their organizations.

In many cases, access to credit by POs can only occur through a combination of internal saving and external credit. This presupposes fully functioning producer organizations with a strong internal coordination and high managerial capacity. In the Koutiala region, POs have developed internal saving

and credit systems often working with the microfinance institution Kafo Jiguineu. An example of successful producer organization using the combination of savings and credit to assist its members access to input and carry out collective marketing is given by ULPC (*Union Locale des Producteurs de Céréales de Dioïla* - Local union of cereal producers), which represents around 1700 producers of cereals and legumes, 25 percent of them being women. The union provides its members with fertilizers and pesticides from its own funds and recoups the costs from farmers after harvest who pay in kind using a reference price which is calculated based on the average price in three villages, plus a premium. ULPC also borrows from banks (30 FCFA million (60,000 USD) in 2011) to purchase cereals from member cooperatives and managed grouped cereal sales and give higher prices to supplying producers, who also benefit from improved yields thanks to access to inputs and in-kind credit.

A number of factors account for the success of ULPC high level of internal coordination, managerial capacity and technical competency, which ensures the organizations access to credit from banks. Moreover, UPLC forged a fruitful direct collaboration with national and internal agri-research institutions resulting in a better alignment of research to farmers' needs.

Another successful case is Faso Jigi, a producer cooperative, established to carry out grouped purchases of inputs marketing of cereals on behalf of producer groups. At the beginning of the campaign, Faso Jigi offers a fixed base price for cereals (millet, sorghum or maize). In early June each year, it pays to the producers 60 percent of the base price for quantities it commits to deliver, which allows producers to finance their agricultural inputs, plowing and possibly hiring labor. After harvest, Faso Jigi pays the remaining 40 percent of the fixed price to producers after deliveries, but it deducts interest on the payment made in the first phase.

Management committees of each participating producer organization are responsible for collecting output production and for storage in village banks. The committees are also in charge of the transport towards secondary and central markets (e.g. Bla, Niono and Ségou). Collective supplies are marketed to local retailers and processors, and Faso Jigi also contracts directly with some of them. Faso Jigi also develops new marketing options and market valorization, as well as marketing channels in order to offer farmers price premiums. Grouped marketing ensures stable and remunerating incomes to farmers, which are spread over three periods each year, with possible bonuses. Faso Jigi marketed around 1,000 tonnes of millet, sorghum and maize in the last agricultural campaigns, in addition to large quantities of rice, shallots and onions.

Many other collective action organizations had positive outcomes, which shows the potential to scale-up production and marketing, as well as processing, within the millet-sorghum value chain.

4.4 Toward a strategy for competitive and inclusive sorghum and millet value chains

The following summarizes the structure of the millet/sorghum value-chain in much of West Africa and is quoted from the USAID study (Mamadou 2010):

- Value chain actors have limited market incentives—generally a result of governments' control of input markets and food aid programs—to invest in commercial millet/sorghum production, large-scale processing, and supply chain management practices.
- Growth in millet/sorghum processed products, although currently a small percentage of total consumption or sales of millet/sorghum has the greatest potential to transform the value chain and infuse inter-relations between actors with incentives for long-term, win-win cooperation.
- Unstable policy environment, notably the unofficial restrictions on cross-border trade in cereals that

are a component of governments' policies of self-sufficiency in food security items, prevents a more efficient and vibrant flow of information and cereals between surplus and deficit areas as they occur across the region.

- Weak organizational capacity among producers and other value chain actors limits the potential for improving trade relationships beyond being based on price-based, bulk sales to more transparent, cooperative long-term trade relations.
- High transport and logistics costs due to corruption and roadway checkpoint delays.

The sorghum-millet which is the basis for staple food in rural households in Mali can be a viable alternative to rice and wheat for urban consumers. But a number of constraints limits its competitiveness and impede the development of sorghum and millet value chains. Like most semi-developed value chains, sorghum and millet exhibit weak processing and packing activities while market is beset by large seasonal price variations that can be daunting and imputable to large variations in supply, quality availability and lack of storage. However, there is ample room for improving marketing using new information technologies.

One advantage for dry cereals is that their production relies on an efficient use of local resources (e.g. labour and capital) (Faivre-Dupaigre *et al.* 2006). Intensification of poultry and other short-cycle livestock production systems would also spur demand-driven growth. But most intensive production takes place in coastal cities where imported maize, rice and wheat or animal feeding competes with the cereals that are produced inland, such as sorghum and millet. Therefore, uniform trade policies and unrestricted regional trade and investment would be critical to unlock the potential of these staple value chains including sorghum and millet.

More transparent information on cereal markets would pave the way for more efficient markets. First, assessing national harvested quantities is difficult, in spite of performing agricultural surveys. A more daunting challenge is evaluating inventories, particularly farmers' inventories. As a result, there is great uncertainty about available quantities on the market (i.e. those marketed or possibly to be marketed), not to mention the influence of external markets and margins achieved by speculation.

Sorghum has a potential to meet greater food demand in rural and urban markets as well as the burgeoning feed market. Important prerequisites include improving farmers input access to boost yields, building up the required agro-processing infrastructure, and enhancing value chain linkages. A number of initiatives are being promoted to secure greater integration of sorghum and miller producers into value chains. One important instrument to improve market linkages is the use of producer-processor contracts. A typical example of such contracts is the outgrower scheme allowing participating farmers to supply breweries under contracts with sorghum. The pilot project funded under the Common Fund for Commodities (CFC) is applied in Ghana and Sierra Leone and its outcomes are also applicable to Mali. The basic objective of the project is to substitute imported cereals (such as barley) by locally-produced sorghum. Under the pilot project, the out-grower scheme turned sorghum production into a cash crop serving an established agro-processor. The success of the program necessitated private-led investment in warehousing, purchasing, treatment, storage and supply of sorghum. Under the program, new farming technologies have been introduced and are being implemented. Local and foreign varieties are being tested for adaptation as high yielding industrial sorghum (Deters, 2011).

Policy support is critical to reverse the long standing neglect toward staple crops in general and sorghum and millet in particular among the major crops grown in Mali. It is clear that private investments and a more actively engaged agro-industry in the cereal value chains can only occur under a favorable policy environment. Following the food crisis of 2007-08, Mali has recalibrated its rural development strategy

to include cereals more forcefully. Mali's Rural Development Strategy or SDDR (*Schéma directeur du développement rural*) has placed cereals, including sorghum and millet as among the priority areas, as part of the new policy framework for poverty reduction⁷. However, a review of the public expenditures patterns show that the practices still carry a serious anti-cereal and anti-sorghum/millet bias. Much of the agricultural and rural public investments devoted to cereals went mostly to rice with little to dry cereals like maize, sorghum and millet. More needs to be done to translate the objectives stated in the SDDR into reality.

5. Conclusion and policy recommendations

Sorghum and millet are two of the most critically important food security crops in the Sahel (15 countries comprising the CILSS group stretching from Senegal to Chad). Their adaptability to light soils and lower rainfall make them highly suitable when other crops are not feasible. Over 50 percent of the Sahel population depends on sorghum and millet as the primary food source. Yet owing to policy neglect (much of it due to bias toward commodities for exports or toward urban consumers needs) and the resulting lack of incentives, these crops are typically grown with little or no inputs and produce low yields, compounded by lower fertility soils. Consequently, these crops remain largely subsistence crops with limited surplus to market and lower market penetration compared to maize or rice. As a result, sorghum and millet value chains remain under-developed with little processing apart from small scale milling.

A detailed analysis of the sorghum and millet value chains in Mali helped identify the key constraints along the value chain and pointed to specific recommendations to rebuild these two critical staple food value chains. A coherent sorghum and millet policy and investment programme would target the following priorities:

- (i) Create the required market, price and credit incentives needed to increase adoption of improved technologies by farmers and to improve yields;
- (ii) Promote higher marketable surplus by subsidizing investments in producer-run storage facilities to improve marketing and introduce supply and price risk-management schemes;
- (iii) Provide subsidized credit and investments for small- and medium-sized agriprocessing units through public-private partnerships in agriprocessing mills (which use sorghum and millet in animal feed, as well as processed and semi-processed food and beverage products);
- (iv) Encourage demand for sorghum and millet food products by strengthening food quality control measures and supporting improved quality packaging through subsidized investments; and
- (v) Support the emergence of strong and market-oriented producer organizations for sorghum and millet by funding training and capacity based on need, and by subsidizing investments in storage and encouraging public-private partnerships involving producer organizations, finance institutions, and agriprocessors.

⁷ Note: this chapter was written before the political turmoil that befell Mali and the instability that followed since April 2012.

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Chapter 16

Enhancing cassava marketing and processing in Cameroon: Drivers, constraints, and prospects of the value chain

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1. Introduction

Cameroon's economy remains highly dependent on its agricultural sector which currently employs 68 percent of the national active labor force, significantly contributes to GDP, and provides 15 percent of public budget². Since the early 80s, urbanization has induced increases in the demand for food crops to which local supply has been rather unresponsive. As a result, market prices have increased.

Given domestic market failures, Cameroon remains vulnerable to world food markets volatility which has direct pass-through effects onto local urban markets because of high reliance on food imports. In 2008 for instance, the food prices crisis triggered protests and riots in Cameroon, as in its other regional counterparts: Burkina Faso and Côte d'Ivoire. Structural investments should be geared towards the commodity chains and agricultural sectors which have the potential to scale up staples' local supply in order to avoid risks of food shortages. Staples are the main food items for income and social classes which are the most exposed to food crises (i.e. poor urban dwellings). This chapter focuses on the cassava commodity chain which is the primary starchy food in southern Cameroon, and second at the national level. It represents around 8 percent of households' nutritional intake on average.

In order to strengthen food security, the cassava sector has recently benefitted from support provided by the National Development Program of Roots and Tubers (PNDRT) with the overarching goal to increase cassava production and consumption. Backed by IFAD, this 15 billion FCFA project has been implemented by the national government over the last seven years. Regarding cassava in particular, it has promoted a significant rise in production, channeled mainly through the supported producers' groups, with average farm yields having undergone a twofold increase from 10-12 tons up to 25-30 tons per hectare.

With regard to processing and marketing though, the results are less visible, due to the inherent difficulties to overcome logistical and quality constraints due to the rapid perishability of cassava crops. This lack of downstream development and linkages with the production stage of the value chain generates a significant bottleneck for the cassava sector with many potential implications in terms of poverty alleviation.

Coping with the above features, this chapter aims to examine thoroughly the key drivers and constraints of downstream development of the cassava value chain. Such downstream linkages of additional and significant marketing outlets with increased production should be adapted to the features of local familial agriculture through supported farmers' organizations and cooperatives. The study also identifies the main marketing constraints and inefficiencies for cassava raw products, processed, and by-products, and their income implications for local smallholders. Drawing on existing studies and evidence, additional fieldwork and several other evaluations, this chapter presents the main barriers and bottlenecks to scaled-up marketing, which would ensure more consistent income flows for local producers and traders.

This chapter is organized as follows. Section 2 is an overview of the Cameroon cassava value chain and its organization. Section 3 identifies and characterizes the main constraints and drivers of processing and marketing. The last section concludes and provides recommendations on the main drivers, initiatives, and policies to emulate in order to improve sectoral performance of the value chain, which would in turn benefit smallholders.

The institutional framework of the cassava value chain is the same as the one for the other agricultural commodities, with the central role of the Ministry of Agriculture and Rural Development (MINADER)

² Ministry of Agriculture and Rural Development (MINADER), 1999

partnering with other government bodies and ministries (trade, industry, finance, and other specialized entities). When a commodity sector is to be supported, the main strategies are materialized through development or launching programs (or a subset of projects). The PNDRT for instance seeks to induce increases in farm yields by distributing appropriate input package (seeds and improved varieties), facilitating market access, and relying on seedling and extension agents for technical advice to be delivered to the main targeted beneficiaries in villages and on local markets.

2. A general overview of the cassava value chain in Cameroon

2.1 Contribution of the cassava value chain to the agricultural sector

The current government strategy for agricultural development revolved around a more intensive-based agricultural sector, which is stimulated by dynamic and growth-generating value chains that provide employment: among them is cassava. Centering agricultural development around those value chains seeks to encourage inclusive value chain development at all stages (production, processing, marketing) up to the end products and markets.

Like other commodity sectors in Cameroon, cassava is characterized by complex marketing and processing channels, partly due to the different categories of stakeholders involved (and their outcomes), and due to the intricacies and overlaps between several industries (e.g. feed industry) or between the stages of a given commodity sector under the prominence of the informal sector. This results in a lack of reliable and consistent data, as revealed by the rural development strategy.³

The cassava value chain is of strong importance with regard to basic food intake of the population, representing 20 percent of cultivated land and around 46 percent of national food crop production. Besides, around 90 percent of producers are rural poor women. National production is estimated to be around 3.1 millions of tons in 2010 and has remained steady over the last years. Cassava is especially important as a contributor to food security in Cameroon because:

- Cassava products are components of basic food intake for 7 to 8 million people in Cameroon, mostly living in the 8 southern provinces (Nord and Extreme-Nord being exceptions), and cover around 8 percent of daily nutritional needs, lying just below plantain (9.8 percent) in the group of starchy food crops.⁴ At the regional level, cassava is the first crop in the category of roots and tubers that is produced to a large scale in Central Africa. It is by now a major component in fighting hunger and the food crisis (IITA, 1989).
- Cassava is highly climate and soil-tolerant regarding its yield performance and thrives in growing conditions in agro-ecological areas and seasons which would not otherwise fit the physiological requirements of other crops. Cassava does not require large amounts of inputs and fertilizers and is highly suitable for processing, which compensates for its high perishability as a crop. Caloric yields of cassava by land unit and growing time unit are very high and overperform those of other cereals and tubers. Regarding dry matter yields by land unit, cassava dominates the top ten tropical crops.

³ MINEPAT, Document de Stratégie de Développement du Secteur Rural, 2005

⁴ Feasibility study for an agro-industrial production unit of cassava products and processed products for daily food consumption (SNI 2009) p. 13.

Cassava is the first consumed staple in Cameroon. The way it is consumed (processed, prepared, packed) is heterogeneous across cities, ethnic groups, or regions. Some consumers prefer it as a fresh root, others prefer processed products (fufu, gari, or sticks). Fresh roots represent 50 percent of total quantities consumed in cities and villages for all end products of the value chain, which is a much higher share than in the 90s. Following the currency devaluation in 1994, food imports have substantially reduced, as local food crops were promoted, which has benefitted cassava production geared towards self-consumption and deliveries to local markets and as an import-substitution strategy.

Cassava by-products are the first source of starchy food in the whole of Southern Cameroon (PNDRT 2003, ECAM III 2007). Cassava products represent 60 percent of the roots and tubers' market share (in value), comprising 40 percent of processed products (fufu, gari, sticks, and waterfufu) and 20 percent of fresh roots.

2.2 Stylized facts on consumption

Household consumption⁵

Table 1 displays results from the latest ECAM survey from the National Statistical Office (INS), carried out in 2007, regarding cassava by-products. Cassava expenditure is presented by socio-professional category of the household head (millions CFAF).

Table 1. Household consumption of cassava processed products in 2007

By-products		Executives and entrepreneurs		Skilled workers		Laborer and unskilled workers		Domestic workers/trainees		Total/city
		Cons.	STC	Cons.	STC	Cons.	STC	Cons.	STC	
Gari	Douala	100	18%	258	27%	566	13%	6	5,4%	930
	Yaoundé	125	22%	158	17%	208	5%	11	10%	502
	Cameroon	554	/	924	/	4227	/	111	/	5816
Fufu	Douala	44	9%	121	13%	205	6%	0	0%	370
	Yaoundé	162	33%	236	25%	271	8%	7	41%	676
	Cameroon	484	/	924	/	3286	/	17		4711
Waterfufu	Douala	43	8%	44	13%	86	5%	9	32%	182
	Yaoundé	33	6,6%	4	1,2%	2	0,1%	8	28%	47
	Cameroon	495	/	330	/	1562	/	28	/	2415

Source: Excerpt from Agropme (2010) from INS data, ECAM3 (2007)

STC=share of total national consumption in percent, Cons=Consumption in millions CFAF

Results show that the overall market for cassava processed products is large with an overall value above 13 billion CFAF, including 3 billion for the urban Douala and Yaoundé markets. In Douala, this market is mainly driven by the poorest social classes who favor gari. In Yaoundé, the middle and upper classes dominate the market with consumption oriented towards fufu. In urban markets, gari represents 53 percent of quantities and value, but is around 45 percent at the national level. Fufu is around 35 percent and waterfufu 20 percent.

⁵ This sub-section is based on the study conducted by AGROPME for PNDRT and l'IRTCM/FAR in 2010.

Consumption patterns

To put the above figures into a dynamic perspective, we compare results from both ECAM studies carried out in 2001 and 2007. Table 2 presents figures for both 2001 and 2007 waves in Yaoundé and Douala and deduces average annual growth rates (AAGR) of demand (waterfufu not covered in the first wave). Regarding differences across income and social classes, they are roughly the same as above reviewed. We note no significant changes in the market volume over this time frame and now discuss substitution effects between processed products.

Gari

- Overall national decline in demand of 6 percent over the whole period, amounting to an average annual decline rate of 1 percent;
- Growth in urban demand in Douala and Yaoundé of a 5 percent AAGR. This growth pattern is driven by the lower income classes who represent 50 percent of total consumption. Demand has remained steady for the upper classes.

Table 2. Comparisons of household consumption in cassava processed products between 2001 and 2007

	GARI				FUFU			
	Gari (2001)/million CFAF	Gari (2007)/million CFAF	Growth rate (2001-2007) (%)	AAGR (%)	Fufu (2001)/million CFAF	Fufu (2007)/million CFAF	Growth rate (2001-2007) (%)	AAGR (%)
Douala	621	930	49,8		462	370	-19,9	
Yaoundé	444	502	13,1		661	676	2,3	
Douala & Yaoundé	1065	1432	34,5	5	1123	1046	-6,9	-1,2
Cameroon	6192	5816	-6,1	-1	4479	4711	5,2	0,8

Sources: ECAM2 (2001)/ECAM3 (2007).

Fufu

- Household demand has remained steady at the national level (0.8 percent AAGR)
- Demand has declined in urban markets with a -1.2 percent AAGR in Douala and Yaoundé, the lower classes having kept their consumption levels at constant levels and representing 45 percent of the market value. The decline was driven by the upper class and the Douala market.

Household preferences

Demand in cassava by-products is a traditional component of Cameroon's food consumption. This part is based on Horus (2010) study. Cassava sticks are ready-to-eat products and frequently consumed all year round, and by all household members, especially in urban areas. Fufu requires long preparation times (half an hour), although households do not find preparing it to be a hassle and demand remains substantial. Gari has advantages in terms of preparation, and is especially favored by children as a sweet collation between meals. Fresh roots are also appreciated and consumed boiled, women are skilled in recognizing the less acid varieties and in preparing them.

Those products are generally purchased from local weekly markets and cannot be found in supermarkets. Gari and sticks are purchased for immediate consumption whereas fufu and fresh roots are sometimes preserved over several days. Quantities purchased are in general limited, due to high perishability. It is often stated that all those products cannot be kept for long and have high impurity rates (in any case, not reliable or consistent either). Sticks are more appreciated with more elasticity, clear color, and without acidity. Consumers do not like the lack of transparency on the part of sellers who often display good quality samples that are much better than the products they actually sell.

2.3 Cassava production in Cameroon

Root and tuber production, especially cassava, generally relies on smallholders whose farms are mostly less than 2 ha (cassava plots' acreage). It can also be found in mid-size farms (2-4 ha) and larger producers (over 4 ha). A survey conducted in 1995 exhibited the following distribution of cassava farms which, although out of date, has been confirmed by FAO in 2010 (Martin Tsounkeu 2010) and fieldwork conducted for this chapter.

Table 3. Cassava farm sizes

Farm size	Acreage	%
Small plots	< = 2 ha	62,5
Mid-size plots	2 – 4 ha	17,5
Large plots	>4 ha	20
Total		100

Source: OCISCA Survey, 1995

It is important to recall that local cassava varieties in humid areas require a 12-18 months production cycle, expanding to 15-24 months in highlands and sub-Saharan conditions. The growing cycle has however been reduced to 10-15 months for the PNDRT popularized varieties in humid conditions, and 15-18 months in other areas.⁶

The main production areas for cassava are concentrated in the Southwestern region and another part in the littoral region (shore). Gari and waterfufu production is more spread. Those products constitute the base of the local population's nutrition, which explains why weekly village or communal markets are of crucial importance (Table 4).

Table 4. The main production areas for cassava in Cameroon

Product	GARI	WATERFUFU	FUFU
Main areas	Malendé (Muyuka) Muyuka Oyé Passim (Melong) Balengui (Kumba)	Batoke et Bakinguili (Limbe) Lelem (Melon) Sollé (Yabassi) Malende (Muyuka) Malende (Kumba) Ikiliwindi	Baré (Nkongsamba) Melong II Sollé (Yabassi)

Source: PNDRT, 2010

⁶ Due to a lack of financial resources, and in order to maximize impacts and avoid resource diversion, PNDRT strategy was amended and now supports only 20 percent out of the 6,000 villages which were identified as involved in cassava production.

In the PNDRT-uncovered basins, production farming systems have remained extensive and are characterized by associate cropping, with local growing techniques which are adapted to local agro-climatic conditions (and economic conditions). Cultivated varieties are the most suitable to food self-consumption through fresh roots, surpluses being delivered to local markets as fresh roots, fufu, or sticks. Yields are around 8-10 tons/ha. Due to high perishability and the fact that areas of production are landlocked, cassava is generally kept in the field for 15-24 months, being gradually harvested depending on the household's food or cash needs (through sales on local markets).

In most PNDRT-covered zones, farming systems undergo a slight intensification pattern through the adoption of the new aforementioned high yields cassava varieties (25-30 tons/ha), specialization of cassava farmers' organizations and increases in cassava acreage. Cassava varieties which have been introduced by PNDRT and which are most suitable for industrial and processing not eaten as fresh roots but has to undergo the first processing stage before it can be consumed. Because of lacking financial resources, PNDRT could not afford to distribute processing equipment to all beneficiary villages. There is thus a strong concern for processing in villages where cassava acreage has substantially increased (as well as farm yields) but production is lost in the fields due to insufficient processing facilities and processing incentives. The reason for this is the marketing risks arising from the fact that local farmers and farm associations have not grasped the marketing channels for processed products. Another problem is that, high yield cassava varieties cannot be conserved more than 2-3 months in the field after it is fully mature, unlike traditional. Although there was capacity building support for local equipment providers in the cassava value chain (through field studies in African countries such as Nigeria, Ghana, and Benin), village based producer groups generally cannot afford the capital costs. Furthermore, the quality of raw products does not satisfy industrial standards which are required in the profession.

2.4 Market analysis of cassava supply and demand

A new approach for cassava value chain development at the local scale is envisaged by the IRCTM (Regional Initiative for Cassava Processing and Marketing), supporting PNDRT through IFAD funding, in order to increase the value of cassava and its by-products to achieve better market penetration in different segments. The study related to this value chain development sought to determine detailed market information both in quantitative and qualitative terms, for both the Douala and Yaoundé markets, including demand levels required by IRCTM and PNDRT to promote the production of cassava by-products on an industrial and semi-industrial scale. Most of the main results are used here to inform about the market analysis of the sector.

Cassava fresh roots

According to evaluations by the Ministry of Commerce, local consumption of fresh tubers (in quantity) is comparable with the bunch of processed cassava products which are locally marketed or exported. Fresh tubers stemming from improved varieties have to be subject to a first processing stage right after harvest in the fields before being transported to markets.

Traditional products

Fufu and gari suffer from insufficient drying over the rainy season (lack of non-solar drying equipment), which severely shorten their shelf life and render local supplies less consistent and more contained over the year. This raises prices over the rainy season to a significantly higher value than those recorded over the dry season.

Urban consumers would prefer more biosafety in the processing and marketing processes, with improved packaging, but this would render most local supplies unaffordable for them, which in turn means that there is not enough demand to compensate for quality improvement. It is however likely that the improved living standards of urban middle classes would be compatible with more willingness and capacity to pay for quality, and generate new incentives for quality to which local supply is not yet ready to respond. Cassava is barely suggested outside home meals as a sophisticated product, it often comes as a non-processed food product, a side dish to a meal, or as sticks. Waterfufu is the most popular cassava product in rural areas, due to its long conservation length (2-3 months), the ease of making it and its numerous secondary and tertiary processed options for income enhancing marketing. It can be consumed boiled or processed into sticks, cossettes, or chikwangué, when it is intended to be exported.

Cassava starch for industrial use

The main marketing outlet is the sector of cardboard-making industries, which has a potential market of 350-400 tons a year, for a unit purchase price standing around 500-550 CFAF/Kg. In Douala, the Plasticam company specializes in cardboard making and sources starch from Ferme Agricole du Sud which is located in Batouri, Eastern Region. The firm assesses cassava starch with regard to its stickiness compared with maize starch which is commonly used by many other cardboard makers located in Douala and Limbé. The CICAM company is another potential marketing outlet for cassava-native starch with a potential demand which has been estimated around 150/200 tons a year, and to serve as raw material for its weaving unit located in Garoua. The purchase price suggested is rather low (330 CFAF/Kg), CICAM would thus not constitute a major marketing outlet but only a supplementary one for semi-industrial starch cassava processing units (Horus 2010).

Nestlé Cameroun, Douala, shown interest in sourcing locally produced cassava starch and/or flakes (Horus 2010), with potential output of 1 500 to 2 000 tons a year by 2018. A partnership between the Chamber of Commerce, MINADER, and PNDRT is envisaged to stimulate emergence of several mid-size processing units to serve this demand. A starch-processing factory is being built through this partnership frame in the Sangmélima district (in the Southern region).

Dry cleaners (in urban areas) are mostly served by small scale processors and local POs, but they source starch mostly from cassava products. Those customers could only represent a supplementary marketing outlet for one semi-industrial processing unit, because sector has collapsed and each dry-cleaning unit requires only a small amount of starch. Direct consumption of households is low and essentially takes place in the biggest urban centers of Cameroon. According to Horus (2010), one firm based in Douala -Cervo- has specialized its processing activities towards supplying raw products to dry cleaners, among which there is starch. Its production volume remains low even though there are development prospects in Chad.

Cassava flour

Cassava flour is used for spangling in baking using 5 to 6 000 tons of cassava flour a year. In bread making this represents 10 to 20 000 tons a year, assuming that the maximum rate of cassava flour in the one used to make bread was around 5 to 10 percent. According to Horus (2010), the viewpoints of the main stakeholders are as follow: (i) bakers state that they are open to incorporate cassava flour in bread making provided it reduces their production costs and some have conducted experiments in this area; (ii) grinders are skeptical since they cannot see how enough cassava flour can be produced which meets

quality standards and at a reasonable cost; (iii) all agree on the fact that grinders are the best placed to ensure consistent quality in flour made of wheat and cassava; (iv) other potential marketing outlets can be considered at the industrial scale, especially for the production of biscuits and doughnuts (5 to 10 000 tons a year for the same interval of incorporation rate of cassava within the flour as bread); (v) Due to drying constraints, local supplies of cassava flour by small scale processors is to remain marginal. In addition, consumers favor French baguettes which can only be prepared with wheat flour, and which has to be partly substituted for by cassava flour (Horus 2010).⁷

Cassava cossettes for animal feeds

Cassava use in animal feeds exists in Cameroon but is confined to small family pig production units mainly in the southern part of the country. Cassava is barely used in livestock feeding which relies on fodders because there is a lack of information for breeders about cassava's nutritional content. It is not part of fodder mixtures currently in use, because supplies are insufficient and there is lack of critical mass. The potential market for cassava cossettes in animal feeds is estimated to be around 35 000 tons a year and concerns pig and poultry outlets. Cassava would then partly substitute for maize and the potential market would be developed if breeders were to buy fully prepared products made of cassava or incorporate cassava into their feeding formulae up to its full capacity.

Ready-to-use products

The only ready to use cassava by-products that exist in Cameroon are starch and cassava sticks. Potential (and solvable) demand for those products is restricted to the minor share of the population who purchase food and other products in supermarkets. Two ready to eat products were launched in 2010 and are marketed on a small scale: spiced crisps produced by the GIC Talles Dry Food in Yaoundé, and Cassava semolina, which is semolina, produced by a pilot unit set up by the Chamber of Commerce in Douala. Supermarkets and high end restaurants are the main retailing channels for such products and would sell more only if there was greater demand for them, which there is not at present. Regarding cassava semolina, a pilot incubation center (CIP) with cassava processing facilities has been inaugurated in Doula by October 2010 by the Ministry of Industry. The CIP has been designed by the Chamber of Commerce, of Industry, Mines, and Traditional Industry of Cameroon (CCIMA), and cassava semolina is intended to be delivered to local markets and exported.

Price structure (local markets)

In the region surrounding Douala, cassava price is lower in Melong than in other localities which have been surveyed. Processing activities are not that diversified though. Processing is not very developed in Bakinguili and Passim, which are a little bit far from urban centers. Cassava is more expensive in Muyuka where processing is the main income generating activity for farmers, where the demand for processing stimulates local markets.

⁷ According to Horus (2010), grinders have raised the point that bread baguettes made from mixed wheat/cassava flour might have different attributes from the current one, which would necessitate its promotion and associated costs that they are not willing to incur.

Table 5. The main cassava by-products in Cameroon

By-products	Localities	Purchase price		Sale unit	Cassava price/kg	Packing units
		Min	Max			
GARI	Muyuka*	6 500	10 000	29kg	50 F	100 Kg
	Bombe	6 500	8 500	29kg	35 F	100 Kg
	Passim	3 500	5 500	20kg	25 F	100 Kg
WATERFUFU	Muyuka	6 000	7 500	50 kg	50 F	100 Kg
	Lelem	2 000	2 500	35kg	30 F	100 Kg
	Bakinguili	5 000	10 000	50kg	25 F	100 Kg
FUFU	Melong	12 000	15 000	120 kg	20 F	100 Kg

* **Note:** Yoke is located in Muyuka district (important gari production zone) and 64 kms from Batoke and Bakinguili villages (important waterfufu production areas. **Source:** PNDRT, 2010

Around Yaoundé region, cassava processing is driven by the processing of sticks (cosettes), one of the by-products from cassava paste. Cassava sticks are largely consumed, gari, fufu, and waterfufu productions are marginal.

Table 6. Cassava price structure in the Yaoundé region

By-products	Localities	Purchase price		Sale unit
		Min	Max	
WATERFUFU	Ebolowa	6 000	7 500	85 kg
	Bityli	3 000	4 500	50 kg
	Lobo	5 000	5 000	50Kg
GARI	Ebolowa	4 500	6 000	20kg
	Ambam	4 500	5 000	20Kg
COSSETTE	Bityli	4 000	5 000	25 kg

Source: PNDRT, 2010

3 The downstream nodes of the value chain

In order to satisfy end product consumers, producers generally have two marketing channels: an intermediate channel through wholesalers or exporters and local markets.

Relationships between producers and other stakeholders take several forms. They can be marked by trust, loyalty, and exclusiveness/marketing arrangements. The most important purchasers generally attempt to buy the loyalty of their most consistent and reliable producers. By giving cash advances, they try to encourage them and give them incentives to ensure consistent, timely deliveries of the right quantities. This is notably the case for waterfufu producers who deliver to several exporters among their main clients.

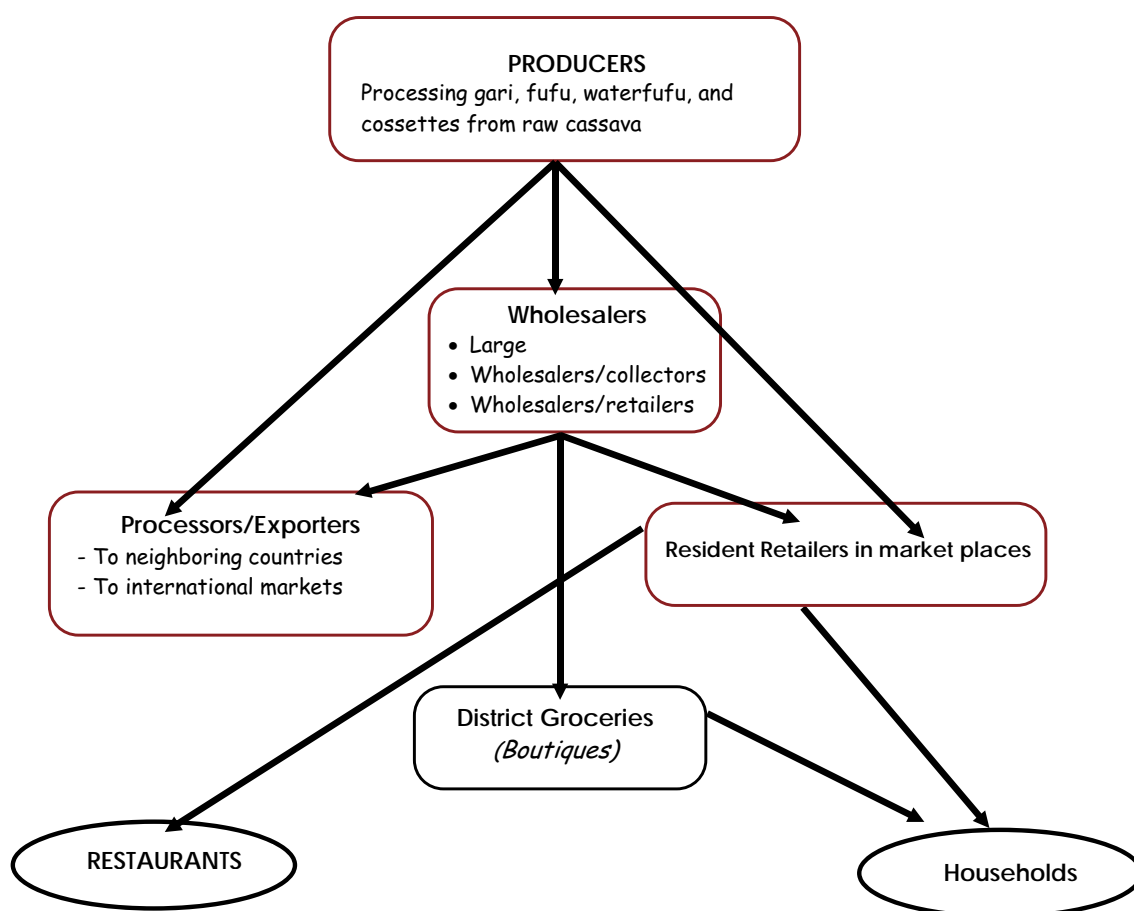
3.1 Large wholesalers

Intermediaries are divided between wholesalers and retailers. Wholesalers can be ranked in several categories: large, collectors, and mixed wholesalers/retailers.

These focus exclusively in fufu and operate on local and border markets. They generally possess marketing equipment composed of trucks and storage buildings. In Yaoundé, there are six in the Mokolo market. These mainly source cassava products from the Eastern region, and to a lesser extent from the Grand Mbam, sourcing through a network of collectors who are generally shareholders of the wholesale business. Those large wholesalers often come from the Northern regions.

Marketing channels of gari, fufu and waterfufu in the final consumers' markets (Douala and Yaounde)⁸

Figure 1. Presentation of the main stakeholders of the cassava by-products marketing chain (cases of Yaoundé and Douala markets)



Source: PNDRT, 2010

⁸ This part is based on the study of Agropme (2010) which was commissioned by PNDRT and l'IRTCM.

Wholesalers/collectors (*Bayamsellam*)

They source cassava products by collecting themselves or through agents with whom they have close, kinship-based, or familial relationships from producers (personal) and from weekly markets located in production areas. Those wholesalers/collectors in general specialize in one particular by-product: gari, fufu, or waterfufu. They have access to warehouses in the market place. In Douala, they can be found in the central market “marché de la gare” for fufu and gari marketing, and at the “marché des chèvres” for waterfufu. In Yaoundé, those stakeholders are based in the Mokolo market for gari. Crossing information sources, it appears that all of them manage to sell over 40 tons of gari on a weekly basis in this specific market. Fufu stakeholders are based in Mfoundi and Mokolo market places while waterfufu can be found at the Mfoundi and Acacia (Mbiyem Assi) markets.

They practice marketing either in warehouses (Yaoundé), or in the open markets (Douala). Those market places are the main hub for each city, of products’ marketing and dispatch large purchased quantities to other intermediaries or directly to final consumers (households, restaurants, or processors in other sectors, e.g. starch processing, animal feeding).

The set of products owned by a wholesaler in Douala and Yaoundé market places

Waterfufu (50 kg) from Northwest region at the « marché des

Waterfufu from the Center region (50Kg) at the Mfoundi market in Yaoundé

Fufu balls dried in the granary of Moungo at the Douala central market

Bafia cossettes (50kg) aligned bags within a wholesale warehouse at the Mfoundi market in Yaoundé

Relationships between wholesalers and producers are in general based on loyalty and trust, when quality is established (and consistency). But relationships between wholesalers and collectors are different since it is the quality of available products which matters.

Wholesalers/retailers

These are operators who source quantities from producers and collectors and who retail small quantities (1 to 15 litres) to final consumers (households and restaurants) and to grocers (only gari though). Almost all work in retail, like the waterfufu wholesalers from the northwest.

An example of products sold by a wholesaler/retailer

Fufu bowls (Souza)

Gari in retailed quantities (Mokolo market in Yaoundé)

Waterfufu originating from North West Acacia Market, Biyem-Assi Yaoundé

Wholesalers face several constraints which ultimately affect prices and cause delivery delays.

With regard to sourcing, such constraints lie in the bad road conditions and landlocked production areas, high transportation costs to the Yaoundé markets (around 7,000 CFAF per 100 Kg-packaged bag: 1,500 from villages to Bamenda, 2,500 from Bamenda to Yaoundé, and 3,000 other costs for labor and taxes).

Regarding products, there is a lack of homogeneity and high rates of perishability which reduce profits for traders and retailers. Consignments of gari which have deteriorated have been returned from neighboring countries, forcing wholesales to lower prices to avoid spoilage, sometimes below the production cost.

Short shelf life puts enormous pressure on product sales. The taste of gari can change and it can go moldy after a few weeks; fufu can change color and attract weevils; waterfufu can become acidic if exposed to air and then change color. Those constraints imply that all market actors must specialize in one product, being gari, fufu, or waterfufu. They have to source products by collecting from smallholders and small scale processes at periodic markets (in villages), and that they have to go to producers for sourcing.

Table 7. Price structure for wholesale markets in CFAF

By-products	Packing(bags)	Min purchase price	Average sale price	Max sale price
White gari	300Kg	60,000	65,000	90,000
Yellow gari	300Kg	35,000	45,000	65,000
Fufu	50Kg	9,000	10,000	12,000
	100 Kg	15,000	17,000	24,000
Waterfufu	50Kg	7,000	8,000	10,000
	100Kg	10,000	20,000	25,000

Traders' margins are highly dependent on rather prohibitive transport costs amounting to 4,000 CFAF for each bag carried between production areas and Yaoundé. But those products remain in general very competitive in spite of high retail prices, thanks to their reputation for good quality among households and restaurants. 100 Kg packaged waterfufu is in general sourced from the Eastern region by log trucks for chikwangué and cassava sticks' processors who are the main clients. The eastern region is the most competitive production area since sale prices can go down to 8,000 CFAF per 100 Kg bag.

On average, prices are a slightly lower in Douala, with 5 to 10 percent difference as compared with Yaoundé. Sale prices of waterfufu sources from the North West are higher than other competing products.

3.2 Retailers

These are small scale traders who carry out sourcing on a daily basis and on the spot (on the markets) from wholesalers, and in small amounts (one bag). They are not specialized like wholesalers and they generally own a set of fresh food crops and products among which are gari, fufu, or waterfufu that they retail in small amounts (20cl, 1l, 1,25l, 2,5l, 5l, 15l). Their main clients are households and restaurants. The products they display on the ground or on open shelves are subject to bad weather and ambient risks (rain, dust, sun, odors, and so on). For their purchases, they are not generally loyal to one particular wholesaler, and the quality of available products remains the most important determinant.

Table 8. Price structure for retail sales on the Douala and Yaoundé markets

Product	Type	Packaging	Average purchase price	Min sale price	Max sale price
Gari	Yellow	17Kg (13L)	/	2,600F	3,800F
		5,66Kg (4 ;33L)	/	900F	1 300F
		1kg	/	153F	225F
	White	17Kg (13L)	/	5,000F	5,700F
		5,66Kg (4 ;33L)	/	1,700F	2,000F
		1kg	/	295F	335F
Cassava flour	Bafia	4Kg (5L)	/	800F	1,200F
		1 Kg	/	200F	300F
	Eastern	100 Kg	18,000F	13,500F	24,000F
		4Kg (5L)	/	700F	1,100F
		1 Kg	/	175F	275F
	Moungo	1Kg	/	200F	325F
Waterfufu	NW	1Kg	/	200F	200F
	Center	1Kg	Not for retail		
	Shore	1 Kg		200F	300F

Notes: Sale units in use in Douala and Yaoundé differ from the ones in practice that applies in production markets. On consumer markets, sellers aim give the impression that they offer comparable prices to production markets and derive margins from using smaller sale units, i.e. 17 kg (13l) buckets instead of those of 20 kg (15l).

Source: PNDRT, 2010

The main difficulties faced by retailers are their exposure to bad weather and other risks, lack of biosafety and hygienic conditions, weak commercial margins and trade capacities, inconsistencies of wholesalers' supplies (e.g. waterfufu from North West and fufu from Mbam), and high degree of perishability.

3.3 Exporters

According to their products' destination, two exporter categories can be distinguished:

Regional exporters

They export to neighboring and bordering countries (Central African countries in general). They source their products via collectors from producers and processors and send them to their customers based in Congo, Gabon, Equatorial Guinea, or Nigeria. Loyalty and trust can be found in the commercial relationships between some producers who have benefitted from PNDRT support and some collectors or direct foreign buyers (e.g. smallholders from Souza who exclusively produce for a regional exporter to Congo). This type of arrangement also exists for gari exported to Equatorial Guinea.

Waterfufu is sold by 125kg-packaged bags with an average weekly export quantity of two tons, amounting to 100 tons a year. It is rather difficult to evaluate the exact quantity as they are mostly part of the informal sector.

International exporters

These are exporters who are the operators who have especially benefitted from PNDRT support and who export waterfufu or waterfufu by-products (cassava sticks and mainly chikwangue) that they self-process to the European Union (France, Germany, Belgium) and Switzerland. They are partners within a professional organization which regroups fifteen members of so either in Yaoundé or Douala, the biggest exporters being based in Douala.

Some of them have initially attempted to negotiate marketing arrangements with smallholders who were supported by PNDRT to ensure consistency of supplies. But this strategy turned out to be unsuccessful caused by a lack of smallholders' professionalism, inconsistencies in deliveries, inconsistent quality, transport costs, low production quantities, and uncompetitive prices.

Almost all international exporters currently source their products from producers or wholesalers through a network of traders in order to ensure consistent deliveries, technical and contractual requirements such as quality and quantity specifications, consistency, and price competitiveness. In turn, Yaoundé exporters are sourcing their products from Ntui, Mbangassina, Nkolgem, and Ayos localities. They make timely purchases in Mfoundi market in Yaoundé to ensure they have enough stocks. They process the purchased waterfufu quantities within their own unit before exports. Chikwangue does represent around 90 percent of the final output that they exporting. through the Yaoundé-Nsimalen international airport.

Douala exporters are dominated by five key actors who source most of their products in the Eastern region from four main traders who operate with a network of loyal smallholders. They transport products to Douala (Syncatex/Docoti market) by log trucks to deliver 90 Kg bags to their exporting customers for 8 000 CFAF. In those markets, the weekly deliveries are estimated to be around 375 bags (of which 1/3 is exported to one leading firm). Crossing information sources, Douala exporters were estimated to process around 1 760 tons of waterfufu for producing chikwangue to be exported on international markets (via Douala airport).

This type of sourcing is well recognized and very competitive for the following reasons: consistency and reliability, low transport costs and price competitiveness, product quality. It is noteworthy that there are specific contractual requirements between traders and exporters. In particular, are only paid for when quality is confirmed, when watertufu. This arrangement removes any possible conflict regarding the quality of received products.

Table 9. Cassava products and by product exports (tons) to EU and USA in 2000/2001

Exported productions	Yaoundé Nsimalen	Douala airport	Douala port	Total
Cassava leaves	255	-	-	255
Cassava sticks	373	-	-	373
Cassava	-	184	165	349
Cassava flour	-	155	-	155
Total	628	339	165	1132

Source: AGRISTAT 2002

Table 10. Cassava by-products and product exports (tons) to neighboring countries in 2000/2001.

Product	Abang Minkoo Gabon	Kye Ossi Gabon	Gabon Guinea	Aboulou Gabon	Kentzou RCA	Ekondotiti Nigeria	Total
Cassava sticks	34	5	-	0,4	-	-	39
Cassava	-	-	440	-	966	0,05	1406
Cassava flour	500	167	772	3	-	-	1443
Tapioca	1	-	72	0,1	-	143	215
Total	534	172	1 284	3	966	143	3 103

Source: Stratégie sectorielle pour le secteur manioc, 2006

In spite of these imperfections, those statistics tend to show that the cassava products and by-products' exports are of higher quantities in the whole Central African region than overseas.

Selling and purchase conditions

Small pre-payment proceeds with order issuing and the rest comes after the order is confirmed once the product is sent to the grinder for quality certification. Packages must return to the providers. According to the executive secretary of the Professional Grouping of Traditional Staples in Cameroun (GPATRAC), the weekly exported quantities of chikwangue and cassava sticks are 35 tons for the members of the organization, which comprises 10 tons exported from Yaoundé, and 25 tons from Douala.

Table 11. Cassava paste quantities processed by international exporters

	<i>Yaoundé</i>	<i>Douala</i>	<i>Total</i>
Weekly exported quantities of waterfufu by-products	10T	25T	35T
Yearly exported quantities of waterfufu by-products	520T	1300T	1820T
Yearly processed cassava paste (waterfufu)	704T	1760T	2 464T

Source: Estimation based from guessed informants and exporters' statements.

3.4 Modern retailing channels

These are the marketing places where mass consumption products like rice, wheat flour, pastas, and cooking oils, are sold. For cassava by-products, the situation is as follows.

Table 12. Situation of the products under study in the modern retailing channels

	<i>Current distribution</i>			<i>Reason</i>	<i>"feelings" related to products under study</i>
	<i>Gari</i>	<i>Fufu</i>	<i>Waterfufu</i>		
Supermarkets	No	No	No	No proposition made for those products	Ready to supply provided that quality and safety requirements are satisfied, and that there is some demand from consumers
Groceries	No	No	No	No proposition made for those products	Ready to supply provided that quality and safety requirements are satisfied, and that there is some demand from consumers
Retailing in large quantities	No	No	No	Unavailability of those products for this type of sales	Possible to supply provided demand is significant (groceries and boutiques mainly)

Collective places for meal-taking do not show up in the above table, yet they are an interesting and significant marketing outlet for cassava by-products.

Stakeholders in the marketing channels of gari, fufu, waterfufu mostly operate in an informal fashion without establishing contracts or any professional convention between the various operators. This deprives them of any reliable information source about each actor (identification, location, economic data), and encourages sales proceeding in production areas, home-grown processing and a traditional approach of marketing relationships (customers have to take care when sourcing by making purchases in producers' localities, producers to not take care or develop delivery services).

Starting places in Cameroun for international exports are Yaoundé-Nsimalen and Douala airports, and the Douala harbor. Most exports are to Europe and USA. Regional trade with CEMAC countries and Nigeria proceeds through Douala Peschaud and Ekondotiti harbors. The starting points of these trade flows are the border markets in Kye-Ossi and Abang Minkoo regarding trade between Cameroon, Gabon, and Equatorial Guinea.

4. Constraints and opportunities for the cassava value chain in Cameroon

In spite of being a major driver of Cameroon's food security, the cassava value chain has to cope with several challenges and constraints in terms of production, processing, and marketing, and with regard to stakeholders' organization(s) and financing alike. Those constraints severely impede income generation and the overall value chain development process. Several opportunities however exist and several options can be envisaged to overcome those constraints and entail a more intensive and inclusive development process.

4.1 The main constraints and bottlenecks in the cassava value chain

A. Constraints impeding emergence of modern production systems and better market access

- a. Low levels of fertilizer use and soil degradation patterns: Cassava is known to be a soil-exhausting crop. Given high input prices and difficult market access to fertilizers, the main strategy of cassava farmers lies in crop rotation and fallowing. Fallow periods are not long enough though, due to demographic pressure on land and pressures to produce food. Better input market access through outgrower schemes or other type of contractual relationships with the downstream stakeholders could enhance production.
- b. Insufficient quantities and quality of cassava seeds and material: the sector needs around 50 million cuttings, which are far from being covered.
- c. The lack of knowledge and practice of conservation techniques (and high costs): the most commonly used practice is tubers' conservations in fields, still planted in the soils, sometimes several months after full maturation. PNDRT and research institutes introduced new varieties that must however be harvested right after maturation and cannot be preserved more than 2 to 3 months in fields. These varieties must be necessarily processed so as to increase their length of conservation. After harvest, the quality declines very rapidly between 3-4 days, which necessitates marketing the by-products, and relying on processing. One priority should thus be to provide smallholders with training in basic local processing and marketing techniques.
- d. Organizational and structural constraints and problems: the cassava value chain is still characterized by current informal business practices and exhibits several coordination failures (horizontal and vertical), which entail a lack of spillover and consultation between stakeholders, reducing the scope for fruitful synergies. Furthermore, production markets are rather tight, with inconsistent flows of production, badly integrated, and with high transaction costs. Indeed, local varieties which are cultivated in production areas are in general meant to cover self-consumption needs for rural households, and only remaining surpluses serve markets. Weak organization of most stakeholders and market players, in addition to a lack of grouped sales' practices in villages, constitute a major constraint to cassava product marketing and induce high transaction costs. It is also noteworthy that production areas are mostly landlocked and end markets are located far away from those production areas. Weak access to market information (at the national and international levels) generates information asymmetries which are detrimental to most stakeholders, traders and some wholesalers. Producers and processors in turn face disincentives and more uncertainties for decision making, which is aggravated by an overall lack of information on the whole value chain (non-market information included).

B. Financial constraints

- a. High costs of equipment/infrastructure for processing, storage, and transport: the high price of material inputs for processing and storage equipments, as well as their operational and maintenance costs, result in unaffordability for most rural producers while freight costs are a strong limitation to scale up the potential income benefits that could be derived by targeting exports on the sub-regional level (Central Africa) and to Europe.
- b. Restricted credit access: Several actions have been conducted by several donors (IFAD) and the government to ease credit access for cassava producers, with mixed results. Such actions included projects such as (i) PPMF, (ii) PADMIR, PNDRT, and so on. It has to be acknowledged that the modalities to access credit have remained rather stringent and daunting (interest rates, repayment lengths) for most cassava producers, while not being appropriate with regard to the growing season's calendar. Intra-value chain arrangements between stakeholders would be more appropriate.

- c. Insufficient working capital: Regarding difficulties in accessing credit and lack of collateral required by local micro-finance institutions, economic activities of most value chain stakeholders proceed through own funds (producers, processors, and small entrepreneurs). Uncertainties on the profitability of each marketing channel together with management problems to render working capital issues a sensitive problem, and a possible bottleneck.

C. Management problems

- a. Bad administrative performance (accountancy/administration): Basic documents are often lacking and not available, from POs or small processing and marketing enterprises alike, which poses numerous difficulties when evaluating performance and performing accurate assessments of activities and of the value chain overall.
- b. Lack of knowledge and practice of management tools: Current practices in the cassava value chain are very close to those of the informal sector, which is visible as well in the groups supported by the PNDRT
- c. Inconsistencies of supplies and sourcing: Distance between urban markets and production areas, weak organization of primary collecting centers, missing market information (or unavailability), transportation problems, bad condition of rural tracks and roads, and irregular patterns of supply and demand altogether do not induce loyalty in commercial relationships between stakeholders, which reinforce the problem of inconsistent supplies and unpredictable delays for local markets
- d. Bad planning of activities: Planning, when done, is barely controlled and monitored, and largely depends on external constraints such as the timetable of buyers, sourcing, market characteristics, and so on, rather than on the true production, packaging, and marketing constraints (e.g. production cycles)
- e. Low professionalization levels of most stakeholders: business practices of the informal sector remain prominent, and a large share of stakeholders is involved in simultaneous economic activities aside from cassava so as to diversify and supplement their household income. There is almost no specialization in cassava production, processing, and marketing among the various stakeholders of the value chain.

As a result of the afore-mentioned constraints, the cassava value chain exhibit the following weaknesses:

- a. Low farm yields
- b. Improved varieties for better/more efficient processing are unavailable
- c. Inconsistent supplies of cassava by-products
- d. Difficult market access/significant market access constraints
- e. Low levels of value chain organization
- f. Low levels of competitiveness of Cameroon's cassava by-products in developed countries

4.2 Cassava producers and processors' organizations

POs are a significant institution that can help upgrade the value chain organization since they allow stakeholders to build critical mass that is required for marketing and processing given products (especially those with higher value) and by-products, to centralize and share information, reduce transaction costs (e.g. input grouped purchases, grouped sales) and may induce more loyalty/trust-building/formalization of commercial relationships between producers/processors and other stakeholders such as the ones involved in the marketing channels (wholesalers, retailers, institutional customers, traders, industrial firms, or exporters). They also have an insurance and risk-sharing role regarding production risks and income. Below are presented two specific case studies of *groupings*.

Box 1. Processor women group FEDDMA (around the Mbouda market)

Processing fresh cassava tubers is an activity that is carried out by a group of around ten women located at the Mbouda market in the Mbamboutos district where the bulk of produced cassava is marketed (not self-consumed). Those women process cassava cossettes to produce cassava flour. Raw cassava is purchased on the market or in neighboring localities, and then processed and marketed on the spot. There are several bottlenecks for sourcing cossettes (high local demand, inconsistent supplies, storage losses) and several marketing risks (bad sales, lack of organization, horizontal coordination failures). Interesting opportunities stem from the presence of exporters and the existence of several potentially high income marketing outlets.

When working on an individual basis, each woman faces constraints arising from limited individual working capital and equipment for processing and marketing. Hence, the FEDDMA GIC was established by the PNDRT in 2005 so as to remedy those problems and overcome those constraints through collective action for both processing and marketing activities, and by pooling the financial means of each woman (addressing the issue of limited working capital). Now each woman pays annual fees amounting to 25,000 CFAF and puts 400,000 CFAF in the common working capital of the group, in addition to a monthly participation of 50,000 CFAF in the group's ROSCA. This scaled up working capital enables substantial investments and better sourcing, with significant marketing income, once organizational, processing, and management capacities were strengthened and upgraded under specific PNDRT supporting and training activities. Several facilities were provided to the GIC such as a warehouse (12 X 8 m) which can hold 30 tons of cossettes (representing 250 bags of 120 kg each), two trolleys, one scales (2 tons capacity), and grinders. Regarding marketing, the GIC handles this on its own, but marketing outlets are still restricted. PNDRT planned to support the group through proximity support organization (OAP) and workshops in order to train its members in market negotiation developing their business.

Marketing and processing cossettes is by now a regular activity which takes place over 9 months from from November to August. Since 2010, GIC has attempted product diversification by starting fufu production (waterfufu). Gross annual income of the group has undergone a dramatic increase from 22 million CFAF up to 60 million CFAF and the GIC has achieved a net profit of 5.5 million CFAF in 2010.

Establishment of the GIC enabled substantial efficiency gains and allowed each processor to better satisfy her clientele, ensure consistent supplies, and source new income enhancing markets and customers. Such experience shows how additional profits can be generated thanks to critical mass building and how GICs can perform well in terms of small scale processing and marketing.

Box 2. Producers' women group of the Bityili CVC (Coordinating village committee)

Coordination failures are also a significant bottleneck between local producing units of cossettes and markets and customers, such as in Bityili, close to Ebolowa. There is a significant gap between supply and demand in quantities, type of products, and timing of deliveries. Better horizontal coordination among producers would enable them to better serve local markets, achieve income gains and transaction costs savings. Transactions are not organized upstream and proceed through specific spot market transactions. Marketing contracts would rather ensure consistent sourcing and secure income for producers. In this fertile region, cassava is also grown as a cash crop under traditional cultivation techniques with low yield levels.

The main wholesale market is the Ebolowa market for fresh roots and processed products such as cassava paste, flour, tapioca, cassava sticks and semolina. On average, failed sales are acknowledged to be the main marketing issue. There are interesting opportunities for producers provided local producers' organizations are more formalized. For instance, border markets are served by Western producers whereas local production benefits from advantages in terms of transportation and marketing costs.

The CVC Bityili association (Comité de Concertation Villageois) was established on 11 May 2006, according to the provisions of the PNDRT. This association is composed of 100 registered members with 62 active members and a start-up capital of 695,000 CFAF held on deposit with a micro-finance institution. PNDRT provided the CVC with improved varieties and extension support for multiplication techniques and better production practices through demonstration fields.

Since 2010, the association has acquired processing equipment from PNDRT, such a wood dryer, cossettes-making machines, moisturizing tanks, and successfully launched processing activities (cossettes, fermented paste, and sticks). The by-products are sold in the Ebolowa market, but also in the border markets with Gabon, and Equatorial Guinea. Gross annual income has grown from 2 million CFAF up to 10 million.

Acquiring processing equipment has also enabled the CVC to overcome storage problems and improve the conservation lifespan of its products, and to improve negotiation capacities of processors in relation to other stakeholders, such as traders and retailers. The collective organization has allowed processors to increase returns to investment, improve marketing and income from transactions, and induce some market repositioning onto more lucrative markets.

4.3 Processing and marketing capacities of cassava producers

A. Past experiences

Several actions were conducted at the beginning of PNDRT operations (1995-2005) by individuals and producers' groups to increase marketing and processing incomes. Several lessons can be drawn from past failures (we will also cover more recent successes):

Amongst those endeavors, irrespective of being supported by public or private funds, the following organizations have been involved: GIC UTRAM of Souza, the Alek firm from Douala, the GIC PROTRAVICAM from Douala, the processing cassava firm of Lek from Pouma, the GIE FAM from Ngoumou, the UPMAN group from Nkenglikok (Yaoundé), the cassava processing unit from Pouma (see details in Horus, 2010 for conditions and observations about those experiences).

In a nutshell, the main causes of past failures can be classified as follows:

- Inconsistent cassava sourcing, caused in general by (i) erratic farm production, (ii) lack of adequate collective/transportation means (own or rented vehicles), (iii) high purchase prices of tubers bought from producers, (iv) and insufficient working capital (not to mention lack of loyalty in commercial relationships with providers and clients and absence of forward contracts in commercial transactions).
- Inadequate equipment with regard to production scale, demand, or technical capacities (often oversized), which is often inherent in a lack of knowledge about their maintenance and utilization, technical bottlenecks in the production process (often at the drying stage of production), and lack of technical performance/yields of the machinery.
- Too high production costs for starch compared with maximal price affordable by industrial customers, which is likely due to inadequate cassava varieties regarding farm yields and starch contents⁹, and bad performance of the machinery with regard to starch extraction capacities.
- Constraints and inefficiencies in marketing: lack of useful market information and information on most stakeholders (business viability, reliability, and so on), low products' diversification of marketing and commercial stakeholders, competition from the informal sector on the delivery of semi-industrial traditional high-quality by-products (fufu, gari), the lack of industrial outlets for starch production driven by payment delays from most potential customers (and their limited payment capacities), including pressing customers, and which decrease marketing margins and increase working capital requirements, liquidity constraints in the context of restricted credit access for most traders and retailers owing to the time interval between tubers' purchases and products' sales (on credit), and a lack of knowledge of market conditions and demand (market studies not very reliable).
- Lack of initiatives/motivation of the main beneficiaries: some experiences (UTM Pouma, GIE FAN from Ngoumou) highlighted a lack of motivation from women growers who were supposed to have access to new facilities, and overly relied on the project's promoters for development purposes. GIC members are not necessarily well suited to take responsibility in managing semi-industrial processing units. Promoting rural entrepreneurship, leadership, and small firms' management, together with provision of adequate information services, appears as a key prerequisite.

B. Access to and management of market information systems

Several technologies are currently available to ease access and use of market information services by cassava producers and their groupings: (i) local radio stations, (ii) newspapers, (iii) internet services, (iv) cell phones, and so on. Among those communication means, rural radio stations and other community-based FM radios appear as the most adequate means to convey relevant information and messages on agricultural value chains. Nevertheless, cell phones are emerging as the most appropriate communication means on that matter, given their rapid expansion in Cameroon over the last ten years, regardless of whether in urban or rural areas. Diffusion of relevant information through cell phones would be very efficient for the management of inputs from information platforms (Esoko or whatever platform proving to be well functioning), by means of SMS exchanges.

C. Credit access to professionalize processing and marketing

The most salient observation made when interviewing producers and their groups, whether being supported by PNDRT or other organizations, is that most producers are seeking to expand their processing and marketing activities but they face limited financial means, and credit access is only marginal. Some

⁹ Most of the reviewed experiences occurred at the beginning of the PNDRT program by 1995- 2005, before the distribution of improved cassava varieties.

only benefit from own funds which are however insufficient to address their financial needs (investments, working capital, etc.). Apart from a few exceptions, most groups do not have access to credit from financial institutions, and do not make spontaneous requests, although they do need it. Even when the response was positive, financial institutions would only agree on partial provision.

It is therefore a pressing need to emphasize structure and organization of POs so as to reinforce their organizational, management, marketing, and other relevant capacities, and to assist them in sending financial request and credit application which are likely to provide them with finance and access to credit. This would be an additional guarantee for credit repayment to financial institutions.

On the other hand, the rural microfinance environment is rapidly evolving driven by the launch of the PADMIR project framework, funded by IFAD and the government's attempts to establish and make an agricultural bank work by 2012. It is therefore of crucial importance to put an emphasis on capacity building programs for producers' groups and to enable them to (i) identify on their own financing opportunities, (ii) prepare business plans of their activities and documents for financing requests which are solvable, (iii) manage and implement activities according to a rigorous predetermined time line, (iv) gain confidence regarding their credit repayment capacities, and (v) improve their perception of the economic and financial environment and their capacity to anticipate changes. Training and capacity building programs should also seek to improve their market access capacities, diversify their clientele and commercial partners, and better negotiate contractual arrangements, and so on.

Box 3. Few examples of successful groups in credit, processing, and marketing

a) CVC of Biatombo: This is a group located in the Mbangasina production basin (at a 60 km distance from Bafia, the local PNDRT office of Ebolowa), supported by the PNDRT since 2006. This cassava producers' group is made of around 200 members, 80 percent of them are women, and has been benefitting from several PNDRT types of support since 2007, such as improved cuttings, 4 drying areas (100 m² each), small agricultural facilities and equipment, one warehouse for cassava cossettes, built in the midst of the weekly market.

This group managed to invest 2 million CFAF in the building of its warehouse (amounting to 20 percent of the grand total) and has been able to expand its activities and scale up incomes by taking advantage of the PNDRT investments to the extent of becoming (since 2009) the main collecting place for cossettes in the Mbangasina basin. The good performance of grouped sales' organization allows them to deliver around 10 trucks of 7 tons a week. Having experienced increases in demand, cultivated land, and farm yields, the main challenge was to scale up processing, especially drying cossettes. The 4 drying areas provided by the PNDRT became insufficient to address the needs and production volumes of producers. The CVC then turned to CEPI, a rural microfinance institution to acquire individual credit for the purchase of moisturizing and drying facilities. Production and processing are handled by individuals while marketing is done collectively. Biatombo CVC which has by now sufficient organizational capacities, no longer relies on PNDRT support for the pursuit of its activities.

b) Cassava traders in the Ebolowa market: These are women traders in cassava by-products in the Ebolowa market. Thanks to PNDRT support, they were grouped together in 2007 within a GIC. They are also forming the CCM (Comité de Concertation du Marché). They purchase cassava by-products from all the producer villages in the same area, store them and sell them to wholesalers from Yaoundé or neighboring countries. They also do retailing to local consumers from Ebolowa and its surroundings. The main marketed products are cassava cossettes and gari.

Box 3. Few examples of successful groups in credit, processing, and marketing (Cont.)

In 2008, PNDRT provided them with several marketing facilities such as a marketing warehouse and small transportation equipment to ensure better handling within the market. Thanks to capacity building support from PNDRT, the GIC acquired by 2009 a credit of 6 million CFAF from a local microfinance institution (MUFFED), which was then fully reimbursed. In 2010, the GIC obtained a second credit amounting to 10 million CFAF from the same institution, which is almost entirely repaid. Good organization of the GIC enabled trust-building between members and financial partners. Good management practices and adaptation capacities to a changed environment turn out to make the group a sustainable market player which does no longer require support from PNDRT to pursue its activities and economic expansion.

- c) Current situation of advanced processors (Horus 2010):** Only one semi-industrial processor provides starch to Plasticam and exports to Asia. Its success is rooted in the securing of sourcing and consistent deliveries in raw cassava from its own field, completed by some external purchases. Others had difficulties in terms of sourcing cassava. GIC FEEDMA experienced inconsistent exports over the last few years, to a lack of secure sources and a restricted set of customers. Processors from Centre and Littoral have engaged into semi-industrial processing activities by promoting and implementing better and more secure sourcing and market information use strategies, but still face daunting challenges in terms of equipment and financing (GIC PAB, GIC Odefcom, GIC BY, GIC UTRAM, GIC Cedam, Coopérateurs, and Alek firm).

5. Policies and initiatives to revamp the Cameroon's cassava value chain

5.1 Current policies for Cassava in Cameroon

Cameroon is gradually recovering from an economic crisis which started in the mid-80s, and has been considered as an LDC (least developed country) so as to benefit from a debt relief program from the IMF and World Bank. In 1997, a strategic framework was set up, yielding the DSRP for poverty reduction strategies which sought to enhance economic recovery and equal distribution of the gains from economic growth. Notwithstanding, this achievement of the LCD initiative¹⁰ did not coincide with a completely successful implementation of the DSRP. Further, the financial and economic crisis starting in 2008 has led Cameroon to revise its policy strategy.

The implementation of the rural sector development strategy has not induced significant production increases since 2003, mainly because of a lack of effective rural infrastructures, adequate financial services, and inappropriate fiscal policy. The contribution of the rural sector to GDP growth and economic development has remained substantial though.

The DSCE, strategic frame for growth and employment, was set up in 2009 and well reflects the new vision of the government whose strategic orientations envision Cameroon as “an emerging economy, democratic, and promoting its diversity with unity”, by 2035.

¹⁰ It was a condition of partial national debt reduction to recycle reimbursement resources for poverty reduction.

State disengagement from productive sectors, following privatization induced by structural adjustment plans, has resulted in significant declines in production quantities and quality, as well as in agricultural finance and funding, which was not counterbalanced by contributions from the private sector. The incidence of those impacts is stronger in the food crop sub-sector.

In this context, the Cameroon government adopted a new agricultural policy (NPA) in 1990, within the global framework of the IMF-World Bank Adjustment structural plan, which was based on gradual privatization of agricultural activities, professionalization of producers' groups and associations, and on diversification of agricultural production. In 1994, the FCFA currency devaluation resulted an increase in food import costs, in turn encouraging consumption of locally produced crops. Food crops such as plantain or cassava then underwent significant increases in production and consumption, and received significant support within the agricultural development strategic framework.

Cameroon thus launched a broad agricultural diversification program for farms (PDEA) in the early 90s, within its NPA framework. Government strategy set the goal of a 30 percent increase in farm yields and in cultivated acreage over the next 15 years, compared with 2005 levels, in order to ensure food security and rural employment.¹¹

Following bad outcomes of the NPA, a new strategy was adopted in Cameroon, still geared towards productivity increases but centering on a restricted set of commodity sectors having a leading role in agricultural growth and employment creation. This comprises the rice sector, maize, banana, plantain, sorghum, palm oil, cow peas, legumes, and cassava. In 2003, a new rural development strategic document was launched to address new challenges, among which are (i) strengthening of the agricultural sector as a growth engine and a key driver of economic and social development, (ii) promotion of professional and inter-professional organizations of the different stakeholders which are the main actors of agricultural development; (iii) improvement of food security driven by increases in production and rural incomes. Specific projects such as PNDRT (for roots and tubers in general, cassava in particular) constitute the main intervention tools of the government for the implementation of agricultural policy in the focused commodity sectors like cassava.

5.2 Initiatives required to revamp Cameroon's cassava value chain

A. Information and market mechanisms

In the base PNDRT documents, it was envisioned to make operational a stand-alone market information service that would have been linked to a national observatory for root and tuber value chains. The overarching goals were to reduce information asymmetries between the main stakeholders, encourage information sharing on markets and within the value chain, and improve the flow of commercial exchanges and relationships.

Following difficulties implementing such a stand-alone organization, IFAD operated a strategic change by 2007 to incorporate the services provided by DESA (Direction des Enquêtes et Statistiques Agricoles) of MINADER to the functions of this market information service. This was to increase access and visibility, and its sustainability by including all agricultural products of Cameroon in the information collecting network.

Current situation of the MIS of PNDRT/MINADER

Esoko Networks signed a contract to provide the MIS platform to the PNDRT through SMS by 2009. Following the kick-off workshop for training surveyors and other MIS managers in October 2009, the

¹¹ Document de Stratégie de Croissance et d'Emploi (DSCE).

Box 4. The National Program of Roots and Tubers' Development (PNDR)

In order to avoid spreading and duplication of means and efforts to upgrade the cassava sectors by several programs and projects, the government has established the PNDR in 2004, assisted by IFAD, within which cassava represents 80 percent of activities and funding. The initial goals that were set at inception were:

Strengthening the organization of the commodity chain of roots and tubers through capacity-building of producers and processors' organizations (as well as other stakeholders), promoting an inclusive and inter-professional sectoral development in a sustainable fashion, improve the marketing channels and market access of producers and processors' organizations at the local, regional, and sub-regional levels, for both fresh and processed products; Improve processors' response to increases in the market demand of products' quality and quantities through a better access to information services and appropriate communication technologies, post-harvest and processing technologies, at the various stages of the marketing chain; Contribute to sustainable intensification of roots and tubers' production through the use of upgraded technologies which are adapted to farmers' capacities and means, especially women, so as to enable them to better address market requirements.

The downstream part of the value chain has been subject to several changes driven by the PNDR program, among which have been observed the following:

Regarding processing and equipment providers: (1) The long-term sustainability of semi-industrial processing units which would be specialized in traditional by-products appears as very uncertain because of (i) the fierce competition from artisanal lowly-priced production, (ii) difficulties to have consistent sourcing in sufficient quantities, which are yet necessary requirements to achieve expected economies of scale and build critical mass, (iii) constraints in terms of the populations' purchasing power, which cannot induce any improvement in quality with enough valorization (monetarily); (2) The real impacts of extension and support services of PNDR to villages and small rural enterprises of the cassava sector are not significant. Hence, support to processors should first prioritize assistance to well-screened producers' organizations so as to acquire equipment.

Regarding market access and finance sourcing: Several POs which have benefitted from substantial support for equipment still face difficulties to achieve full development. Indeed, their expansion could be sustained only on condition that they can source sufficient tubers' quantities, have appropriate collecting means, and rely on well-organized marketing sources and channels, with some management and prospective support.

MIS has undergone two major phases:

- 1) October 2009-June 2010: information on market prices and quantities prioritized by PNDR were collected on a weekly basis by 25 surveyors from DESA and released on the Esoko platform through the internet network. Absent partnership with a local mobile phone operator (being negotiated at that time) meant difficulties when accessing market information through cell phones.
- 2) July 2010-December 2010: Information, while still being collected, was no longer released on the Esoko platform, and not available from PNDR either. Failures were apparently due to a lack of financial incentives for workers and managers, according to DESA executives.

Since June 2011, value chain information access and access to information on prioritized roots and tubers' markets were suspended, awaiting effective payment for the usage rights of the annual license.

The suggested operational approach

Following the contract between DESA and the MIS (providing 25 surveyors in prioritized markets), in order to make the MIS operational, we suggest the following approach:

- 1) The CCM should be implemented or strengthened on the 25 markets of PNDRT.
- 2) Within each CCM, one resource person should be identified and trained in information collecting and transmission for each market.
- 3) Within each CVC, one resource person should be identified and trained in information collection and transmission regarding the value chain at the village level, and work in close collaboration with the nearest agent and the supporting organization connected with the village, which in turn would be in charge of releasing the information.
- 4) Regional business delegates would take responsibility, in addition to their coordination and implementation role for information collection by surveyors, of monitoring and cross-checking all information being transmitted before final validation and release on the platform (internet and cell phones).
- 5) The national delegate observing body to be responsible for information compilation from all information gathered by regional offices and for regular analyses and projections on prices and other relevant variables and information for commercial relationships among the value chain stakeholders.

Required means

To optimize the MIS, the following necessary steps are required:

- 1) The fees for the usage rights of the Esoko platform license should be paid for as soon as possible.
- 2) Training workshops for the numerous market information purveyors should be effective for surveyors, CVC, proximal agents, CCM, commercial delegates, PNDRT executives.
- 3) Logistic and physical means that are required should be effectively provided to all the involved labor force (above mentioned): vehicles for field visits, cell phones for communication, measurement machinery, and so on.

B. Strengthening the role of equipment providers in the value chain

Around 15 equipment providers for cassava products have been supported by PNDRT since 2006. A document called "Catalogue of processing facilities for cassava in Cameroon" was prepared in 2008 by PNDRT, after a study funded by IRCTM and IFAD. PNDRT and IITA ordered a hundred cossettes-making machines by 2009 from national providers. Theoretical and practical training (design and construction of grinders) was provided in 2010 and 2011 to a dozen manufacturers, among whom some were not within the initial list displayed in the PNDRT catalogue.

The survey carried out by CIRAD in 2010 showed that most equipment providers face significant constraints, which are often related one to each other:¹²

- 1) A lack of achievement of critical mass: facilities' orders are often for one unit, which increase manufacturing costs and training workshops tackle this problem any further.
- 2) Innovativeness and innovation capacities: most providers only reproduce models they have already produced and have limited capacity to improve existing ones. Very few of them have the necessary innovation capacity to produce new facilities based on plans.
- 3) Lack of working capital, which poses constraints on the size of their inventories for the main production inputs (consumables, components, and other pieces, steel pieces) and possibilities the

¹² Horus (2010) provides many details on categorization of facility providers, according to operational scale, constraints, and opportunities.

- option to take advantage of special offers and prices for given inputs to store them in advance.
- 4) Lack of knowledge about the activity: equipment providers barely know how to determine their production costs and marginal price, and are often unable to identify their levels of activity.
 - 5) Lack of facilities: there are some shortages for certain machineries, which ultimately affect the final quality of produced equipment.
 - 6) Wrong building shape (size, isolation, maintenance, access): this also poses a problem of final quality that is deliverable.
 - 7) Frequent use of temporary labor: this necessitates frequent training for person hire, which limits accumulation of knowledge capital and experienced labor.

Strong support in the form of capacity building for management of credit access, cassava specific facility construction, standardization of processing equipment, and labor organization/human resources are to be envisaged.

C. Credit access for groups of producers/processors

PNDRT is not meant to be an explicit subsidizing instrument for income generating activities and stakeholders. However, upon beneficiaries' request, the program has means to enable them to receive support and extension services regarding their financing needs. The local microfinance institutions, in general, own sufficient liquidities, from their own funds or re-financing by formal banking institutions, to finance this type of credit. But credit schemes for cassava groups are often considered by MFIs as relatively riskier than more classical credit for traders and commerce, for the following reasons: the credit scheme is to finance a new activity whose profitability is lower than wholesale or retailing, and (ii) new borrowers who appear less trustworthy. This does not induce MFIs to diversify their finance portfolio towards riskier sectors (regarding repayment risks).

To overcome those constraints, a risk fund (RF) of around 100 million CFAF was established to cover MFIs' perceived risks and facilitate credit granting to cassava groups in the midterm with the overarching goal of promoting roots and tubers. The RF was set to share repayment risk related to agricultural production and processing between MFIs and PNDRT, and to insure against insolvent clients/credits by partial coverage. Unfortunately, terms and conditions for risk coverage under the RF which should have been discussed and agreed upon with MFIs and under PPMF's guidance have yet to be finalized and RF is not operational, as for now, in spite of a renewed interest and financing requests made by beneficiary POs. The following reasons may be invoked: (i) operational difficulties of the PPMF (Microfinance promotion project), (ii) weak organization (and inefficiencies) of supported POs by PNDRT, (iii) low levels of RF funds, (iv) PNDRT's willingness and capacities to make RF work, (v) MFIs' reluctance to allow preferential conditions/rates for the supported groups, (vi) strategic orientations made by the MINADER to gear PNDRT activities towards production increases and national food securities after the 2008 winter's food riots.

D. Improving women's groups' efficiency to raise income and productivity

The cassava value chain is dominated by women who represent around 90 percent of the main involved stakeholders and who hold key positions and functions along all value chain segments, from production to marketing. In spite of PNDRT's re-centering activities on 1 200 prioritized villages, organization and structure of CVCs and of the inter-professional association have not been fully achieved, due to a lack of sufficient human

resources and capital mobilized within the project.¹³ Likewise, village development plans which were designed on a participative mode together with beneficiaries have been barely implemented.

We here suggest that local close extension services should be supplied to women's groups by NGOs and other specialized agencies or institutions with expertise in capacity building. The overarching goal is to increase labor productivity and income through better dynamics of women's groups and the build-up of a strong inter-professional structure inclusive of all value chain stakeholders and actors. Clear rules and modalities should set out to ensure participation of all involved stakeholders.

E. Creating value for locally demanded cassava by-products

PNDRT conducted several activities to evaluate local supplies towards local demand and consumption (for both domestic and industrial uses), sub-regional, and international demand of cassava by-products such as starch, gari, chikwangue, frozen cassava leaves, unfermented flour, etc. but impacts are difficult to measure and hardly sizable. This has several causes, including the weak organizational efficiency of the value chain (at the inter-professional level),¹⁴ the lack of sufficient supply of by-products (especially starch, flour and paste) which is directly related to inconsistent supplies and irregular sourcing, and the lack of appropriate follow-up on the conducted activities.

The main activities were (i) organizing meetings between supplies and buyers of cassava starch, paste, and leaves, (ii) organizing several commercial/selling fairs and field visits in all neighboring countries (West and Central Africa), and (iii) support for local producers' groups to scale up and improve packing and packaging of cassava crisps, dried cassava leaves, and other higher value products, (iv) source new customers and marketing partners, (v) conduct market and feasibility studies for marketing new products such as "pre-cooked and vacuum-packaged cassava", unfermented cassava flour, and so on.

For traditional domestic by-products (sticks, fufu, cosettes, etc.), potential demand is by and large superior to real supply, which might increase their value and price. The added value is nevertheless kept far from its full potential due to organization and coordination failures in the value chain, constraints and uncertainties pertaining to marketing (risks and other shadow costs). This also applies to the by-products which are marketed through local industries such as starch, unfermented flour and cassava cosettes for animal feed. Furthermore, the local supply of those products, which is marginal, has to compete with imported substitution products, some of which are subsidized (wheat flour, maize or potatoes' starch, soy flour, etc.)

To ensure the sustainability and visibility of those promotional and value adding activities, there are some prerequisites such as sufficient supplies of processed cassava by-products (critical mass), strong inter-professional structure capable of lobbying governmental bodies and inducing them to adopt protectionist policies for local markets and small scale industry. This would give local firms engaged in the cassava value chain with a more long term vision on their income expectations and let them some time to grow before being able to compete with other countries and on domestic, national, and global markets.

¹³ Specialized NGOs were expected to support and assist the beneficiaries in markets and villages, but have only been fully operational since 2011.

¹⁴ A study on cassava products' marketing was carried out by PNDRT and IRCTM/IFAD in 2008 for CEMAC region and for some European countries. The study showed that there is a huge potential demand for certain products such as chikwangue or frozen cassava leaves.

F. Expanding intra-regional trade: strategies and actions

- (i) **Organizing field visits and trips between traders:** Unfortunately, this activity was not considered as a priority within the PNDRT and no field trip has been ever organized.
- (ii) **Rehabilitating border markets:** PNDRT has built marketing and storage warehouses on ten border markets, which has successfully enabled some traders and producers to better respond to regional demand.
- (iii) **Market information systems and practicing on markets:** Expansion of mobile phones enables the functioning of rapid information-sharing on all CEMAC markets. If all CEMA countries were to be connected to the Esoko network, this would allow one to have access to all useful market information from all relevant places. IFAD, through IRCTM, has envisaged drawing on lessons from PNDRT experience and applying them to all IFAD projects in the CEMAC region so to improve the functioning of market information systems. But effective functioning is yet to be restored in Cameroon first.
- (iv) **Developing/Scaling up communication infrastructures (roads, telephone).** In the base documents of PNDRT, it was envisaged to devote one fourth of the overall budget to the setting and maintenance of rural tracks and roads and to unlock production areas in order to decrease market transaction costs and get closer to urban consumption centers, markets, and border markets. Those funds were to be sourced from PPTe initiative but were difficult to mobilize. PNDRT had thus to focus its effort on the most landlocked production areas located in the Center and Littoral regions. Facilitation of sub-regional and intra-regional trade has already been discussed up to the level of prime ministers and presidents. Several road infrastructure projects, including the one that seeks to connect capital cities of all CEMAC countries, are to be executed or in progress, with financial and technical participation and assistance from several donors such as World Bank, AfDB, or European Union.
- (v) **Reduction of non-tariff barriers for trans-border trade:** Improving customs and customs' administration and services, clearing procedures, anti-corruption policies and measures, harmonizing bio-safety, sanitary and quality standards.

6. Conclusion and general recommendations

In spite of a new focus on and a renewed interest in Cameroon's policy strategies in agriculture and in the cassava sector, most value chain stakeholders face challenging constraints and difficulties. This chapter highlighted those stakeholder deficiencies, organizational and management failures, coordination problems, and structural/infrastructural shortages, paramount to limit effective business expansion of the value chain, while potential local and regional demand is large and substantial. This is reflected in low farm yields and productivity, a lack of critical mass to ensure consistent supplies to market and regular sourcing for marketing and processing, which altogether result in a low competitiveness of cassava by-products onto local and international markets (in developed countries), and on industrial marketing outlets, with respect to other locally-produced or imported cereals.

Specific objectives of agricultural development policies sought to improve structure and organization of the value chain, standardize processes and quality of local production (complying with international norms), disseminate information and promotion mechanisms (upstream and downstream), improve retail markets and distribution networks (actual and potential markets), and expand financial arrangements and products which are adapted to cassava production and marketing and to the capacities of the value chain stakeholders.

PNDRT has then promoted increases in roots and tubers' production in the selected producing areas thanks to improved technologies resulting in a doubling of farm yields, and an increase in cultivated land devoted to cassava production.¹⁵ Several difficulties have however remained, because several bottlenecks have put constraints on further development and on the scope of fruitful experiences, at each stage of the value chain (production, marketing, processing).

- (i) Distribution of PNDRT cuttings selected from improved varieties has not coincided with a significant increase in tubers and by-products on markets, caused primarily by marketing constraints which were not sufficiently addressed.
- (ii) Organization issues are still challenging. An internal investigation carried out in June 2011 showed that only 20 percent of PNDRT-established groups of producers and processors (CVCs and CMs) were considered as economically viable and sustainable. On a related note, producers' organizations should be rather offered a cooperative status (or a GIE one) and must be supported to handle processing up to a larger scale. It is regrettable to observe that PNDRT has not produced spillovers with the downstream part of the value chain (marketing/ processing/ exports). This is indeed a direct consequence of the initial focus of the program on production related matters and an excessive focus on food security, which were in turn detrimental to processing, organizational (stakeholders and value chain) and market access/participation. A more value chain focused approach could be a solution. An effective and agreed upon implementation of the main guidelines and orientations of the action plan elaborated by December 2006 within "the Cameroon's cassava sectoral strategy" document with the assistance of the ITC and other donors would be the first stage in such a solution.


The cassava value chain development can only be enhanced and sustained if some supportive policy for semi-industrial processing and marketing is designed and implemented, aside from the revitalization of artisanal and traditional processing currently within producers' groups (who need more professional structures and management), groupings, and SMEs. Such a policy should include a better promotion strategy for local supply, standardization efforts for quality, overcoming marketing constraints, seeking critical mass building through horizontal coordination, improvement of vertical relationships through contracting, trust-building, and loyalty, expansion of trans-border trade, and reduction of non-tariff barriers, and overall improvement of investment and business environments.

Some specific strategies (e.g. Horus 2010) are envisioned to scale up cassava flour processing and starch supplying to secondary and tertiary stakeholders in order to build national supply up to a semi-industrial scale, increase and expand traditional cassava ready to eat by-products' processing and marketing if they are competing with low cost artisanal products by adding value through improved quality and bio-safety, as well as expanding marketing outlets pertaining to the animal feed sector, which appears as one of the most promising outlets. Those strategies revolve around strong vertical coordination and at least partial integration between producers and processors so as to decrease processing costs and leverage economies of scale. This would necessitate relying on well performing varieties regarding not only both farm and processing performance and requirements, but also industrial yields' attributes (extraction rates, drying...), and reaching critical masses. Some support could be added by an enabling regulation which would favor the use of composite or mixed wheat/cassava flours, provided that this coincides with local and regional consumers' preferences. Last, issues pertaining to consistent supplies and sourcing, reliability and costs of facilities (necessity of serial production), information and knowledge of markets, as well as logistics, have to be included in the core of cassava value chain development strategies.

¹⁵ National statistics exhibit substantial production increases in the PNDRT-supported areas over the PNDRT intervention period : 214 percent for cassava, 187 percent for yams, and 325 percent for potatoes (see the 2010 INS report on social transfers).

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The food crisis of 2007 - 2008 was a turning point in world agriculture. In West Africa, in particular, this episode sparked a greater commitment on the part of governments to pursue policies to rebuild the food production potential, especially of staple foods, long neglected in favor of a few products for export. This necessitates a new development model that redefines the roles of the public sector, the food industry and producer organizations in the promotion of competitive and smallholder-inclusive food value chains.

This book presents a thorough analysis of food value chain policies, past and present, in West Africa. The book examines detailed value chain case studies in several countries, covering both export commodities (cocoa, cotton, mangoes, horticulture) and staple food (palm oil, rice, maize, sorghum, millet and cassava). The book also describes a large number of public and private initiatives and contains many thematic analyses on the private food industry and producer organizations and their critical roles as agents of the market.

This book fills an important gap and makes a valuable contribution to the literature on the development of value chains of basic foodstuffs in West Africa. As such, the book can serve as a resource for information on good practices and for policy guidance, especially at a time when many countries in the region have embarked on implementing their national agricultural strategies derived from the CAADP program.

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