The diversity of retail formats in West Africa requires a diversified set of policies. While supermarkets are expanding in West Africa, traditional markets and small shops will remain the dominant formats for years to come.

West African agroprocessors face serious problems in sourcing reliable quantities of raw materials from their suppliers at consistent quality, forcing many of them to imports.

West African stakeholders are reinventing how various value chains are organized –ranging from cocoa, where the region is the dominant world supplier, to the poultry industry, where it faces strong import competition.

Part III

How are West African Agrifood Systems Responding to Market Trends?

This part analyses how retail food distribution systems, agroprocessing industries and agricultural value chains in the ECOWAS zone are responding to the forces of structural change in the agrifood system described in Part I and the rapidly evolving demand for Agricultural products described in Part II. Part III looks at the food system "from farm to fork." Following the emphasis of the AGWA study on the role of demand in driving food system change, however, Part III starts at the fork and then moves back up to the farm. A full review of the food system including storage, logistics, assembly, and wholesale and retail markets is beyond the scope of this report and is also constrained by data availability.

Rather, the analysis in the first two chapters of Part III focuses on the current and potential roles of modern retailing (Chapter 8) and agroprocessing (Chapter 9) in transforming West African Agriculture. Both these segments have drawn increasing policy attention in recent years as possible vectors of dramatic change in agrifood system organization and performance. Chapter 10 then examines how specific value chains are adapting to the various forces of structural change and demand and identifies how characteristics of different value chains affect their ability to compete in the new global environment facing West African Agriculture. The chapter focuses in detail on six value chains that illustrate many of the challenges and opportunities facing West African Agriculture, followed by a briefer discussion of several others for which demand prospects are promising. The value chains analysed in detail include:

- ***Rice and cassava***, considered "strategic" products by ECOWAS. These value chains have experienced dramatic increases in production in some of the ECOWAS countries due to technological and institutional innovations but are now facing challenges in capturing or developing new market opportunities that require tighter quality control.
- ***Poultry and dairy products***, for which demand is growing strongly but which face very strong competition in the regional market from overseas suppliers; and
- ***Cocoa and cotton***, two value chains that historically have been West African success stories in the export market but which now are seeking new institutional models to deal with current challenges.
- The other value chains with strong growth potential that Chapter 10 briefly discusses include vegetable oil, ruminant livestock, maize, cowpeas, fruits for processing, and cashews.

In responding to changing demand patterns, market rules, and technologies, the retail distribution system, agroprocessing, and broader value chains face several common challenges. These include:

- The need to provide reliable, convenient, safe and low-cost food for the mass market made up of low-income consumers whose primary concern is ensuring their access to low-cost calories and proteins. These consumers, however, are also frequently time-poor and hence also demand increased convenience in their food. Meeting this combined demand for low

cost and convenience requires driving down unit costs of production throughout the whole value chain through capturing available scale economies, adopting technologies that reduce unit costs, and reducing transaction costs throughout the value chain. It also requires establishing and enforcing norms for quality assurance and food safety.

- Responding to the burgeoning demand from the growing middle class for a more diversified diet, with particular growth in the demand for perishable foods such as fruits, vegetables, and animal products and for more processed and prepared foods. Meeting this growing demand will require strengthening linkages between input suppliers, farmers and processors to ensure product quality and consistency. It also requires that firms strive to make consumers' experience with buying and consuming the firms' products easier and more enjoyable than those of rivals.

- Managing the uncertainty surrounding these markets, including uncertainty concerning availability and quality of supplies, shifting demand, and the policy environment.

- Doing all this within the constraints imposed by existing infrastructure and policies.

The chapters in Part III examine how the various segments of the West African food system are addressing these challenges and make suggestions about policies that could enhance their response.

Chapter 8

Modern Food Retailing in West Africa: Emerging Trends and Outlook

One of the key questions posed to the organisers of the AGWA study at its outset was whether the "supermarket revolution" which has been well documented in Asia, Latin America, and Southern Africa, would soon sweep over West Africa, transforming food retailing and excluding small farmers from supplying this growing retail market. This chapter is aimed at addressing that question. It examines trends and potential future growth paths for retailing formats such as supermarkets and Quick Service Restaurants (QSRs), and puts them in the context of the broader food retailing system.

The information available on modern retailing in West Africa is extremely fragmentary. In order to understand possible future trajectories for modernization of food retailing in West Africa the chapter first briefly reviews experiences in other parts of the world, particularly in Southern and Eastern Africa, and their implications for broader food system development. Section 8.2 then takes a closer look into the experiences with supermarkets in sub-Saharan Africa, focusing on the forerunners: Kenya and South Africa. Both countries offer insights into possible pathways and implications for supermarket development in the rest Africa. The rest of the chapter examines the grocery and food services sectors in West Africa, with a focus on Ghana and Nigeria. The chapter concludes by discussing the future outlook of modern food retailing in West Africa and related policy implications.

8.1 Background: global evidence on the "supermarket revolution"

The rapid growth of modern food retailing in developing countries and its impact on the broader food system have been a major focus of research on food systems transformation since the early 2000 (Weatherspoon and Reardon, 2003; Reardon and Timmer, 2007, 2012; Tschirley *et al.*, 2010). Most of this work has focused on supermarkets, a term used synonymously with modern grocery retailing including food retail stores of various formats such as supermarkets, hypermarkets, and convenience and neighbourhood stores (Reardon *et al.*, 2008). There is no sharp distinction in the literature between modern and traditional food retailing, as this difference is context-specific. However, modern grocery retailing is generally characterised by (1) self-service formats, (2) improved shopping ambience in terms of space, hygiene, air conditioning, etc., and (3) consistent supply of a broad assortment of food products of different qualities and brands. Food services are another important segment of food retailing, comprising hotels, restaurants and catering. Modern food services include quick service restaurants (QSRs) of different formats. Modern food service as well as modern grocery are typically characterised by chains of outlets operating under different brands. Franchising is a common instrument to enable the rapid spread of modern food retailing without requiring heavy capital investments by the franchise owner.

The so-called "supermarket revolution" refers to the rapid expansion of modern grocery retail formats in developing countries since the early 1990s. While it took over a century for modern food retailing to become the dominant force in the United States and Western Europe, its expansion in developing and emerging economies happened much faster. Notably in Latin America, Central and Eastern Europe, Asia and some countries in Southern Africa, supermarkets have grown from niche players to dominant forces in food retailing during periods of one to two decades, inducing far-reaching changes in the entire food system.

Evidence suggests that supermarket expansion in developing and emerging economies has so far occurred in three waves: the first wave started in the early 1990s in South America, Central and Eastern Europe, East Asia (outside China) and South Africa. The share of supermarkets in total retail sales in these areas increased from about 10% in 1990 to about 50 to 60% in the mid-2000s. This was followed by a second wave starting in the mid-to late 1990s in Mexico, Central America and much of southeast Asia, with supermarkets' shares increasing to 30 to 50% since the mid- to late 1990s. A third wave can be observed since the late 1990s and early 2000s in countries such as China, India and Vietnam (Reardon and Timmer, 2007). Expansion into other parts of the developing world, including West Africa, has been uneven and generally at a much slower pace than expected a decade ago (Tschirley, *et al.*, 2010).

Structural drivers for the expansion of modern food retailing include urbanization and rising incomes, trade liberalization, growing middle classes and increased female urban labour force participation. Modern food retailing responds to emerging consumer demands for a variety of food products under a single roof and in a safe and comfortable shopping environment. Strong national and international brands instil consumer confidence in the safety and quality of food, especially in environments where public food safety standards are poorly enforced. In addition to these structural drivers, the rapid growth of supermarkets during the past two decades was boosted by a massive increase of foreign direct investment (FDI) in food processing and retailing, and eventually food logistics, triggered by the opening up of various developing regions to trade and foreign investors since the 1980s (Reardon and Timmer, 2012). Since then, supermarket chains expanded from saturated OECD markets into emerging markets that offered higher initial profits and first-mover advantages.

Evidence from Latin America, East Asia and some African countries (South Africa, Kenya) reveals certain common features of supermarket expansion in developing countries. Typically, supermarkets start out by serving a small upmarket and expatriate clientele in large cities. With growing middle classes and increased efficiencies in procurement and domestic supply chains, supermarkets start competing for customers in the lower middle-class segments and beyond. The diversification of the client base is accompanied by geographic expansion into secondary cities and eventually rural towns. In terms of products, supermarkets tend to focus first on processed, packaged and dried foods before entering into fresh food markets. The "first-mover" fresh foods purchased in supermarkets have been storable, staple commodities or, more rarely, imported fresh fruits and vegetables (FFV) and foods experiencing first-stage processing consolidation such as poultry, beef, and pork (Weatherspoon and Reardon, 2003; Neven and Reardon, 2004). Domestic sourcing of fresh fruits and vegetables gradually expands, depending on the maturity and response of the domestic supply chain. Typically, fresh fruits and vegetables account for some 10 to 15% of supermarkets' food sales in developing countries, and supermarkets' shares in fresh food markets have remained limited.

The rapid expansion of supermarkets in several developing regions spurred interest of researchers, policy makers and donors on the impacts of the expansion on the broader food system in general and on small farmers and retailers in particular. Supermarkets are modernising and innovative forces for the entire food system by developing consistent supplies of quality-differentiated products and driving efficiencies in supply chains and logistics. Consumers benefit from a larger choice of products, usually of higher quality and, eventually, lower prices. Private standards introduced by supermarkets offer consumers some assurance of quality and food safety in environments characterised by the absence or poor enforcement of official standards. Supermarkets' procurement practices provide incentives for domestic producers to increase the quality and consistency of their products and introduce efficiencies in the supply chain logistics. Finally, once supermarkets have moved beyond upmarket niches and supply larger numbers of middle- and lower-income customers, traditional marketing channels have to respond by improving product quality and safety as well as product presentation and hygiene at and around market places.

Despite these positive impacts of supermarkets for consumers and the broader agrifood system, there are concerns about the ability of domestic suppliers, especially small farmers and SMEs, to adjust in order to meet the demands of supermarkets. Are domestic SMEs in food processing and trade able to meet the requirements concerning quality, consistency and volumes? Are small farmers able to enter and remain in preferred-supplier lists for fresh produce? Other issues include the possible displacement of traditional grocery retail outlets such as open markets, small kiosks and neighbourhood stores and the related impacts on employment and food prices. Finally, there are concerns about market power exerted by large supermarket chains, especially in countries where they dominate food retailing.

Notwithstanding the limited share of supermarkets in domestic fresh fruit and vegetable markets, most of the research and policy attention has focused on this product segment and the related procurement practices of supermarkets. This interest has been due to the importance of fresh fruits and vegetables to ensure a balanced diet of the rural and urban population on the one hand, and as a potential avenue for smallholders to diversify away from low-value staples into higher value products and markets on the other hand. Fruits and vegetables are seen as "smallholder-friendly" due to the labour intensity and alleged absence of economies of scale in production. Supermarkets were seen as a new and fast-growing potential marketing channel for smallholders, offering higher income opportunities, especially if the supermarkets bypassed intermediaries and established direct supplier relationships. Likewise, there was a concern of small producers being gradually replaced by larger farms, as has frequently happened in fresh produce export value chains. Other product categories requiring processing have received far less attention. Hence, not much is known about the ability of domestic processed and packaged food to enter the supermarket channel and of domestic SMEs in food processing to become regular suppliers of modern food retailers. Moreover, the growth of the modern food services segment and its procurement practices has received little attention.

8.2 Evidence from sub-Saharan Africa

8.2.1 Market penetration

South Africa and Kenya have been the forerunners of supermarket development in Africa. In both countries the number of supermarket outlets and their shares in food retailing expanded rapidly between the mid-1990s and the mid-2000s. In South Africa, supermarkets accounted for 50-60% of total food retailing in 2002. In Kenya, surveys conducted by Michigan State University in 2003 estimated supermarkets' shares in total urban food retailing at 20% (Neven and Reardon, 2004). In line with experiences elsewhere, the share of supermarkets in urban fresh fruit and vegetable markets was much lower, estimated between 2% (Tschirley, *et al.*, 2010) and 4% (Neven and Reardon, 2004). However, the volume marketed through supermarkets was already half of the country's fruit and vegetable export volumes at that time.

In view of this rapid and early expansion, most supermarket literature in Africa has focused on Kenya and, to a lesser extent, South Africa. Supermarket chains from these two countries have also expanded throughout Eastern and Southern Africa and, more recently, into Ghana and Nigeria. Hence, experiences in these pioneer countries can be useful for understanding potential future developments in West Africa along with their likely impacts for the food system and related policy implications. This especially applies to Kenya, which has comparable socio-economic and demographic indicators with larger West African countries.

A striking feature of supermarket development in Africa is the importance of domestic rather than international players in both Kenya and South Africa. Here the rivalry between two market leaders has spurred the initial expansion, followed by other, smaller chains. In South Africa, the initial expansion was driven by ShopRite and Pick n Pay, each controlling about 40% of the modern food retail market segment in 2002. The rest of this market segment was made up by a few smaller chains,

including SPAR, Woolworth, and a large number of independent supermarkets. These chains used different formats including hypermarkets, supermarkets, superettes (small format supermarkets) and convenience stores in order to target different market segments. In 2010, the third largest player, SPAR, had expanded its market share to 20%. Competitive pressure has led to the rapid expansion into townships, smaller towns and rural areas. In 2011, US retail giant Wal-Mart acquired South-African retailer Massmart, which will further spur competitive pressure.

In Kenya, the share of supermarkets in food retailing grew by 18% per annum between 1995 and 2003, albeit from a small base (Neven and Reardon, 2004). In addition to the long-term drivers such as growing urbanization and middle classes, the expansion of supermarkets was propelled by liberalization of import and domestic markets, which increased the accessibility of a wide range of products at more competitive prices. The two dominant players driving the initial rapid expansion were Uchumi and Nakumatt.[62] While Nakumatt has focussed on the upper-income market, Uchumi targeted a broader clientele of varying income levels. Smaller chains such as Tusker, Naivas and Ukwala located their outlets close to major bus stops and transport hubs, targeting middle and lower-middle income urban households. The top five supermarkets collectively accounted for roughly two-thirds of modern food retail sales. The rest was made up by smaller, independent supermarkets and convenience stores, some of which were located in smaller towns and some located in high-income neighbourhoods, catering to specific demands of expatriates and other higher income groups. In 2003, nearly 60% of the stores were located outside of Nairobi, and basically every provincial capital had one or more supermarkets (Neven and Reardon, 2004). Small and independent stores opened new markets and were then followed by the five bigger chains.

Despite the initial rapid growth of supermarkets in both countries and their dominant position in South Africa, traditional food retail channels have remained important. Even in South Africa, only 47% of fresh fruits and vegetables are estimated to pass through the supermarket channel, with the remaining 53% via other channels including open markets and other small retailers (USDA, 2011). This is in part due to the existence of modernised wholesale markets enabling other retail channels to compete with supermarkets in this segment. For staple foods and packaged foods, small neighbourhood stores (spazas), kiosks and hawkers (street vendors) remain important, especially in townships and rural areas. There is a growing awareness among manufacturers and transporters of the importance of spazas as distribution channels. About 20% of the estimated 100 000 spazas reported having their supplies delivered directly by manufacturers of soft drink, dairy and bakery products (USDA, 2011).

In Kenya, growth rates of supermarkets slowed during the latter part of the last decade, partially due to economic problems of the largest chain (Uchumi) but also due to the persistence of a highly unequal income distribution, which results in a still limited middle class and a large share of low-income households. The traditional distribution system composed of open markets, traditional wholesalers, small shops and a large informal sector continues to dominate food distribution (Dihel, 2011). The share of traditional channels in total food retailing (urban and rural) is estimated between 80% (USDA, 2012b) and 90% (Deloitte and Planet Retail, 2011).

In Kenya, the 2003 MSU survey in Nairobi found that supermarkets'[63] market penetration was highest in staple foods (32% of total food expenditures of surveyed households), followed by dairy products (15%), meat (4.5%) and fresh fruits and vegetables (4.5%). The reason for this uneven penetration is that staples and dried products are easier to store and handle than fresh produce. Moreover, due to the larger volumes, supermarkets can negotiate better prices with manufacturers or importers of packaged food products and pass these prices on to consumers. They further attract consumers with a broader assortment compared with traditional stores.

62 Both are domestic firms. Uchumi resulted from the privatization of a government-owned enterprise and is listed at the stock exchange, whereas Makumatt is owned by an Indian Kenyan family.

63 luding supermarket chains and small, independent supermarkets.

Concerning the depths of market penetration, the 2003 survey found that 80% of all surveyed households in Nairobi bought part of their food from supermarkets at least once a month. Even in the poorest income quintile, 60% of the households reportedly made small purchases at nearby supermarkets, even though at lower frequency, usually about once per month, and for small values at a time. The two main incentives to buy at supermarkets are the larger assortment and low prices for key staples such as sugar, maize flour, oil, wheat and bread. However, poor households purchased almost no fruits and vegetables in supermarkets due to their higher prices compared to other outlets. In Zambia, a survey conducted in the four largest cities found a higher share of middle and upper income customers in supermarket food sales. Two-thirds of all food sales in supermarket chains went to the top 20% of the income distribution whereas the bottom 60% accounted for only 12% of sales. Moreover, three-quarters of all fresh fruit and vegetables sold through supermarkets were purchased by the top income quintile (Tschirley, *et al.*, 2010).

Income, access to refrigerators, vehicle ownership and proximity are key factors that determine the likelihood of shopping in supermarkets. They allow households to make fewer trips and store greater quantities at home, especially of fresh products. This compensates for disadvantages posed by distance and urban congestion. Moreover, younger and better educated persons tend to shop more in supermarkets compared to other demographics.

Evidence from different countries shows the selective adoption of supermarkets by consumers who continue to shop for different items in different retail outlets at different frequencies. Even high-income households in Zambia continue to shop in various traditional outlets. In Kenya and Zambia, the top 20% of income earners of the surveyed households spent between two and three times more in traditional shops, markets, and informal retail outlets than in supermarket chains (Tschirley, *et al.*, 2010). This confirms the importance of proximity and urban congestion in shopping behaviour even for households where income is less of a constraint.

8.2.2 Procurement

In order to supply supermarkets, producers need to meet stringent requirements concerning volumes, consistency, quality, food safety, packaging and timing of delivery. Only producers able to meet these requirements will enter and remain on preferred supplier lists. Both in South Africa and Kenya, domestic producers and processors have been able to respond to supermarkets' procurement requirements. Domestic packaged foods compete well with imports, and Kenyan producers are particularly strong in dairy products and snacks. According to USDA, between 55% and 85% of supermarket grocery sales in Kenya are sourced domestically. As mentioned before, empirical research is mainly focused on the procurement practices for fresh fruits and vegetables and their implications for the domestic supply chain. The key findings are briefly summarised below.

Overall, evidence shows that leading African retailers gradually introduce similar sourcing practices as their peers elsewhere in the world. These include a gradual shift towards specialized wholesalers and direct procurement from preferred suppliers. For example, Shoprite has its own regional distribution centres for fresh produce handled by a subsidiary company under the Freshmark name. The growers and packers selling to Freshmark are responsible for all post-harvest activity including washing, packing, labelling and barcoding. Payments are made within 20 to 30 days. Growers are expected to make daily deliveries in their own rented refrigerated trucks and bring their produce to these distribution centres from which the various stores in the respective regions are supplied. Freshmark preferably buys from large farmers who are also able to supply the export markets and meet requirements for quality and consistency of supply. It only reverts to imports if no suitable domestic suppliers can be found. Its distribution centres also supply other smaller retailers (Weatherspoon and Reardon, 2003). In 2003, 90% of the fruit and vegetable supply in South Africa was sourced directly from outgrowers, managed by the distribution centre, and only 10% through wholesale markets. In South Africa, Freshmark worked with 300

outgrowers, mainly larger farmers, most of them also supplying export markets.

In other African countries, Freshmark also procures from small farmers, sometimes through spot transactions and sometimes through NGO-facilitated outgrower schemes, such as in Zambia (Haantuba and de Graaf, 2008). For its regional expansion, initially it procures from South Africa until a critical number of stores has been established – usually at least three – to make a distribution centre profitable (Weatherspoon and Reardon, 2003).

In Kenya, Uchumi used a decentralized procurement system based on a preferred supplier programme. Over time, the company moved progressively from brokers and wholesalers towards direct purchases from farmers, which allows it a better control over quality, supply reliability and price stability. At the same time, it increasingly relied on larger farmers with good irrigation infrastructure able to supply all-year-round. Payment is made two to four weeks after delivery. Delivery has to be frequent, daily for some perishable vegetables such as tomatoes. Nakumatt, in contrast, relied on specialized wholesalers for its fruit and vegetable sourcing. These wholesalers bought from a larger and more diverse supplier base, including many small farmers, and carried out value-adding activities such as sorting, packing and cutting in house. Their diverse clients included institutional customers (schools, hotels, and government organizations); the differing quality preferences of the wholesalers' clientele allowed them to be less restrictive in their procurement criteria.

Overall, procurement systems have been moving towards centralization and shifts from traditional brokers to specialized/dedicated wholesalers, and from spot markets to use of preferred supplier systems, and then to use of private quality standards. These trends tend to favour medium to large farmers who are in a better position to meet the requirements in terms of volumes, quality and consistency. There is mounting evidence that smallholders, individually or as groups, face tough challenges to enter and remain in preferred supplier lists of supermarkets (Tschirley, *et al.*, 2010). In Kenya, Neven *et al.* (2009) found that the majority of smallholder producers face stiff entry barriers due to initial requirements concerning investment capital (e.g. physical infrastructure and transport), working capital (inputs), and social capital (effective rural organization to achieve volumes and consistency in supply and share fixed costs). Another study based on a survey in central Kenya conducted in 2008, found that off-farm income, education, and vehicle ownership or access are key determinants enabling farmers to participate in supermarket chains. Many of the small farmer suppliers have been supported by an NGO linking farmers to supermarkets and providing invoice discounting services to bridge the payment gap. The study also found that net incomes were almost 50% higher for farmers selling to supermarkets compared to traditional channels. In the case of small-scale farms, supplying to supermarkets generated an even higher income gain of 67% on average (Rao and Qaim, 2010).

While large farmers dominate fresh fruit and vegetable production for export markets, medium-sized farmers dominate production for supermarkets. However, medium and large farms depend overwhelmingly on hired labour, which is higher-paid on average than other farm workers and employed year-round. Following international experiences, the future development of the sector could lead to inclusion or exclusion of small farmers. In some cases with rising rural wages, larger farms might regularly substitute capital for hired labour. In other cases, large farmers have engaged in outgrower schemes with smaller producers to expand.

8.2.3 Supermarket expansion beyond Kenya and South Africa

South African and Kenyan retail chains have been expanding into other African countries, especially in Southern and Eastern Africa, competing with smaller domestic players. Shoprite opened its first store in Zambia in 1995 and expanded heavily in the following years. In 2003, the company had operations in 13 counties, and this number increased to 16 in 2012, including Ghana and Nigeria. Other large South African retailers such as Pick n Pay, Massmart and Woolworth have also expanded in neighbouring countries.

SPAR operates in nine African countries, including, recently, in Nigeria. Kenyan market leader Nakumatt opened its first store in Rwanda in 2008 and now operates stores in Uganda, Rwanda and Tanzania. Uchumi has opened its first store outside Kenya in Dar es Salaam and plans to open seven stores in Uganda (Jacobs, 2012). Franchising has been used as a strategy for expansion into other markets, as it requires lower initial capital investments. However, the first anchor stores are often owned and managed by the parent company.

In general, the penetration of supermarkets across Africa has been slower than anticipated in the early 2000s following the rapid growth in Kenya and South Africa and the initial wave of investments in other countries. However, there are recent signs of acceleration. So far, mainly national and regional players invested in the sector, apart from limited entry of French chains in some francophone countries (Casino has entered Cameroon, Gabon, Madagascar and Senegal through franchising) (Bra, 2012). However, the entry of Wal-Mart in South Africa by acquiring a 51% share in the South African retailer Massmart is expected to accelerate growth and competitive pressure in the African supermarket sector.[64] It has embarked on an aggressive price competition strategy in 2012, putting its competitors under pressure (Jacobs, 2012; Deloitte and Planet Retail, 2011). Wal-Mart is aiming to expand Massmart's share in grocery retailing in South Africa and other African countries. In addition to sustained economic growth, urbanization and growing middle classes, regional integration enhances the possibilities for cross-border sourcing, especially in the case of fresh produce.

8.3 Modern food retailing in West Africa

Information on the state of modern food retailing in West Africa is extremely limited. There are no studies on supermarkets or food services, their business models and procurement practices available in the public domain. Even basic information about the size and structure of food retailing in West Africa is scarce. Capturing the size and structure of food retailing is particularly difficult given its diversity and the importance of the informal economy. Food retail volumes or turnover are not reflected in public statistics, and private market information and research firms largely confine their activities to Nigeria. Even these private market research firms usually rely on industry sources and extrapolate information obtained from certain respondents, largely from the formal sector, and from the trade press.

This section is based on information published by the Foreign Agricultural Service (FAS) of the United States Department of Agriculture on Ghana, Nigeria and Senegal, and from Euromonitor International on Nigeria.[65] In addition to secondary information available, the section draws on interviews in Accra and Lagos conducted as part of the AGWA study in order to better understand the perceptions and views of food retailers and consumers on issues, challenges and future directions of different food retail channels. While the emphasis was placed on modern food retailing, operators and customers in traditional markets were also interviewed.

8.3.1 Structure of grocery retailing

Overall the grocery retail sector in the three countries is still at an early stage of transformation, and modern food retailing is still in its infancy. Food distribution is dominated by traditional channels and a large informal sector to an even greater degree than in Eastern and Southern Africa. Traditional open markets are the main food distribution channels, accounting for half of overall food retailing in Senegal and two-thirds in Ghana and Nigeria (USDA, 2010; USDA, 2007 USDA, 2012a). These markets typically consist of small stalls of 5 to 10 m^2 clustered in large open areas. Most grocery wholesalers are also located on or

64 Massmart is a managed portfolio of ten wholesalers and retail chains, each focused on high volume, lowmargin, low-cost distribution of mainly branded consumer goods, through 228 outlets, and one buying association serving 478 independent retailers and wholesalers, in 12 countries in sub-Saharan Africa. However, its operations outside of South Africa are mostly small, accounting for only about 10% of total sales. While Massmart is the second largest retailer in South Africa, it only has five% market share in grocery retail (Deloitte and Planet Retail, 2011).

65 However, the estimates published on food retail market sizes vary considerably between sources and years, and they are not always clear about the extent to which the traditional and informal sector is included in the estimates. Hence, the estimates of the size of the food retail markets and the shares of the main retail channels cited in this section should be considered as rough estimates of orders of magnitude.

close to open markets (between 60% to 70% in Ghana and Nigeria, respectively). Open markets not only have a dominant position in basic food staples (cereals, roots and tubers) but also in fruits and vegetables, meat, eggs and fish. They are also important outlets for packaged foods and frozen meat and fish, both domestic and imported. In Ghana, frozen chicken imports are mainly distributed through cold stores, many of which are located in open markets. Most importers also operate as wholesalers and retailers. In Ghana and Senegal, many supermarkets are owned by importers. Most importers have satellite outlets or representatives in the main open markets. Over time, there has been some consolidation and shortening of food import chains. For example, in Ghana an estimated 40% of imported food products are purchased by retailers directly from importers who maintain warehouses and distribution points in several locations (USDA, 2012a).

Focus-group interviews in Accra and Lagos revealed that the attractiveness of open markets is due to their broad range of goods and lower prices compared to other food retail outlets. Customers usually bargain for prices except for imported high-value products and international brands of packaged foods. Some consumers also prefer the freshness of products in the open markets and the possibility to taste and inspect unpackaged staples such as gari. At the same time, consumers complain about congestion, poor hygienic conditions, product presentation and a stressful shopping environment. Moreover, travel to these markets can be time-consuming, particularly in large cities. Hence, most customers in larger cities tend to buy larger quantities of food staples and packaged foods.

Open markets also serve as the main sources of supply for small independent food retailers, who tend to source from wholesalers or sub-wholesalers on or around these markets. Small, independent stores comprise a wide spectrum of outlets, ranging from superettes to neighbourhood stores and kiosks. They normally sell food staples, packaged foods and beverages in small quantities and sizes, along with non-food items. Some of the larger stores are directly supplied by importers as part of their distribution and promotion strategies. Only a small fraction of neighbourhood stores sells frozen foods due to limited and unreliable access to electricity. Although prices are slightly higher than in open markets, their proximity makes them the first choice of many households, especially those in the lower-income brackets with limited access to refrigerators and transport. As in case of supermarkets, households' ability to buy and store fresh produce depends on their access to refrigerators and reliable energy supply. Moreover, many small neighbourhood stores sell on credit to frequent and trusted customers and thus play an important role in food security for poor urban households with irregular cash incomes. At the bottom end of the food retail spectrum are mobile food vendors, street hawkers and roadside stalls selling food staples, fruits and vegetables as well as packaged foods to the mobile population.

8.3.2 Modern grocery retailing

According to industry estimates, the share of modern food retail outlets including supermarkets, hypermarkets, gas marts and convenience stores only reaches 1%-2% of total food retailing in Ghana, Nigeria and Senegal. In 2012, most modern grocery retailers only had between one and five outlets. Yet, the modern food retail segment has become more dynamic over the past five to ten years, marked by the entrance of international supermarket chains and franchises. In view of recent sustained per capita income growth rates and similar expectations for the future, investors see considerable growth potential in larger West African countries, especially in Nigeria – the second largest market in sub-Saharan Africa. Ghana and Nigeria compare well with Kenya in terms of key economic and business indicators such as per capita income, population size, ease of doing business and income distribution, but are far behind concerning food distribution and retail market development. The following paragraphs provide a brief snapshot of modern grocery retailing in the three countries.

Nigeria. While supermarkets, and especially international brands, are a more recent phenomenon in Ghana, they have a much longer track record in Nigeria. The oil boom during the 1970s and the

resulting growth of middle- and upper-income classes attracted several national and international concerns to invest in the Nigerian retail market. Brands like Leventis Stores, UAC Stores, UTC Stores, Bhojsons, SCOA and Kingsway opened stores in Nigeria's major cities of Lagos, Ibadan, Port Harcourt and Kano. Given the underdeveloped domestic supply chain, these retailers largely depended on imports to meet consumer demands in terms of product diversity, quality and reliability of supply. The socio-economic downturn during the 1980s and early 1990s and ensuing economic policy measures resulted in an adverse business environment for supermarkets. On the one hand, public spending cuts and retrenchment of public-sector employees led to a decline of the middle class and a worsening of the income distribution, forcing large population groups back into the open markets and neighbourhood stores. On the other hand, import bans and mounting import restrictions related to the cost and availability of foreign exchange made it increasingly difficult to secure regular supplies of food items. Hence, by the late 1990s, most of the above-mentioned retailing chains had stopped their operations. Only a few smaller local players survived the turmoil.

Since the early 2000s, modern food retailing has regained traction in Nigeria, fuelled by improved macroeconomic stability and strong growth. In September 2008 the government significantly reduced the number of items prohibited for import and reduced the duty on others. Hence, a major impediment for modern food retail expansion, especially in its early stage, has been relaxed. As a result, multinational retail and food service chains have entered the country, alongside increased investments by local entrepreneurs in the modern food retail and food service sectors. Even with all of the challenges posed by Nigeria's economy, the private sector views the consumer food delivery market as too large and too dynamic to be ignored.

Property developers are also expanding their activities in Nigeria, often in tandem with major retailers. The opening of The Palms, a first-of-its-kind shopping mall in Lekki, Lagos, in 2006, ushered in South African retail giants Shoprite and Game. Shoprite and Game are the anchor tenants of this 40 000 m^2 site, each occupying about 5 500 m^2. While Game stocks a wide range of merchandise from groceries, electronics, furniture and other household goods, Shoprite concerns itself with mainly fast-moving consumer goods. Shoprite currently also operates three outlets in Lagos, one in each Abuja, Enugu State and Kwara State. Two outlets in Kano and Ibadan were scheduled to open in late 2013.

The entry of Shoprite into Nigeria has been followed by SPAR, a Dutch brand operating a franchise model in seven African countries. During 2009, SPAR entered a franchise agreement with the Artee Group, which was established by Indian immigrants to Nigeria in 1988 and which operates five retail outlets in Lagos, Abuja and Port Harcourt. The first SPAR store in Nigeria opened in 2010 in Lagos, and a second one followed in 2011 in Abuja. Having acquired six additional locations for SPAR supermarkets, the Artee Group plans to begin the conversion of Park 'n' Shop to the SPAR brand, though the Park 'n' Shop brand will be retained for shopping centres. SPAR announced its plan to open 20 additional outlets during the next three years. Other notable domestic supermarket brands include Cash N Carry, Goodies, Addide, Grand Square and Amigo.

The entry of three international retail chains and their expansion plans set the stage for increased competition in the sector. Game, a subsidiary of the South Africa-based retailer Massmart, provides Wal-Mart a direct entry into the Nigerian market. Game operates stores in seven African countries including Ghana and Nigeria.

Ghana. In Ghana, the number of supermarket brands and outlets is more limited than in Nigeria. In 2006, a USDA report listed 10 brands, 4 of which had three outlets and the rest were single stores (USDA, 2007). Most were owned by Lebanese residents of Ghana, and all owners were also importers. Until the mid-2000s, these stores carried primarily imported packaged products targeting expatriates and domestic high-income markets. The food retail market in Ghana was estimated at US$1 billion in 2006 (USDA, 2007). Local,

unprocessed foodstuffs and staples including fresh fruits and vegetables, fish and meat accounted for almost half (46%) of the overall market, followed by imported high-value food products (34%) and products partially or completely processed and packaged in Ghana (20%).

With the growth of the middle-class and the entry of Shoprite in 2007, supermarkets have been diversifying their product offerings and are targeting a broader range of customers. Shoprite had already intended to open a hypermarket in Ghana in the late 1990s but then decided to enter the market with a smaller supermarket format, U-Safe, given the market and business environment. As Ghana's formal retail market strengthened, Shoprite closed most of the smaller U-Safe stores with the opening of one hypermarket in 2007 in the Accra Mall. Larger home-grown players such as MaxMart and Koala have remodelled and expanded their stores substantially towards "mini-hypermarkets" with a broader product range. The strong recent growth performance and the expected future growth of investments and consumer spending in Ghana fuelled by the emerging petroleum industry is expected to sustain growth of modern food retailing, at least in urban areas. For example, as of March 2013, Wal-Mart was actively exploring the possibility or entering the Ghanaian market.

Senegal. In Senegal, larger supermarkets are almost exclusively located in Dakar. In total, there are about 200 supermarkets and mid-sized grocery stores in the Senegalese capital, which boasts a large expatriate community and a sizeable middle class. Over the past 10 years, several modern supermarkets have opened in Dakar, including five outlets of the French Casino chain and the Hypermarket Exclusive, owned by Indians. There is also a growing number of gas-station-type convenience stores. Several domestic chains (e.g. Pridoux, Select, and Filfili) are owned by French and Lebanese expatriates (USDA, 2010).

8.3.3 Food services

In view of the trends towards eating away from home discussed in Chapter 6, the food services sector has been growing strongly. Little is known about the structure and size of the food services sector in West Africa, which consists of hotels, restaurants and catering. Evidence suggests that the sector is as equally diverse as the grocery sector, ranging from large international hotels to small restaurants and street-food vendors. However, information about numbers of operators and outlets of the different food service segments and their turnover is scarce and fragmentary.

Industry sources state that the restaurant industry in Nigeria has been growing quickly and quick-service restaurants (QSR) have been growing particularly fast. This sector is composed of traditional casual restaurants and food stalls, street-food and modern quick-service outlets. While exact data are not available, street-food vendors and small casual restaurants comprise the bulk of the quick-service sector. These outlets are particularly important for low-income households, but they cater to broad segments of the urban population. Similar to traditional small grocers, accessibility and locational convenience are key determinants of their popularity in congested urban areas.

In addition to these traditional and informal outlets, the formal QSR sector including formal-sector fast-food restaurants has also grown rapidly over the past decade. Modern QSRs fill the gap between the traditional casual restaurant and street-food sector on the one hand and conventional up-market restaurants on the other hand. They respond to the growing demand for ambience and improved safety and hygiene conditions as well as to changing urban lifestyles. In Nigeria, the formal QSR sector is larger and started earlier than in Ghana. Mr Biggs is the industry pioneer.[66] Starting as a coffee shop in the Kingsway department store in the 1960s, it was the first Nigerian food services company to use a franchise model. Mr Biggs has grown to over 170 locations and extended into Ghana. Other important players include Tetrazzini, Big Bite, Mama Cass, Tantalizers, Chicken Republic and Pizza Republic. According to industry sources, the modern-fast food industry in Nigeria grew by 30% per year between 2000

66 The Mr Biggs restaurant chain is a division of United African Company, a Nigerian conglomerate with investments in a range of economic subsectors.

and 2009. Total revenues generated by the 800 outlets were estimated at US$400 million in 2009 (Research and Markets, 2010).

For both countries, the entrance of international QSR franchises has reoriented the QSR segment, bringing new standards, status, ambience and a robust branding culture. While Mr Biggs was originally the most modern QSR in the market, entrants such as KFC from the United States and Barcelos from South Africa have challenged the competition in terms of ambience and brand recognition. KFC entered Nigeria in 2009 and Ghana in 2011. Chicken Republic and Pizza Republic are also major players with unique profiles. These brands are not just multi-national transplants; they were established by a Nigerian entrepreneur who had been living abroad for 16 years. While they are domestic brands,[67] the founder designed them to mimic international competitors and has been successful in doing so. Since Chicken Republic's launch in 2004, the brand has grown to more than 65 company-owned and franchised stores valued at US$120 million. In a discussion with the AGWA team, the firm's founder stated that the market is being driven by youth: "They want to associate themselves with modern brands and modern ways of eating."

Standard brands such as KFC and Chicken Republic signal to consumers a consistent product and ambience, but equally importantly, they bring high standards for food safety. According to a KFC employee formerly working in a domestic fast-food outlet, operational standards at KFC are higher throughout the entire process from food purchase, storage and preparation to customer service. These include clear standards for operational issues such as how to thaw chicken, when to change the cooking oil, and employee hygiene. As a rule, food in these outlets can only be kept for a certain period and cannot be re-used. Employees must clean the dining area in a routine fashion according to a schedule. Applying these standards requires workforce training and incentives.

67 The Republics are now part of Food Concepts PLC, a Nigerian public company housing these brands plus a fine-dining full-service restaurant, a bakery as well as a poultry farm.Food Concepts states that its goal is to "revolutionise the food sector in West Africa and to deliver extraordinary satisfaction to our stakeholders."

A majority of QSRs, especially the international franchises, offer a relatively limited menu. The menus are centred on chicken, fried or rotisserie, with other common accompaniments such as rice or french-fried potatoes. Some also offer sandwiches, meat pies and burgers. According to outlet representatives, the menu-item cost structures are designed to enable all consumers to afford at least something. For example, KFC employees say that their most popular menu item is the ice cream cone, as many people who cannot afford an entire meal want to order at least one menu item.

Although KFC has many stand-alone outlets in Nigeria, many of the "high-ambience" QSRs are located in shopping districts, malls, or in conjunction with other eateries. Consumers view these outlets to be some of the most "upmarket" dining options, aside from fine dining.

There are other domestic players, offering a diversified menu based on traditional foods. These include Mama Cass, Tantalizers, Tetrazzini and Big Bite, which mainly target upper-middle-class customers. The foods are prepared and presented in a buffet. For example, Mama Cass started as a small cafeteria during the early 1990s offering bakery products, snacks and rice. It has now eight outlets in Lagos and Abuja and one in Abeokuta and serves a range of traditional dishes along with snacks, bakery and confectionary products, and poultry. The company purchases poultry, fish and yogurt from preferred suppliers and periodically checks their quality in a laboratory. The company's catering business has been growing rapidly over the past five years. Tetrazzini and Big Bite are other examples of domestic chains offering broader selections of both traditional and Western dishes. According to the staff interviewed, the demand for African dishes has been stagnant whereas the demand for Western dishes has grown.

In Ghana, the domestic QSR sector is less developed and focuses mainly on fried foods such as chicken, rice and fish. Papaye is the only domestic QSR chain, but its menu is focussed on fried chicken, French fries and rice rather than on traditional dishes. However, international fran-

chises such as Chicken Republic, Pizza Republic, Mr Biggs, Barcelos and KFC have also entered the Ghanaian market.

Food ingredients are procured both domestically and through imports, depending on country and product category. Food staples, bread and pastries, and most fruits and vegetables are mainly procured domestically, primarily from preferred suppliers to guarantee quality and consistency of supply. Products that are partly imported include rice, poultry (in the case of Ghana), fish, potatoes, and some dairy products. The degree of domestic sourcing is higher in Nigeria due to a larger domestic processing industry for packaged foods such as noodles, pasta, fruit juices and poultry meat, along with import restrictions for these and other product categories. Fast-food chains in Lagos largely rely on imported processed and canned vegetables because of their reliability and quality compared to domestic suppliers.

More detailed work is needed about the sourcing patterns of the food services sector and the role of specialized agents and wholesalers as well as direct contracting with suppliers. While concerns about volumes and consistency of supply are similar to those of the modern grocery sector, quality requirements may be lower for some segments of this industry. This could imply lower entry barriers for smaller farmers to supply the food services sector, as long as their supply can be aggregated.

8.3.4 Main constraints facing modern food retailing

Interviews with grocery retail managers in Accra and Lagos revealed some of the key challenges underlying the slow growth of modern food retailing in Ghana and Nigeria. These can be summarised as follows:

- ***Availability and cost of real estate.*** Interviewees in both countries highlighted the difficulties to find appropriate real estate in suitable locations to expand their stores. Lengthy and often non-transparent procedures for obtaining permits were cited. Real estate in the major city centres is expensive, and building new premises requires even larger capital outlays, often beyond the financial capacity of many domestic operators. Especially large regional players such as Shoprite prefer locations in shopping malls or centres that attract larger numbers of customers, but these have been developing slowly. These factors particularly constrain the growth of hypermarkets, whereas smaller formats are less affected.

- ***Urban congestion.*** A second constraint for hypermarket expansion is urban congestion, especially in large cities like Lagos and Accra. This is accentuated by many consumers' lack of access to convenient forms of transportation (cars or well-functioning public transport). Again, smaller formats and convenience stores located in various locations across major cities but with coordinated procurement functions might be better suited for congested urban environments.

- ***Human resources.*** There is scarcity of skilled human resources to perform key management and operational functions and serve customers. This requires investments in on-the-job training and often the use of expatriates.

- ***Unreliable electricity supply*** is a further constraint, especially for expanding fresh, frozen and chilled produce sections, as the reliance on generators drives up operating costs. Supermarkets in Nigeria reported difficulties to keep generators running throughout the night. Even small changes in the cold-storage temperature can result in product losses, especially for highly perishable items such as fish. Unreliable electricity supply also discourages consumers from buying refrigerators, which limits the demand for large purchases of perishable items. Consumers lacking refrigerators have to make more frequent, smaller purchases of such perishables, which is often more convenient to do from small-scale retailers in their neighbourhoods.

Underdeveloped domestic supply chains

Sourcing domestic products that meet supermarkets' requirements in terms of quality, packaging and consistency of supply remains a key challenge.

So far, most products in Ghanaian supermarkets are imported, with the exception of some basic food staples, fruits and vegetables. However, the latter are mainly procured on an ad hoc basis from wholesalers in open markets. Domestic sourcing of meat requires extensive quality control on a piece-by-piece basis, since buyers cannot rely upon the enforcement of public food safety standards even in large abattoirs. Shoprite in Accra mainly sells imported frozen poultry. In addition, however, it procures fresh poultry meat from two poultry farmers close to Accra. Due to lack of supply of processed meat and in order to ensure quality and safety, whole birds are purchased and then slaughtered and prepared into different cuts. Consumers are willing to pay a premium for fresh domestic meat, and there are important opportunities for developing niche markets in modern food retail outlets. However, domestic poultry producers and their associations have made little use of such opportunities.

In Nigeria, the degree of domestic sourcing is higher due to the availability of larger producers and processors and the persistence of import bans for certain key commodities. Some of this sourcing is not just local, but involves shipments across Nigeria. Supermarkets procure poultry meat from large, integrated farms that also process and package meat. For example, the Amigo Supermarket in Abuja buys chicken (some using brokers) from Zartec, the country's largest poultry producer based in Ibadan, and also sources vegetables and fruits from the Jos plateau in the central highlands. Exclusive Stores in Abuja sources its fruits and vegetables partially from a preferred supplier in Jos, complemented by brokers and purchases from the open market. This supermarket also supplies imported fruits and vegetables preferred by its expatriate and upper-income customers. Prices for imported fruits and vegetables are approximately double those of the domestically produced versions. The main problems with domestic supplies of fresh and packaged products are related to quality, presentation, packaging, and consistency of supply. Key problems of imported items are related to delays in shipments and customs clearing.

While Nigerian food retailers have better access to domestic fresh and packaged products than do their Ghanaian counterparts, prices tend to be higher than in neighbouring countries due to import restrictions and an adverse business climate. These price differences encourage large-scale smuggling of goods from neighbouring countries, which are distributed through a wide web of small and informal stores and markets. Given their exposure to public scrutiny, modern grocery retailers and QSRs can only procure products that are either produced domestically or have entered the country via legal channels. This places formal retailers at an additional disadvantage concerning prices vis-à-vis competing distribution channels.

8.4 Outlook

Overall, urban food distribution remains dominated by traditional channels including open markets, traditional wholesalers and retailers. However, there are signs that the growth of modern food retailing might speed up considerably in the coming years in view of the increased dynamics of the sector and recent entry of regional and international players into both the modern grocery and food-services sectors. Compared to the countries' market size, urbanization levels and economic dynamism, modern food retailing in Ghana and Nigeria is underdeveloped. Domestic, regional and international players are increasingly aware of the opportunities, and many of them have ambitious growth plans. Experiences in other African countries, especially Kenya, show that the expansion of modern food retailing can happen very quickly. Still, there are formidable challenges related to the business and operating environment and urban congestion. Stated growth objectives of major domestic and international players therefore need to be treated with some caution.

Growth is certain, but its pace is difficult to predict. The future will see the entry of more multinational modern food retail operators as well as increased participation of local brands. The pace of this expansion and its impact will depend on the overall business environment, the continuation of economic growth and its pattern (which will affect the size of the middle class), trends in urban infrastructure (especially electricity sup-

ply and public transport) and how quickly supply chain bottlenecks can be addressed. Even in the case of moderate growth, modern food retailing will have spill-over effects on the broader domestic food systems and offer increasing niche market opportunities for domestic and regional suppliers. Modern retailers are introducing new benchmarks in terms of product quality, safety, presentation and packaging, ambience and customer service. As the modern food retail channels grow (both in the grocery and food services segments), competitive pressure is likely to force them to cut costs by developing domestic sourcing strategies. This is likely to stimulate the development of specialized wholesalers as key links with domestic suppliers. As supply chains tighten up and logistics improve, there will also be more opportunities for direct procurement by modern grocers and QSRs from local producers and processors. Opportunities for promoting and placing domestic brands for high-quality domestic products, fresh and packaged, will increase. These include meat, dairy products and fruit juices, but also rice and instant preparations of traditional food staples (such as gari and instant yam), if presentation, packaging and quality consistency can be improved.

Irrespective of the pace of growth of the modern supermarkets segment, it is unlikely to obtain a dominant position in food retailing in the foreseeable future. Hence, the traditional channels remain important for the large majority of customers in both rural and urban areas. Yet if these other segments are to respond effectively to the competitive pressures emanating from modern retailers, food wholesaling in West Africa needs to improve. Improvements in food wholesaling have played a central role developing better performance among a wide range of retail formats in Latin America and in Asia, and supermarket chains have often played a key role in stimulating the growth of modern wholesalers (Seidler, 2001, Reardon, *et al.*, 2012),. Large supermarket chains often carry out some of the wholesaling functions for themselves as well as for other retailers and QSRs, sourcing products via preferred supplier arrangements. But these chains typically continue to obtain some of their products from brokers and other dealers. Independent wholesalers play a key role in supplying other types of retailers, particularly some of the smaller chains and independent retailers. Wholesale markets, by aggregating large volumes of product in a single location, serve as important venues for transparent price discovery that generate important market information about demand and supply conditions for all actors in the value chain. The aggregation of product also allows sorting of products into various qualities, targeted to different market segments.

Yet wholesaling throughout sub-Saharan Africa has for many years lagged behind the rapid growth of cities (Tollens, 1997). Common problems of urban wholesale marketplaces include urban congestion around outdated facilities located in city centres, deteriorated physical infrastructure (e.g. cold chains) with poor hygienic conditions, and poor management of facilities. Historically, wholesale markets have often been managed by municipal authorities who frequently looked upon them as a way of generating revenue through market taxes rather than as a tool to serve the rapidly changing needs of wholesalers and retailers. Given that wholesale markets generate some public goods in terms of market information useful to all actors in the value chains, some public financial support of such markets is warranted. In addition, because their physical location has important implications for public infrastructure, traffic flow, and public health, municipal officials need to be involved in their planning (Argenti, 2000). But if they are to serve the needs of the private sector effectively, the private sector needs to have a strong voice in their management, which is only likely to come about if the private sector has its own capital invested in these facilities as well. Thus, such facilities need to be public-private partnerships.

Not all wholesaling will take place in physical wholesale markets; in addition to large supermarket chains, independent retailers may undertake various forms of collective organization (e.g. creations of voluntary chains and retailer cooperatives) that involve creating a wholesaling organization that serves all the members of the group. It is striking, however, that agrifood policy in West Africa has generally paid little attention to the wholesaling function, focusing either at the farm level or the retail level.

8.5 Main findings and policy implications

The rapid growth of supermarkets in developing countries and its implications for the larger food system has received much attention during the last decade. Supermarkets and modern quick-service restaurants introduce new standards in food retailing in terms of the range of product offerings, product quality and safety, product presentation, shopping and dining ambience, and, eventually, prices. Moreover, their procurement practices contribute to the modernization of domestic supply chains, e.g. by enhancing the efficiency of logistics and introducing traceability of products. They provide domestic producers – farmers and processors – reliable access to growing domestic markets. However, small farmers and processors often find it difficult to supply supermarkets and meet their procurement requirements in terms of quality, volumes, and delivery schedules.

In Africa, South Africa and Kenya have been the leaders in supermarket development. Both countries experienced a rapid expansion of supermarkets between the mid-1990s and early 2000s. While supermarket expansion in other African countries progressed at a much slower pace, there are signs of acceleration given the recent entry of global supermarket chains and prospects of continued strong economic growth. Hence, experiences in these two countries can provide some useful insights for other countries, including in those in West Africa. In line with international practices, Kenyan and South African supermarkets expanded their market shares for packaged foods much more rapidly than for fresh foods, given the challenges of setting up reliable supply chains for the latter. Contrary to other regions of the world, this growth has been driven by domestic players that have eventually expanded into other countries. Since both countries have strong food processing industries, these were able to supply the bulk of supermarkets' product offerings for processed and packaged foods. However, despite the initial rapid expansion of supermarkets, other food marketing channels remain important, especially for fresh produce. Urban congestion and time and income constraints lead to only a partial adoption of supermarket shopping even among urban middle-classes. Neighbourhood stores, convenience stores and open markets remain important. In the case of fruits and vegetables, supermarkets followed a well-known trend towards centralized procurement systems, initially through specialized wholesalers and then through subsidiary procurement centres. Small farmers face difficulties to enter and remain in supermarkets' preferred supplier lists.

In West Africa, modern food retailing is still in its infancy, and urban food distribution remains dominated by traditional channels including open markets, traditional wholesalers, neighbourhood stores and informal food vendors. However, there are signs that the growth of modern food retailing might speed up considerably in view of increased dynamics of the sector over the past five years and the recent entry of regional and international players into both the modern grocery and food services sectors. Despite the recent growth of supermarkets and quick-service restaurant chains and outlets in countries like Nigeria and Ghana, modern food retailing is still grossly underdeveloped in view of the market size, urbanization levels and economic dynamism of these countries. Domestic, regional and international players are increasingly aware of these market opportunities, and many of them have ambitious growth plans. Nevertheless, important challenges remain on the supply side related to the business and operating environments, access to financing and real estate, unreliable electricity, and urban congestion. Hence, while growth of modern food retailing is certain, its pace is difficult to predict. It will chiefly depend on the continuation of broad-based economic growth and on the extent by which the aforementioned constraints are attenuated.

Even in case of modest growth, modern food retailing will have spill-over effects on the broader domestic food system by stimulating the development of specialized wholesalers and direct domestic procurement systems, and by offering niche market opportunities for domestic and regional suppliers. However, it is unlikely that modern food retailing will obtain a dominant position in the foreseeable future. Hence, policy should have a neutral stance concerning modern food retailing. General improvements of the business and operating

environment (e.g. concerning utilities, ease of doing business, contract enforcement and improved access to finance) will benefit all players in the food system. The main policy and investment priorities should be on upgrading the conventional retail and wholesale systems, which still serve as the main conduits for domestic food products. Improving the efficiency, cleanliness and ambience in the traditional marketing system, especially open markets, would have broad benefits for consumers and suppliers alike. Needed actions include measures to improve logistical efficiency for traffic flow and the loading and unloading of goods, in combination with better garbage collection, sewage service and other hygiene improvements. Such measures will enhance the safety and attractiveness of such markets for customers.

Modern grocery retailing enhances food choices, especially for packaged and processed food. These products respond to urban consumer demands for convenience and modern lifestyles. Higher-value branded products also tend to be safer. However, highly processed food products with long shelf lives often have lower nutritional value compared to less altered foods. Hence, improving the availability, quality and safety of fresh produce and dry staples with high nutritional value such as legumes is an important priority from a nutrition security perspective. Similarly, given trends towards consuming more packaged food and fried dishes, providing health and nutrition education, along with improved food labelling, will be important in helping consumers make informed food choices.

Chapter 9

Agroprocessing and Agro-industries: Current State, Opportunities and Challenges

This chapter takes a closer look at the agroprocessing sector in West Africa in the context of the broader structural transformation. After a brief introduction, the chapter highlights key features of agroprocessing in the region in terms of different enterprise segments and their relative importance across industries and market segments. The chapter then turns to the performance of agroprocessing, highlighting key challenges and opportunities for the different enterprise segments in various subsectors. The final section highlights policy issues and options for upgrading agroprocessing and agro-industries.

9.1 Background: agroprocessing and agro-industries

With the exception of fresh fruits and vegetables, most primary agricultural products undergo some type of processing before their consumption. This even applies to basic food staples such as rice, cassava and livestock products. Agroprocessing is the transformation of agricultural raw products through mechanical, biological and chemical alterations, or combinations thereof.[68] It often involves several subsequent processes (e.g., oil extraction followed by refinement), referred to as primary, secondary, or even tertiary processing. Processing converts agricultural raw material or commodities into agrifood products for human and animal consumption or for further industrial use, e.g. in the chemical and pharmaceutical industries. It changes the quality, safety and health attributes of agricultural commodities and agrifood products by modifying their attributes in terms of shelf-life, colour, texture, nutrient content or volume.[69]

Part II has shown that the demand for processed products in West Africa has been increasing with rising incomes, urbanization, and lifestyle changes that reduce the time that urban consumers are willing and able to spend on food purchase and preparation. Food attributes such as shelf life, convenience in preparation, safety, nutritional value, packaging and presentation are all becoming more important, albeit at different velocities among different countries and population strata. Hence, the importance of agroprocessing industries within agrifood chains is increasing. Moreover, their structure and performance have important implications for the costs, quality and safety of agrifood products. The performance of the sector in terms of processing efficiency and product quality is both related to and dependent on the performance of upstream and downstream segments of the value chain. The former determines the availability and quality of raw material and other ingredients throughout the year, whereas the latter influences marketing and distribution costs. Agro-industry performance also depends on an efficient supply chain for processing equipment, spare parts, and maintenance services and on the condition of basic transportation, communication, and energy infrastructure.

The terms agro-industries and agroprocessing are often used interchangeably. While agroprocessing only refers to the post-harvest transformation of agricultural products, agroindustries also include the upstream part of agricultural value chains (e.g. input and equipment manufacturing). This chapter focuses on agroprocessing as the downstream part

68 Examples include de-hulling, shelling, and milling (mechanical alteration), fermentation (biological alteration) and pasteurization (chemical alteration).

69 A distinction needs to be made between processing and value addition. From an economic point of view, processing only adds value if consumers or users of the processed product are willing to pay a premium exceeding the cost of processing. Moreover, value addition does not necessarily require and is not limited to processing. Other transactions such as sorting, grading, storing, packaging, transporting and trading also add value. Furthermore, processing or other operations that are carried out at an economic loss represent value subtraction rather than value addition.

of agro-industrial activities. Agroprocessing differs widely in terms of scale, complexity, technology and labour and capital intensity, ranging from basic village-level cottage industries to large modern industrial processing plants. At the smallest scale, agroprocessing is carried out at the household level, sometimes on a seasonal basis.

9.2 Key features of agroprocessing in West Africa

The West African agroprocessing sector reflects this diversity in terms of size, range of commodities, mechanization and technology levels, reliance on domestic and imported raw materials, internal and external market orientation, quality awareness, degrees of value addition, and vertical and horizontal integration. Various typologies have been proposed based on the scale of operations, enterprise size and level of formality and technology (Ilboudou and Kambou, 2009; Broutin and Bricas, 2006). However, the boundaries between categories are often blurred and are usually commodity-, product- and context-specific.

A detailed understanding of the size, structure and performance of the agroprocessing sector is limited by a dearth of data and analysis. Official data tend to be fragmented, outdated or overly aggregate, i.e. mainly at the level of major subsectors such as foods and beverages and their contribution to Manufacturing Value Added (MVA). More detailed data on the number of enterprises of different sizes, their production and technology levels, and ownership and management structure are rarely available, not even at an industry level. Moreover, official data only capture the formal part of the sector while a significant share of processing and value addition takes place outside of the formal economy. These data limitations pose serious constraints to evidence-based policy making and programme design for the sector. Not surprisingly, there are few studies on agro-industries in the region apart from scattered reports on single sub-sectors such as cotton or cocoa.

Despite these caveats, this chapter discusses some key features of agroprocessing in West Africa concerning its structure and performance and their implications for policies and upgrading strategies. The chapter mainly draws on: (1) a literature review conducted by an international agribusiness specialist as part of the AGWA research, (2) interviews with agrifood companies conducted during the AGWA fieldwork in Lagos and Accra, (3) information on the Nigerian packaged food market from Euromonitor International, (4) additional literature research and (5) the authors' own experiences in the region.

9.2.1 Geographical distribution

Agroprocessing takes place throughout the region, but formal-sector firms are most heavily present in the "big three" countries of Nigeria, Côte d'Ivoire and Ghana. Table 9.1 presents a ranking of 13 of the 15 ECOWAS countries for which data are available; the table ranks the countries in terms of their volumes of production of raw material and primary processed products for several major crops as reported by FAOSTAT. The importance of export-crop processing (palm oil, cocoa, and rubber) is particularly striking in Côte d'Ivoire, while Nigeria ranks first in rice and cassava, as well as industries based on imported inputs such as wheat and milk powder, which are not listed in the table.

The location of processing plants within a given country depends on a number of factors, including access to markets and raw materials, infrastructure and utilities, as well as incentives such as tax breaks and subsidies. Reliable access to raw material of dependable quality and competitive cost stands out as a key determinant. Import-dependent companies tend to be located close to major ports or large consumer markets. Processors of perishable and bulky raw material such as sugarcane, cassava, oil palm and fresh produce tend to be located close to major production areas. Small processors are often located close to raw material sources and can sometimes out-compete larger companies for those raw materials given the smaller plants' lower assembly costs (see the discussion in Chapter 10 on rice and cassava).

Table 9.1 Ranking of countries by the size of their agroprocessing sectors

Ranked by volume of production of raw material and primary processed products.

Country	All crops[a]	Rice	Cassava	Palm nut oil	Sugar cane	Cocoa	Cotton	Rubber
Nigeria	16	1	1	3	4	3	1	3
Côte d'Ivoire	25	5	4	1	8	1	5	1
Ghana	28	7	2	2	2	2	8	5
Guinea	43	3	5	6	13	6	6	4
Benin	49	10	3	8	3	8	4	13
Liberia	57	8	7	7	13	7	13	2
Mali	60	2	11	13	5	13	3	13
Togo	60	13	6	4	13	4	7	13
Sierra Leone	61	4	8	5	13	5	13	13
Senegal	64	6	9	13	1	13	9	13
Burkina Faso	71	9	14	13	7	13	2	13
Niger	79	14	10	13	6	13	10	13
Guinea-Bissau	86	11	12	13	13	13	11	13

Source: AGWA background research based on FAOSTAT data

[a] The "all crops" figure represents the sum of the individual rankings for the crops listed in this table. The lower this score, the larger (in volume, compared to the other countries in the region) a national processing subsector industry is deemed to be. While the aggregate score implies comparisons across different subsectors solely on the basis of the volume of raw material processed, which varies greatly between subsectors, it provides a rough guide to the relative size of the entire agroprocessing sector in each country. On the other hand, the subsector scores allow direct comparisons between countries on a like-for-like basis. The ranking does not include the processing of imported raw materials such as sugar, wheat and dried milk, but since Nigeria leads the region in all three commodities, followed by Côte d'Ivoire and Ghana, the overall rankings of the leading countries would not change if these products were included in the calculation.

9.2.2 Size distribution

The agroprocessing sector is highly segmented and marked by a strong dichotomy. At the top, there are a limited number of medium and large enterprises, often affiliates or subsidiaries of multinationals or domestic conglomerates, with high levels of capitalization and technology and with strong brands. At the bottom, there are vast numbers of micro- and small operators, mostly in the informal sector, using rudimentary technologies. In between, there is a relatively small number of small and medium sized agro-industries in the formal sector. This phenomenon, often termed "the missing middle", is also found in other manufacturing sub-sectors in Africa (Dinh *et al.*, 2012). The shares of the different enterprise segments in volumes and values of output vary by commodity, as will be further discussed below.

The relative importance of small, medium and large companies and their respective shares in value addition is highly subsector- and commodity-specific. As mentioned above, data on the number and key features of processing enterprises and their breakdown according to countries and subsectors are scarce and rarely accessible in the public domain. Available evidence such as value chain studies and industry reports[70] on various countries in the region and the AGWA field work conducted in Ghana and Nigeria suggests the highly diverse picture (see also Chapter 10 on selected value chains).

Large-scale industries tend to be concentrated in subsectors exhibiting strong economies of scale and capital intensity in processing and where reliable access to raw material of dependable quality can be established. This is the case for industries relying on imported raw materials such as wheat (e.g. flour mills[71], pasta and noodle manufacturers and large bakeries), milk powder (dairy products,

70 Including industry reports from the market research company Euromonitor International on Nigeria.

71 For example, Flour Mills of Nigeria is the market leader by capacity but new entrants into the market, such as Dangote, Honeywell, and BUA, are increasing their market shares. The entrance of these new and aggressive millers, which are both domestic and foreign, into the Nigerian flour milling industry has increased competition based on price and quality. Nigeria's millers commonly export to ECOWAS countries under the free-trade treaty to take advantage of strong demand for pasta, wheat and bread in the region. Nigerian companies also benefit from 30 per cent export incentives and do not pay local duties (AGWA field research).

flavoured drinks, yoghurts, and cheese), fruit juice concentrates, and, to some extent, rice (where, for example, Nigerian mills process imported rough rice). Medium and large industries based on domestic raw materials can be found in the traditional export crops (e.g. cotton gins, cocoa grinding, and rubber processing), in plantation crops (sugar mills and refineries, and oil mills, especially for palm oil).Other medium- to large-scale industries can be found in the beverage sector (breweries, soft-drinks), paddy rice and maize milling, poultry production, aquaculture and fish processing, and the production of branded animal feeds.

These industries have flourished to the extent that they have been able to establish a reliable raw material base. This is generally easier if: (1) there are limited alternative uses for the raw material (e.g. industrial crops like rubber), (2) the raw material is highly perishable and bulky and needs to be processed or packaged soon after harvesting (e.g. sugarcane, oil palm, export bananas and other fresh fruits), and (3) specific varieties restrict alternative uses (e.g. sorghum varieties developed for beer brewing).

While many large-scale, capital-intensive operators are linked to multinational companies, there are also several strong domestic and regional players. The latter are usually parts of domestic conglomerates, mostly in Nigeria. Employee numbers in firms within this group are estimated to be in excess of 100 but fewer than 500 per plant. Medium-sized formal sector industrial operations with between 50 and 100 employees also exist in some of the commodities mentioned above, notably milling of paddy rice, maize, animal feeds and palm oil, as well as in rubber conditioning and cassava processing for starch and flour. Micro- and small enterprises are primarily engaged in either artisanal or semi-industrial processing of oil crops, paddy, cassava, maize and animal feed compounding with processed inputs. The larger units may be nominally incorporated into the formal business sector, but the vast majority operates informally (Lambert 2012).

In many commodity sub-sectors, operators of different sizes and technology levels co-exist, usually targeting different markets in terms of product quality, price, and geographical location. Examples of such subsectors include milling of grains and pulses, oil extraction, feed milling, and bakeries. Micro- and small operators mainly serve local markets and the low-income segments of the urban population. Large companies have moved beyond just targeting upper- and middle-income market segments with their branded products and are increasingly targeting lower-income groups as well. Examples of product categories targeting the mass market include beverages (soft drinks, beer); dried packaged foods such as noodles, pasta and snacks; and sauces and condiments (e.g. Maggi cubes). The main instrument for market segmentation is the use of different package sizes, with small packages often carrying particularly high profit margins multiplied by large sales volumes. Large companies benefit from their broad distribution networks, strong brand names and large advertising budgets. The artisanal sector dominates many of the traditional staple food chains, such as cassava processing, fish smoking, and production of fermented maize doughs (a staple in some of the coastal countries).

9.2.3 Historic evolution and trends

The sector's diversity derives from its dual origins – as an important player in the global trade of agricultural commodities on the one hand and as a component of local cuisine and of households' food-security strategies on the other hand. Agro-industries linked to plantation crops have a long history in the region, with many of them dating back to colonial times. Additional large agroprocessing enterprises were established post-independence as part of the import substitution strategies pursued in the region. Initially, the agro-industry sector was promoted to add value to perishable agricultural products (e.g., palm oil and sugar cane). As part of the import-substitution strategy, governments supported the establishment of large, mechanised processing enterprises in order to capture economies of scale. In addition to the above-mentioned subsectors, these enterprises also targeted food crops such as maize, cassava, yams, fruit juice and tomato processing.

Many of the companies established soon after independence were owned and/or managed by the government. Apart from management problems, these companies faced major challenges on the market side, as their products were frequently less successful in the market than anticipated. Moreover, raw material sourcing was a persistent bottleneck, leading to low capacity utilization rates, undermining profitability. In some cases, large companies were unable to compete successfully with small companies in accessing raw material, such as, for example, in the Malian rice sector (see the discussion in Chapter 10). Due to these shortcomings, most state-owned agro processing companies were eventually privatised or closed (Broutin and Bricas, 2006).

During the period of import substituting industrialization until the mid-1980s, there was little interest in micro-, small- and medium-sized agroprocessors in the region, except for some NGO programmes and efforts by CILSS to promote processing of local cereals through its PROCELOS programme.[72] This changed only during the 1990s, when donors and national research institutions "discovered" small and medium enterprises (SMEs) in food processing as an important avenue for value addition and employment generation in the non-farm rural economy. A broad range of technologies of different scales were designed and piloted, often successfully. The development of improved processing equipment was accompanied by product testing to ensure safety and quality. However, these efforts, such as those of PROCELOS, were often limited to pilot projects and pilot enterprises, with the hope that demonstration effects would trigger replication and up-scaling. However, this mainstreaming frequently did not occur as envisaged due to poor business enabling environments, unavailability of broader access to key support services and finance, and weaknesses in product presentation, packaging, marketing and distribution.

Despite its enormous size, the artisanal food-processing sector has long been below the radar screen of programmes to develop food-processing, which were mainly targeted at somewhat larger and more formal SMEs (Broutin and Bricas, 2006). For many products, however, micro- and small enterprises remain a very important segment of the industry, with processing carried out by small, independent units, often involving small-scale mechanization such as milling, oil pressing, and de-hulling. This enterprise segment also has a long track record as provider of cheap foods and dietary diversity for the rural and urban population. It has grown strongly since the early 1990s due to the diversification of West African diets discussed in Part II and the reduction of activities of large-scale agroprocessors in the early 1990s following structural adjustment. The region boasts a huge diversity of dishes and diets based on various preparations of domestic food staples such as roots and tubers, beans, cereals, and oil-palm fruit, which often require some processing. The processing is frequently performed at the household level, often as a part-time activity to preserve farm produce and earn some cash income. The prevalence of household-level processing explains the high share of small-scale food processing carried out by women, often in combination with trade or food services.

After the 2008 food price crisis, there has been resurging interest by domestic and international investors in the Agricultural sector, including agroprocessing. Fuelled by recent strong economic growth, interest of foreign investors in Africa has increased. Between 2000 and 2010, net FDI flows totalled US$33 billion against only US$7 billion between 1990 and 1999 (Dinh, *et al.*, 2012). Even though the bulk of FDI went into extractive industries, the agrifood sector has also received increased attention. Much of this interest is focused on the upstream and downstream segments of the agrifood system, including input supply, agroprocessing and, to some extent, modern food retailing. In addition to traditional players with long-standing presence in the region such as Nestlé, Cadbury (now part of Kraft United Foods), and SIFCA, investors from emerging economies such as India and Southeast Asia are increasingly active in the region. An example is OLAM International, founded by members of the Indian diaspora in Senegal. OLAM began operating in West Africa

72 http://www.fao.org/docrep/X5158F/x5158f1a.htm.

in 1989 and now operates in 11 countries. While initially focusing on commodity imports and exports, the company has been investing in upstream activities such as rice milling as well as fully integrated ventures including farms. The company is engaged in a range of commodities including cocoa, sesame, cashew, wheat, and tomato paste, but also sells a number of branded and packaged products. It also bought a stake in the SIFCA Group, the largest private-sector company in the agro-industrial segment in Côte d'Ivoire, with operations in palm oil, rubber and sugar. Moreover, a number of equity funds and related investment vehicles targeting agribusiness have been set up in recent years, with various levels and combinations of public and private shareholdings.

9.3 Overall sector performance and trends

9.3.1 Declining shares in total industrial output

Agro-industry has traditionally been an important part of the manufacturing sector in West Africa, although its importance varies significantly among countries. Overall, West Africa's manufacturing base has been declining as a share of total economic output over the past 40 years. While the share of the industrial sector in West African GDP grew from 27% in 1970 to 37% in 2008, that of manufacturing declined from 13% to 5% during the same period (UNIDO and UNCATD, 2011). According to ECOWAS (2010), the manufacturing sector accounted for 7.4% of the regional GDP in 2006. Moreover, over 80% of the region's overall manufacturing and value was generated in four countries – Nigeria (40%), Côte d'Ivoire (23%), Ghana (10%) and Senegal (9%). Even though this trend can partially be attributed to the phenomenal growth of Nigeria's oil production, it also mirrors the limited competitiveness of the manufacturing sector and its downsizing following structural adjustment. See the discussion in Chapter 10 for further details.

Agro-industries are an important part of manufacturing, although their share varies across countries. According to the International Standard Industrial Classification (ISIC), agro-industries comprise six main groups, namely food and beverages; tobacco products; paper and wood products; textiles, footwear and apparel; leather products; and rubber products. Recent UNIDO data for the whole of Africa show that agro-industry plays a significant but shrinking role in the continent's manufacturing value added (MVA). In 2009, agro-industry's share in MVA was 27%, compared with 35% in 2000. The decline is attributable to stronger growth in the medium- to high-technology sector, amounting to 5.7% per annum, against 1.1% per annum for the food and beverages subsector. Likewise, Africa's share in world food and beverage manufacturing declined from 2.4% to 1.6%, whereas its share in chemical manufacturing increased from 1.6% to 2.2% during this period. Within the agro-industrial sector, food and beverages is the biggest subsector, accounting for 16.6% of MVA in 2009, followed by tobacco (2.6%), wood (1.8%), textiles (4.7%, in which locally produced cotton is a major component), and leather (1.2%). However, as discussed throughout Part I, regional averages mask important diversity among countries. Even though no comprehensive data on the share of agro-industry in West Africa's manufacturing could be accessed for this report, ECOWAS' West African Common Industrial Policy (WACIP) refers to agro-industry as the largest subsector within manufacturing. Earlier data on Ghana (2003) and Senegal (2002) show that the agro-industry's contribution to total MVA was between 50% and 60% (Yumkella *et al.*, 2011). Within agro-industries, food and beverage industries accounted for about 60% in Ghana, followed by wood processing (excluding furniture).

9.3.2 Many of the most dynamic agro-industries depend on raw material imports.

While no direct comprehensive data on volumes and values of processed agricultural products are available, trade and consumption data provide some broad indications about growth trends and dynamics. Trade data suggest increased regional processing capacity of wheat milling and related products such as pasta, breakfast cereals, along with sugar refining and tobacco manufacturing (see section

4.3.3 in Chapter 4). The strong growth of wheat imports and the increase of wheat consumption revealed by food balance sheets of various West African countries (see Chapter 5) illustrate the dynamic of the wheat milling and downstream industries such as bakeries, confectionary, noodles and pasta. Tables 7.2 and 7.3 in Chapter 7 show the importance of dried processed foods (including noodles, pasta and packaged rice), bakery and confectionary products, dairy products, and sauces, dressings and condiments in the Nigerian packaged food market and their strong growth prospects. International and domestic brands play an important role in the packaged food market. The rice industry shows a similar dynamic, with the recent influx of larger-scale mills in Nigeria, Ghana and other countries.

The demand and consumption analysis in Part II further revealed strong demand for dairy products including yogurts and flavoured drinks, and this demand is mainly served by medium- to large-scale processors using imported powdered milk. The same applies for fruit juices, which largely draw on imported fruit concentrates. In the vegetable oil category, which currently relies heavily on imported palm oil, however, there are emerging signs of import substitution through foreign direct investment in oil-palm production and processing by large East Asian palm oil companies in coastal countries (e.g., Sime Darby in Liberia) as well as European companies such as Unilever in Côte d'Ivoire.

9.3.3 Huge productivity gaps within a dualistic industry structure persist.

A dual industry structure – an abundance of micro and small firms on the one hand and a limited number of medium and large firms – is not confined to agro-industries but characterises the manufacturing sector at large. Given the large differences in capital- and labour-intensity between the large and small firms, it is not surprising that there is also a persistent labour productivity gap between the two types of firms. Söderbohm (cited in Dinh, *et al.*, 2012) reports a tenfold gap in the value-added per person between manufacturing firms employing more than 50 workers and those employing fewer than 10 workers. Moreover, he finds that "small manufacturing enterprises almost always stay small."

A study by La Porta and Shleifer (cited in UNIDO and UNCATD, 2011) on the nature of business informality in 24 African countries shows that firms that operate outside the legal framework have lower productivity than small formal firms. Furthermore, they are smaller in size, produce based on orders, are run by managers with low human capital, do not have access to external finance, do not advertise their products, and largely sell to informal clients for cash. The analysis also highlights something very important from an industrial policy point of view: informal and formal firms occupy very different market niches, and the former rarely become formal since there is very little demand by formal firms for informal products, indicating that informal firms trade more directly with the public rather than business-to-business. There is also some evidence that informal firms do not become formal as they grow.

The persistent market and enterprise segmentation and limited upward mobility of small, informal operators along the technology and size ladder is due to a combination of several factors:

- ***Skills and human resources:*** managing a medium-scale enterprise operating in a formal market environment requires a different skill set than managing a small enterprise, creating entry barriers;
- ***Different cost structures:*** informal firms benefit from cheap labour (largely family-based), lack of labour regulations and avoid taxes and other regulations. At the same time, their informality restricts their access to financial services, outside capital, technologies, services and more lucrative segments of the output markets.
- ***Access to land and capital:*** Informal firms have very restricted access to land needed to expand their operations. Even though start-up financing might be mobilized within the informal network economy, accessing growth finance is a big challenge. Lack of formalization and

registration of land and other productive assets reduces their collateral value, undermining access to growth finance.

Most small and micro-food processors are part of a social network economy that is more geared towards risk diversification and sustainable livelihoods than towards enterprise growth and profit maximization. This has important implications for the performance of small operators and their ability to survive and thrive in a harsh business environment. On the one hand, social networks play a key role in the establishment and operation of micro and small enterprises, helping them to cope with risks, market imperfections and asymmetric power structures. They are used to mobilize initial investment and working capital through a vast array of informal financial institutions and instruments such as rotating savings and credit associations, tontines, and microfinance institutions. They also facilitate access to information, markets and production inputs. Even long-distance trade in the region often operates through informal networks.

On the other hand, being part of a social network economy also implies responsibilities and obligations towards other members of the network and exerts strong pressure on entrepreneurs who succeed to redistribute income to poorer members. This especially applies to networks within kinship structures, which tend to impose strict rules. Entry into the kinship network takes place by birth, and exit is impossible. Horizontal networks based on neighbourhood, places of origin, activity, age or religion are generally more open and flexible concerning entry and exit (Broutin and Bricas, 2006).

Hence, while social networks subsidise start-up and facilitate operations, they tax expansion and growth. Members of network economies have developed numerous strategies to disguise wealth and reduce their "tax burden" to the broader network.[73] One of them is to grow by multiplying small-scale enterprises rather than expanding the scale of a single unit operation. This strategy can be due to several reasons. First, running a number of small enterprises, say mills, spreads the risks of technical breakdown over several units. Second, each additional entity requires only limited amounts of investment and working capital. Third, a portfolio of small businesses spreads market risks. Fourth, small units are less capital- and more labour-intensive, allowing the owner to employ many members of a given social network, thereby contributing to her or his social status and social capital. Fifth, access to raw material to achieve high utilization rates can be easier using a portfolio of small units distributed over various locations. Sixth, a diversified enterprise portfolio also presents advantages of proximity to customers. Given the multiple risks facing small entrepreneurs, such growth paths are rational and may explain in part the dearth of medium-sized enterprises in West African food systems (Broutin and Bricas, 2006).

The micro- and small-enterprise segment in food processing plays an important role in employment generation and livelihood diversification, especially for women, and in providing affordable food products for large numbers of rural and urban low-income households. The great variety of products also contributes to dietary diversity. Moreover, while many medium and large companies rely on imported raw materials, micro and small enterprises mainly process domestic agricultural products. However, as noted above, these enterprise segments are also plagued by low levels of technologies and skills, resulting in low labour productivity and incomes. Rudimentary technologies and hygiene levels often lead to poor product quality and safety.[74] Moreover, product presentation and packaging are poorly developed and constrain access to more dynamic markets that offer higher income opportunities.

Despite its apparent weaknesses, the artisanal sector, made up of micro-firms operating informally, has often been successful in adapting products to changing consumer demands and sometimes in outcompeting enterprises in the formal sector. The weaknesses of small informal operators have often led to their relative neglect by policies and programmes aimed at agroprocessing

73 For example, women engaged in small-scale trade, processing or other activities save and invest part of their profits in savings-based informal financial institutions. In Sahelian countries, wealth is often invested in cattle kept by mobile herders, out of sight of social-network members.

74 However, food safety is not always a problem among micro and small operators; it varies widely among products (Broutin and Bricas, 2006)

and private-sector/SME development, which are most often focused on the formal, medium to large enterprise segment. While it may be unrealistic to expect a large-scale transformation and growth of the vast number of operators, the sector is by no means as static and homogeneous as often perceived. There are various examples that have shown the ability small operators to adapt to changing consumer demands and provide a variety of traditional food products to low- and middle-income households. For example, the production of gari is dominated by small units, sometimes operating in clusters in proximity to major cassava producing areas. Gari has all the attributes of a convenience food, with strong demand in both urban and rural areas. While there are certainly opportunities to upgrade hygiene and sanitary standards of small gari producers and improve packaging, the acceptance of such improved products over artisanal ones, even among middle-class consumers, is not automatic, as the discussion in Chapter 7 has shown.

There are other cases where artisanal producers have been more successful in adapting to changing consumer demands than have industrial processors. Broutin and Bricas (2006) describe the example of the transformation of dried yams into chips, which can be stored, transported and eventually further processed into flour that can be prepared with boiling water into an instant food called amala. Two large companies, Nestlé in Côte d'Ivoire and Cadbury in Nigeria, also developed and introduced dehydrated instant yam products, but they did not show great success, apparently because consumers did not perceive sufficient value added over the traditional products (based on the artisanally produced flour) to pay the price difference.

In Senegal during the late 1980s the government initiated a programme to promote millet consumption in Dakar in order to reduce import dependency on wheat and create markets for domestic producers. Initially, the programme focused on supporting an industrial mill (la Societé Sentenac) to produce packaged millet flour and semolina. The product was successfully introduced into the market, accompanied by a strong advertising campaign. This initial success of the products encouraged several small enterprises to develop similar products with the support from development projects. These small companies diversified into several millet-based products, targeting the bakery sector to incorporate millet flour into their bread (baptised pain riche). The CFA franc devaluation gave another boost to this small sector of approximately 50 companies. In the early 2000s, Sentenac withdrew from millet processing, shifting back into wheat milling, which it considered more profitable, and leaving the market for millet-based products to small operators. Total production of packaged millet amounted to about 5 000 tonnes in 2001 out of a total millet consumption in Dakar estimated at 45 000 tonnes (in 1998). The remainder of the consumed millet was transformed (de-hulled and milled) either by artisanal processors in the market or in the consuming households (Broutin and Bricas, 2006).

These examples show the potential of different strata of micro and small enterprises to transform traditional products in ways that makes them more appealing to urban households, targeting various market segments and income groups.

9.4 Opportunities and constraints for expanding agroprocessing in West Africa

9.4.1 Opportunities

Demand and consumption trends suggest substantial opportunities for agroprocessing to enhance domestic value addition and better link the Agricultural sector to domestic, regional and international demand. For domestic and regional markets, the following subsectors boast significant potential (for details, see Chapter 10):

- ***Rice milling***: targeting various market segments, with an emphasis on improved quality.
- ***Maize and cassava processing:*** into flours, starch, syrups and glucose.
- ***Vegetable oil production***: including palm oil and other vegetable oils with a higher content

of unsaturated fatty acids (e.g. sunflower and sesame oils) to respond to consumers' increasing demand for more healthy fats.

- ***Sugar:*** given the growing demand for soft drinks, pharmaceuticals, confections and snacks. So far in West Africa, sugar growing takes place mainly on estates, but examples in Southern and Eastern Africa show opportunities for outgrower schemes; an example in West Africa is the Savannah Sugar Company Limited in Adamawa State in Nigeria, established by CDC.

- ***Fruit juices:*** introducing natural fruit juices for the increasingly health-conscious middle-class population and establishing fruit concentrate production plants.

- ***Beer:*** substitution of imported barley by sorghum (practiced by Guinness in Nigeria and Ghana) and cassava (practiced by SAB Miller in Mozambique and now starting in Nigeria and Ghana).

- ***Animal feed:*** based on maize, soybeans, oilseed cakes, and cassava pellets.

- ***Cocoa grinding:*** Globally, grinding is moving increasingly into cocoa-producing countries, with the international chocolate companies focusing more on manufacture of the confections, new product development, and marketing. West Africa's share of global cocoa grindings is 16%, located mainly in Côte d'Ivoire, Ghana and Nigeria. Cocoa grinding is mainly large-scale, given its capital requirements.

- ***Cotton textiles:*** A UNIDO feasibility study (Gherzi Textil Organization, 2011) identified potential in Côte d'Ivoire and Nigeria to expand textile manufacturing if issues such as irregular electricity supply (see below) can be resolved.

- ***Meat processing:*** Given the projected rapid growth in demand for meat in the region (Part II) and the poor condition of many current abattoirs that endangers public health, new investment in slaughter facilities through public-private partnerships is needed in most countries.

- ***Dairy processing:*** As noted in Chapter 10, in the inland Sahelian countries, small-scale dairy processing plants based on local milk production have been expanding recently. Large-scale dairy processing will likely remain heavily dependent on imported milk powder, but given the growing demand for products like yoghurts, opportunities exist for expanded local value addition based on the imported powder.

- ***Cashew processing:*** Africa produces more raw cashew nuts than any other region of the world, and West Africa accounts for 80% of that production. Côte d'Ivoire and Guinea-Bissau are the largest producers. Yet the region only processes 5% to 6% of its output, with the remainder exported raw to Vietnam or India for processing. In contrast, Tanzania and Mozambique, the largest producers in East Africa, process between 20% and 30% of their nuts. The cashew industry in West Africa is attracting increased interest from Brazilian, European and U.S. investors. There are important technical and safety issues to be addressed in cashew processing (as the raw nuts are toxic to the skin), but the scope exists to expand processing markedly.

Almost all of these industries present substantial opportunities for strengthening backward linkages with farming. Likewise, as discussed before, strengthening farm-agribusiness linkages is crucial for enhancing the performance of agroprocessing by increasing capacity utilization rates. In several subsectors, contract farming and outgrower schemes have been used successfully in West Africa and elsewhere. Examples include sugarcane, fruit juices, palm oil, and sorghum for beer brewing. In the case of staple foods, outgrower schemes are less common and performance has been more mixed. For these crops, improving spot markets and their links to wholesaling by strengthening infrastructure for post-harvest handling, storage and transport might be more promising. In this scenario, wholesalers would play a key role in supplying agroprocessors and would in turn work either through their own agents or farmer organizations to assemble the products at the farm or rural-market level. (See Chapter 11 for a discussion of policy issues surrounding wholesalers.)

9.4.2 Constraints

Despite the increased interest and potential in agroprocessing and agro-industry development in West Africa, a number of important factors continue to stifle the sector's growth and competitiveness and its forward and backward linkages in the agrifood system. While many of these constraints and the options to overcome them are value-chain specific, a few well-known structural constraints apply across the entire sector. These are briefly discussed below.

Poor vertical coordination with domestic farming is perhaps the most important issue affecting agro-industry development in the region. The limited ability to consistently procure raw material of dependable quality results in low utilization rates of the installed processing capacities, undermining profitability and competitiveness. (See Chapter 10 for examples from several different value chains.) Weaknesses in physical infrastructure, utilities or the business environment are more easily overcome or circumnavigated than dysfunctional markets and weak contracting systems. Many of the constraints faced by processors originate in deficient raw material supply, which can be traced back to farmers' lack of timely access to appropriate inputs due to market distortions or market failure. It is also linked to farmers' small range of risk management tools, which forces them to deal with risk mainly through diversification. As a consequence, most smallholders produce only very small marketable surpluses of any given crop, raising processors' costs of raw-product assembly. Poor farmer responses to processors' raw material needs are also market-related, wherein buyers are reluctant to provide an assured outlet for products or reward quality, fearing farmers will not observe contractual agreements.

To a great extent, the success of the wheat, sugar refining and rice-polishing industries in responding to burgeoning domestic demand is their assured access to sufficient supplies of good quality raw material, which are offloaded from the vessels that deliver the goods from the world market and then are transferred with relative ease to their industrial-scale processing plants in the vicinity of the ports. It is likely that if the maize, paddy rice, cassava and vegetable oil processing industries had the same ease of access and assured quality and quantity of raw materials, they too would achieve performance levels similar to those of the import-processing industries.

Poor physical infrastructure, especially concerning transport and trade, increases transport time and costs, reducing the competitiveness of domestic agro-industries vis-à-vis imports. The issues concerning long-distance traffic, road governance and the organization of the trucking industry are further discussed in Chapter 12. In addition, the poor state of rural feeder roads discourages agro-industries from sourcing locally.

Energy, especially electricity, is a key input to mechanization of production, processing and operating cold storage. Unreliable power supply and frequent electricity outages are common across the region and hurt agroprocessing in five ways. First, large- and medium-scale processors and distributors of perishable products all along the food chain are forced to invest in generators, which drive up their costs substantially. Second, when firms do operate on the electrical grid, they often face electrical surges that can damage their equipment. Third, small-scale processors, especially in rural areas where access to electricity is rare, are forced to operate petrol- or diesel-powered equipment (e.g. small mills) rather than electric-powered equipment whose operating costs are lower. Fourth, the lack of reliable electrical supply in certain areas leads processors to concentrate more in major urban areas rather than closer to raw product supplies or else bear the cost of generating their own electricity. Fifth, the lack of reliable electrical power also discourages households from buying refrigerators, which constrains demand for some perishable processed products, such as dairy products. Electricity is frequently cited as the biggest problem of agro-industries in Nigeria, and some investors, international and domestic, targeting the regional market are relocating to Ghana because of Nigeria's unreliable electrical supply (AGWA field research).

Access to and cost of finance is another core issue frequently featuring at the top of the list of constraints cited in business-climate and enterprise surveys (see Box 9.1). While investment capital is critical for upgrading equipment and expanding productive assets, the importance of working capital is sometimes overlooked. Working capital is the lubricant of agro-industries, allowing them to purchase raw material and keep sufficient inventories to maintain high capacity utilization rates. Yet the demand for working capital is also a function of the organization of the value chain, particularly the efficiency of the links between agroprocessors and their sources of raw materials and other key inputs. To the extent that the supply chains providing critical inputs (raw products, packaging materials, spare parts, etc.) to the processors are unreliable, the processors may be forced to build up inventories of the inputs when they are available rather than working on a just-in-time delivery basis. The need to hold these inventories drives up working capital needs, so developing better vertical coordination in the input supply system is one way to reduce the working-capital constraint. A similar situation applies on the output side; to the extent that wholesalers and retailers of the processed product have limited access to working capital, they may require supplier credit from the agroprocessor, driving up the processor's need for working capital.

On the other hand, agroprocessors with good access to working capital finance are in a position to pay cash upon delivery, often a key factor determining their ability to compete with other product buyers. Larger companies may even be able to prefinance inputs and technical advice to outgrowers. In export chains such as cocoa, international buyers sometimes provide finance to exporters or other domestic aggregators in order to ensure adequate supply, and this finance is passed on upstream to primary aggregation levels, allowing cash payment. In the case of commodities such as cocoa, finance may only be provided against inventories which are often stored in bonded warehouses under the supervision of a collateral manager.

Access to and costs of finance vary considerably between enterprise segments: multinational and large domestic companies tend to have access to international bank finance at much lower costs than those offered by domestic financial institutions. Micro- and small enterprises tend to have little access to formal finance, but this is partially compensated by informal finance, e.g. within social networks. However, the amounts, terms and conditions for such finance are often insufficient to support enterprise growth. Small and medium enterprises in the formal sector tend to face the greatest challenges. While their financing needs are too large to be met by informal sources or

Box 9.1 Reasons for agroprocessors' limited access to financing

The reasons for agro-processor's limited access to and high costs of finance are manifold. In addition to constraints at the client or enterprise level, they range from poor macroeconomic management to limited capacity of the domestic financial system to provide adequate financial services. Even though macroeconomic management has improved in most countries over the past 20 years, inflation rates remain important, particularly in the non-CFA franc countries, driving up interest rates and eroding the value of deposits. Often governments need to pay high prices for public debt instruments (e.g. treasury bills), which provide comfortable investment opportunities for banks, undermining their incentives engage in much more difficult and risky activities such as lending to SMEs, especially in agriculture-related activities. High levels of informality and poorly-functioning registries for assets (e.g. real estate, equipment, mobile assets, and accounts receivables) reduce the ability of micro, small and medium enterprises to use their assets as collateral to obtain larger loans on better terms. Moreover, poor contract enforcement due to a slow and overwhelmed court system results in financial institutions' requiring high collateral in order to cover their risks, leaving good business propositions underfunded.

microfinance, their access to formal bank finance is restricted by collateral constraints, their elevated risk profiles and the transaction costs of the loans. Even the recent surge of equity investment vehicles is mainly targeting the upper segment of the market.

Skills and human resources are often insufficient in various fields, including food-processing and equipment technology, business development, marketing and finance. This skill shortage especially applies to small operators, who frequently even lack basic operational and management skills. However, even medium-scale domestic firms often lack knowledge and access to best practices on key operational functions such as cost accounting, financial management, logistics for distribution and supply-chain development, product development and branding. Beyond general business development, agroprocessors need additional specific training and advisory services in more technical fields such as good manufacturing practices including hygiene, food safety and quality management. These knowledge gaps place domestic operators at an additional disadvantage vis-à-vis their international peers.

Secure access to land. Secure access to land for setting up production sites is a key problem due to the complexity of land tenure systems and delays in formalization of long-term property rights. Especially for larger investments, secure long-term rights are an important prerequisite to instil investor confidence. Informal operators also face problems of obtaining secure access to land, which is a major constraint to expanding their businesses.

Ease of doing business: regulatory constraints. Table 9.2 shows the evolution of ECOWAS member states' performance on the World Bank's Ease of Doing Business index over the 2006-2011 period. Two observations stand out. First, rankings for West African countries are very low on a world-wide basis, with only 2 of the 15 ECOWAS countries, Ghana and Nigeria, ranking above the bottom third of all countries globally on average over the six-year period.[75] Second, there has been no uniform improvement in rankings across the area over time. For example, while Ghana has clearly improved, Nigeria's performance has de-

75 A higher number on the table represents a lower performance.

Table 9.2 *ECOWAS member states' ease of doing business rankings, 2006–2011*[a]

Country	2006	2007	2008	2009	2010	2011	Average
Ghana	109	87	82	87	77	60	83.7
Nigeria	108	108	114	121	134	133	119.7
The Gambia	127	131	128	135	141	145	134.5
Cape Verde	128	132	137	147	142	129	135.8
Sierra Leone	155	160	163	156	143	150	154.5
Mali	162	158	160	162	155	148	157.5
Senegal	158	162	168	152	151	157	158.0
Burkina Faso	165	161	164	155	154	151	158.3
Togo	149	156	159	166	162	158	158.3
Côte d'Ivoire	157	155	155	163	168	170	161.3
Benin	147	151	157	172	172	173	162.0
Liberia	169	170	167	159	152	155	162.0
Niger	171	169	171	174	171	172	171.3
Guinea	167	166	172	171	178	179	172.2
Guinea-Bissau	176	176	179	181	175	181	178.0
Average ECOWAS 15	149.9	149.5	151.7	153.4	151.7	150.7	

Source: World Bank, extracted from Euromonitor International, 2012 online database.
[a] Rankings out of a total of 185 countries world-wide.

clined significantly, despite the Nigerian economy having grown strongly over the period. Overall, the 15 ECOWAS countries showed no improvement, although individual countries show very different trends, precluding many region-wide generalizations. Nonetheless, in many countries weak contract enforcement is a particular problem, as are financing constraints resulting in the unwillingness or inability of agribusiness and input suppliers to move beyond cash and spot transactions into pre-financing and forward contracting.

Table 9.2 shows performance relative to other countries. It is possible that business conditions may have improved in an absolute sense in many countries in the region over this period; such an improvement could increase incentives to invest to serve the local and regional market. But for certain types of FDI, particularly those targeted at the export market for products that can be produced in many different tropical countries, it is the performance relative to other parts of the world that is particularly important, as West Africa is now competing in a global market.

9.4.3 Agro-industry as a policy orphan

Strengthening the up- and down-stream linkages of agro-industries, including agroprocessing, can help stimulate sustained growth in both the agricultural sector and the food and fibre markets that it targets. On that basis alone, agro-industrial development should be a policy priority. However, the central concerns of agro-industry span the domains of several sector ministries and agencies – agriculture, industry, health, and trade – none of which primarily deal with agro-industries. For example, ministries of agriculture primarily focus on farm-level production, and up- and downstream functions have received less attention. On the upstream end of the value chain, agricultural ministries have often been directly involved in procuring and distributing inputs and technologies and have a limited track record in supporting private-sector based Agricultural input supply chains and support services. Downstream, the main focus has traditionally been on post-harvest handling or value addition on-farm, or through farmer organizations. Support to agri-business, including SME's in agroprocessing, and to strengthening of farm-agribusiness linkages has rarely been part of agricultural ministries' core functions. Ministries of trade and industries and related agencies implement policies and programmes geared towards manufacturing, private-sector and SME development in general. Although these policies and programmes address many of the generic constraints facing enterprises in manufacturing and trade, they often lack specificity concerning the particular challenges facing agro-related enterprises, such as those related to food safety, quality, coping with seasonality and ensuring reliable access to dependable raw material supplies.

Hence, given the absence of a government agency with a clear mandate or a specific policy framework, agro-industries have long been a "policy orphan." Its plight and potential have only recently been recognised by global and regional players. Consequently, until recently, there have been few comprehensive approaches to agro-industrial development at the national and regional levels, in stark contrast to the CAADP process discussed in Chapter 11, which is focused primarily on production agriculture. While ECOWAS has a regional industrial policy that includes agroprocessing, CAADP is not explicitly linked to it.

Things are beginning to change, however. In 2010, at the request of the African Union, FAO, UNIDO and IFAD launched the African Agribusiness and Agro-Industries Development Initiative (3ADI) with the following objectives (African Union *et al.*, 2010a, pp. 7-8):

1. Leverage the current attention to Agriculture for development in Africa to accelerate the development of agribusiness and agro-industries sectors that ensure value-addition to Africa's agricultural products, respond to domestic market requirements and contribute to intra-Africa trade;

2. Enhance the governance of agribusiness and agro-industry and support a well-coordinated effort by African countries, African Regional Economic Commissions (RECs), relevant UN and other international agencies and the

private sector to share knowledge and harmonise programmes in ways that capture synergies, avoid fragmented efforts, and enhance developmental impacts;

3. Support an investment programme that will significantly increase the proportion of agricultural produce in Africa that is transformed into differentiated high-value products, such that by 2020 more than 50% of Africa's food products sold in local and national markets are in the processed form and such that the proportion of Africa's agricultural exports that are processed into final consumer products more than doubles, fully meeting food safety standards demanded by consumers in the continent and in the global market.

The 3ADI programme operates by providing a combination of technical assistance (e.g. from UNIDO) to investors in identifying opportunities and constraints to agroprocessing in key value chains and then helping connect agroprocessors with financing sources, including through the African Agriculture Fund, a private equity fund managed by the firm Phatisa.[76] Through its coordination with the CAADP market access pillar (see Chapter 11), 3ADI is also well-placed to help lobby for policies more favourable to agroprocessing and agro-industry. As of early 2013, 3ADI was supporting value-chain development and agroprocessing projects in six West African countries: Burkina Faso, Ghana, Liberia, Niger, Nigeria, and Sierra Leone.[77] In addition to 3ADI, other efforts such as the Grow Africa Initiative launched at the World Economic Forum in Davos in 2012 and the complementary New Alliance for Food Security and Nutrition promoted by the United States, aim at increasing FDI and African investment in both production agriculture and agro-industries, in coordination with CAADP. It will be important that these new initiatives do indeed coordinate both at the national and the regional levels with CAADP to help ensure policy consistency.[78]

As discussed in Chapter 11, at the regional level, ECOWAS has created an Interdepartmental Committee on Food and Agriculture that will include representatives from ECOWAS departments dealing with agriculture, industry and trade to help guide the implementation of the regional agricultural programme. At the national level, some countries have responded by establishing specialized agribusiness units in agricultural ministries (e.g. in Ghana), or by creating inter-ministerial coordination mechanisms (e.g. in Senegal). While these are important steps into the right direction, their effectiveness in fostering coordination within and between ministries and other agribusiness stakeholders remains to be seen. In addition to government agencies at various administrative levels, agri-business development requires close collaboration with a very diverse and heterogeneous private sector, which is often poorly organized.

9.5 Main findings and policy implications

With growing income, urbanization and female employment outside the home in West Africa, the demand for processed food is increasing. Food attributes such as shelf life, convenience in preparation, safety, nutritional value, packaging and presentation are all becoming more important, albeit at different velocities among different countries and population strata. Moreover, the structure and performance of the domestic agroprocessing sector have important implications for the costs, quality and safety of agrifood products. Development of agroprocessing is critical for adding value to domestic raw materials and strengthening the linkages between the agricultural sector and a growing and increasingly diverse demand for food and non-food products. It provides strong opportunities for employment generation and livelihood diversification in the context of West Africa's rapidly growing labour force and the structural transformation of food consumption patterns. Parts of agroprocessing, particularly at the SME level, are easier to enter than other segments of the industrial sector, due to their relatively limited capital, technology and human resource requirements. However, as witnessed by growing imports of processed foods and the limited share of processed

76 http://www.phatisa.com/The_Fund_Manager/AAF/

77 In 2012, 3ADI's mandate was extended to cover selected LDCs outside of Africa; when operating outside of Africa, it is known as the Accelerated Agribusiness and Agro-Industries Development Initiative. See www.3ADI.org for details.

78 ROPPA has raised concerns that the heavy emphasis in some of these new initiatives on FDI threatens family farming and the control of the CAADP agendaby local stakeholders. See Focus Section B in Part IV for more details.

agricultural exports, the regional agroprocessing sector is not yet fully capable to respond to the growing demand.

The West African agroprocessing sector is highly diverse in terms of size, range of commodities, mechanization and technology levels, reliance on domestic and imported raw materials, internal and external market orientation, quality awareness, degrees of value addition, and vertical and horizontal integration. The sector is marked by a strong dichotomy. On the top, there are a limited number of medium and large enterprises, often affiliates or subsidiaries of multinationals or domestic conglomerates, with high levels of capitalization and technologies and with strong brands. At the bottom, there are vast numbers of micro- and small operators, mostly in the informal sector, using rudimentary technologies. In between, there are also relatively few small and medium sized agro-industries in the formal sector. This phenomenon, often termed "the missing middle", is also found in other manufacturing sub-sectors in Africa.

The relative importance of small, medium and large companies and their respective shares in value addition is highly subsector- and commodity-specific. Large-scale industries tend to be concentrated in subsectors exhibiting strong economies of scale and capital intensity in processing and where reliable access to raw material of dependable quality can be established. This is the case for industries relying on imported raw materials such as wheat (e.g. flour mills, pasta and noodle manufacturers and large bakeries), milk powder (dairy products, flavoured drinks, yoghurts, and cheese), fruit-juice concentrates and, to some extent, rice (where, for example, Nigerian mills process imported rough rice). Medium and large industries based on domestic raw materials can be found in the traditional export crops (e.g., cotton gins, cocoa grinding and rubber processing) and in plantation crops (sugar mills and refineries, and oil mills, especially for palm oil). Other medium- to large-scale industries can be found in the beverage sector (breweries, soft-drinks), paddy rice and maize milling, poultry production, aquaculture and fish processing, and the production of branded animal feeds. These industries have flourished to the extent that they have been able to establish a reliable raw material base. Although industrial agroprocessors form an important part of the manufacturing sector in most countries, formal-sector firms are most heavily present in the "big three" countries of Nigeria, Côte d'Ivoire and Ghana.

The artisanal sector has a long track record as provider of cheap foods and dietary diversity for the rural and urban population. It has also a great importance in employment creation and empowerment, especially for women, and as a user of domestic agricultural produce. Micro- and small enterprises are primarily engaged in artisanal or semi-industrial processing of oil crops, paddy, cassava, maize and animal feed compounding with processed inputs. The larger units may be nominally incorporated into the formal business sector, but the vast majority operates informally.

In many commodity sub-sectors, operators of different sizes and technology levels co-exist, usually targeting different markets in terms of product quality, price, and geographical location. Examples of such subsectors include milling of grains and pulses, oil extraction, feed milling, and bakeries. Micro- and small operators mainly serve local markets and the low-income segments of the urban population.

The performance of the agroprocessing sector has been hampered by a number of well-known constraints related to physical infrastructure (roads, electricity), finance, skills and human resources, secure access to land, and other aspects of a poor business environment. Perhaps the most important constraint is reliable access to raw material at dependable quality and competitive costs, resulting in low utilization rates of installed capacities. The importance of raw material supply is illustrated by the fact that industrial processing flourished in industries primarily using imported raw materials such as wheat, milk powder or fruit-juice concentrates.

Despite these challenges, growth opportunities for agroprocessing exist in a number of subsectors. These include rice milling, maize and cassava processing, vegetable oil production, sugar milling

and refining, fruit juice production, beer brewing, animal feed production, cocoa grinding, as well as cotton and cashew processing.

The following are key considerations in crafting more effective policies to support West Africa's agroprocessing sector.

A differentiated and balanced approach. Agro-industrial development requires a differentiated and balanced approach that recognises the diversity of operators in the sector and the respective weaknesses, challenges and opportunities of each enterprise segment. Large companies can introduce new technologies and set benchmarks in product quality, sourcing arrangements and distribution. Due to their leverage, they can mobilize international finance, access domestic and international markets for branded and higher value products, and provide important market outlets for domestic producers. Under certain enabling conditions, they can engage in resource-providing contracts with farmers and their organizations to overcome constraints in input and output markets, financing and other support services. Small and medium-sized companies in the formal sector have specific knowledge of local markets and can adapt products based on domestic raw materials to consumer demands accordingly. While multinational companies tend to supply their global brands into West African markets with little adaptation, domestic companies can blend traditional culinary preferences with convenience and safety attributes that appeal to urban consumers. Informal food processors are important users of local raw materials and providers of affordable and diverse foods to low-income populations.

Public policies and development programmes should aim at enhancing the enabling environment for agro-industrial development in general while levelling the playing field between different operators. Improving the general enabling environment requires reforms and investments to address bottlenecks concerning transport and communication infrastructure, power supply, rule of law, contract enforcement, land access and tenure security. These measures benefit all economic operators across sectors and enterprise sizes. Levelling the playing field requires transparency and clear rules for large investors such as those envisaged in the Voluntary Guidelines for Land Tenure (FAO, 2012c) and the Principles for Responsible Agricultural Investments.

Improving the sourcing of local products and strengthening the inclusion of family farmers. Governments could also provide incentives for enhancing domestic sourcing of raw materials and small farmer inclusion in supply chains. These could take the form of fiscal incentives, cost sharing for targeted infrastructure development, capacity building and training. Provisions could also be included in land concessions for plantation development, i.e. the need to complement the development of a nucleus estate with outgrower schemes and strengthening of producer organisations. Contract enforcement, risk sharing, and conflict arbitration mechanisms could also be strengthened.

Strengthening the vertical coordination between farmers and agroprocessors requires developing a collaborative as opposed to an adversarial relationship between the two parties. Potential conflicts of interest arise over prices and policies regarding imports of competing raw agricultural products (e.g. raw sugar to be further refined in domestic processing plants). While some such conflicts are inherent in buyer-seller relationships, they can be mitigated through a focus on improving system-wide efficiency (e.g. through adoption of new technologies and institutional arrangements) and a transparent accounting system that helps assure each party that it is equally sharing in the risks and rewards. Another recurrent problem is agroprocessor-provided input financing to farmers. If the processor is the sole buyer of the output, then credit recovery is straightforward. If, however, multiple potential buyers exist, farmers who take credit from the processor sometimes sell to others ("side-selling.") Even if the farmer uses the receipts to repay the input loan (which often does not occur), the processor loses the volume of input needed to operate the plant at capacity. Problems of side-selling have led to breakdowns of processor-provided farm credit as value chains have liberalized (see Chapter 10). Alternatives such as farmers sharing in the equity investment in the plant (e.g. building up their

equity participation over time through a marketing cess) could change the incentives facing farmers, as they would now have an ownership interest in the plant. For such an approach to succeed, however, transparency in the accounts would be essential.

The dangers of policies that simply mandate that agroprocessors source product locally, such as the current requirement for inclusion of cassava flour in bread in Nigeria (discussed in Chapter 10), are that they are very top-down and may not correspond with consumer tastes and preferences; furthermore, they may also overestimate the industry's capacity to adjust to the policies in the mandated time. Instead of mandatory instruments such as quotas for using local raw materials, the use of other types of incentives is preferable. These should start from the consumer end, based on market research, which is currently severely underdeveloped in West Africa.

Strengthening SMEs. Governments and donors can help to level the playing field for domestic SMEs that are disadvantaged in their access to finance, human resources, knowledge and technologies, as well as product marketing and distribution. For example, SMEs do not have the means to engage in market research, promotions and advertising campaigns as do their large domestic and international competitors. Possible support measures include co-financing of new product development, e.g. through consumer testing, market research and business development on a demand-driven basis. Associations of SMEs can play an important role in collective marketing and promotional activities. In other parts of the world, collectively supporting such activities has been an important activity of value-chain-wide commodity associations or value-chain participant councils – similar in some ways to the *interprofessions* being promoted in many of the francophone countries (Shepherd *et al.*, 2009; Staatz and Ricks, 2010). Any such initiatives need to be accompanied by investments in and monitoring of quality and safety standards in order to establish consumer confidence and support domestic brand development.

Innovation and technology development. While a range of technical solutions have been developed by national and international technology development and research centres, widespread adoption and adaptation of such technologies is still a challenge. This requires mainstreaming technologies within private equipment manufacturers and developing and equipping supply chains, including with spare parts and repair facilities.

The incentives to register as a formal enterprise could be enhanced through reforms of the business enabling environment, streamlining regulations concerning licences, taxes and reporting requirements.

Training on food safety, hygiene and good manufacturing practices. National education systems need to be strengthened in specific agribusiness-related areas. These include technical fields such as food technology, packaging and equipment design and repair, but also hygiene, quality management and supply-chain management. In addition to increasing technical education in these areas, enterprises in the informal sector could be assisted by basic business development and financial management training and related support services, sensitization on food safety and hygiene issues (especially for high-risk commodities) and introduction of low-cost improvements in production methods to achieve better food safety and hygiene.

Improved standards for food quality and food safety. Food safety is first and foremost a public health concern. However, as consumers' incomes rise, food safety and quality (including clear nutritional labelling) become key demand issues for an increasing number of people and hence a determinant of the competitiveness of West African agroprocessors vis-à-vis imports. These concerns give advantages to strong national brands and imports that have developed credibility regarding their quality with consumers. To compete, other agroprocessors need to strengthen their credibility with respect to these attributes. Clear public standards regarding food safety and quality can help domestic firms, especially SMEs, increase their credibility.

Yet in developing and enforcing improved quality and food safety standards, West African policy makers need to strike a careful balance between

public health concerns, the purchasing power of the poor, and the ability of the large number of micro-enterprises and SMEs engaged in agro-processing to upgrade their practices quickly. The strict and rapid application of food safety standards derived mainly from international benchmarks would likely imply the closure of vast numbers of small food processors and vendors. Therefore, in practice, implementation of food safety standards in West Africa (which are indeed largely based on international standards) is usually flexible and rather tolerant. The problem with this approach is that sanctions are applied arbitrarily. An alternative approach would be to develop intermediate standards for the general public that are more in line with the productive capacities of local processors and purchasing power of the large majority of the population. These standards would need to be linked to a clear and credible roadmap for their upgrading.

Chapter 10

Response of Selected Value Chains

This chapter examines the responses of selected value chains in West Africa to the evolving demand and supply conditions in regional and international markets described in Parts I and II. Given space limitations, the chapter makes no pretence of being a comprehensive review of how all important value chains in the region have responded to these changes.[77] Rather, the chapter presents overviews of six value chains, analysing their ability to respond to a changing market environment, lessons learned from that response, and remaining challenges and opportunities facing them. The chapter covers: (1) two value chains that have experienced large increases in production due to technological and institutional innovations but are now facing challenges in capturing or developing new market segments that require tighter quality control (rice and cassava); (2) two value chains that face very strong competition in the regional market from overseas suppliers and whose prospects, in the absence of strong protection, are limited mainly to the development of important niche markets (poultry and dairy); and (3) two value chains for export crops that have historically had strong success (cocoa and cotton) but are now seeking new institutional models as they face current challenges. The chapter also briefly highlights several other value chains where demand prospects are very strong, offering opportunities for future expansion of production if reliable output of consistent quality products can be assured. The last section of the chapter discusses cross-cutting issues and challenges for value chain development and upgrading, and implications for policies and investments.

In this study, we define a value chain as "the full range of activities that are required to bring a product from its conception to its end use. These include design, production, marketing, distribution, and support to get the product to the final consumer" (Dunn, 2005). The value chain thus includes the entire network of actors involved in input supply, production, processing, marketing and consumption of the product. It is typically composed of several, sometimes competing, supply channels that target particular market segments. This is particularly apparent in the discussion below about rice, which has several different production and marketing sub-channels, each involving different actors and serving different consumers. This chapter looks at performance largely from the perspective of the overall value chain rather than individual sub-channels. Nonetheless, in analysing the challenges and opportunities facing the different value chains, it discusses the importance of different market segments and the roles of small, medium and large enterprises within these segments. Given space limitations, the chapter does not analyse the effectiveness, sustainability and impact of policy and programme interventions at the sub-channel and individual enterprise levels.

The chapter largely draws on secondary information including "grey literature" such as unpublished documents from donors and background papers prepared by national consultants as part of the AGWA research. This is complemented by information obtained from interviews with key value chain stakeholders, especially from the poultry sector in Ghana and various agroprocessing enterprises in and around Lagos.

79 The literature on value chains in West Africa is immense. Elbehri, 2013 provides detailed analysis of several major West Africa Agricultural value chains, both for food and export crops. For reviews of other studies, see Drechsler, 2011 and Lambert, 2012.

10.1 Value chains oriented towards West African consumers

10.1.1 Rice[80]

Rice is widely consumed throughout West Africa, with about 46% of consumption imported. As shown in Part II, demand is growing rapidly in rural as well are urban settings, driven by the desire for a staple that is readily available and is easy to prepare. Because domestic production in the region has not kept pace with demand, imports have soared (Chapter 4).

Paddy production in the ECOWAS zone averaged 10.6 million mt in 2008-10. Although production takes place throughout the region (Figure 10.1), three countries accounted for two-thirds of the production in this period: Nigeria (34%), Mali (19%) and Guinea (14%) (FAOSTAT). Rice is produced in a wide variety of systems throughout the region. These include, among others, irrigated systems under full water control in major rice development areas in Mali, Senegal, and Nigeria; irrigation under partial water control systems throughout the region, including seasonally flooded lowlands (bas fonds); mangrove production in coastal countries such as Sierra Leone, Liberia and Guinea; and upland production, which has expanded recently with the introduction of New Rice for Africa (Nerica) varieties.

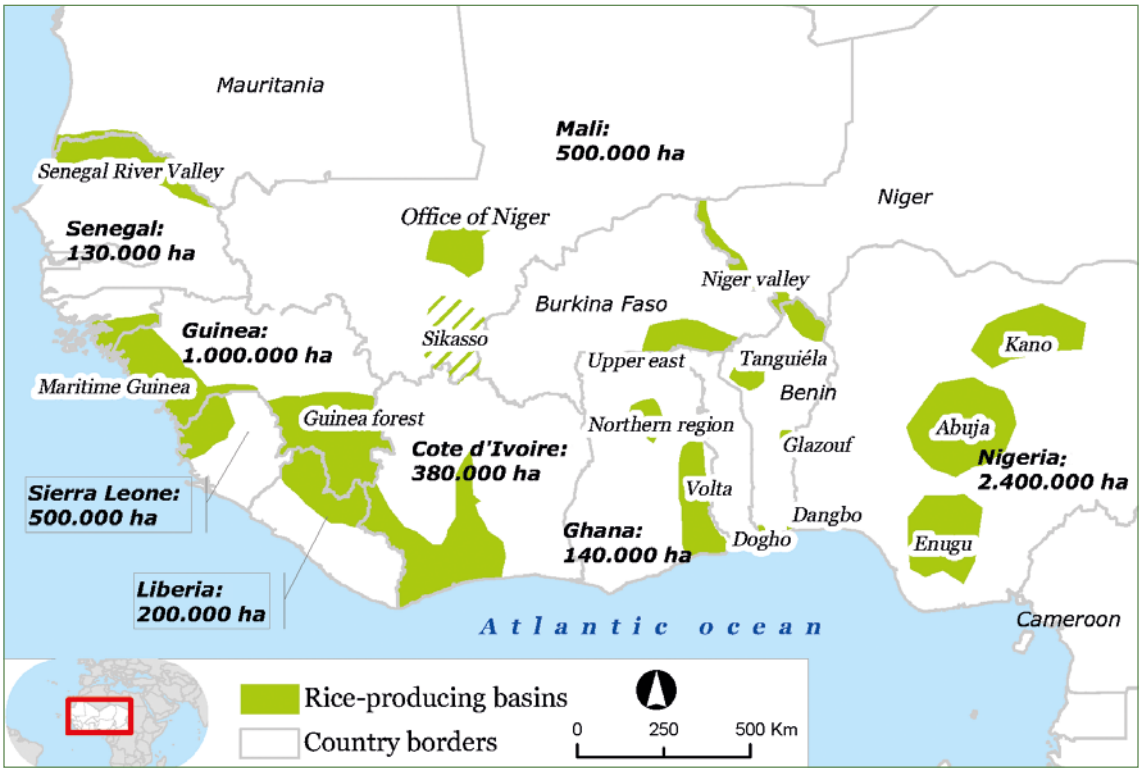
Production and productivity levels vary widely across these systems. For example, typical yields of rainfed, unimproved bas fonds and uncontrolled flooding systems in Mali are estimated at around 800 kg/ha, while yields in the best controlled, large-scale gravity-fed irrigated systems, using improved technologies, can exceed 6 mt/ha (USAID, 2009a). Most rice producers in the region are small-scale farmers (predominantly women) growing rice for home consumption under systems at the lower end of the productivity scale. If they generate small surpluses above home-consumption needs, they are typically traded in local markets or exchanged with neighbours. For these farmers, rice production is not really a commercial enterprise. To the extent that rice from these systems does enter commercial circuits, the small amount of surplus produced per farm leads to high per-unit assembly costs, lowering incentives of traders to buy from these farmers. Some of the recent national rice initiatives launched in the wake of the 2008 food price crisis, however, aim at increasing the productivity of these systems, which implies the need to upgrade the marketing channels if these systems are to become more commercially oriented.

In contrast, in the better water-control areas of larger irrigation schemes, such as in the Senegal River valley and Mali's Office du Niger, rice production, while still taking place predominantly on small farms (under 10 ha), is more commercially oriented, and men are more involved in its production. Frequently 40% or more of output is sold, and it is typically milled locally, bought by local rice traders, and moves into both urban and rural markets. A few large-scale rice farms have also emerged in the region recently, sometimes linked to outgrower schemes and a milling facility, as West African and foreign investors begin to see local commercial rice production as an alternative to imports for supplying the major urban markets.

Parallel to the supply channels just described is a very large import supply channel, with the bulk of the rice coming from Asia, and serving the large coastal and inland urban markets. Increasingly this rice reaches rural markets as well, as rice consumption in rural areas grows (see Chapter 6). Key actors in this supply channel are importers who are typically based in the capital cities. In most countries, particularly those with smaller populations, there are only a few large wholesalers who dominate the trade, given the scale economies and need for access to substantial financing to operate in the international rice trade. These wholesalers then sell to sub-wholesalers and a whole range of retailers (sometimes on credit), who in turn sell to consumers. Most consumers buy their rice in shops or open markets on a per kg basis or in large sacks. Imported rice destined for the upscale market is frequently sold in small consumer-ready packages in shops and supermarkets. In some cases (particularly in Nigeria) local processors have begun producing highly cleaned,

80 This section draws heavily from USAID, 2009b; del Villar *et al.*, 2011; and Lambert, 2012.

Figure 10.1 *Rice production basins in West Africa*



Source: del Villar, *et al.*, 2011.

carefully packaged and branded rice to middle-class consumers.

The import market is also differentiated, with its largest part devoted to the mass market, but with imports of higher quality rice targeting upper-income consumers. In Nigeria, in an attempt to boost domestic milling of rice, the government has banned imports of non-parboiled (polished) rice, limiting imports to rough and brown rice.

Rice preferences are highly differentiated across the region, and agroprocessing procedures and import patterns reflect these differences. For example, Senegalese consumers overwhelmingly prefer 100% broken rice, considered to be low quality on the international market; Guinean and Nigerian consumers prefer parboiled rice, and Nigeria also has the largest market for whole grain, higher quality rice (including large quantities of imported, parboiled rice). Within each country, consumers further differentiate themselves according to cost and quality considerations. In Mali, for example, the agricultural market information system distinguishes four major market segments: the bulk of the market (80-85%) is accounted for by 35-40% broken rice, of mediocre quality, originating from both national production and imports. A further 10% of the market is made up of somewhat higher quality 10-15% brokens, while the remainder of the market (5 to 10 %) is split between long-grain rice (with no brokens), originating mainly from local production, and imported aromatic rices that are used mainly on special occasions (Diarra *et al.*, 2011). Preferences between imported and locally produced rice also vary by country and income segment, but there is a general perception that imported rice is of more consistent quality, with fewer impurities.

To accommodate these diverse production systems and consumer preferences, processing of rice also takes various forms across the region, involving both parboiling and milling. Milling is largely small-scale, using Engelberg-type de-hullers that are frequently up to 30 years old, often imported

from India, and that produce variable quality milled rice (USAID, 2009b).[81] Nonetheless, these mills have the advantages of relatively low investment costs and of being located close to the farmer (many are mobile), reducing assembly costs for paddy and allowing the farmers to recover the husks easily for livestock feed. In some countries there has been expansion of mini- and medium-scale mills, which produce a more consistent quality and have higher conversion rates of paddy to milled rice and larger capacities, allowing the operators to target the growing middle-class demand for a higher quality product. Because of these mills' higher initial investment and maintenance costs and their need for a larger volume of paddy to operate at capacity, they are better suited for situations of concentrated production (such as in the full-water-control irrigated areas) than in areas of more scattered and less commercially oriented production as in upland and bas fonds zones.

Experience with large-scale industrial mills has, in the past, generally been poor. In situations where they have faced competition from the small-scale mills, they have often had problems in attracting enough paddy to operate close to capacity (USAID, 2009b; Diarra, *et al.*, 2000; Lambert, 2012). The ability of the small mills to outcompete for paddy likely reflects their lower assembly costs (being smaller and hence having to aggregate supply over a smaller area) and/or higher recovery rate of milled rice for a given quantity of paddy.[82] The potential advantage of the large mills in terms of higher quality output (fewer broken grains) can be lost if paddy is not dried carefully; hence, close coordination with growers is needed to ensure consistent paddy quality. Failure to obtain such quality has led some large millers to integrate backward into farming to produce their own paddy. Indeed, ensuring quantity and consistency of quality has been the Achilles heel for competitiveness of West African rice processors for many years. The difficulties of attracting sufficient paddy of consistent quality in Nigeria led large millers to lobby successfully for a ban on polished rice imports, leading to a substitution of imports of rough and brown rice (largely from the US) that is milled domestically.

The 2008 spike in world rice prices and the restrictions on rice exports by major exporters such as India and Vietnam focused the attention of government officials and the private sector on options for expanding rice production in West Africa. Many governments in the region launched programmes to expand domestic rice production, inspired in part by past successes such as that of Mali's Office du Niger (Box 10.1). Private-sector actors, including both domestic and multinational, also began investing in domestic production and milling, betting that West Africa could be competitive with imports from Asia under the new higher world prices for rice. A number of recent studies (e.g., del Villar, *et al.*, 2011; Adjao, 2011; Diallo *et al.*, 2012) confirm these views, suggesting that West African production costs (at least at the farm level) are comparable to those in Asia under market conditions prevailing in 2008-10.

Some of the recent private-sector investments involve attempts to develop contracts with small- and medium-scale farmers to furnish paddy to new, larger-scale mills that aim to produce a more consistent quality product to compete with imports. These efforts are works in progress, so it is not possible to draw definitive conclusions about their success. But there are some early indications that problems of contract enforcement and vertical coordination are in some cases hindering aggregation of sufficient volumes of paddy to allow the large mills to run near capacity. For example, the multinational Olam initially developed an outgrower scheme in Nigeria to supply its modern rice mills (USAID, 2009b). Fuelled by initial success and mounting political pressure, the company quickly increased the number of outgrowers with which it contracted but ran into increased management problems such as side-selling of rice by farmers

81 Engleberg-type mills de-hull and mill rice by passing the rice between two steel rollers. The advantages of these machines are their relatively low initial cost, simple design and easy maintenance. They typically can process between 200 and 1 000 kg of paddy per hour. Their disadvantages are that they produce a fairly high number of broken grains of rice and often have a lower paddy-to-milled rice conversion ratio than other types of mills. The small or mini-rice mills (minirizeries) referred to below typically have rubber rather than steel rollers, which yield a more consistent quality of output with fewer broken grains; these mills also have a higher hourly volume of output. Their higher initial investment cost, need for frequent replacement of the rollers, and requirements for a larger supply of paddy (which may be costly to assemble when roads are in poor condition) have discouraged their adoption until recently in West Africa. For more on the milling technology, see Barker *et al.* , 1985.

82 For example, in the early 1990s, the small Engelberg-type mills in the Office du Niger in Mali had a higher recovery rate than the large state-owned mills (Diarra, *et al.*, 2000). The latter, however, were old and in poor repair. Normally, one would expect a large mill to have both a higher recovery rate and a higher quality of output, but if they cannot attract enough paddy to operate near capacity, their unit cost of milling can easily exceed that of the small mills.

who had received inputs from the company on credit. According to an interview with an Olam representative during the AGWA field work in Nigeria in March 2012, the company has now leased a 3 000 ha farm in order to vertically integrate into production because of problems of assuring adequate supplies of paddy from smallholders. Similarly, in Mali, the firm Grand Distributeur Céréalier au Mali, which has been reprocessing rice bought from small mills to produce a higher-quality product for the upscale market, obtained a lease in 2010 for 7 400 ha of land to produce paddy and other products directly for its processing and marketing operations (Michigan State University Food Security Team, 2011). These examples suggest that the problems of supply aggregation and contract enforcement at the producer level remain critical. Producer organizations can play an important role in this aggregation process, as they have done in Mali's Office du Niger. A 2009 regional value chain analysis by USAID, however, argues that efforts to strengthen rice producer organizations in the region have focused too much on strengthening horizontal linkages among farmers and not enough on how the organizations need to coordinate their actions vertically with other actors in the value chain, e.g. through interprofessional organizations (USAID, 2009b).

Looking forward, two potential storm clouds loom on the horizon for expanded rice production in West Africa. First, OECD/FAO world price outlook projections through 2021 foresee declining real prices for rice as per capita rice consumption declines in Asia (due to rising per capita incomes leading to diet diversification) and as Cambodia and Myanmar enter the market as major low-cost exporters. The OECD/FAO projections foresee the world rice/coarse-grain price ratio falling from 2.5 in recent years to 1.8 by 2021 and the rice/wheat price ratio falling from 1.8 to 1.6 (OECD/FAO, 2012). Even with the long-term trend towards lower prices, however, year-to-year volatility will remain an important risk. Second, climate change may result in less favourable production conditions and lower water availability (particularly in the Sahelian regions), raising production costs. The lower price of rice relative to other cereals may further spur rice consumption in West Africa, while lower real world prices and the effects of climate change may reduce the profitability of production in the region.[83]

One implication of these factors is that efforts to expand rice production in the region need to pay particular attention to holding down per-unit costs throughout the value chain. At the farm level, improving input availability will be critical in this effort (see Focus Section C in Part IV, p. 315). It is important, however, that such cost-savings at the farm level represent savings to the economy as a whole (e.g. via more productive seeds and better water control) and not simply transfers of resources (via subsidies) to farmers from other parts of the economy. Savings in the post-harvest segments of the value chain are also critically important. These will require, inter alia, transmittal of financial incentives to farmers for careful drying and storage of paddy to ensure better processing outcomes, improved systems for paddy aggregation and assured delivery to processors, and improvements in wholesaling, packaging and marketing of the milled rice. Recent evaluations of the rice value chain (e.g. USAID, 2009b) argue that lack of consistent quality in milled rice is a major constraint to West African producers capturing a larger share of the market currently supplied by imports.

It will also be important, however, that rice development policies and programmes recognise the highly differentiated nature of the market for rice in most West African markets. In particular, there remains a very large proportion of the population that is low-income and is willing to make a trade-off between the cost of their rice and some degree of product quality. Larger mills produce a cleaner and more homogenous product than do the small local mills, but the widespread ability to date of the small mills to outcompete the large mills for paddy suggests that the small mills have a lower unit cost of processing than do the large facilities. There is a danger that in the quest to improve the quality of domestically produced rice, policies will subsidise industrial mills (e.g. via tax exemptions for imported equipment), thereby favouring a shift

83 A critical unknown is how Asian rice production systems will also adjust to the changing demand patterns in Asia and to climate change. Rice yield increases in Asia have been slowing in recent years, and some Asian producers (e.g. Vietnam) are already diversifying into higher-value products.

to the higher-cost processing and denying low-income consumers access to cheaper rice. This is not to suggest that efforts to introduce medium- and large-scale mills and improvements to small-scale milling systems (e.g. use of de-stoning machines for paddy prior to milling and increased use of mills with rubber rollers) should be hindered. There is certainly a growing market among the middle class for higher-quality domestic rice, and even lower-income consumers frequently complain of impurities in their rice. The shift to new milling systems, however, should be market-driven. If the large-scale mills successfully resolve their problem of ensuring a reliable volume of local paddy, they may also achieve scale economies that lead them over time to displace the small mills.

Because of the differentiated nature of both rice production systems and consumer preferences for rice in West Africa, it is unlikely that a single strategy will upgrade all the supply channels of the value chain. On the one hand, improvements in farm-level productivity in the low-yield upland and bas-fonds systems could help improve the food security of the farm families growing the rice and begin to respond to the growing demand for rice in rural areas. There is evidence, at least for Mali, that the marginal cost of increasing production in these systems would be lower than in the more input-intensive full water-control systems (Adjao, 2011). Yet upland and bas-fonds systems are riskier than systems of full-water control, particularly in the Sahelian countries, so risk considerations may push investments towards the more capital-intensive production systems. Capturing a larger share of the burgeoning urban markets for rice, however, will require improving productivity in these irrigated systems and linking that production with improvements in milling and marketing (USAID, 2009b). This, in turn, will require better coordination between farmers and millers, e.g. through interprofessional organizations, to improve post-harvest handling of paddy to ensure better milling outcomes.

Finally, given the political sensitivity of rice prices, there are frequently pressures for tax exemptions on imports that work against encouragement of domestic production. For example, political sensitivity of rice prices has led to some market distortions in Nigeria that are self-defeating, such as the partial exoneration from import duties on unpolished rice that has led to investment in port-side rice milling capacity far from Nigeria's rice producing areas (Lambert, 2012).[84]

84 For more details on rice pricing policies and their impacts on incentives for producers in Nigeria, Ghana, Burkina Faso and Mali, see the set of studies on the rice sector produced by the FAO's Monitoring African Food and Agricultural Policies (MAFAP) project, available at http://www.fao.org/mafap/products/countryreports-technical-notes/en/.

Box 10.1 The rice story in the Office du Niger, Mali

Mali's Office du Niger (ON) has been called "a large irrigation scheme that works" (Aw and Diemer, 2005). Currently covering over 120 000 ha of irrigated land that is cultivated primarily by smallholders, the ON was originally developed by the French colonial authorities in the 1930s for irrigated cotton production. This proved infeasible, and the ON was soon converted to a major rice production zone. Following independence in 1960, Mali's government adopted a state-led approach to rice production in the zone, initially promoting collectivised production. The ON administration dictated that only rice could be produced on the irrigated fields of the zone, provided farmers with inputs and extension instructions, and held the monopoly on all paddy purchases and milling in the zone (through five large state-owned mills). It in turn sold the milled rice through OPAM, the state grain board, which then marketed it through contracts with four large wholesalers who also dominated the rice import trade. Prices throughout the system were set by the government. Productivity in this system was low, and by the late 1970s, the ON had accumulated large debts, and its irrigation infrastructure was deteriorating. With support of the World Bank, the European Union, France and the Netherlands,

the ON undertook a series of reforms from 1982 through the early 2000s that resulted in a remarkable transformation of the zone, increasing production, productivity, and farmer incomes rapidly. Rainy season rice yields nearly quintupled from 1982/83 to 2002/03, rising from 1.6 mt/ha to 6.1 mt/ha, helping to drive down Mali's dependence on rice imports from 50 percent to under 20 percent (Aw and Diemer, 2005; Diarra, *et al.*, 2000).

Key elements in the ON success during this period were the following:

- Rehabilitation of irrigation infrastructure coupled with empowering farmer organizations to play an increased role in the management and maintenance of the irrigation perimeters.
- Research into improved rice varieties and production techniques, including encouraging a shift from broadcasting seeds to transplanting.
- The development of a management contract between the state and the ON that linked funding to performance on a number of specific benchmarks and that called for a gradual withdrawal of the ON from marketing and processing to concentrate on water provision.
- Liberalization of paddy milling and rice marketing. In 1987, the state abolished the ON's monopoly on rice milling and marketing within its borders.
- With support from the Netherlands, small, mobile rice mills were introduced into the ON, which were operated by village associations, private individuals, and women's groups. The numbers increased rapidly, from 1 in 1987 to 383 in 1992. Because of the small mills' higher conversion rate of paddy into milled rice and their low assembly costs for paddy, they were able to outbid the large mills for paddy, and by 1995 the large mills had been driven out of business.
- The rapid spread of the small mills created a new source of supply of rice for sub-wholesalers of rice in Bamako and other urban areas. These merchants had previously been dependent for their supplies on the four large rice wholesalers in Bamako who dominated both the import trade and previous sales of rice from the ON. The rice value chain thus became more competitive, driving down marketing margins.
- The 1994 CFA franc devaluation resulted in sharp boost in rice prices denominated in local currency, strengthening farmers' incentives even more to increase production.

The sequencing of the reforms was critical to their success. The initial investments in infrastructure rehabilitation and improved production technology created the potential for a strong supply response once farmers' incentives were improved thanks to the liberalization of milling and rice marketing. This was in contrast with Mali's experience with the liberalization of coarse grain markets, where the production response was tepid, especially for millet and sorghum for which improved production technology was more limited. It was equally important that the marketing reforms preceded the currency devaluation. If the devaluation had occurred before the marketing liberalization had made the market for domestic rice much more competitive, it is likely that most of the increase in the consumer rice price resulting from the devaluation would have been captured by the tight oligopoly of Bamako-based rice wholesalers who previously had controlled both the domestic and import trade. As it happened, the strong demand by sub-wholesalers in Bamako for rice from the ON following the devaluation (to compete with the now much more expensive imported rice) led to rapid transmission of the higher prices to farmers in the Office. Within two weeks of the devaluation, the share of the Bamako consumers' price received by ON farmers jumped from 67 percent to 82 percent, while the wholesalers' share increased only from 2 percent to 3 percent (Diarra *et al.*, 2000).

Since the mid-2000s, two factors have constrained further productivity growth in the ON. First has been the difficulty of developing reliable input marketing in the zone after the withdrawal of the Office from its marketing activities. Farmer organizations have taken the lead in organising input provision on credit to their members, but it has taken time to develop a reliable system. Second, population growth has led to fragmentation of parcels. In the absence of legal market for land rentals or sales, it has proven difficult to consolidate holdings into farm sizes in many parts of the ON that can support a family, leading smaller farmers to default on their water payments to the ON and face eviction (Michigan State University Food Security Team, 2011). On the other hand, over the past 10 years, the Malian government also leased large undeveloped areas of the ON in exchange for extension of the irrigation system in these areas. The terms of these leases were not always transparent, leading to further debates about land tenure rules in the zone. Improving the land tenure system in the zone is likely to be the next major reform challenge for the Office du Niger.

10.1.2 Cassava

Nigeria is the world's largest producer of cassava, and the crop is grown widely in the region, particularly in the coastal states. As shown in Parts I and II of this report, cassava production and availability per capita have expanded rapidly in many coastal countries of West Africa since the 1980s, and apparent per capita consumption has also been growing in several of the Sahelian states. The growth in human consumption has been driven by four phenomena. First, because of its high yield of carbohydrates per ha, cassava represents an inexpensive source of calories, and thus is attractive to West Africa's large low-income population. Second, during the period 2007-08, grain prices appear to have increased more rapidly than those of cassava, inducing consumers to substitute cassava products for cereals.[85] Third, some processed forms of the product, such as gari, are quick and inexpensive to prepare, offering a convenient substitute for rice.[86] Fourth, in the Sahelian countries, diet diversification by the middle class has led them to include processed forms of cassava, such as gari and attiéké, into their meals as a substitute for other staples.[87] As discussed below, industrial use of cassava and its incorporation into animal feed has also been growing. Although the region is the world's largest cassava production zone, exports of processed cassava out of the region have remained small.[88] In contrast to rice, West African cassava producers face no competition from imports of cassava products or of the raw roots, which are very bulky and perishable and hence not traded internationally.

On the supply side, research at the International Institute of Tropical Agriculture (IITA) in Ibadan, Nigeria, in the mid-1970s led to the development of varieties with improved virus and mealy-bug resistance that had 40% higher yields than traditional varieties even when no fertilizer was applied (Nweke *et al.*, 2002). The IITA research focused not only on varietal selection but also on the development of improved, small-scale processing technologies, particularly mechanised peelers, chippers, and graters. Economic returns to using the new varieties in combination with the new processing equipment were higher than using any other combination of traditional or improved varieties and processing technologies. (Camara, 2000). Thus, the IITA package proved attractive

85 Between June 2007 and June 2008, cereal prices in Mali, Senegal, Ghana and Cameroon rose between 40 and 80%, while the price of cassava, plantains and beans increased on the order of 15% (Minot, 2011).

86 Gari is a granulated, partially gelatinised form of cassava flour that has been roasted or fried (often with palm oil), yielding a product that can be stored for up to 8 months without refrigeration. Because it is already partially cooked, its subsequent preparation for consumption requires less fuel than do most other staples, adding to its attractiveness to low-income and time-poor consumers.

87 Attiéké is produced from fermented cassava pulp and resembles rice in texture. It is widely consumed in Côte d'Ivoire. In its fresh form, it is highly perishable, but in recent years, dried "instant" attiéké has become increasingly available and is sold in packaged form in several countries in the region.

88 In 1997, Ghana exported 51 000 mt (FAOSTAT), of which 20 000 tonnes were in the form of cassava chips to the European Union for use as cattle feed (Nweke and Haggblade, 2010). Since that time, annual exports from Ghana have fallen to 12 000 to 18 000 mt. There are also reportedly some unrecorded exports of gari from Benin via Togo to Central Africa (Soulé *et al.*, 2013).

to farmers and began to diffuse rapidly in Nigeria starting in 1997. It spread more slowly in other countries, beginning to be adopted in Ghana in 1993 and only later in Côte d'Ivoire.[89]

Cassava is a versatile crop with many potential uses, including human consumption, animal feed and industrial uses such as starch, syrups, alcohol and polymer production (Figure 10.2). The roots of "sweet cassava" varieties can be consumed directly after peeling, but those of most varieties contain cyanic acid, necessitating processing before consumption (peeling, leaching out the acid, grinding or grating, and drying). Processing in West Africa takes place on two scales: a micro-industry level (often undertaken by women) to produce food products such as gari, attiéké, and flour; and industrial processing into starch, syrups, flour, animal feeds, and (soon) beer. IFAD (cited in Soulé, *et al.*, 2013) estimates that 30 million people in West and Central Africa, mainly women, derive income from cassava processing, most of it small-scale.

Prior to independence, colonial authorities promoted cassava as a famine-reserve crop, as it has no specific maturation date and hence can be stored in the ground until needed. Nweke, *et al.* (2002) argue that the transformation of the cassava value chain goes through four stages:

1. Initially, cassava is grown primarily as a famine reserve crop.

2. Next, it becomes more widely used as a rural food staple.

3. As production and processing expand, it becomes an important cash crop for urban consumption.

4. Finally, it also becomes an important component of livestock feed and a raw material for industrial processes.

89 Adoption in Ghana may have been delayed by the country's overvalued exchange rate during the late 1970s and early 1980s, which gave imported staples like rice a price advantage over domestically produced staples such as cassava. In Côte d'Ivoire, the government pursued policies that held down the price of rice relative to other staples, thus favouring rice consumption over cassava. In addition, Ivorian small-scale cassava processors reported that the IITA mechanical graters, which were originally designed mainly for gari production, were not as well suited as manual graters for the production of attiéké, the main processed cassava product consumed in Côte d'Ivoire (Camara, 2000).

The past 30 years has seen cassava in West Africa shift from stage 2 to stage 3 in most countries, but there has only been timid movement towards stage 4. Estimates by Kormawa and Akoroda in 2003 for Nigeria (reported in Lambert, 2012) indicate that industrial use accounted for 16% of total production (10% for chips; 5% to produce a syrup concentrate for soft drinks and less than 1% for starch). Small-scale processors focus on producing food products such as gari, attiéké, chips for animal feed, and cassava flour, often with variable quality. Industrial scale processors not only can produce food and animal feed products, but also products not feasible for small-scale processors, such as starch, syrups, and ethanol. Nonetheless, small and large-scale processors may end up competing for the same roots to process, which can hinder the ability of the large-scale processors to operate at capacity.

Although cassava can be stored in the ground unharvested until needed, once harvested it must be processed within 24 to 48 hours to avoid deterioration. Thus, large-scale processing requires careful just-in-time coordination between farmers and processors in order to ensure that processing plants can operate near capacity while avoiding gluts. The roots are about two-thirds water by weight, and hence transport costs are high. Lambert (2012) estimates that an efficient industrial processing plant needs to draw supplies of roots from no farther than 30 km, implying that the processor needs to have reliable delivery contracts with many farmers close to the plant, use mobile processing equipment to do initial chipping/drying near the farms, or be vertically integrated into farm-level production itself. In contrast, small and medium-scale processors face a much simpler task of sourcing raw product, buying roots from spot markets or directly from farmers on an as-needed basis.

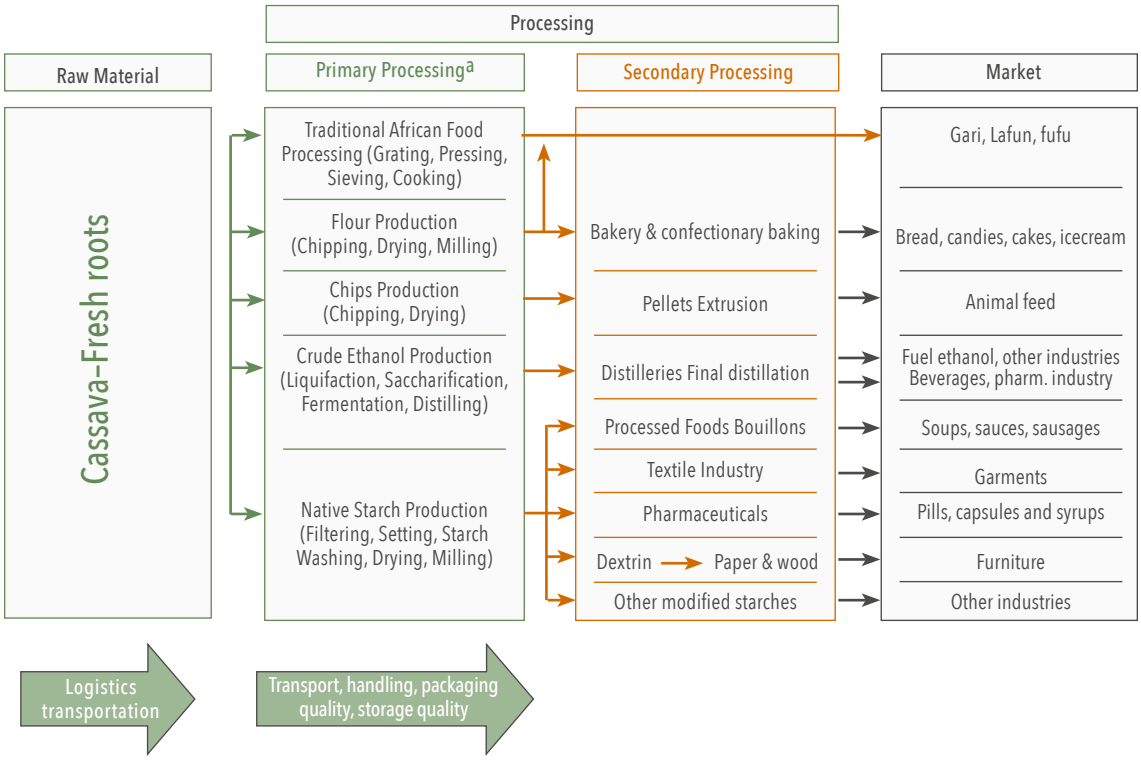
Attempts to move to from small-scale to large-scale processing (again, mainly in Nigeria), which could allow more consistent quality control, have also run into problems of aggregating and coordinating supply of the roots for processing. Frequently, plants operate at 40% or less of their capacity due to inadequate supply of roots. The problem arises for at least three reasons. First, because cassava production is rainfed, most farm-

ers plant and harvest their crop at the same time, leading to seasonal gluts and shortages of the roots.[90] Second, even if they had contracted with the plants for delivery of their crop, farmers frequently would sell to others if higher prices were offered. This suggests that the smaller-scale processors, as in the case of rice, may have been able to outbid the large processors for raw product due to their lower raw-product assembly costs and/or greater economic efficiency in processing. Third, large-scale processors face the ubiquitous problem in Nigeria of unreliable electrical service, requiring them either to shut down production when power is cut (losing the value of all the products on the production line) or operating with generators, which greatly increases their production costs.

90 Because cassava can be harvested at different times, this problem is potentially resolvable through differential pricing of the root depending on its delivery date to the plant. It is not clear why processors did not adopt such a pricing strategy.

Attempts to deal with the supply aggregation problem have met with mixed results. Beginning in 2009, the USAID MARKETS project and IITA partnered with Ekha Agro Processing, Ltd., Nigeria's largest producer of glucose syrup, to help the company develop a more reliable sourcing system for its roots. It had previously relied on purchases from farmer cooperatives, but the failure to get firm delivery commitments from these groups led the plant to operate only at 10% of capacity. The partnership with the USAID project and IITA worked to develop contracts with more than 20 000 cassava outgrowers and cluster farmers to deliver 400 tonnes of roots per day to the company's plant in Ogun state, near Lagos. Despite the development of these contracts and the company maintaining 3 000 ha of land for its own production of roots to supplement those bought from farmers, the plant has only managed to increase capacity utilization to 50% (AGWA field research).

Figure 10.2 *Structure of the Nigerian cassava value chain*



[a]All processes above include peeling and washing

Source: Federal Government of Nigeria, 2006

Problems of vertical coordination along the value chain are illustrated by Nigeria's experience with the Presidential Initiative on Cassava Production and Export launched by the Obasanjo administration in 2005 (Lambert, 2012; AGWA field research). The Initiative set a target of increasing production from 35 million mt in 2005 to 150 million mt by end of 2010. Included in the initiative was an initial requirement for inclusion of 10% high-quality cassava flour (HQCF) in bread – a measure aimed at reducing the country's reliance on imported wheat. The initiative encouraged farmers to expand cassava production through the distribution of cuttings of improved varieties and with the promise of a greatly expanded demand by the baking industry. The prospect of this larger market for cassava flour also led to an influx of investment by small-scale processors. With the assistance of various development projects, 120 new micro cassava processing centres valued at over N1 billion (US$6.4 million) were established across country. Bakers, however, were reluctant to substitute the HQCF for wheat flour, citing the lack of quality control on cassava flour produced by the small-scale processing facilities. Farmers, in the meantime, had expanded production and were stuck with no market for their expanded output. Even though the target for HQCF incorporation into bread was reduced to 5% after 2007, the initiative was seen as a failure by 2010. A consumer survey in Lagos carried out in 2011 found that none of the respondents interviewed said that they had ever tasted the cassava bread (AGWA field research).

With the launching of Nigeria's new Agricultural Transformation Agenda in 2011 (see Chapter 11), the goals of the previous Presidential cassava initiative have been revived and new objectives added, such as expanded production of cassava-based alcohol (to be blended with petrol). The new policy calls for reinstatement of the 10% HQCF blending requirement with wheat flour for bread effective in 2012, with the percentage increasing to 40% by 2015. In 2012, Nigeria imposed an additional 65% ad valorem tax on imported wheat, bringing the total tariff on wheat to 100%, both to encourage the shift to HQCF in baked products and to help fund the new cassava initiative. The government has taken a number of other actions, including creating a multi-stakeholder committee to manage the newly created Cassava Bread Development Board, removing import duties on enzymes used in producing HQCF, and focusing on large-scale processing with tighter quality control to try to avoid the pitfalls of the previous cassava initiative. The government anticipates 18 large industrial scale HQCF plants will be established soon to generate the 1.2 million tonnes of HQCF required under the Federal government's very ambitious target of 40% inclusion rate of HQCF in wheat bread (Lambert, 2012). But the organizational challenges in coordinating the supply of roots to these plants are likely to be very high in a setting where contractual compliance is viewed by many farmers as optional and where side-selling is rampant. These challenges may force many of the plants to vertically integrate into large-scale farming themselves.

Thus, the cassava value chain in West Africa has had some major successes in becoming an increasingly commercial crop processed predominantly by small-scale operators and generating millions of jobs. The growth of gari and attiéké consumption are examples of small, informal-sector processors and related value chain operators responding to consumer demands for a convenient, affordable staple that is an alternative to rice. But the ability of the cassava value chain to take the next step to become a more fully commercial crop feeding into a modern processing industry and capturing regional, domestic and export markets for products ranging from animal feed to starch to pharmaceuticals has been hampered by weak coordination linking farmers to the processors. A major test of the ability to design improved contractual arrangements will be the brewer SAB-Miller's plans to launch production of a cassava-based beer in Nigeria in 2013.

In addition to improving coordination to promote large-scale processing, there is also a big potential for small- and medium-scale processors to improve their incomes and value added by improving product quality, safety, packaging and branding in order to respond to growing urban demand through modern retail systems and also service diaspora markets for traditional products

that are perceived to be nutritious and well presented. The modernization of the small-scale food processing sector will require systematic upgrading of industrial processes, equipment operation, food hygiene and business management and will require concerted public-private sector collaboration, for example through value-chain participant councils.

10.1.3 Poultry

Consumption of both eggs and poultry meat have been growing substantially in West Africa over the past 30 years (see Part II). West African poultry producers have been able to satisfy almost all of the growing market for eggs in the region. In contrast, for those countries that have kept their borders open to international trade in poultry products, most of the growth in poultry (primarily chicken) meat consumption has been captured by imports. The loss of market share in poultry meat reflects not only the ability of exporters from Brazil, the US and Europe to deliver poultry products to West African ports at low costs (for reasons explained below) but also the difficulties that West African countries have had in adopting the institutional arrangements needed to ensure the tight coordination of inputs such as feed, veterinary products, and day-old chicks required by modern industrial poultry production.

Poultry production in West Africa involves three distinct systems: small-scale traditional systems, somewhat larger semi-commercial systems, and large-scale commercial systems.[91] Traditional systems account for around 70% of birds in most West African countries. In these systems, growers raise a small number of birds for home consumption, with small surpluses destined for the market. The birds scavenge for food, receiving few if any purchased inputs and no veterinary care or vaccinations. There is no distinction between birds raised for egg production and those for meat. Productivity in this system is low due to high mortality and relatively slow growth of the birds. The system has the advantage, however, of requiring very low investment, making it a widely used system to produce animal protein for the family and to generate supplementary income and liquidity, especially for women. The birds, which are local breeds, are adapted to the local production conditions. Since much of the consumption is located in areas with few cold chains, production from this system faces little competition from imports. Semi-commercial production, which is common in peri-urban and urban areas, tends to be the main source of commercial production of meat and eggs in the inland Sahelian countries. Production is based on improved local breeds or cross-bred stock, although often there remains little differentiation between layers and broilers. Producers provide simple housing for birds, purchase at least some of the feed, and provide veterinary services when available. Production is more commercially oriented, aimed at urban markets. Formal marketing contracts are rare, however; most output is sold through oral contracts with retailers (e.g. for eggs) or on spot markets. The formal marketing contracts that do exist have little influence on choice of technology, supply of inputs, or quality of output. Some of this production is seasonal, targeting major holidays such as Christmas or New Year's Day, when poultry consumption increases.

Large-scale commercial production typically involves mechanised production facilities, in which feed costs usually represent 70% to 75% of the cost of production. For this reason, the success of these operations depends critically on developing stable, low-cost feed supplies. Production is based on genetically improved stock that are specialized for either egg or meat production. Disease control measures (vaccinations, biosecurity practices) are also critical in maintaining productivity, especially as West Africa lies on major flyways of migratory birds that can spread avian influenza and other diseases. Feed conversion rates are high under a controlled production environment in specialized housing, with broilers reaching market weight in as little as six weeks. Spent layers are sold for

91 This categorization differs from FAO's 4-way classification of poultry production systems in use globally (http://www.fao.org/docs/eims/upload//224897/factsheet_productionsectors_en.pdf). The FAO classifies poultry production into 4 sectors: (1) Industrial integrated systems with a high level of biosecurity and birds and products marketed commercially, (2) commercial systems with moderate to high biosecurity and birds/products usually marketed commercially, (3) commercial poultry production systems with low to minimal biosecurity and birds/products entering live bird markets and (4) village or backyard production with minimal biosecurity and birds/products consumed locally. Since very few West African producers fall into FAO's sector 1, in the discussion below, sectors 1 and 2 are combined and labelled "commercial systems." The following description of the three production systems is drawn largely from Farrelly, 1996, and from a series of case studies of poultry markets in West Africa carried out by researchers from the University of Washington and summarised by Schneider *et al.* , 2010.

processing, for example into soups, or on spot markets. Success of this system depends not only on the adoption of the improved technology but also a set of contractual and institutional arrangements to manage the risks inherent in such capital-intensive operations. In industrial countries, typically firms involved in selling the chickens or eggs establish contracts with growers, providing them with day-old-chicks, feed, veterinary inputs or services, and technical directions on growing practices to be followed, while the farmers provide labour, housing, and handle disposal of waste. In West Africa, given problems of contract enforcement, it is more common for all these operations to be integrated within a single firm.

Table 10.1 shows distribution of poultry numbers in West Africa. Nigeria has the largest number, 39.2% of the total, followed by Ghana (9.3%), Côte d'Ivoire (9.1%), Senegal and Burkina Faso (each 7.9%). Although Nigeria has the largest number of birds, it ranks fourth from the bottom of the 15 ECOWAS countries in terms of birds per capita; Togo, Senegal, Burkina Faso and Mali have the highest numbers of birds per capita. Growth rates of flocks have varied substantially over time and by country, for reasons discussed below. A particular shock was the 2006 outbreak of avian influenza. Given the weak biosecurity practices of most growers, especially traditional producers where no effort is made to isolate poultry from contact with wild birds, the threat of major damage was large. Nigeria was the site of the initial outbreak, with over 1 million birds destroyed or dying there. Although this was a small proportion of the total flock, more serious was the reaction of Nigerian consumers. Fearing the disease, consumers initially boycotted chicken, leading to a fall in poultry prices of over 80% (Schneider, *et al.*, 2010). In response to the outbreak, most countries in the region banned imports of poultry products from any country having suffered infection.[92] As noted below, some countries, such as Senegal and Burkina Faso, have maintained the import bans to the present time, using the phytosanitary controls as a non-tariff barrier to protect domestic producers.

92 As explained below, Nigeria had already banned imports of frozen poultry and eggs in 2002 to protect domestic producers from foreign competition.

Table 10.1 *Poultry numbers in West Africa*

2008–2010 averages; CAGR uses three year averages for 1981–2010

				Compound Annual Growth Rate		
Country	Total poultry flock (million birds)	Share of ECOWAS total	Birds per capita (2010)	1981-83–1988-90	1991-93–1998-2000	2001-03–2008-10
Benin	15.9	3.4%	1.9	-2.3%	3.1%	3.0%
Burkina Faso	37.1	7.9%	2.4	4.2%	2.4%	5.7%
Cape Verde	0.6	0.1%	1.3	6.3%	-0.8%	3.5%
Côte d'Ivoire	42.4	9.1%	2.3	3.3%	2.0%	4.2%
Ghana	43.6	9.3%	2.0	-0.5%	6.6%	7.6%
Guinea	20.5	4.4%	2.3	2.6%	4.0%	5.5%
Guinea-Bissau	1.5	0.3%	1.1	6.3%	5.1%	0.1%
Liberia	6.8	1.5%	1.8	4.0%	0.4%	4.6%
Mali	35.5	7.6%	2.4	5.3%	1.4%	3.6%
Niger	15.1	3.2%	1.1	1.1%	1.1%	3.2%
Nigeria	183.3	39.2%	1.2	4.1%	0.2%	4.3%
Senegal	37.1	7.9%	3.3	4.2%	5.1%	4.8%
Sierra Leone	8.9	1.9%	1.7	3.4%	0.7%	21.3%
The Gambia	0.8	0.2%	0.5	6.7%	-2.0%	3.7%
Togo	18.9	4.0%	3.6	14.4%	4.7%	7.4%
ECOWAS TOTAL	468.1	100.0%	1.7	3.5%	1.7%	4.9%

Source: Calculated from FAOSTAT data

Poultry value chains

Egg value chain. West African producers appear to have become increasingly competitive in egg production. The ratio of domestic to world prices of eggs has fallen sharply since 2000; by 2007 domestic prices in most countries were at or below world prices (Schneider, *et al.*, 2010). Most countries in the region are self-sufficient in eggs, and, as indicated in Part II, consumers have increasingly turned to eggs as an inexpensive source of high-quality protein. For example, in a survey of Accra consumers interviewed in late 2011 as part of the AGWA fieldwork, 62% of respondents reported eating eggs at least once a week, compared with 35% reporting consuming frozen chicken (the most frequently consumed type of chicken) and 82% reporting consuming dried fish (the most frequently consumed form of animal protein). The widespread consumption of eggs is due to their low cost, availability in small amounts, perceived healthfulness and cleanliness.

Commercial egg production, however, is challenged by variability in feed prices, especially of maize and of protein sources, such as groundnut and soybean meal. The widespread absence of contracting between producers of these feed products and local poultry producers reduces the capacity of poultry producers to anticipate their costs and, in some cases, induces them to integrate backward into crop production themselves. Interviews with Senegalese poultry feed manufacturers also reveal that their perception of the unreliable quality of maize imported from Mali often leads them to turn to imported maize. Moreover, when production of cereals falls in West Africa, competition between use of grain for feed and for human consumption becomes more acute, driving up prices unless trade policies are flexible enough to allow imports to flow in to stabilize prices. This is a generic problem in countries where the bulk of coarse grain production still goes to direct human consumption, unlike in middle- and upper-income countries (including major poultry exporters like Brazil and the US), where most of domestic coarse grain consumption is in the form of livestock feed. In Nigeria, abrupt changes in government policies, including the imposition of import bans on cereals and oilseeds that are the object of special government production initiatives, have also created major challenges for egg producers. The adverse effects of these trade restrictions on poultry producers have been exacerbated by increased competition for cereals from agroprocessors (breweries and breakfast cereal manufacturers), which have further bid up the prices of these inputs (AGWA field research). In some of the smaller countries in the region, especially those dependent on more semi-commercial systems of production, irregular access to other critical inputs, such as veterinary products and day-old chicks, also pose challenges.

Thus, while the egg value chain has not faced large challenges from extra-African imports in most countries, its further growth is conditioned, like that of rice processing and cassava processing, on actions aimed at improving the reliability, quality, and cost of the agricultural raw materials that serve as its key inputs.

Poultry meat (broiler) value chain. In contrast to egg producers, producers of broilers in West Africa have faced strong international competition over the past 20 years. Although poultry consumption has grown strongly in many countries, most of this increase has been met by imports. To understand the forces at work, it is useful first to discuss the nature of the demand for poultry meat in West Africa and review events that have strongly affected poultry trade into the region, and then examine the experiences of three different countries (Ghana, Nigeria, and Burkina Faso) that have had very different policy responses to these events.

Demand for poultry meat in West Africa.

In West Africa, consumption of poultry (largely chickens, but also including guinea fowl, turkeys, and ducks) traditionally was reserved for special events, as it was in much of the rest of the world before the industrialization of production drove down prices dramatically. West African consumers preferred free-range birds, purchased live, and slaughtered at home. Since poultry was frequently prepared in stews, consumers also preferred birds with tougher meat that would maintain its integrity when stewed for a long time. The introduction of chicken products, both domestic and imported, produced in large-scale commercial operations has led to market segmentation. While birds produced

in traditional and semi-commercial operations are still preferred for special occasions, the lower-priced "industrial" birds offer consumers a cheaper product, available already dressed and often cut up in parts, that is quicker to prepare and more suited to time-constrained urban lifestyles. Thus, the two products exist side-by-side in the market, but with substantial price differentials between them; consumers choose among them based on relative prices and tastes (Table 10.2). See also Chapters 5-7 which discuss the growing demand for poultry in the context of West African's overall food budgets, food consumption shares, and changing consumption patterns.

Table 10.2 *Chicken prices in Accra in early 2012*

	Average Price of Product (cedis/kg)	
Type of chicken product	Modern Market	Traditional Market
Live chicken	–	9.07
Frozen chicken	8.60	4.61
Chilled chicken	9.56	–
Ready-to-eat	8.75	–

Source: AGWA field studies.

The poultry meat market in Ghana has become differentiated between imported frozen poultry meat and locally produced birds. The latter are of two types: spent layers, sold typically after approximately 72 weeks, when their egg production rate per day falls below about 55%; and broilers. The spent hens are sold live in local markets and are generally destined for stews. The broilers are sold in various formats, from live animals to whole dressed birds to cut-up parts. Consumers surveyed as part of AGWA research in Accra in 2011 indicated a preference, other things being equal, for local poultry. Other things are not all equal, however, as local production is most often sold either as a live or whole dressed bird, requiring a larger expenditure of money and time to prepare it. Hence, the Ghanaian poultry is more targeted for special occasions, while the imported poultry has become a more frequent item in the diet, both at home and in quick-service restaurants.

Import surges and import bans

The impact of the WAEMU CET on West Africa's poultry trade. Beginning in the mid-1980s, and rapidly accelerating in the late 1990s, imports of frozen chicken began arriving in West African markets. For example, between 1996 and 2003, annual chicken imports from the European Union into ECOWAS countries increased from 12 500 mt to 86 000 mt (Schneider, *et al.*, 2010). The adoption of the WAEMU common external tariff (CET), initially just in the WAEMU countries and subsequently extended to all ECOWAS countries, set the ad valorem tariff rate for poultry at 20%, well below the previous rate practiced in many countries. This prompted a further increase in imports, which increasingly came not only from the EU but also North America and more recently Brazil, which has emerged as a low-cost producer in the world market.

Differing policy responses to the import surge: Ghana, Nigeria and Burkina Faso. The experiences of Ghana, Nigeria and Burkina Faso illustrate differing policy responses to the import surge of low-cost poultry products from abroad and some of the consequences of those decisions. Ghana, after initially trying to protect its domestic producers with higher tariff rates, accepted the import surge. Nigeria banned frozen poultry imports starting in 2002 in order to protect domestic producers, particularly the larger scale commercial producers. Burkina Faso, which faced fewer imports due to the natural protection offered by its landlocked location, used phytosanitary regulations to restrict imports, protecting its semi-commercial family-farm producers of poultry.

Ghana.[93] Modern poultry production expanded rapidly in Ghana starting in the 1960s. However, by the mid-1980s, low-priced frozen chicken meat from Europe and North and South America began entering the Ghanaian market, undercutting the prices received by local broiler producers. The resulting strong price competition from imports led to an initial attempt by the Ghanaian government to protect domestic producers through the imposition of a 40% import tariff in 2003, but under pressure from the IMF and the World Bank, this was cut back to 20% (the level of the WAEMU common external tariff), in addition to a VAT of 12.5% and various other levies equalling 4.9% (for

93 This section draws heavily on material collected during AGWA field research and on Killebrew *et al.*, 2010a.

a total protection rate of 37.4%). In spite of this level of protection, most of the largest broiler producers went out of business or shifted exclusively to egg production, the number of feed mills fell from 30 in 1988 to 12 in 2010, and of 16 hatcheries that were producing day-old chicks in the early 2000s, only 7 were still operating in 2011.

The growth of frozen chicken meat imports into Ghana has been phenomenal over the past 20 years, increasing from none in the period 1980-85 to an average of 70 000 mt per year over the period 2005-09. During this period, per capita availability of poultry meat increased seven-fold, from 0.7 kg/year to 4.8 kg/year, with 69% of the increase coming from imports (FAOSTAT). The competitiveness of the imports stemmed from several factors:

- Low production costs in the exporting countries as a result of economies of scale, made possible in part by well-functioning and coordinated markets for inputs such as maize and soybean meal and contracting arrangements between integrators and producers that gave strong incentives for cost minimization.

- The ability of the exporters to ship frozen chicken parts rather than whole birds to West Africa. This gave the imports a double advantage:

  - It allowed the exporters to Ghana (and other countries in West Africa) to segment their exports among different markets, selling the high-value parts such as breasts to high-income markets in the North that pay a premium for them while shipping lower-value products (such as wings and backs) to West Africa. For example, of 51 shipments of imported poultry recorded by the Ghanaian Veterinary Service Directorate in July 2011 (weighing just over 2 000 mt), 41% of the shipments and 44% of the weight were accounted for by chicken backs. The rest were largely wings and leg quarters (calculated from data collected during AGWA field research). In contrast, Ghanaian broiler producers had to sell their entire birds on the local market and did not have the option of sending the higher-valued portions to high-income markets in the North.
  - The availability of frozen parts was more convenient for many consumers in that they could (1) purchase a small amount of chicken rather than a whole bird and (2) the chicken was already dressed, while many of the birds produced locally were sold live and had to be killed and dressed (see Chapter 7 for details). While Ghanaian commercial producers sell dressed birds, most sell them as whole birds, as only a handful have capacity to process them into cut parts (Killebrew, et al., 2010a). If they developed such capacity, they could begin to exploit a niche market for chilled, local chicken, but this would require major upgrading of their cold chains, quality control, and branding.

- Export subsidies from Europe may have played a role in helping the frozen chicken get a foothold in the Ghanaian market.[94] Imports from the EU remain important, but Brazil is the largest exporter, and its exports are free of export subsidies.

- The frozen parts are widely available, as any shop or market outlet with access to a freezer can stock and sell the imported chicken, as opposed to chilled or live chickens, which are generally available only in open markets or modern retail establishments.

The ability of the Ghanaian commercial broiler value chain to compete with imports has been further challenged by the variable quality of domestically produced veterinary drugs and day-old chicks and the high price of their imported counterparts, large variability in feed costs due to the feed/food competition for grain mentioned earlier, and operational challenges in terms of poor roads and unreliable electricity supply that increase costs and hinder the ability to process and distribute processed poultry to the main centres of demand (especially Accra).

94 As of late 2012, EU export subsidies on poultry stood at 325 Euros/mt (http://www.bloomberg.com/news/2012-04-19/eu-to-cut-beef-export-subsidies-by-33-on-elevated-prices- 1-.htm). These subsidies have become a point of contention between the EU and Brazil. While the US pays no explicit export subsidies, some countries (e.g. China) charge that US farm subsidies to the grain industry drive down US feed costs, giving US poultry an unfair advantage in international markets (http://www.nationalchickencouncil.org/statement-on-ustr-announcement-by-usa-poultry-egg-exportcouncil-and-national-chicken-council-on-china-anti-dumping-case-on-chicken/).

The response of the Ghanaian government to date has been to allow consumers to benefit from low international poultry prices in order to expand their consumption, even though a majority of the increase is captured by imports. Nonetheless, as per capita poultry and egg consumption in the country is increasing, due not only to lower chicken prices but also growing incomes, poultry numbers in Ghana have grown at a faster rate over the period 2001-03 to 2008-10 than any other country in the region except Sierra Leone, where the growth represents recovery from the civil war (Table 10.1).

As discussed in Chapter 12, the newly revised ECOWAS CET proposes to impose an import tariff on poultry meat of 35% rather than the current 20%. Given the cost differentials between Ghanaian and Brazilian producers, however, it seems unlikely that this modest increase in border protection will be enough to allow Ghanaian poultry producers to recapture the bulk of the domestic market (assuming that the VAT and other levies on imported poultry remain unchanged). A more realistic objective in the short- to medium-run is to focus on developing niche market strategies while addressing the basic structural constraints facing the value chain over the medium to long term.

Nigeria.[95] Nigeria's commercial broiler industry is much larger than that of any other country in the region, and is concentrated in the southern states surrounding Lagos. Since the 1980s, the Nigerian government also promoted semi-commercial production (known in Nigeria as "backyard production") as a poverty alleviation measure in the central and northern parts of the country. Faced with the increased international competition, Nigeria has taken a protectionist approach to defend those investments, banning imports of frozen chickens and eggs starting in 2002.

The impact of the import ban has been mitigated, however, by two factors. First, import bans on maize, soybean meal, and groundnuts in the context of special production initiatives for these products have driven up input costs for poultry producers, offsetting some of the benefits of the poultry import ban. Second, the ban has created incentives for widespread smuggling of imported chicken from neighbouring countries, particularly Benin, into Nigeria. Benin has become the second largest importer of chicken meat in the ECOWAS zone (after Ghana), with imports exceeding 112 000 tonnes in 2009 (FAOSTAT food balance sheets). An estimated 90% of the total is re-exported clandestinely to Nigeria, often without refrigeration, raising serious public health risks (Killebrew, *et al.*, 2010b). The Poultry Association of Nigeria (as reported in AGWA field research) alleges that in order to preserve the chicken in the absence of a cold chain, smugglers often treat it with chemicals, some of which are carcinogenic.

While the protection allowed the Nigerian broiler industry to grow, consumer access to inexpensive poultry products has been much more limited in Nigeria than in Ghana. Whereas apparent per capita consumption of poultry increased sevenfold in Ghana between 1980-84 and 2005-09, in Nigeria it actually fell slightly, from 1.7 kg/year to 1.6 kg/year (see Chapter 5). Nigeria's experience thus illustrates some of the trade-offs policy makers face in balancing consumer and producer interests when designing food policies.

Burkina Faso. In contrast to Ghana and Nigeria, Burkina Faso has no large-scale commercial broiler operations, with production of eggs and broilers taking place in traditional and improved village-level systems and in semi-industrial units (with a maximum of 30 000 birds, but many with fewer than 1 000) located around Ouagadougou and Bobo Dioulasso, the two largest cities. The semi-industrial units are oriented primarily to egg production, while the improved village production supplies much of the urban market with chickens and with Guinea fowl eggs (ROPPA, 2012a; Schneider and Plotnick, 2010).

In contrast to the coastal states, imports of poultry products account for less than 1% of the market in Burkina Faso. The low level of imports is due to:

- The country's natural protection thanks to its landlocked location. Ouagadougou is over 750

95 This section draws mainly on material in Killebrew *et al.*, 2010b and from AGWA field research.

km from the ports of Lomé, Abidjan, Cotonou and Tema, with weak cold chain links between those cities and Burkina Faso. The high transport costs from the coast contribute importantly to the competiveness of local production relative to imports.

- Burkina's very strict enforcement of phytosanitary rules regarding avian diseases, which restricts imports from several countries.

- Strong consumer preferences for locally produced, "traditional" chicken because of its flavour.[96]

Table 5.4 in Chapter 5 shows that per capita availability of poultry in the country is 2.2 kg/person/year, about half that of Ghana but above the level in Nigeria. It appears unlikely that imports from abroad will displace local production to any great extent in the future. ROPPA, however, sees a threat to the village-level and semi-industrial production coming from the potential installation of larger commercial production units, driven by pressures from consumers, government, and major employers such as mining enterprises, to reduce the price of food in the country (ROPPA, 2012a). For such units to succeed, however, they would need to master the problems of obtaining stable supplies of consistent quality feed and other inputs, problems that have challenged current producers in Burkina Faso and commercial producers along the coast.

Future perspectives for the West African poultry value chain.

OECD/FAO outlook projections foresee the real prices of poultry meat remaining stable from 2012 through 2021, with poultry meat remaining the least expensive meat source on global markets. In West Africa, demand for poultry is likely to be pushed higher by the projected rise in global fish prices over the 2012-2021 period (OECD/FAO, 2012), which will induce fish consumers to shift towards cheaper sources of animal protein. The growth of international trade in poultry products is expected to slow from an annual rate of 5.5% over the past decade to under 2% through 2021, with up to 89% of the increase in exports coming from low-cost producers Brazil and the US. These countries are low-cost producers not only because of their production technology but also because of the institutional arrangements in place to ensure reliable input availability and fulfilment of contractual obligations that are critical to the success of large-scale commercial poultry production. Such institutional arrangements are largely absent in West Africa.

It thus appears that while egg production will likely remain competitive in West Africa, it will be difficult for broiler producers in the coastal states to capture a large portion of the mass market from imports in the next five years in the absence of strong protection measures (high tariffs or outright import bans). Even with poultry moving to the higher "fifth band" of tariff protection (35%) under the proposed ECOWAS CET (see Chapter 12), it will be difficult for West African producers to compete with imports for the mass market unless the underlying structural challenges facing the value chain are addressed, and it will take time to do so. The market will remain segmented, with continuing demand for locally produced free-range birds for special occasions, and cheaper imported chicken and turkey parts (especially low-cost backs, necks and legs) meeting a demand for lower-cost and easily prepared meat. There is likely some scope to expand the niche market among upscale consumers for locally produced, well-packaged, and traceable chilled chicken, but this will require a significant upgrading of processing, packaging, distribution and branding. It is also important to continue to encourage "backyard" poultry production as a way of upgrading diets and incomes in rural areas.

The contrast between the experience of Ghana's and Nigeria's poultry value chains illustrate trade-offs faced by policy makers. Ghana, by allowing the inexpensive imports, has offered its consumers an additional source of inexpensive protein, and consumption has risen seven-fold, but many Ghanaian broiler producers, particularly commercial operations, have not been able to compete and have gone bankrupt or converted entirely to egg production. Nigeria, on the other hand, has

96 These chickens are commonly referred to in Burkina Faso as "poulets bicyclettes" because they are often brought to market by vendors riding bicycles or motorbikes. The tradition across many income classes of consuming grilled chicken from roadside vendors and small restaurants further boosts the demand for local chickens.

protected its domestic commercial producers, but at the expense of stagnant per capita availability of poultry meat in the country and the exposure of Nigerian consumers to possibly dangerous imported products smuggled into the country in unhygienic conditions.

Landlocked countries, such as Burkina Faso (and Niger and Mali as well), will likely remain competitive with imports due to their natural protection, relying mainly on improved village-level and semi-commercial operations to supply most of the urban demand for poultry meat, with some larger-scale operations for egg production. Yet in these countries as well, improved contractual arrangements to ensure greater stability in the supply of critical inputs (particularly feed and veterinary supplies) will be critical to their long-term success – especially as transportation and cold chains that link these countries to the major ports improve over time and thus reduce the delivered cost of imported frozen poultry products to the inland markets.

10.1.4 Dairy Products

Current situation.

Even more than the poultry meat value chain, the dairy value chain is dominated by imports, particularly of milk powder, a substantial proportion of which is reconstituted into fluid milk or processed into products such as yoghurt in West African processing plants. Nigeria is the largest importer of dairy products in Africa, accounting for almost half of the imports into the ECOWAS zone. Nigeria is followed by Senegal, Ghana, and Côte d'Ivoire; these four countries absorb approximately 80% of total dairy product imports into the region (Lambert, 2012; AGWA field research). Even in a landlocked country such as Mali, 80% of the dairy products consumed in the Bamako area are derived from imported powder. Pastoral milk production, however, remains an important source of food and income generation (particularly for women) in more northern rural areas of Mali and neighbouring countries (Michigan State University Food Security Team, 2011).

Like poultry producers, dairy producers in West Africa operate in three different types of production systems. In the northern parts of the region, pastoralists (mainly Fulanis) produce milk as part of a transhumance-based production system. The milk production is locally consumed, sold or bartered, often for grain; this enterprise is mainly the domain of women. The herds, based on zebu (Bos p. indicus) breeds, are managed for both dairy and beef. Milk production per cow is low, seldom exceeding a couple of litres per day, and highly seasonal, depending on pasture conditions. Over the past 20 years, as agriculturalists in the Sudano-Guinean zones have increasingly incorporated cattle into their farming systems, they have often hired Fulanis to manage their cattle for them, and milk production from these animals is similar to the system just described. A second system involves medium-scale production (from a few cows to a few dozen) in peri-urban areas in the Sahelian countries and northern parts of the coastal countries. This system involves both pure zebu breeds and crosses with European breeds. The producers, typically organised in cooperatives, sell to local small-scale dairy processors that in turn sell fresh milk and some processed products (e.g., fermented milk products) to urban consumers. Production is also seasonal, depending on feed resources, but these producers provide more purchased inputs to their animals, including feed concentrates, veterinary care, and sometimes artificial insemination. A third, and by far the smallest system, involves commercial production using imported European (Bos p. taurus) breeds. This production is largely concentrated in the few highland areas where these animals can survive without special housing or extensive veterinary treatments against trypanosomiasis and tick-borne diseases that are widespread in the coastal countries.

As detailed in Part II, the consumption of dairy products, including processed products such as yoghurts, is growing rapidly in the region and likely to continue to grow quickly in those countries experiencing strong economic growth. In addition to milk powder imports, there is also importation of UHT milk from abroad, as well as its local production from imported milk powder. For some of the processed products such as yoghurts, however, there are also substantial imports, as West African consumers are often wary of the quality of locally

produced products, even if they are based on imported milk powder.

The reliance on imports has been driven by the low cost and year-round availability of the imported products in contrast to local production, which varies substantially between rainy and dry seasons. The low cost is in turn due in part to the higher productivity of dairy herds based on Bos p. taurus breeds in temperate-climate countries as compared with the zebu breeds that predominate in West Africa. There are few areas in West Africa, such as the Jos Plateau in Nigeria, that are suitable for the higher-productivity temperate-climate breeds. Efforts to introduce them into other areas have led to the need for costly controlled environments, making production unprofitable, although in some areas cross-breeds between local and imported cattle have had some success. Production using local breeds in the coastal areas (where demand is highest due to the large cities) frequently runs into disease problems, such as trypanosomiasis and tick-borne maladies.[97] In addition to the inherent productivity advantages of dairy production in more temperate zones, substantial subsidies from OECD countries to their dairy industries – including export subsidies in the past – have put West African producers at a severe disadvantage.[98]

In recent years, world prices of milk powder have increased sharply, hitting a record level of over US$4 000/mt in 2007/08 (OECD/FAO, 2012). This, combined with rising per capita incomes, has led to expansion of commercial milk production in peri-urban areas of some of the landlocked Sahelian countries, based on small-scale processing plants supplied mainly by small-scale producers. In addition, there has been some expansion of commercial production in the Jos Plateau of Nigeria. This production is driven by a strong consumer preference in these areas for fresh milk (allowing the dairies to charge a premium for their product) and a degree of natural protection due to their inland location. Cooperatives have played a key role in many of these efforts, both in input provision and in organizing milk assembly and processing. Major challenges remain, however, in ensuring access to quality feed year-round (lack of which leads to large seasonality in production) and in milk marketing (Michigan State University Food Security Team, 2011).

Future perspectives for the West African diary value chain.

OECD/FAO projections foresee real prices of milk powder on the world market declining slightly from 2011 levels but remaining at a plateau of around US$3 000/mt through 2021, well above the levels of US$1 500-2 000 seen in the 1990s and early 2000s[99]. While the higher prices of imports and the strong potential demand growth as incomes rise in West Africa may offer some scope for expansion of local dairy production, this will likely be confined to peri-urban areas in the inland countries and a few isolated highland areas such as the Jos Plateau, where disease problems are less than along the coast and where transport costs offer some degree of natural protection. In other areas, it is unlikely that West African producers, using either zebu or cross-bred cattle, will be able to compete with imported products that originate from intensive (and often subsidised) dairy systems in the North.

If West African dairy processors can assure local consumers of the quality of their products, however, there is likely strong potential for value addition through processing, based largely, but not exclusively, on imported inputs.

10.2 Value chains oriented towards exports

In contrast to rice, cassava, poultry and dairy products, which in West Africa are overwhelmingly oriented towards consumption within the region, cocoa and cotton are export commodities, with only a very small proportion of total production

97 Although India has been able to build the world's largest dairy sector based on zebu cattle, there are three critical differences between India's experience and the current situation in West Africa: (1) Indian producers did not face the problems of bovine sleeping sickness (trypanosomiasis) that severely limits production in more humid areas of West Africa; (2) the much higher human population density in India reduced per-unit marketing costs for milk, a highly perishable product; and (3) India's dairy development strategy in the 1960s and 1970s relied on heavy quantitative restrictions on imports, which would be difficult for West Africa to implement under WTO rules.

98 EU dairy export subsidies, which were substantial from the 1980s to the mid-2000s, had fallen to zero by 2012 with the spike in world prices for dairy products.

99 All prices are in 2005 dollars.

consumed in West Africa. Following the long-term decline of international prices for traditional West African agricultural exports such as cocoa and cotton and difficulties to maintain the quality and quantity of production following liberalization (described below), the attention of policy makers and donors shifted in the 1990s increasingly towards non-traditional exports, such as fruits, vegetables, and nuts. Despite some notable successes, the overall importance of non-traditional exports has remained limited. With rising global commodity prices, however, the prospects of traditional West African agricultural export crops have improved. These subsectors include large numbers of small farmers and have strong potential for contributing to overall growth and poverty reduction. Export markets for these products tend to be larger, and hence production increases are less likely to depress prices.

Effectively competing in global markets for these export crops requires the capturing of several types of scale economies, including:

- Scale economies in maritime shipping and meeting minimum order size of overseas buyers.
- Implementing systems of quality assurance to meet export markets' increasing demands for quality in terms of traceability and assurance of compliance with various production standards – for example with respect to labour conditions and environmental sustainability.
- Implementing disease control measures industry-wide in situations where compliance by all producers is necessary to prevent outbreaks that could threaten the productivity and reputation of the country as a reliable exporter (e.g. spraying programmes in the cocoa industry).

To the extent that the raw products are processed domestically before export, processors face the same problems of ensuring reliable supplies of raw material and other inputs as described earlier for large-scale processing of cassava and rice. On the other hand, developing systems to capture these scale economies and ensure vertical coordination may be easier in export crop value chains than in value chains oriented primarily towards domestic consumption. Export commodities typically move through only a few ports, making the marketing channels less complex than those for domestically consumed foods, which are sold in hundreds of thousands of locations across the region. There are also frequently fewer buyers for the export commodities, which reduces the problems of farmers' not respecting delivery commitments (side-selling), but which also opens the door to farmers' not receiving competitive prices for their output. The existence of constriction points in export value chains makes it easier to use indirect cost recovery mechanism for value-chain financing, e.g., through marketing assessments or export taxes. Unfortunately, such systems are prone to misuse, as the following discussion will illustrate. Nevertheless, financing arrangements within export crops can have important spill-over effects such as the use on food crops of fertilizer obtained through the export-crop value chain or the linkage of farmers to mutually owned financial institutions linked to the export crop but catering to the broader financing needs of the farm household.

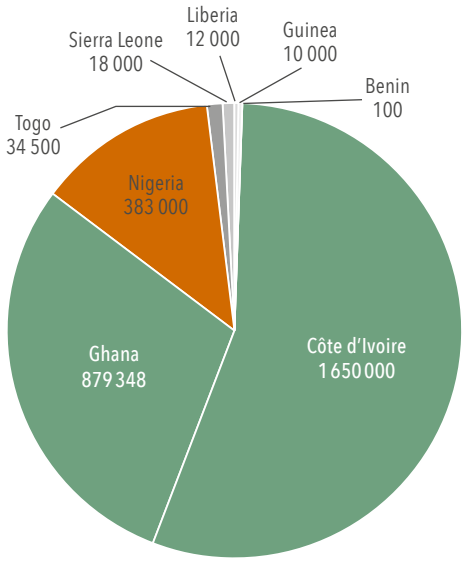
10.2.1 Cocoa

As shown in Chapter 4, cocoa is by far West Africa's leading agricultural export, and the region is the dominant force in world markets. Three West African countries – Côte d'Ivoire, Ghana and Nigeria – along with Cameroon accounted for 58% of global production in 2009/10, with Côte d'Ivoire – the world's largest producer – alone accounting for over one-third (FAOSTAT).[100] Other West African producers include Togo, Sierra Leone, Guinea, Liberia, and Benin (Figure 10.3). Some of these countries have important cocoa plantations that were abandoned during civil conflicts and are now being revitalized. In West Africa, 90% to 95% of all cocoa is produced by smallholders with farm sizes of two to five hectares. Production is labour-intensive, with little farm-level mechanization (Traoré, 2009). A general problem in many producing countries is the aging of trees,

100 Other major global producers, in order of importance, are Indonesia (the third largest producer after Côte d'Ivoire and Ghana), Brazil, Ecuador, and Malaysia.

resulting in falling productivity levels. However, the potential for substantial productivity increases even in old trees by applying inputs and improved agricultural practices has been demonstrated in Ghana and, more recently, Liberia.

Figure 10.3 *West Africa cocoa bean production, 2012 (in mt)*



Source: FAOSTAT data.

While the majority of cocoa continues to be exported in the form of beans, in-country grinding of beans to produce cocoa powder and cocoa butter for export and the domestic markets has been growing over the past 30 years. West African governments have encouraged investments in grinding capacity by both international and local firms – e.g. through lower export taxes in Côte d'Ivoire for exporters who process some of their beans in-country – in order to capture more of the value added from the value chain. Worldwide, cocoa grindings in producing countries accounted for 37% of the global total in 2005/06, and by 2011, Côte d'Ivoire had overtaken the Netherlands as the world leader in cocoa grinding capacity (Lambert, 2012; Agritrade, 2012).[101] Cocoa processing is capital intensive, and the industry is dominated by large multinational firms.

101 The government of Côte d'Ivoire has set a target of increasing grindings from 35% of its total crop in 2012 to 50% by 2015.

Vertical coordination challenges in the cocoa value chain.

Several characteristics of cocoa production have important implications for the vertical coordination challenges faced in the value chain.

1. Cocoa is a perennial crop. Once planted, a cocoa tree takes at least three years to enter into production, and trees stay productive for up to 30 years. Because of the time lag between planting new trees and their becoming productive, supplies expand only slowly in response to higher prices. Once the trees are productive, however, they continue to produce, so although farmers can take actions that affect their yields, production generally falls only slowly in response to lower prices.[102] These rigidities in supply response contribute to cyclical price fluctuations that are typical for perennial crops and for meat production.

2. Once harvested, farmers extract the seeds from the pod, ferment them for several days (which creates the chocolate flavour) and then dry them before sale. The care with which these operations are carried out has a large effect on the quality of the beans. Because buyers obtain beans from many different farmers and the beans are usually pooled, farmers who are not careful in the post-harvest operations can impose large costs on those who are careful by degrading the quality of the entire pool. Therefore, to maintain quality, value chain participants must devise and enforce incentives for careful quality control, especially at the farm level.

3. Traceability concerns are rising among buyers of cocoa in industrial countries, e.g. with respect to sustainable production practices and non-use of child labour. Addressing these concerns requires tighter coordination among stakeholders in the value chain.

4. Disease control is critical in maintaining tree productivity and quality, and disease in one

102 Officially recorded production in an individual country may fall more in response to low prices than does actual production, as farmers frequently smuggle their cocoa to neighbouring countries where prices are higher.

grower's trees can spread easily to a neighbour's. Thus, there is need for collective efforts at disease control, typically through spraying.

5. Once in the hands of the buyer, the beans are sorted and stored. The dried beans are then shipped to a domestic or overseas processor to be shelled and roasted. The beans are ground into cocoa liquor (or paste) and then refined to produce cocoa butter and cocoa cake. Cocoa cake is used to make cocoa powder. Chocolate is made by mixing cocoa butter with cocoa liquor, an extract from cocoa cake and other ingredients, such as sugar and milk. While cocoa butter can be substituted by many other vegetable fats, such as palm or shea oil, cocoa powder has no substitute. Hence, in reality, cocoa processors face two separate markets, one for cocoa butter in which they face competition from other vegetable oils, and one for cocoa powder, which has no substitutes.

6. There are large scale economies in the assembly, processing, and sale of cocoa beans and cocoa products on international markets compared to the optimal scale of farm-level production. The scale economies in international marketing reflect both technical issues (such as scale economies in maritime transport) and the minimum lot size for the major cocoa auction markets and the large international firms that buy cocoa. One of the original justifications for creating marketing boards for cocoa and similar crops in West Africa was to assist small farmers in connecting to this international market effectively and to provide them with some countervailing bargaining power in international markets. In reality, once created, these boards became tools for taxing cocoa farmers, frequently buying at low prices and reselling on the international for much higher prices.

Different policy approaches to cocoa: Nigeria, Ghana, and Côte d'Ivoire.

At independence, the three major cocoa producers in the region, Nigeria, Ghana, and Côte d'Ivoire, opted for state control over the cocoa value chain, both to deal with some of the structural issues discussed above and because control of cocoa exports represented a convenient way to generate substantial government revenues. As discussed in Chapter 11, all three countries taxed their export-crop sectors heavily; for example, prior to liberalization, cocoa generated 20% of government revenue in Côte d'Ivoire (Traoré, 2009). The models of government control differed across the three countries. Nigeria and Ghana opted to use the Cocoa Marketing Boards that had been established under British colonial rule. These boards held the monopoly on all cocoa purchases in the country and all export trade. Each board set pan-territorial prices for its country for the cocoa they purchased from farmers and attempted to stabilize prices paid to farmers. The boards had the potential to stabilize farm-level prices, albeit at a low level, because they earned substantial margins on their marketing operations; for example, in 1993, Ghanaian producers received only 30% of the FOB[103] price of their cocoa (Ruf, 2009).[104] The boards also provided extension services to growers and spraying to control black pod disease. As part of their marketing activities, the boards also instituted grading and quality control measures, typically at rural assembly points, that resulted in Nigerian and Ghanaian cocoa earning a reputation for high quality in international markets in the 1960s and 1970s.

In contrast, Côte d'Ivoire's marketing agency, the *Caisse de Stabilisation et de Soutien des Prix des Produits Agricoles (CSSPPA)*, authorised licensed buying agents of exporters (known as *traitants*) to purchase the cocoa from growers. The CSSPA specified the producer price (which was established each year on the basis of production costs rather than world prices) and payment schedules for *traitants* to remunerate them for their marketing services. The CSSPPA also established an export reference price. If the exporter negotiated a price with international buyers higher than the reference price, the exporter paid the difference to the CSSPPA; if the negotiated price was less than the reference price, the CSSPPA reimbursed the

103 Free on board

104 The three countries also participated in international efforts to stabilize the price of cocoa through the buffer stock scheme run by the International Cocoa Organization (ICCO). The ICCO's efforts, however, like those of most other international commodity agreements, failed, and the ICCO's last stocks were liquidated in 1997 (Traoré, 2009).

exporter the difference. Quality control was left in the hands of the *traitants* (Traoré, 2009).

Nigeria's reforms. In 1961, Nigeria accounted for 18% of world cocoa exports. By 2011, it accounted for less than 1% (Nigeria Federal Ministry of Agriculture and Rural Development, 2011). From the 1960s through the mid-1980s, the heavy taxation of cocoa farmers through the marketing board system; sharp declines in world cocoa prices following the commodity boom of the mid 1970s; [105]overvaluation and non-convertibility of the naira; and the outflow of resources from agriculture that accompanied Nigeria's oil boom all contributed to sharp declines in Nigeria's cocoa production and exports. In addition, some production was smuggled to neighbouring CFA franc countries to earn convertible currency. As a result, the revenues of the Nigerian Cocoa Board (NCB) fell sharply, reducing its ability to deliver services to farmers. In 1986, as the broader economic crisis in Nigeria worsened, the country adopted a structural adjustment programme (SAP). As part of the SAP, the NCB was abolished and the value chain was opened to private traders (ibid.).

The abolition of the NCB had mixed effects. On the one hand, prices, production, and exports all increased. For example, recorded production increased from 150 000 mt in 1987 to 253 000 mt in 1988 (FAOSTAT), although it is likely that some of this increase in recorded production reflected cocoa that in previous years was smuggled out of the country now being exported through Nigeria. Farmers' share of the FOB price soared from around 20% prior to the reforms to 70%. On the other hand, with the elimination of the NCB's quality-control activities, the quality of Nigerian cocoa quickly declined and so did the price premium that Nigerian cocoa previously enjoyed on international markets. A large number of new actors entered the trade, many of whom were interested primarily in trading the liberalized products to gain foreign exchange to import other commodities rather than building long-term business relationships in the value chain. As a result, the reliability of shipments to international buyers also fell sharply, making it increasingly difficult for Nigerian exporters to sell future delivery contracts, which were now seen as very risky. Consequently, although prices rose for farmers, so did price volatility. In addition, Nigerian cocoa processors, who had previously been aided by low domestic prices, found it increasingly difficult to compete with exporters for beans, and many had to reduce production or close (Traoré, 2009).

Today, Nigeria's cocoa value chain beyond the farm level is characterised by a mixture of large multinational firms, engaged in both export of beans and local processing, and some small and medium-scale firms involved in processing cocoa that goes into locally produced beverages. In 2011, the Nigerian government included cocoa as one of the key commodities in its new Agricultural Transformation Agenda (see Chapter 11). The aim is to double cocoa output by 2015 though expanding plantings (adding 100 000 to 150 000 new ha of cocoa production) and providing farmers with improved seedlings and expanded access to fertilizers. One of the reasons for inclusion of cocoa in the Transformation Agenda is the labour intensity of production. The Agenda estimates that 185 000 new jobs will be created across the value chain between 2012 and 2015 if the production targets are met (Nigeria Federal Ministry of Agriculture and Rural Development, 2011). The Agenda argues, however, that in order to succeed, some entity needs to take the lead in ensuring the quality control and extension functions that were formerly assured by the NCB. The Agenda calls for the creation of Marketing Corporations, "owned by the value chain", that could fulfil this role, citing the Ghana Cocoa Board (see below) as an example of a possible model.

Ghana's reforms. The history of Ghana's cocoa value chain up through the mid-1980s parallels that of Nigeria in many ways. Ghana's cocoa marketing board, known as the Cocobod, held a monopoly on all internal trade and exports of cocoa. From the early 1960s to the early 1980s, officially recorded production fell by 60%, and Ghana's share of the world market fell from 35% to 10%. By 1977, Côte d'Ivoire had surpassed Ghana as

105 The wholesale price of cocoa on the New York exchange fell from over US 3 200 per mt in 1977 to just over US$1 500 per mt in 1982 (Ruf, 2009).

the world's largest cocoa producer (Traoré, 2009; Ruf, 2009). In 1983, Ghana began its Economic Recovery Programme, supported by the World Bank and the IMF, which addressed many of the country's macroeconomic problems such as the overvaluation of the cedi and recurrent government budget deficits. The cocoa sector responded to the improved economic climate, which, by reducing overvaluation of the currency, resulted in higher producer prices. Production increased from 168 000 mt in 1983 to over 312 000 mt in 1992 (FAOSTAT). Taxation of the sector remained high, however, with growers only receiving 30% of the FOB price in 1993 (Ruf, 2009). In 1992/93, in hopes of further stimulating cocoa production, Ghana launched a partial liberalization of the value chain. The Cocobod authorised Licensed Buying Companies (LBCs) to purchase cocoa from farmers as long as they respected the minimum prices set by the board; they also were obliged to sell to the Cocobod at fixed prices, which essentially fixed marketing margins. The Cocobod retained its quality-control role, verifying close to the farm level the grades and weights of beans bought by the LBCs. The Cocobod also maintained its role in providing extension and spraying programmes.

Ghana's partial liberalization thus created a marketing structure in rural areas similar to that which existed in Côte d'Ivoire prior to that country's liberalization of its cocoa value chain. One main difference was that in Ghana, quality control remained in the hands of the marketing board rather than in the hands of the individual buyers. The Cocobod also helped organise large bidding packages for fertilizer each year, leading to lower input prices for farmers.

Since the Cocobod essentially sets output prices throughout the system, the LBCs compete mostly on non-price terms for beans, offering farmers timely cash payments, extending credit, providing extension information, and providing inputs on favourable terms. The reforms were accompanied by a falling rate of taxation on cocoa exports and other export crops (see Chapter 11); by 2007, Ghanaian growers were receiving 70% of the FOB price of their beans. As the attractiveness of cocoa production grew, the number of LBCs operating in rural areas increased, resulting in a more competitive market (Anang, 2011). In a survey of 80 randomly selected cocoa farmers in Western Ghana in 2008/09, 93% ranked the performance of the LBCs highly and said that the reforms had improved the cocoa marketing system (Anang *et al.*, 2011). Particularly important has been the continued involvement of the Cocobod in disease control (the board has provided free mass spraying programmes since 2001) and quality control. Ghana cocoa continues to receive a quality premium on international markets well above that offered for Ivorian and Nigerian cocoa.[106] Ghana has also worked to increase the proportion of the crop that undergoes initial processing domestically. After independence, Ghana nationalized all grinding mills, but with the liberalization it has opened up to private investment. In 2009, the country ground approximately 150 000 mt, or 21% of its total cocoa bean production, and the private firm Cargill built a new plant at Tema with an additional 65 000 mt of capacity (Traoré, 2009).

Côte d'Ivoire's reforms. The decline of world cocoa prices from the mid-1980s through the early 1990s, combined with an ill-advised attempt by the Ivorian government to withhold cocoa from the world market in an attempt to drive up prices, contributed to a profound economic malaise in the country. In response, the government first authorised a partial liberalization of the sector in 1995/96, authorizing private firms to export cocoa and limiting the CSSPPA to 15% of the export market. In 1999, the CSSPPA fully withdrew from cocoa marketing; its role was reduced to that of an advisory and regulatory agency, and it was subsequently disbanded. With the withdrawal of the CSSPPA from the market, all price-stabilization efforts of the government ended and farm-level prices became linked to world prices, resulting in greatly increased price volatility at the farm level. At the same time, export taxes remained high, holding down producer prices. The market became increasingly dominated by multinational firms. In the initial years after the reforms, however, vertical coordination decreased,

106 The Cocobod also is in charge of marketing Ghana's shea nuts and shea butter. This market has strict quality standards, as improper processing can lead to the presence of carcinogens that exclude the product from lucrative foreign export markets. Ghana is the recognised leader in West Africa for its work with producer groups to ensure that its shea products meet those standards (Perakis, 2009).

as these firms were not able to work out long-term supply arrangements with growers, who focused primarily on selling to whoever offered the best short-run price; as a result, the average quality of cocoa produced declined (Losch, 2002). In more recent years, firms such as Nestlé have expanded efforts to launch extension programmes with growers as part of initiatives to help secure their supplies and improve quality in the face of growing world demand for cocoa (Lucas, 2012).

Remarkably, despite the turmoil and civil war in Côte d'Ivoire from 1999 through 2010, cocoa production continued unabated (varying between 1.2 and 1.4 million mt/year) and investment in domestic grinding capacity increased. Rural infrastructure declined, however, and many aging trees were not replaced. As a precondition for IMF debt relief, in November 2011, the Ouattara government launched a further reform of the Ivorian cocoa sector, with the aim of restoring some of the price stability lost with the abolition of the CSSPPA and improving vertical coordination in the value chain.[107] The reforms involve three pillars:

- The establishment, in 2012, of a central body, the Conseil du Café-Cacao (CCC), composed of representatives of all value-chain stakeholders, responsible for the management, regulation, development and price stabilization of cocoa.
- The establishment of a new marketing arrangement whereby all exporters are required to engage in the forward sale of 70 to 80% of the next-year's crop through twice-daily auctions. The forward sales are intended to allow the establishment of a benchmark price for growers and ensure farmers a guaranteed minimum share of 60% of the CIF[108] price.
- The establishment of a reserve fund at the Central Bank of West African States (BCEAO) to cover risks beyond the normal operations of a price guarantee system – aimed primarily at allowing orderly adjustment in case of a major drop in world prices.

In addition, the reforms have abolished a major tax break given to exporters who grind some of their beans in-country. Exporters who ship all their beans overseas for processing had argued that this tax break put them at a major disadvantage in sourcing beans in Côte d'Ivoire. Its abolition may slow down the recent rapid expansion of grinding capacity in the country.

Challenges and perspectives for the cocoa value chain.

West Africa remains a dominant producer in the world cocoa market, and it is also accounting for an increasing share of world cocoa grindings. Demand for cocoa products is growing, particularly in Eastern Europe and Latin America, and there is a growing market in high-income countries for high-quality chocolate products that are certified as having been produced under environmentally sustainable conditions. Ghana has been able to exploit some this high-end demand through the creation of its "Ghana Quality" label for its beans and cocoa powder. There is also some scope for further value added through expanded production of cocoa-based beverages in countries like Nigeria and Ghana, where demand is growing. Further expansion into confections, however, is unlikely given the domination of European and North American firms in this part of the industry.[109] In Côte d'Ivoire and Nigeria, the grinding industry and the export of beans are dominated by multinational firms, so the scope for expansion of local processors, at least in the initial, highly capital-intensive grinding industry, is small.

The experiences of Nigeria, Ghana, and Côte d'Ivoire illustrate the challenges in developing institutional arrangements for addressing scale economies, structural vulnerability of growers to price instability (given the long-term nature of their investment in trees) and vertical coordination in the value chain. The three countries created various forms of state marketing agencies to try to address these challenges, but in the absence of effective measures for growers to discipline the behaviour

107 The following discussion is drawn from Agritrade, 2012.
108 Cost, insurance and freight
109 The trend in recent years has been for international chocolate manufacturers to outsource more of their cocoa grinding to producing countries, while concentrating on confection manufacturing, new product development, and marketing (Traoré, 2009). The manufacture of chocolate confections is more difficult in warm climates, given the low melting point of chocolates, which then require refrigerated storage to maintain their integrity.

of these agencies in the years following independence, the boards became primarily tools for resource extraction from the sector and were often plagued by inefficiencies in their operations. The experiences of Côte d'Ivoire and Nigeria in abolishing their boards, however, have shown that in the absence of new arrangements to address these structural problems, simply liberalising the sector does not necessarily lead to good performance. Both Nigeria (via the proposal to create Marketing Corporations) and Côte d'Ivoire (via the creation of the CCC) are now moving back towards greater state involvement in managing the value chain, in part inspired by Ghana's reform of its Cocobod.

There are also increased efforts by multinational processors to develop long-term relationships with growers to increase productivity, quality and traceability, including certification of compliance with sustainable production practices and the non-use of child labour.[110] For example, the Sustainable Tree Crops Programme is a public-private partnership managed by IITA with support from USAID and the World Cocoa Foundation, which is funded by the chocolate industry. The programme seeks to "maintain increased productivity of high quality tree crop products, over the long term, with an emphasis on farm rehabilitation and reclamation of deforested land; improve efficiency in the marketing chain, so that it delivers fair prices to farmers and quality products to end users; make African tree crop products competitive in international markets; improve the socio-economic situation of farmers; and conserve the natural resource base and biodiversity."[111] The challenge will be to develop such arrangements that share risks and returns equitably among the different stakeholders in the value chain.

Given the importance of cocoa export tax revenues for the major producing countries, there has been very little discussion in West Africa of allowing cocoa buyers to source beans from any country in the ECOWAS zone, in spite of the Community's principle of the free movement of goods within the zone. Yet as grinding capacity increases in West Africa, grinders will have a growing interest in sourcing beans regionally rather than just nationally. In reality, some regional sourcing has always occurred, as farmers and traders frequently smuggle beans across borders based on relative prices. An important policy question for the future is whether such regional sourcing will be legalized, which would then require harmonization of price stabilization programmes across the producing countries.

10.2.2 Cotton in francophone West Africa[112]

Cotton in the francophone countries was one of West Africa's first "green revolutions", with yields quadrupling over a 40-year period and production expanding even more rapidly. In 1960, the countries of the CFA franc zone of West and Central Africa accounted for only 1% of the world's cotton fibre production and 11% of the production in sub-Saharan Africa. Over the next 40 years, production grew at a compound rate of 9% per year, and by 2000 these countries accounted for 4.4% of total world production and 69% of that in sub-Saharan Africa (Tefft, 2010). By 2010, the CFA franc zone of West and Central Africa had become the second largest cotton exporter in the world after the United States, and cotton was a major source of income for over 2 million West Africans (Lambert, 2012).

Since the early 2000s, the sector has faced crisis due to several causes, prompting a restructuring of the value chain in most countries. Understanding the reasons for cotton's initial successes and subsequent difficulties yields insights into broader

110 Concerns about the use of exploitative forms of child labour in cocoa production, particularly in Côte d'Ivoire, became a major issue in North America and Europe in the early 2000s. In response to these pressures, the major international chocolate manufacturers signed a voluntary protocol (the Harkin-Engel protocol) aimed at eliminating all child slavery from cocoa production by 2005 and removing the "worst forms of child labour" from the industry. The major chocolate companies, working through the World Cocoa Foundation, developed certification systems with growers in order to comply with the protocol. In recent years, the concerns about child labour have resurfaced. In November, 2012, the chocolate manufacturer Hershey was sued by a stockholder group that alleged the company was knowingly sourcing beans from farmers in West Africa who did not comply with the Protocol (Hsu, 2012).

111 http://www.cocoafederation.com/issues/stcp/index.jsp

112 Nigeria historically has also been a major cotton producer in West Africa; over the period 2001-10, it was the second largest producer in the region after Burkina Faso, closely followed by Mali (FAOSTAT). However, Nigeria's cotton value chain has been characterised by low yields and falling employment over time. While Nigeria has historically processed a much higher percentage of its cotton production domestically than have the francophone countries, of 175 textile firms that existed in 1980, only 25 still existed in 2012 (Lambert, 2012). The Nigerian government has concluded that the past performance of the cotton sector has been poor, and has targeted it for major changes under the new Agricultural Transformation Agenda (Nigeria Federal Ministry of Agriculture and Rural Development, 2011). Since the purpose of this section is to focus on a value chain that has been regarded, at least during part of the postindependence period, as a major success, we concentrate on the cotton experience in the francophone countries.

economic coordination issues facing West African Agriculture.

Key elements of the francophone model [113]

The French introduced cotton growing as a commercial enterprise in West and Central Africa during the last decades of the colonial period as part of a strategy to supply cotton to the French textile industry. As part of that strategy, the French government created a government-owned parastatal, the CFDT (Compagnie Française pour le Développement des Fibres Textiles), to develop the cotton system as an integrated supply chain, from the provision of inputs to farmers to the sale of lint to the textile firms. The basic CFDT model remained in place in most of the francophone countries until the early 2000s. The CFDT itself remained as the chief actor in the cotton value chains of the countries until the early 1970s, when its operations were nationalized; it remained, however, a major stakeholder in the national companies that emerged out this process, such as the CMDT in Mali (Compagnie Malienne pour le Développement des Fibres Textiles).

The key elements of the integrated model of cotton production in these countries were the following:

- Cotton was promoted among smallholders, who typically grew cotton in rotation with coarse grains (millet, sorghum and maize), and cotton usually did not exceed one-third of their area in any given year. The cotton companies developed extension recommendations that took account of this type of farming system and often explicitly developed efforts, such as the CMDT-supported maize programme in the mid-1980s, to boost productivity of the entire farming system, not just cotton.

- The CFDT and later the national companies held a legal monopoly on all cotton purchases and ginning in the country. The overwhelming majority of the lint was exported via a subsidiary marketing firm and cotton seed was processed by other company-owned subsidiaries to produce oil (for soap and human consumption) and cotton-seed meal, which was used for animal feed.

- The cotton company announced a guaranteed purchase price before planting season and provided inputs (seed, fertilizers and pesticides) to the farmers on credit along with extension advice. Thus, unlike almost any other crop, farmers had both a guaranteed market and a price known before planting, along with access to inputs on credit.

- Because the company had a monopsony on purchases, at harvest time it deducted the credit owed for inputs from the payment to the farmers for their cotton, solving the widespread problem in other agricultural value chains of credit recovery.

- Through the 1990s, the farm prices were set with only a weak link to world prices, allowing the companies to offer a degree of price stabilization. In years of high world prices, the companies accumulated surpluses that were drawn upon (sometimes with additional funding from national governments) to support farm prices when the world price of cotton declined.

- The CFDT-affiliated system of national companies was linked to an international cotton research effort supported by the French government. In 1946, the French established a cotton and textile research institute, IRCT (Institut de Recherche Cotonnière et des Fibres Textiles Exotiques), which was later merged with the French Agricultural Research Centre for International Development – CIRAD (Centre International de Recherche Agronomique pour le Développement). The IRCT/CIRAD research system, linked later to national agricultural research systems, carried out varietal selection and production-systems research across West and Central Africa, gaining regional economies of scale in a research effort that contributed strongly to the rapid growth in yields. For example, of the six major varieties grown by Malian farmers in the early 2000s, at a time when Mali was the largest cotton producer in sub-Saharan Africa, only one was

113 The following paragraphs draw heavily on Gergely and Poulton, 2009 and Tefft, 2010.

developed in Mali, the other five having come from research efforts in neighbouring countries.

- Starting in the 1970s in Mali and spreading to other countries, the cotton companies began encouraging the growth of village associations/cooperatives and hired them to handle much of the initial cotton assembly from farmers and the provision and recovery of credit.[114] The associations invested part of the revenues earned from these operations into village schools, health centres and wells. In addition, to help improve the management of the associations, the companies (especially in Mali) provided functional literacy programmes for adults in the cotton areas.

- In some countries, particularly Mali, the cotton companies were given broader rural development mandates for the zones in which they operated. Some of the activities contributed directly to cotton production, such as developing training programmes for local blacksmiths to manufacture and repair animal-traction equipment, and some involved actions such as construction of feeder roads that not only helped expand cotton production but also had broader development impacts.

Cotton revenues played a major role in capitalizing farms in the cotton zones through the financing of farm equipment (particularly animal-traction equipment), fertilizer – some of which was used on other crops – and veterinary inputs and services. As a result, cotton growers also expanded production of other crops and livestock. For example, those farmers most involved with cotton production in Mali's CMDT zone also produced the bulk of the marketed surplus of rainfed cereals in that area during the late 1980s (Dioné, 2000).

Increasing difficulties: was the system a victim of its own success?

As cotton production grew rapidly in the CFA franc zone, the cotton companies began to face increasing difficulties. As the companies grew, so did their management problems. These were aggravated starting in the mid-1980s when the world cotton price started to fall, due in part to changes in US domestic cotton support policies and to China shifting from being a net importer to a net exporter of cotton. The increasing overvaluation of the CFA franc further eroded the competitiveness of West African cotton. Given the large number of farmers now growing cotton, the companies found it increasingly difficult to support the farm price without incurring substantial losses, and increasingly turned to national governments for support. Governments responded by establishing performance contracts (contrat plans) for the companies, but these were not wholly successful in improving performance due to the opacity of the cotton companies' accounting systems, which made it difficult to establish reliable estimates of their costs (Tefft, 2010).

The 1994 devaluation by 50% of the CFA franc provided a temporary respite to these problems, as the international price of cotton denominated in CFA francs jumped. Farmers responded by expanding areas planted, but yields stagnated, in part because the price of imported inputs also jumped with the devaluation. The recovery, however, was short-lived, as world prices began to decline again in 1995. In addition, given the size and the resources controlled by the companies, they became increasingly subject to political pressures and manipulations in the countries, pressures that increased as the countries democratised. This was epitomised by the "disappearance" in 2000 of the Malian company's US$36 million stabilization fund at a time when prices in the country had fallen precipitously. Many in the Malian press attributed the disappearance, which was never fully explained by the company or the government, to its being used to finance the electoral campaigns of leading politicians. In part in response to these problems, increasingly autonomous farmer organizations began to demand a greater voice in price-setting and other management decisions in the value chain.

Falling world prices, due in part to continuing subsidies to cotton growers in the US, and increased management problems in the cotton companies in the early 2000s hit the value chain

114 The initial development of farmer associations in the cotton area in Mali grew out of farmers' discontent with what they perceived as dishonest weighing and grading of raw cotton at the village level by CMDT agents. For details, see Tefft, 2010.

hard. Production of cotton lint in the West African CFA-zone countries fell by 200 000 mt between 1998-2000 and 2001-2003, half of the decline attributable to a boycott of cotton production by Malian farmers in 2001 that resulted from a cut in the farm price that was brought about in part due to the disappearance of the stabilization fund. Malian production fell by 50% in 2001/02 (FAOSTAT; Tefft, 2010). These problems led to strong pressures to restructure the system, with the World Bank calling for liberalization of the sector, arguing that competition among buyers would lead to higher farm prices and better company performance. Many government and farm leaders resisted, fearing, among other things, a collapse of the input delivery/credit system if the single-channel marketing system was broken up.[115]

The proposed reforms included: (1) strengthening of farmer associations and their increased involvement in providing critical services, (2) opening of ginning and input supply to private actors, (3) gradual withdrawal of the government from the management of the cotton sector and the parallel empowerment of cotton sector "interprofessional committees" (IPCs) and (4) introduction of price-setting mechanisms that attempt to ensure a better link between farm prices and world prices (Gergely and Poulton, 2009). As part of its reforms, Burkina Faso also proposed to link its pricing mechanisms to a national "smoothing fund" to be managed not nationally but at the BCEAO, which would be aimed at avoiding brutal year-to-year changes in the producer price. This proposal looks similar to the price stabilization tool proposed in the most recent reform of the Ivorian cocoa value chain discussed above.

What has emerged from the reform process thus far is a mixed picture across countries. In most countries, the cotton-seed processing plants formerly owned by affiliates of the national cotton companies have been sold to private operators. Benin and Burkina Faso have both opened ginning and input provision to private entities, but have yet to allow ginners to compete among themselves for seed cotton supplies.[116] Benin appears to be moving in the direction of shifting from a public monopoly to a private monopoly. In Mali, the plan has been to liberalize the CMDT by creating four separate companies, each with a monopoly in its own area of operation, but to date the sale of the CMDT has not gone forward. In most countries, there has been some movement to create the IPCs, but it is not clear that they have the capacity to date to provide the type of vertical coordination previously provided by the integrated system. National governments also appear reluctant to relinquish control over the sector, given its economic and political significance for the countries. For example, while Burkina Faso has allowed private ginners, as of 2009 they processed only 15% of total output, and SOFITEX, in which the state retains 35% ownership, remained by far the largest ginner in the country (Gergely and Poulton, 2009).

Challenges and perspectives for the cotton value chain.

Stakeholders in francophone West Africa are searching for a new model of organizing the cotton value chain that builds on the successes of the previous integrated system but that is globally competitive and accountable to farmers and taxpayers. Key contributors to past success included:

- A sustained government commitment, spanning 40 years, to building the value chain, including investing in research, local infrastructure and support services.
- The tight vertical coordination throughout the system that linked input supply, extension, a regional research system and output marketing.
- The commercial orientation of the CFDT, which promoted cotton as a business enterprise to farmers and not just a rural development project.
- The increasing emphasis over time to strengthening farmer organizations and empowering

115 Experience in other African countries that have liberalized their cotton sectors has shown that credit recovery has often become a problem once such single marketing channels have been abolished. See Tschirley *et al.* , 2009, for details.

116 In Burkina, each private ginner operates in its own exclusive zone, while in Benin seed cotton is allocated to ginners administratively.

them to play a key role as part of a vertically coordinated system.

The dilemma facing stakeholders is how to design financially sustainable institutional arrangements that capture the vertical coordination and economies of scale of the prior integrated system, but that also face enough internal and external discipline to hold down costs, offer attractive prices and related services to stakeholders, and promote technical advancement. In many ways, the dilemma is similar to that facing the cocoa value chain discussed above. It is not apparent that replacing the national monopolies of the state-directed cotton companies with private monopolies, either on a national or subnational level, will lead to better performance. The maintenance of the monopolies, even in subnational zones, is linked to the need for assured credit recovery. An alternative would be to run all input loans and payments to farmers for their cotton through a single banking clearinghouse through which all cotton companies would operate. Such an arrangement would ensure credit recovery while allowing the companies to compete with each other for seed cotton. It would require, however, mandatory participation by all the cotton companies. To date, such a proposal has not been part of the reform programmes.

It remains to be seen whether the IPCs will be able to promote the level of coordination that the national companies provided. The IPCs are still young, and it is not clear how much authority they will be granted to act autonomously from government. It seems highly unlikely at this stage that they would be able to organise the type of regional research programme operated by the previous system.[117]

In addition to these organizational issues at the national level, three issues will become increasingly important at the regional level. First is the question of whether private ginners in the newly configured value chain will be able to source cotton across national borders. Such sourcing could reduce assembly costs and increase competition for farmers' seed cotton, but it would require coordination across countries regarding export tax revenues and credit recovery. Second, currently only about 5% of cotton produced in the CFA franc zone is processed in the region into textiles. This low level is in part related to high electric energy costs in the region that make textile processing uncompetitive internationally (ECOWAS, 2010). ECOWAS's efforts to extend and interconnect the West African electrical grid will be critical if local processing is to expand. Third, the countries of the region have adopted very different paths with respect to adopting genetically modified (BT) cotton.[118] Currently, only Burkina Faso has authorised its use, although Nigeria has set a goal of quickly authorizing its use as part of the country's Agricultural Transformation Agenda. Given porous borders, it is inevitable that the seeds will move to neighbouring countries. In the absence of protocols in these other countries governing transgenic crops and agreements with buyers about whether they will accept BT cotton, unregulated spread of the technology could prove disruptive. This is an area where regional coordination is clearly needed.

10.3 Other value chains with strong growth potential

The AGWA background studies identified a number of other value chains with strong growth potential. Space limitations do not permit a full discussion of these value chains here, but key characteristics of these value chains are summarised below.[119]

10.3.1 Vegetable oil

West Africa has a strong structural deficit in vegetable oil, rapidly rising demand (see Part II) and heavy reliance on imports, particularly inexpensive palm oil from Indonesia and Malaysia. This heavy reliance on imported palm oil is ironic, as West

117 Since 1990 Senegal has had more experience than any other country in the region in promoting IPCs for a wide range of agricultural value chains. Their performance has varied widely, in part as a function of the degree to which stakeholders believed that they, as opposed to government, had major responsibility for key coordination tasks in the value chain (Duteurtre and Dieye, 2008).

118 BT cotton refers to cotton varieties in which genes from the Bacillus thuringenisis bacteria have been inserted. The genes produce a protein that is toxic to a narrow range of insect larvae that are very damaging to cotton, greatly reducing the need for farmers to apply insecticides to their cotton crop.

119 For more details of most of these, see Lambert, 2012 and Elbehri 2013.

Africa dominated the world palm oil industry in the 1960s, with Nigeria alone accounting for 27% of world exports in 1961 (Nigeria Federal Ministry of Agriculture and Rural Development, 2011). Other important oilseeds in the region are cottonseed, groundnuts and, to a lesser extent, soybeans, sesame, and (recently) sunflowers. There is also strong demand globally for vegetable oils – especially palm oil with its bio-fuel applications – and FAO/OECD projections (2012) foresee continued strong international demand through 2021. The region has good agronomic potential and a long tradition in production of the basic raw materials, such as cotton seed, oil palm fruits and kernels, groundnuts and sesame. The strong demand for palm oil internationally has also led to increased direct foreign investment in oil palm plantations in West Africa. Like many other value chains in the region, there is both small-scale and industrial processing.

Challenges for the various vegetable-oil value chains in West Africa include:

- The need to upgrade the quality of many of the small-scale processors to meet quality and health standards and adopt improved technologies and better business practices. The health concerns are particularly acute with respect to groundnut and cottonseed oil. In groundnuts, the major concern is widespread contamination with aflatoxin, a carcinogen linked especially to liver cancer. For cottonseed, the liberalization of the market in countries like Mali has resulted in the growth of small-scale cotton presses that are selling unrefined cotton oil for human consumption, which is dangerous because it contains gossypol, a natural phenol that is toxic to human red blood cells.

- Developing better models to link smallholders to industrial processors in order to ensure reliable, high quality supplies of raw materials (similar to the challenges discussed above for cassava). In contrast to Southeast Asia, palm oil is native to West Africa and as such is well integrated into the local diet. Hence, there are many small oil mills and presses competing for oil palm fruit, which increases the risk of side-selling by small farmers who have contracted to produce for industrial processors. In Southeast Asia, where unrefined palm oil is not a central part of the diet, the risk of side-selling is much lower. For this reason, Malaysia, Indonesia and other countries used oil palm outgrower schemes successfully for rural development and poverty reduction.

- In cases where palm oil plantations are being contemplated, the terms of access of investors to large tracts of land need to be made more transparent so that the rights of current inhabitants of the land are respected.

- There is a need for regional governments and RECs to study and adopt best practices learned from around the world, including Southeast Asia, in order to ensure social and environmental safeguards are included in any concessions or leases for large-scale development.

10.3.2 Ruminant livestock[120]

The coastal areas of West Africa, where demand for animal protein is rising rapidly, are structurally deficit in cattle, sheep, and goats; production is constrained inter alia by trypanosomiasis and tick-borne diseases. These areas have historically relied on imports of live animals from the Sahelian zones, with Mali, Burkina Faso, Niger and northern Nigeria being major exporters.

Demand prospects appear strong for these value chains, as indicated by the high income elasticities of demand for meat products discussed in Part II. These value chains, however, need to be concerned about holding down production and marketing costs given the potential competition from other animal protein sources, particularly inexpensive imported poultry, in the coastal markets. The capacity of the value chains for ruminant livestock to respond to growing coastal demand for meat is likely to be constrained by three factors:

- Growing demand for animal products in the exporting countries themselves, which will raise prices for export-grade animals.

120 This section draws on Borlaug Institute for International Agriculture, 2012, and Michigan State University Food Security Team, 2011.

- Low productivity of the herds, which is primarily due to poor nutrition as a result of seasonal variation in pasture resources and a weak animal feed industry.

- Climate change, which will put pressure on traditional pasture resources and likely lead to increased conflicts between herders and agriculturalists. Some such conflicts have also arisen as irrigation projects have increasingly encroached on dry-season grazing areas. It will be critical to develop improved land use rules that are capable of accommodating livestock production systems under these changing conditions and to develop more intensive models of production in areas where feed supplies (e.g. by-products from agroprocessing) are available.

Attempts by the inland countries to capture value added by shifting from live animal to meat exports will be constrained by the poor state of refrigerated transport between the inland and coastal markets, the higher prices paid for offal and other by-products (the "fifth quarter") in the coastal states, and the policy of some of the coastal states (e.g. Nigeria) to foster the construction of abattoirs near their northern borders in order to capture the value added from imported animals.

The regional livestock trade, which historically has been overwhelmingly in the hands of the private sector, has shown remarkable resiliency in adapting in recent years to disruption caused by civil strife in major import markets, such as Côte d'Ivoire. Yet, regional trade continues to face numerous barriers, ranging from rent seeking by government agents at roadblocks along major trade routes to the imposition of taxes on livestock by importing countries (e.g., value-added taxes in Senegal) in contravention of ECOWAS and WAEMU agreements. Addressing such problems is one focus of the ECOWAS CAADP regional programmes discussed in Chapters 11 and 12.

10.3.3 Maize

As shown in Chapter 3, maize production has been grown rapidly in many countries in the region over the past 20 years. The growth is attributable to the existence of improved technology and inputs (particularly improved seeds and fertilizer) and strong demand growth, both for human consumption (as maize has substituted for millet and sorghum in several countries) and for animal feed. The feed demand is driven particularly by the growing egg industry and increasing demand by fish-farmers, and feed manufacturers increasingly source maize regionally as well as nationally. The emergence of small-scale processing of maize into grits, flour, and other consumer-ready products has also helped spark consumption. Demand prospects globally for maize are strong (driven in part by biofuel policies in the United States), with OECD/FAO projecting higher real prices through 2021 and higher maize prices relative to both wheat and rice (OECD/FAO, 2012).

Like rice and cassava, processing of maize for both human consumption and animal feed takes place both in SMEs and larger-scale industrial operations. Nigeria has the largest number of industrial processing operations, producing starch, animal feeds, high-fructose corn syrup, dextrose, and corn oil. Small- and medium-scale processors focus mainly on maize meal, flour, grits and animal feeds. While small-scale milling at the village and household level seems to operate satisfactorily in serving much of the mass market, industrial processing and the feed industry have been hindered by the volatility of quantities, prices and quality of maize available from West Africa's mainly small-scale producers. Both large and small processors usually act as passive buyers of maize from traders or farmers, with little up-stream involvement, to the detriment of raw material quality and availability. A particularly serious problem is aflatoxin contamination, estimated by IITA to affect over 60% of the maize grain harvested in Nigeria (Lambert, 2012). Aflatoxin is dangerous for both humans and animals and can greatly affect the rate of feed conversion among animals. Addressing this problem requires improved actions across the value chain, from encouraging the use of resistant varieties to improved harvest, drying and storage procedures.

Historically, West African maize markets were only weakly integrated into the international mar-

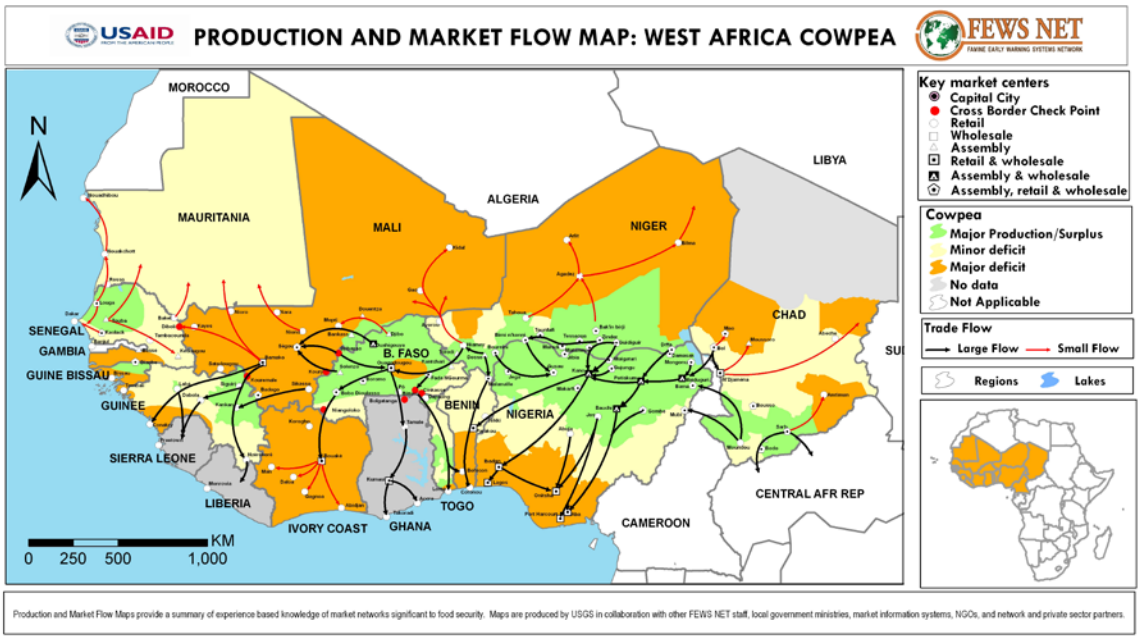
kets, but integration has grown in recent years, particularly in the coastal states where egg producers (e.g. in Senegal) increasingly rely on imported maize because of its more reliable availability, prices and quality than local supplies. Capitalizing on the strong potential of this crop to spur further growth will involve, like many of the other value chains reviewed here, efforts to organise the aggregation of supplies from the farm level, improved coordination of production with the needs of processors, and the improved control of quality along the entire value chain in order to compete with imports. Reducing barriers to regional trade will also be important in allowing processors to source maize more easily across national borders.

10.3.4 Cowpeas

Part II highlighted the high level and strong growth of pulse consumption in several countries of the region, particularly in Nigeria, Niger, Mali, Burkina Faso and Benin. By far the most important of these pulses is cowpeas. West and Central Africa account for about 80% of the world's harvested area of cowpeas, with Nigeria being the world's largest cowpea producer and its largest importer. Niger is the world's second largest producer. Other producers in the ECOWAS region, in order of importance, include Burkina Faso, Mali, Benin, Ghana, Togo, Senegal, and Côte d'Ivoire (Langyintuoa *et al.*, 2003). Cowpeas are produced predominantly in the drier inland areas of West Africa due to their drought tolerance and the lower insect pressure in these areas, and a well-developed trade moves them south to major coastal markets (Figure 10.3).

Cowpeas growers are likely to face growing demand for their crop for three reasons: (1) cowpea grain provides a relatively low-cost, high-protein source ("poor people's meat") to the large number of low-income consumers in West Africa who are trying, with very low incomes, to upgrade their diets; (2) the high-protein cowpea hay is a valuable livestock feed, and demand for it is growing as forage markets expand in response to the increasing profitability of livestock production, especially in peri-urban areas; and (3) processed cowpea products, particularly cowpea fritters and steamed cakes, are very popular street and snack foods in urban areas such as Accra and Lagos, appealing to the growing, time-poor urban population (Nagai, 2008). As a drought-resistant crop, cowpeas are also likely to be an important part of farmers'

Figure 10.4 *Cowpea production and trade flows in West Africa*



Source: FEWSNet

farming systems as they adjust to climate change in the Sahelian and Guinea-savannah areas of West Africa.

After de-hulling (done either manually or in small mills), cowpea grains can be consumed without further processing, while processing for preparation of products like fritters or cakes is currently done either in the household or in small-scale neighbourhood mills. There is little evidence to date that large-scale industrial processing is competitive with the small-scale milling given current consumption patterns (Nagai, 2008). In contrast to the other value chains discussed here, the major constraints seem not to be aggregation for large-scale processing, but rather increasing production at the farm level to meet growing demand and improving storage systems to deal with cowpea weevil (bruchid) infestation, which can lead to heavy damage of grains. Research and extension programmes by IITA, the USAID-funded Dry Grain Pulse Collaborative Research Program, and Purdue University, with partners throughout the region, are currently addressing these problems.[121]

10.3.5 Fruits for processing

Demand for fruit juices is strongly growing throughout the region (Part II), particularly in Nigeria, Ghana and Côte d'Ivoire. Euromonitor (cited in Lambert, 2012) forecasts future demand growth in Nigeria at 8% per year. Surveys indicate that consumers consider fruit juices (either consumed directly or incorporated in flavoured yoghurt drinks) as a more nutritious alternative to soft drinks, although the latter are more widely consumed due to their low cost. In order to stimulate the growth of the domestic fruit juice processing industry, Nigeria has banned the importation of fruit juice in consumer-ready containers. This has led to a shift in imports to fruit juice concentrates, which are reconstituted domestically. Currently, the region imports about US$50 million per year in fruit juices and concentrates. In addition to Nigeria, Ghana, Côte d'Ivoire and Sierra Leone all have fruit juice processing facilities.

Since the fruit juice processing sector is growing strongly and private regional capital is well entrenched, the main challenge for the industry is to develop capacity for domestic supply of raw materials, both fresh and processed, into concentrates and pulps. A few firms in Nigeria have integrated backward into production or have developed outgrower schemes, but the problems of ensuring quality raw materials consistently and developing equitable systems to share risks and benefits among farmers and processors remain in this value chain as in others discussed earlier in this chapter. Given the time lags involved in orchard establishment, developing financing arrangements for establishing new production will also need to be addressed.

10.3.6 Cashew

As shown in Chapter 4, despite very low yields, West Africa has become a major raw cashew exporter, and the region's share of the global market is growing. Nigeria, Côte d'Ivoire, Guinea-Bissau and Benin are all major producers. In addition to strong global demand, there is a growing internal market, particularly in Nigeria, for cashews as a snack food. The challenge now is to increase farm yields and dramatically increase capacity for processing into high quality kernels for export to world markets. There are numerous examples in East and Southern Africa (e.g. Condor in Maputo, Mozambique) of successful processing operations exporting products of the highest quality, HAACP certified, to international markets. As India industrializes and domestic demand for cashew reduces India's export capability, West Africa can take a leading role in cashew nut processing provided supply is ramped up and quality is enhanced and becomes independently certified. Development of a major processing industry requires significant private investment in new facilities, however, and the organization of producers to ensure a reliable supply of quality nuts so that the plants can operate close to capacity.

121 The bruchid infestation (1) induces farmers to sell soon after harvest to avoid insect damage, with the result that they receive lower prices for their product than if they could hold it off the market and sell later; and (2) results in farmers and traders often using insecticides on the stored beans, which if applied improperly can be harmful to human health. A joint IITA-Purdue University project, with support from the Bill and Melinda Gates Foundation, is promoting the triple bagging of stored cowpea grains in polyethylene bags as a safe alternative. By cutting off the oxygen supply to the insects, they die before they can cause significant damage. For details, see Sanon *et al.*, 2011.

10.4 Summary of key points and conclusions

This chapter has reviewed the opportunities and constraints facing several value chains in responding to the changing demands facing West African Agriculture. Of the six value chains examined in some detail, rice is the most diverse in terms of its geographical dispersion, range of production and processing systems and consumer preferences as well as its number of marketing sub-channels that respond to the diverse demand. Overall, it appears that West African rice production, at least at the farm level, is increasingly competitive with Asian rice given the high world prices prevailing since 2008. Yet constraints appear widespread at the processing level, especially in ensuring consistent product quality. A widespread shift to large-scale milling does not seem to be the solution, however, as small mills frequently have been able to outbid the large mills for paddy given the former's lower costs of aggregating paddy in situations of low levels of production and poor transportation infrastructure. Improving the performance of this value chain will require differentiated approaches targeted at the various sub-channels rather than a "one-size fits all" approach.

The cassava value chain has been remarkably dynamic in recent years, with greatly expanded farm-level production and small-scale processing into products like gari thanks to new cultivars and improved processing technologies. The value chain employs millions of people, predominantly women, across the region and processed cassava products like gari effectively compete with imported rice as a home-grown West African "fast food." Cassava also has the potential to be an input into a wide range of industrial products, from starch to pharmaceuticals, yet problems of assuring a consistent supply of raw product to industrial cassava processing plants has been an on-going challenge. Most of the large-scale processing plants (which are predominantly located in Nigeria) operate far below capacity, and government initiatives to spur cassava consumption in that country by mandating that cassava flour be included in bread have run into serious problems of product availability and quality. Overcoming the vertical coordination problems of raw product aggregation will be essential if cassava is to become a major industrial input as well as a key raw product for small-scale processors.

Poultry and dairy products are two West African value chains facing very stiff competition from low-cost imports. In the case of poultry meat, imports from low-cost producers like Brazil, which benefits from its tightly organized production system and abundant supplies of feedgrains, have captured a large share of the market in coastal countries like Ghana that have remained open to imports. Other countries, like Nigeria and Senegal, have protected their domestic producers through import bans, but at the cost of denying their consumers an inexpensive source of high-quality protein. The inland countries, such as Burkina Faso, have benefitted from a degree of natural protection against such imports. The market for poultry in countries like Ghana has become segmented between the cheaper frozen imports and locally produced, more costly but more appreciated local birds. While opportunities exist to expand niche marketing of local poultry, it appears unlikely that West African producers will be cost-competitive with imports in the near future for the low-cost market. A similar situation exists in the dairy value chain, which is dominated by imports of milk powder. Local milk production in the coastal states is severely hampered in most areas by endemic cattle diseases and the lower productivity of native breeds compared to temperate-climate dairy breeds that can only be raised in a few areas in West Africa. There is some scope for expanded production in the inland states, where consumers are willing to pay a premium for fresh milk, but, even in these countries, the main focus of the commercial dairy industry in the urban areas will be on producing processed products from imported milk powder.

The chapter also analysed two value chains that historically have been pillars of export earnings for West Africa: cocoa and cotton. Cocoa remains West Africa's major agricultural export and has greatly expanded local processing in recent years. Yet the major producing countries have struggled to find a governance structure for their cocoa value chains that captures economies of scale and deals with the need for collective action while still

being transparent and accountable to farmers and other stakeholders. The chapter's review of the on-going reforms carried out by Ghana, Nigeria and Côte d'Ivoire of their cocoa value chains illustrates how elusive striking such a balance can be. A similar story emerges with the analysis of the cotton value chains in the francophone countries of West Africa. The integrated cotton system in these countries spurred one of West Africa's first green revolutions starting in the 1950s, but since the 2000s the value chain has struggled to deal with volatile world market prices, political pressures that have sometimes compromised its management, and increased demands for accountability to farmers. The various reforms currently underway in all of the francophone-country cotton systems illustrate the need for the institutions governing value chains to evolve as the production technologies, markets and broader societal institutions change.

The chapter also briefly discussed a number of other value chains in West Africa that appear to have strong demand prospects, including vegetable oil, ruminant livestock, maize, cowpeas, fruits for processing (especially into juices) and cashews.

In addition to the challenges that are specific to the individual value chains discussed above, three general conclusions emerge from the analysis of the value chains examined in this chapter. First, many of the value chains, particularly for staple crops, involve both small-scale and large-scale processing. While the small-scale processors often have advantages in serving low-income consumers, they require considerable upgrading to ensure greater product consistency and product safety. Some of the upgrading involves improving access to simple technologies and practices – for example for de-stoning paddy before processing by small millers. Others involve more system-wide efforts, such as the need to improve storage and handling processes across the value chain to reduce aflatoxin contamination in groundnuts and maize. Yet given the importance of these small and medium processing enterprises to serve an important part of the mass market at low cost while generating substantial employment, they warrant efforts to improve their performance.

Second, the larger-scale processing enterprises have the potential to capture scale economies and provide a broader range of outputs that are critical to capturing new markets, such as industrial products derived from cassava. Yet across most of these value chains, the problem of aggregating and coordinating raw product supplies to these industries is a recurrent problem. Those value chains that have been successful in expanding large-scale processing, particularly into higher-value products, have frequently had an actor or group of actors that have played a central role (dubbed "channel captain" in some of the value chain literature) in ensuring vertical coordination within the chain, including the critical tasks of quality control and supplying access to improved technology. These channel captains have ranged from dominant firms (e.g. the national cotton companies in the francophone countries) to quasi-public agencies (such as Cocobod in Ghana). Yet in many instances, it has been difficult to design such organizations so that they succeed in providing such coordination and, at the same time, are responsive to stakeholders and transparent in their management. The current efforts in many of the francophone countries to build and strengthen interprofessional committees and Nigeria's plan to create public-private Marketing Corporations are efforts to find this balance.

Third, the case studies illustrate that the challenges faced by value chains evolve as the value chains develop and the markets in which they operate change. Thus, there is no "one-size-fits-all" set of recommendations for value chain development. Rather, there is a need to put in place institutional arrangements through which value chain stakeholders can develop continually evolving strategies to address the challenges and opportunities facing them.

In addressing these challenges, at least two approaches deserve special attention. One is the role that interprofessional committees (sometimes called "commodity associations" or "value chain participant councils") can play in helping ensure some of the greater coordination needed within value chains, particularly between farmers and processors, in order to capture new market opportunities. These types of primarily private-sector

led organizations have been used with mixed results in both high-income and developing economies, including West Africa, to address system-wide problems. These organizations have engaged with design and implementation of grades and standards, development of new products and development of tools to adjust supply to anticipated demand over time (Shepherd, *et al.*, 2009). Lessons learned from these experiences identify at least three key design elements for such efforts to succeed (Staatz and Ricks, 2010):

- ***Identifying an impartial organizing entity.*** It is critical that someone or a core group in the interprofessional committee be perceived and accepted by the participants as an objective, impartial, and contributory organizing entity. The role of the organizing entity includes helping to frame the debates about the nature of value-chain-wide challenges and opportunities and, ideally, helping to provide unbiased information to illuminate the discussions, problems, and performance-enhancing alternatives. This role might be played, for example, by a national agricultural research institute or independent think tank. A key question is what role government agencies should play in the committees and whether they would be perceived as an impartial organizing entity.

- ***Membership structure.*** This issue involves deciding which organizations and individuals should be represented on the committee. This, in part, involves deciding the boundaries of the value chain. For example, will consumers be included? What about by-product processors (e.g., cotton seed processors as well as ginners in cotton IPCs)? The individuals on the committees should be acknowledged industry leaders, "broad thinkers," and those who are open to exploring possibilities for working with other value-chain participants for needed improvements rather than simply defending, in a syndicalist way, the interests of their own groups. Ideally, these people also are leaders of stakeholder organizations within the value chain, such as farmer or processor associations. Including such participant organization leaders in the committees allows these key individuals to link back to their memberships effectively, leading to broader discussion, input, and information into the issues the committee is addressing and broadening the ownership and implementation of its proposed solutions.

- ***Financing.*** A critical issue is whether the organization should seek dedicated funding for its activities. While obtaining external "core" funding for the activities of the IPC may allow it to act more quickly on key decisions (such as to undertake consumer testing of a new product), a possible disadvantage is that such funding may attract participants to the council who are mainly interested in gaining access to the funding for their personal benefit. In order to avoid this sort of rent-seeking, it is often preferable to rely on in-kind contributions of time and resources by the IPC members for the committee's main ongoing activities, complemented with applications for small grant funding for specific information-gathering or outreach activities (Chitundu *et al.*, 2009).

A second important issue to explore is the scope for expanding farmers' equity participation in processing plants. A recurrent problem facing industrial scale agroprocessors in West Africa is unreliable supply of high-quality raw agricultural products for their plants. Attempts to design contracts with outgrowers to meet these needs have frequently been undermined by side-selling and lack of respect of contracts. Farmers sometimes charge that processors also do not always respect their contractual commitments – for example, using complaints about quality to drive down prices to farmers. If, over time, farmers built up an equity participation in the plants, they would have greater incentives to see the plant succeed as well as a stronger voice in dealing with plant managers regarding contracting practices with farmers. One challenge is how to build up this ownership stake over time while still returning a price to farmers that is attractive enough for them to continue to produce for the plant. Such arrangements are probably most feasible for production of perennials (e.g. tree crops) where the farmers are "locked in" to the value chain for a long period and thus have a strong incentive to invest in its future success.