

Agro-based clusters in developing countries: staying competitive in a globalized economy



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by

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Eva Gálvez-Nogales

Acronyms

ABIOVE	Brazilian Association of Vegetable Oil Producers
ABPM	Brazilian Apple Producers' Association (Associação Brasileira de Produtores de Maçã)
AC	agro-based cluster
ACOPAFLOR	Colombian Association of Floriculture Professionals (Asociación Cooperativa de Profesionales de la Floricultura Colombiana)
ADC	Andean Development Corporation
AFIPEK	Association of Fish Processors and Exporters of Kenya
AI	Agricluster Initiative
ANAPO	Oilseeds and Wheat Producers Association, Bolivia (Asociación de Productores de Oleaginosas y Trigo)
APEDA	Agricultural and Processed Food Products Export Development Authority, India
APL	Clean Production Agreement, Chile (Acuerdo de Producción Limpia (de salmón))
APROVALE	Association of fine wine producers of Vale dos Vinhedos, Brazil (Associação dos Produtores de Vinhos Finos do Vale dos Vinhedos)
ASOCOLFLORES	Colombian Association of Flower Exporters (Asociación Colombiana de Exportadores de Flores)
CCDV	Technological-Entrepreneurial Consortium – Centre for the Technological Development of the Chilean Wine Industry (Centro Cooperativo para el Desarrollo Vitivinícola)
CCV	Chilean Wine Corporation (Corporación Chilena del Vino)
CDO	Controlled Denomination of Origin
CENAVIT	Bolivian National Centre of Viticulture (Centro Nacional Vitivinícola, Bolivia)
CI	Cluster Initiative
CIAT	International Centre for Tropical Agriculture (Centro Internacional de Agrícola Tropical)
CIDA	Canadian International Development Agency
CIPM	Cluster Initiative Performance Model
CNPUV	National Centre for Research on Grape and Wine, Brazil (Centro Nacional de Pesquisa de Uva e Vinho)
CODEVASF	San Francisco River Valley Development Agency, Brazil (Companhia de Desenvolvimento dos Vales do São Francisco e do Parnaíba)
CORFO	Chilean Economic Development Agency (Corporación de Fomento de la Producción de Chile)
CRF	Coffee Research Foundation, Kenya
DFID	Department for International Development, United Kingdom
DOC	Controlled Designation of Origin (Denominación de Origen Controlada)

ECLAC	Economic Commission for Latin America and the Caribbean
EMBRAPA	Brazilian Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária)
EPRP	Export-led Poverty Reduction Projects (implemented by ITC)
EPZA	Export Processing Zones Authority of Kenya
EXPOFLORES	Association of Flower Producers and Exporters of Ecuador, (Exportadores de Flores)
FDI	Foreign Direct Investment
FTC	Fondo para la Transformación y el Crecimiento, Argentina
FUNDACRUZ	Santa Cruz Agricultural Development Foundation, Bolivia (Fundación de Desarrollo Agrícola de Santa Cruz, Bolivia)
GAP	Good Agricultural Practices
GLOBALGAP	Global Partnership for Good Agricultural Practices
GTZ	German Agency for Technical Cooperation (Gesellschaft für Technische Zusammenarbeit)
HACCP	Hazard Analysis and Critical Control Point
IBRAVIN	Brazilian Institute of Wine (Instituto Brasileiro do Vinho)
ICAR	Indian Council of Agricultural Research
ICT	information and communications technology
IDB	Inter-American Development Bank
IDIT	Industrial and Technological Development Institute of Mendoza, Argentina (Instituto de Desarrollo Industrial y Tecnológico, Mendoza)
IDR	Rural Development Institute, Argentina (Instituto de Desarrollo Rural)
IDS	Institute of Development Studies, United Kingdom
IICA	Inter-American Institute for Cooperation on Agriculture
IKED	International Organisation for Knowledge Economy and Enterprise Development
INAVI	National Institute of Viticulture, Uruguay (Instituto Nacional de Vitivinicultura)
INTA	National Institute of Agricultural Technology, Argentina (Instituto Nacional de Tecnología Agropecuaria)
INTESAL	Salmon Technological Institute, Chile (Instituto Tecnológico del Salmón)
INV	Argentinian National Wine Institute, Argentina (Instituto Nacional de Vitivinicultura)
ISCAMEN	Agricultural Quality and Safety Institute of the province of Mendoza, Argentina (Instituto de Sanidad y Calidad Agropecuaria Mendoza)
ITC	International Trade Centre (UNCTAD/WTO)
ITP	Integrated Territorial Programmes, Chile (also known as PTI, Programa Territorial Integrado)
ITU	Technological Institute of Mendoza, Argentina (Instituto Tecnológico Universitario)
KPCU	Kenya Planters Co-operative Union
KWV	Cooperative Viniculture Organization of South Africa (Koöperatieve Wijnbouwers Vereniging van Zuid-Afrika Bpkt)
LAC	Latin America and the Caribbean
LVFO	Lake Victoria Fisheries Organization
MNC	multinational corporation

MRDBS	Maharashtra State Grower Grapes Association, India (Maharashtra Rajya Draksha Bagaitdar Sangh)
MT	metric tonne (1 000 kilograms and equal to 2 205 lb)
NCDC	National Cooperative Development Corporation, India
NGO	non-governmental organization
NHB	National Horticulture Board, India
POIC	palm-oil industrial cluster, Malaysia
PPP	public-private partnership
PSU	Pennsylvania State University, United States of America
R&D	research and development
RIMISP	Latin American Centre for Rural Development (Centro Latinoamericano para el Desarrollo Rural)
SAG	Phytosanitary and Agriculture Service, Chile (Servicio Agrícola y Ganadero)
SAGPyA	Secretariat of Agriculture of Argentina (Secretaría de Agricultura, Ganadería, Pesca y Alimentos)
SAWIS	South African Wine Information Service
SGS	Société Générale de Surveillance
SIS	Subnational Innovation System
SME	small- and medium-sized enterprise
UNCTAD	United Nations Conference on Trade and Development
UNCuyo	National University of Cuyo, Argentina (Universidad Nacional de Cuyo)
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VALEXPORT	An association of fruit and vegetable growers and exporters in the São Francisco River Valley, Brazil
WBI	World Bank Institute
WTO	World Trade Organization

Executive summary

Although there is a wealth of research and initiatives relating to clusters in general, remarkably little attention has been paid to clusters in the agricultural sector¹. This might be because the notion of cluster is closely related to competitiveness and innovation, and thus it has been traditionally applied to sectors that focus on innovation as a core value, such as information technology, electronics, car manufacturing, biotechnology, and oil and gas industries.

However, agriculture in the twenty-first century is reinventing itself as a new global business reshaped by globalization, standardization, high-value production, massive growth in demand (both for the food and the biofuel industries), retail and packaging innovations, and a ramp up in efficiency. Faced with constant productivity and market pressures, the “new agriculture” needs new tools to enhance its competitiveness and innovation capacity. One of these tools is the promotion of clusters. An agro-based cluster (AC) is simply a concentration of producers, agribusinesses and institutions that are engaged in the same agricultural or agro-industrial subsector, and interconnect and build value networks when addressing common challenges and pursuing common opportunities.

AC initiatives are starting to be seen as a key approach to help advance the agricultural sector of many countries. The promotion or inducement of such clusters has various advantages relative to other approaches. In particular, cluster approaches recognize that all the actors in the agricultural value chain are often more innovative and successful when they interact with supporting institutions and other actors in the supply chain. By promoting vertical and horizontal links between local agricultural enterprises, as well as supporting relationships between them and facilitating organizations (e.g. local governments, research institutes and universities), cluster policies promote the diffusion of innovation, as well as the use and generation of important local externalities. ACs can also enhance access to markets and information. Cluster policies are argued to be crucial for small-scale farmers and agribusiness, as they enable them to engage in higher productivity, and more market-oriented and higher value-added production. Accordingly, central and local governments have discovered that cluster promotion is a valuable tool to support agricultural enterprises in their territory and help them link to global agricultural value chains in a more efficient and sustainable manner.

Promoting ACs in developing countries is not easy. On the contrary, it is likely to be quite a challenge. The existing literature shows that clusters in developing countries (including those in the agricultural sector) are usually more dominated by smaller-scale firms, are organized in a more informal manner, have weaker linkages among actors, face more difficulties in achieving a critical mass of firms and have been specialized in lower-value niches, although

1 The agricultural sector is understood in this paper as extended agriculture, including forward linkages to food and non-food agro-industries.

they are now increasingly entering higher-value markets. Consequently, it is far more difficult to promote clusters in developing countries than in developed ones. Another way to interpret this is that clusters in developing economies require more support.

This is why various institutions have become involved in supporting developing country clusters, including ACs. These include both international agencies and national donor agencies. The fact that the Inter-American Development Bank's (IDB) portfolio of cluster initiatives in the region is US\$380 million gives an indication of how important the cluster approach has become. All the agencies tend to share a similar methodology and a national multisectorial clustering scope. However, they differ in a variety of ways. In particular, differences can be found in their implementing partners, their focus, and the importance of cluster initiatives in their overall policy reform proposals.

The experience of these institutions suggests a number of lessons to be learned. These include the fact that policies and programmes for supporting agricultural clusters (i.e. AC initiatives) are very much needed in developing countries to overcome market, government policy and systemic failures. However, external support to clusters might do more harm than good if it is not carefully planned. The present research has shown that in order to achieve their intended positive effects, AC initiatives should, in a nutshell, improve incentives for producers and agribusiness; provide core public goods; enhance the climate for private investment in agriculture; build effective institutions; and reduce the environmental drag. Similarly, given the differences between clusters in developing countries, a one-size-fits-all approach should be avoided. Donors and international organizations are also finding that converging their efforts and models towards joint initiatives can be beneficial. Other key lessons include the need to look beyond public financing to increased policy involvement and to recognition of the contribution of clusters in export strategies and policies.

The current research shows that clustering in the agricultural sector presents many benefits, such as creating an enabling environment for interfirm cooperation, facilitating the diffusion of innovations, and acting as a means to efficiently channel public support to increase competitiveness in the agricultural sector. Farmers and small-scale firms can benefit from participating in ACs, as they enjoy evident joint-action advantages and agglomeration economies. The study also highlights that collective action undertaken by cluster participants is the cornerstone of ACs, and describes the complementary roles played by the government, private sector (especially farmers, industry and interprofessional associations) and academic, and research institutions in the development of agricultural clusters. It indicates that ACs tend to develop, by and large, around high-value export-oriented agricultural products, while many domestic-oriented incipient clusters do not seem to have a bright future ahead of them.

The research underlines, as well, how AC policies require embracing multiple subjects. Moreover, it demonstrates how clusters face multiple challenges, ranging from issues relating to economies of scale and foreign competition, to those relating to the need to improve food safety and introduce new market-driven products. In response to these challenges, today's agricultural clusters often focus more on better meeting consumer demands than on increasing efficiency and productivity.

Other interesting lessons are that ACs can contribute to the increasingly important creation of a regional/brand identity, and that they are often linked to other clusters, such as tourism. Finally, ACs can develop around different elements, varying from clusters based on particular products to those based on particular practices (such as organic foodstuffs) or social or ethnic groups.

Of course, not everything about ACs is perfect. There are, as well, some dangers associated with clusters in the agricultural sector. For instance, the clustering of related firms and enterprises can help to magnify any negative environmental impact (although, through clustering, firms and enterprises can also help work together to mitigate these impacts). Clusters could also magnify economic impact on a particular area in the case of market collapse. In some cases, clustering can also hinder the dynamism of an area. Although clusters aim to promote “co-opetition” (actors within the cluster demonstrating a balance between competition and cooperation), there is a danger in some cases of too much cooperation within a cluster. This can reduce the dynamism of the cluster. A balance is also needed in terms of links to those inside or outside of the cluster. Cluster policy tends to concentrate mostly upon promoting linkages between actors inside a cluster. These links can be vital for innovation, but links to those outside the cluster can also be important sources that should not be neglected.

1. Introduction

The fields of the Bío Bío region in Chile have become a sea of blueberries² since the “berry revolution” burst onto the scene a few years ago. The local economy is booming, dotting the rural landscape with construction works: the traditional adobe and gable farmhouses have been renovated and enlarged, while new brick houses have been built to accommodate entrepreneurs and agro-industrial engineers. Orchards have signs indicating that they have achieved certification of good agricultural practices (GAP). Packing houses and agroprocessing plants lend an industrial feeling to the rural roads, where refrigerated trucks loaded with berries swarm like ants.

However, the biggest change of all is not visible to the naked eye: Berry farmers, entrepreneurs, packing house owners, extensionists and other actors have woven value networks, i.e. they have built vertical and horizontal linkages among themselves; have worked with universities and research centres to develop new varieties and new technologies; and have sought partnerships with public agencies and non-governmental organizations (NGOs). In brief, the Bío Bío blueberry cluster has been born.

This is a good illustration of an AC: It is simply a concentration of producers, agro-industries, traders and other private and public actors engaged in the same industry and inter-connecting and building value networks, either formally or informally, when addressing common challenges and pursuing common opportunities.

The Bío Bío blueberry cluster is just one example of the many ACs existing in developing and emerging economies. Not all of them are as successful, and even the successful ones do not last forever: They rise and fall like any other business venture. However, ACs seem to generate a number of advantages for small producers and agribusiness firms, from agglomeration economies to joint-action benefits, such as improving access to local and global markets, promoting local governance, and scaling up and disseminating innovations. Consequently, ACs raise the competitive advantage of farmers and agribusiness firms as they increase their current productivity and their innovative capacity. In addition, they attract new agribusiness that supports the innovation and cluster growth as a whole.

If clustering is an approach that seems to work, why not promote it? In fact, promoting ACs is one of the strategies identified by FAO to support agribusiness and agro-industrial development. ACs are increasingly being recognized as an efficient way to develop and stabilize agriculture and agro-industry and to create an environment that improves the competitiveness of agribusiness, particularly small- and medium-scale companies. They also provide the focus that is needed for agro-enterprises, governments and institutions to align

² The Bío Bío cluster contains nearly 40 percent of Chile’s blueberry production, with more than 3 400 ha planted. Chile’s exports of blueberries reached over 21 000 tonnes in 2006, and they are expected to grow at an annual rate of 30–35 percent for the next three years. Source: Berries of Chile, www.berriesofchile.org

and concentrate their efforts to achieve competitiveness and performance targets. Accordingly, governments can improve the effectiveness of their support for the establishment and improvement of agricultural value chains “by promoting the development of and organizing their assistance around clusters” (ITC, 2005). Moreover, ACs can constitute an important tool for the economic and social development of a given territory: They can have positive impacts on income enhancement, employment generation and well-being of workers and entrepreneurs of the cluster and, more generally, they offer great potential for improving the local economy.

Given all of the above, the promotion of ACs would appear to present a vast potential to encourage agribusiness and agro-industrial development with equitable benefits for agrifood chain participants, particularly in developing countries; and to establish favourable business environments, where policies, institutions and services are conducive to sustainable competitiveness.

But how big is this potential? How can it be fully realized? Would the promotion or induction of ACs be a winning strategy for all subsectors and for all countries? What are the limitations of such a strategy and what are the pitfalls to avoid? FAO has tried to find answers to these and many other questions by carrying out worldwide research on ACs and agricluster initiatives, with an emphasis on developing countries. The results of the research are summarized in this paper, which draws on the experience of ACs in Africa, Asia and Latin America, and the views of those individuals who have been in the forefront of their creation and management. The paper tries to: a) provide “best practice” guidelines on AC creation and development; b) establish the relevance of agriculture clusters to the creation of economic opportunity for small-scale producers and agribusiness in particular, and to rural development in general; and c) assist strategy- and policy-makers that need effective solutions to promote agro-industries in developing countries, by providing them with a framework they can apply when assessing the relevance of a clustering programme for the agriculture sector in their own country, and when defining the approach by which such a programme should be launched and managed. It is hoped that the paper will make a significant contribution to raising the profile of ACs as an effective vehicle for rural development, export expansion and opportunity creation.

The paper is divided into seven chapters. A brief introduction is followed by a chapter devoted to the definition of clusters, ACs, agricluster initiatives and other related concepts. Chapter 3 presents existing literature and methodologies on cluster development, and provides general insights into cluster promotion in different regions and economic sectors. Subsequently, a review of ACs in Latin America, Asia and Africa is provided in Chapters 4 to 6, respectively. Finally, Chapter 7 is devoted to presenting the main findings and conclusions of the research.

2. Definition of clusters, agro-based clusters and related concepts

The present chapter clarifies what is meant by clusters and ACs. It also sheds light on some related concepts, such as agribusiness complexes, agroproduction or food parks, agri-export zones, export consortia and “one village one product” initiatives.

2.1 DEFINITION OF CLUSTERS

A simple definition of a cluster is “the geographical concentration of industries which gain advantages through co-location” (Bosworth and Broun, 1996). A broader definition is the “geographic concentrations of inter-connected companies and institutions in a particular field” (Porter, 1998). Clusters can be an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs, such as components, machinery, and services, and providers of specialized infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies or common inputs. Many clusters include governmental and other institutions, such as universities, standard-setting agencies, think tanks, vocational training providers, and trade associations that provide specialized training, education, information, research and technical support (Porter, 1998).

The idea is that clusters evolve, and in so doing reinforce their competitiveness, through the combination of inter-firm rivalry and collaboration (so called “co-opetition”), innovation and the rapid transmission and adoption of ideas, and the generation of important local externalities, such as a skilled labour pool, the availability of specialized inputs – physical, technical and legal (such as those relating to certification) – and enhanced access to information on, for example, technologies and markets.

2.2 AGRO-BASED CLUSTERS³

In many developing countries, the greatest potential for sustainable growth lies in the agricultural sector. Yet ironically, it is this sector where poverty is most widespread and found in its worst forms. Small-scale farmers, and the rural communities in which they live,

³ This chapter is based on a contribution of Brian Barclay, Director of Modicum Strategy Consulting Inc, Vancouver, Canada, and former Executive Coordinator of the Executive Forum of the International Trade Centre (UNCTAD/WTO).

are imprisoned within a “cycle of equilibrium” of low margins, resulting in low risk-taking ability and low investment, which leads to low productivity, low market orientation and low value addition which, in turn, nets low margins (ITC, 2006a).

From a conceptual standpoint, the creation of “value networks” represents the most effective means by which to break this cycle, while concurrently raising prospects for long-term competitiveness within the agricultural sector. In this context, a value network is the aggregation of:

- vertical relationships among suppliers of raw materials and production inputs, agricultural producers, processors and exporters, branded buyers and retailers;
- horizontal relationships among producers, which take the form of growers’ cooperatives or various types of smallholder business consortia;
- support relationships between producers and facilitating organizations (e.g. local governments, business service providers, research institutes, universities and non-government service organizations) that reinforce the quality, efficiency and sustainability aspects of the chain (ITC, 2006b).

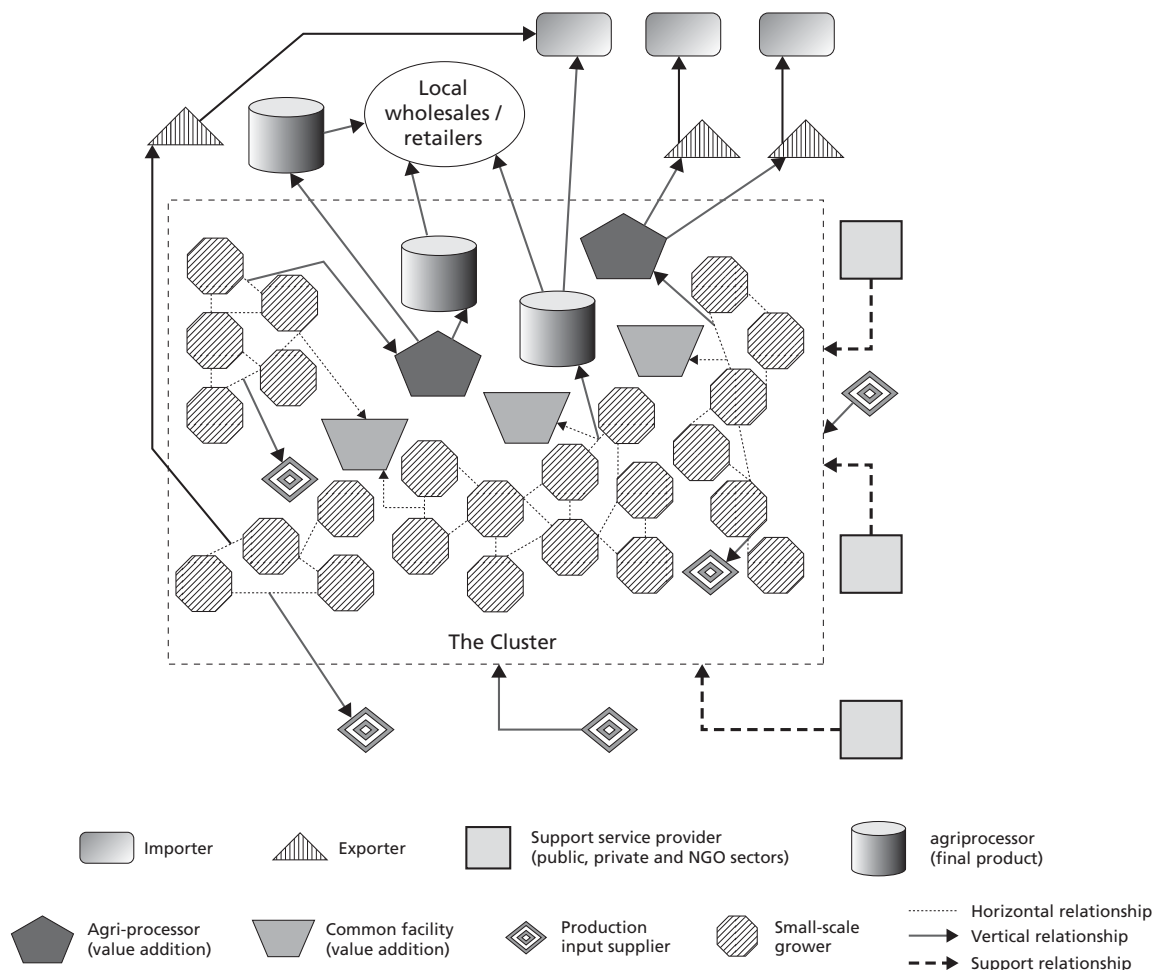
Value networks have, nevertheless, been slow to evolve in the agricultural sector. For the vast majority of farmers and small-scale agro-industries, business is conducted on a traditional “transaction relationship” within which they produce and sell an undifferentiated product as “price-takers”. In such a relationship, producers are fully exposed to swings in the market and have little or no opportunity for creating, or capturing, greater value or for generating deeper commercial and developmental spin-off.

There are, of course, exceptions. Greater integration of the value chain is being achieved through vertical relationships that improve product flow (contract farming and outgrower schemes), coordinate financing and payments (ITC, 2006c), and reinforce communication⁴. And undoubtedly cooperatives, export production villages, joint export marketing and similar efforts to foster horizontal relationships, are having an impact on rural competitiveness and well-being.

But even these examples of “higher return relationships” fall short of the ideal value network where there is close and continuous coordination and collaboration horizontally, vertically and along the support axis of the value chain and where such relationships not only create efficiencies, synergies and opportunities (both commercial and developmental), but also stimulate value addition, innovation and product diversification at the level of small-scale producers and agribusiness, and ensure that maximum returns are retained in the local economy.

⁴ The case of ITC Ltd of India (formerly Imperial Tobacco Company) is a good example of such vertical integration. With the objective of minimizing the impact of traders in the value chain, ITC India established computer facilities in farming villages under what is known as the “e-Choupal” (gathering place) initiative. The ITC computer kiosk provides the farmer with up-to-date information on weather conditions, daily market prices at local markets (mandis), global price trends and technical and production information in the local language at no cost. The ITC’s Choupal Saagor also functions as a hub, providing warehouse facilities and a rural hypermarket for seeds, fertilizers and other production inputs, and is managed by an ITC-trained agent who works on a transaction-based commission basis. There is, however, no obligation for the farmer to sell to ITC. There are currently 6 300 e-Choupals in operation, serving 36 000 villages and 4 million small-scale farmers.

Figure 1. Conceptual illustration of the ideal agriculture value network



Source: FAO Datastream

Only an AC with strong market connections would seem to represent this ideal, or ultimate, value network (or aggregation of individual value networks). An AC is simply a concentration of producers and institutions that are engaged in the food and agricultural sector and that inter-connect and build value networks, either formally or informally, when addressing common challenges and pursuing common opportunities.

An AC is collectively empowered. In other words, the distinguishing feature of ACs compared to “concentrations of producers” is what happens between the “boxes”, not inside them⁵ (Figure 1).

5 “Innovations in Export Strategy: Competitiveness through Export Clustering”, International Trade Centre, 2005 (ITC/P191.E/OED//05-VIII).

A number of the more celebrated examples of successful ACs do not conform to the definition of a cluster used in this paper. While they may reflect effective “value networks” comprising horizontal, vertical and/or support relationships, they tend to involve static relationships and, in many instances, are based on rigid and hierarchical arrangements. They represent a structured response to an identified market opportunity, but do not encourage a level of “co-opetition” that will generate innovation and promote evolution of the business model: two of the essential features of a sustainable cluster.

An AC can be defined very broadly to include crop production and services, livestock, food processing, agricultural machinery and equipment, as well as agricultural-related transportation and distribution.

2.3 RELATED CONCEPTS

An AC could be considered the “ideal” value network, as it encompasses vertical, horizontal and support linkages. However, other forms of value network can emerge in the agricultural sector. These are briefly considered below.

Global value chains: the importance of territorial development in a globalized economy. An agricultural value chain encompasses the full range of activities to bring an agricultural product from the farm to its end use and beyond. A “global agricultural value chain” is divided among multiple firms and spread across wide swaths of geographic space, hence the term global. (Duke University, www.globalvaluechains.org/concepts.html; Vorley and Fox, 2004). The driving forces behind this globalization trend are well known: the increasing scale and international consolidation of market; the growing role of global corporations; the liberalization of markets; the growing dominance of large food retailers in distribution channels; and the increasingly stringent demands for food quality and safety. The globalization of agribusiness activities implies a focus on similarities, standardization, homogenization, concentration and coordination on a worldwide basis.

In this context, talking about local agricultural development and clusters would, at first glance, seem out of place. However, precisely because of the globalization forces and increased competition, it is more important than ever to strengthen the local link of the global chain: A network of agribusinesses (cluster) needs to be supported at a local or domestic level in order to be strong enough to compete and operate in a global value chain. Accordingly, clustering has been rediscovered as a local response to globalization, a “Think globally, act locally” approach to increase agricultural sector competitiveness that combines:

- a local strategy that recognizes the necessity to consider locally related issues in the performance of business activities in the marketplace (Svensson, 2001);
- a global strategy that links the AC to the global value chain in a more efficient manner.

Agribusiness complexes. In many ways the idea of an AC builds on the earlier idea of agribusiness complexes. The term “complex” refers to all the interrelated activities necessary to produce and market a particular agricultural product, and it also highlights how companies within these complexes are often dependent upon one another (Simons *et al.*, 1992). However, the term “agribusiness complex” differs from that of ACs in that clusters have a more explicit geographical dimension. The term cluster is also a broader term, including actors, such as universities and research institutes, which are not directly involved in the production of a particular product.

Agro-industrial parks, also called agroproduction or (agri) food parks, are shared facilities and services (e.g. transport, storage and packaging) built explicitly for the processing of agricultural products. The idea behind such initiatives, common in India, is that it is often difficult for small- and medium-sized enterprises (SMEs) to invest in capital-intensive activities. The building of food parks therefore allows the provision of common infrastructure facilities to be economically assisted, while also helping the enterprises there to gain from other benefits of clustering (FAO, 2006c).

Agri-export zones represent one initiative to explicitly use the idea of a cluster in the hope that this will enhance the export of agricultural products. Such initiatives were introduced to India in 2001⁶, and the country provides a good example of what these zones entail. State governments identify a specific agricultural product whose export is to be promoted. The production of this good or set of related goods would have to be based in a particular area (ranging in size from a single block to a group of districts) that would become the Agri-Export Zone. The export of the good would then be promoted in a comprehensive fashion by looking at and assisting all the different processes within the value chain, as well as the links between them. Assistance to different elements of the cluster can include fiscal incentives as well as financial assistance for activities such as training, research and development (R&D) and infrastructure development.

Export consortia of food and agricultural products are usually made up of SMEs and can be defined as “a voluntary alliance of firms with the objective of promoting the goods and services of its members abroad and facilitating the export of agricultural products through joint actions” (adapted from UNIDO, 2003). Members of the consortia retain their financial, legal, managerial and commercial autonomy but cooperate to promote their exports through schemes such as joint marketing, R&D and, in some cases, sales. They are formal institutions and the firms involved in them are not necessarily geographically proximate.

One-village-one-product. The one-village-one-product campaign is an initiative that originated in Japan for promoting regional development. Villages or local areas are encouraged to concentrate on one value-added and local product, with product development and marketing assistance being provided. The products are then sold nationally and internationally. Initially the campaign was internal to Japan, but it is now part of Japan’s foreign assistance

6 Agricultural and Processed Food Products Export Development Authority, India (APEDA); http://www.apeda.com/apedawebsite/trade_promotion/About_AEZ.pdf

programme⁷. It is also being used by other countries. Thailand, for example, now has a “One-Tumbon-One-Product” scheme (FAO, 2004b). Spice export villages in Sri Lanka are another example of agglomeration and facilities provision in specific locations.

Subnational Innovation System (SIS). The main differences between SIS and clusters relate to their boundaries and their focus. Although centred in a particular region, a cluster has no fixed borders. By contrast, a SIS is based upon public administrative boundaries (Yim, 2007). Cluster analysis looks at multiple benefits of co-locating; not just accelerated spread of innovation but also other benefits, such as external economies of scale. By contrast, the focus of an SIS is solely upon innovation potential. Otherwise the two concepts are largely similar. They both concentrate on the region as the relevant spatial scale and they both involve a variety of actors together with the links between those actors.

⁷ Ministry of Economy, Trade and Industry of Japan (METI);
http://www.meti.go.jp/english/policy/external_economy/trade/OVOP/index1.html

3. Literature review on cluster theory and practice

*Nearly two decades have elapsed since Porter stressed the importance of clusters in his *Competitive Advantage of Nations* (1990), but a virtual explosion of activities and initiatives echoing his ideas is still happening in our day. Van der Linde (2003) notes the ever-growing importance attributed to clusters in the media (409 articles containing the term “industry cluster” in 2001 versus 27 articles in 1993) and in the economic development literature, which has been flooded with studies of cluster initiatives taking place in at least 39 countries. The present paper does not review this entire body of literature, but focuses on the most relevant to gain insight into the different models used to analyse clusters as well as to promote ACs in developing countries. It lists the major research efforts on cluster characteristics and cluster initiatives undertaken since 2000, differentiating between those addressed to developed, transition or developing economies.*

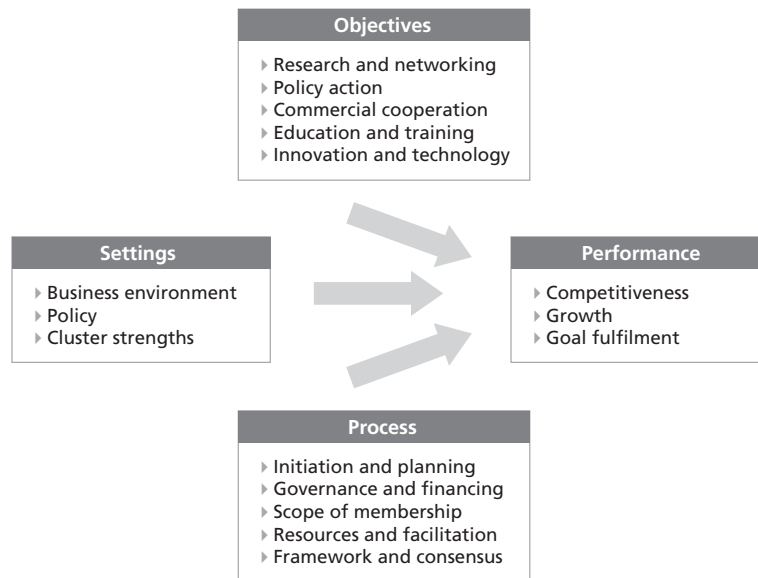
3.1 GLOBAL INVENTORIES OF CLUSTERS

Many efforts have been made to compile the wealth of information on clusters. One of the most important is the inventory of clusters by the Institute for Strategy and Competitiveness at Harvard Business School, known as the *Cluster Meta-Study*⁸. This study has compiled information on 833 clusters from 49 nations, of which 24 are developing countries. It examines several features of clusters, the reasons behind their competitiveness or their lack of it, and patterns of evolution over time.

Another major effort is the *Cluster Initiative Greenbook* (Sölvell *et al.*, 2003), which gathers information from more than 250 cluster initiatives around the globe. Based on the analysis of the extensive data collected, the Greenbook has developed a useful tool to analyse clusters: the Cluster Initiative Performance Model (CIPM), which evaluates four components of cluster initiatives: settings, objectives, performance and process of development (Figure 2).

Another inventory initiative is *The Global Competitiveness Report*, which presents comparative data on overall cluster strength for 75 countries including some developing countries (Porter and Schwab, 2002).

In addition, some developed countries, such as the United States, the United Kingdom and Sweden, have conducted mapping exercises of clusters across their entire territory. For instance, the *Cluster Competitiveness Study* by Harvard Business School has assembled a

Figure 2. The Cluster Initiative Performance Model (CIPM)

Source: *The Cluster Initiative Greenbook (2003)*.

detailed picture of clusters of industries in the United States⁹. Likewise, the Swedish study has identified 38 industry cluster categories in Sweden, which are described with regard to employment and growth in recent years (Sölvell *et al.*, 2008), and the United Kingdom study has drawn up a detailed inventory of clusters across all sectors of the country (Porter and Ketels, 2003). On top of this, the European Commission convened in 2002 an expert group on enterprise clusters and networks, which reviewed national cluster mapping exercises undertaken in 13 European countries and gathered data on cluster-specific characteristics from 84 clusters from 20 countries¹⁰ (European Commission, 2002a).

3.2 GAPS IDENTIFIED IN GLOBAL CLUSTER STUDIES

Remarkably, little attention has been paid to clusters in developing countries and even less information is available on ACs. Out of the 833 clusters analysed in the *Cluster Meta-Study*, only 20 percent are from developing countries, of which less than 1 percent are agricultural clusters. Likewise, very few of the 250 cluster initiatives surveyed in the Greenbook make reference to agricultural clusters in developing nations. The agrifood sector represents a minimal percentage of the cluster initiatives surveyed: 13 respondents out of over 600 belong to the processed food category. Of the total number of replies, 93 percent were received from high-income countries, 6 percent from upper-middle-income economies – mainly from

⁹ Additional information may be found at: www.isc.hbs.edu

¹⁰ Additional information may be found at *The MAP Project 2002*:

http://ec.europa.eu/enterprise/entrepreneurship/support_measures/cluster/map_project.htm

Table 1. Characteristics of clusters in developing countries

Structure	Market focus
<p>Smaller firm size: The majority of clusters from developing countries are dominated by SMEs, whereas in developed countries larger firms predominate.</p> <p>Lacking a critical mass of firms: Clusters from developing countries usually encounter difficulties to achieve the critical mass of firms needed to create sizeable learning externalities to enable the further development of the cluster. This is especially applicable to most African countries, according to Bennell (1998).</p> <p>Informally organized: In developing countries clusters tend to have an informal organizational structure, which becomes more formal only if and when infrastructure improvements or other initiatives involving large investments are envisaged.</p> <p>Comparatively weak internal linkages: The linkages between cluster actors (firms, government, academia, finance and institutions for collaboration) are generally less developed in non-industrialized countries. Therefore, greater flexibility regarding the level of linkage development is necessary when analysing clusters from less-developed economies, where emerging and developing clusters are predominant. The more pronounced weaknesses of SMEs and the less frequent interactions between cluster agents in developing countries – in comparison with developed ones – represent severe obstacles to cluster development. (Anderson <i>et al.</i>, 2005).</p>	<p>Shift from low- to high-value products and services: Saegaert <i>et al.</i> (2004) stated that developing country clusters usually specialize in lower-value niches. On the contrary, clusters from industrialized economies appear mainly on the higher end of the market. This is, however, a changing reality, at least in the agricultural sector. According to the World Development Report 2008, exports of high-value products (horticulture, livestock, cut flowers and organic products) now make up almost half of all developing country exports, far more than the 21% for traditional tropical commodities such as coffee, cacao, tea or cotton (World Bank, 2007).</p> <p>Increasingly connected with the global market: The long-term involvement of large buyers with extensive global connections in SME-dominated clusters from developing countries has often proven to be beneficial. These buyers can improve the ability of SMEs to compete in the global marketplace by “communicating clear-market requirements, providing support on logistical issues and participating in quality improvement programmes” (ITC, 2005).</p>

Source: Author's elaboration.

Europe and Central Asia – and only 1 percent from low-income countries (according to World Bank definitions: World Bank list of economies¹¹).

However, there are some ongoing initiatives in the agricultural sector. Alterra¹² and ARCADIS¹³ are currently leading an initiative to document the development of agribusiness complexes worldwide, supported by the Dutch Ministry of Agriculture. Some of the agribusiness complexes analysed by this initiative are located in developing countries¹⁴. The Agricultural and Food Engineering Technologies Service of FAO has published a study on agro-industrial parks with a focus on developing countries (FAO, 2006c). Again, the Institute for Strategy and Competitiveness of Harvard has recently published several case

11 <http://siteresources.worldbank.org/DATASTATISTICS/Resources/CLASS.XLS>

12 Alterra is part of the Wageningen University and Research Centre.

13 ARCADIS is a knowledge-driven service provider, worldwide active in the fields of infrastructure, buildings, environment and communications.

14 Further information on this project is available at: <http://www.agrocomplex.nl/home.htm>

studies regarding various agricultural clusters in developing and transition economies, some of which are discussed in this paper¹⁵.

This paper attempts to overcome the knowledge gap on ACs by drawing lessons from any type of clusters in developing countries in general and by reviewing the information available on ACs in developing countries in particular. However, caution is required when drawing lessons from other sectors/countries: Sectoral specificities as well as differences because of diverse levels of economic development should be taken into account.

3.3 THE INCREASING IMPORTANCE OF CLUSTERS IN DEVELOPING COUNTRIES

The existing literature shows that clusters in developing countries (including those in the agricultural sector) are usually more dominated by smaller-scale firms, are organized in a more informal manner, have weaker linkages among actors, face more difficulties in achieving a critical mass of firms and tend to be specialized in lower-value niches, although they are now increasingly entering higher-value markets. These characteristics of clusters in developing countries are further explained in Table 1, with an emphasis on their internal structure and market focus.

Understandably, given all the above, it is far more difficult to promote clusters in developing countries than in developed ones. Another way to read this is that support to clusters in developing economies is certainly more needed. This is why various institutions have become involved in supporting developing country clusters, including ACs. The United States Agency for International Development's (USAID) portfolio of cluster initiatives as of January 2003 was in the region of US\$60 million in 26 countries and has strongly increased since then; and IDB's portfolio exceeds US\$380 million. Several other institutions have developed programmes to support competitiveness in developing and transition economies through clustering. The Andean Development Corporation (ADC) implements the "Support competitiveness programme", which includes nine cluster projects in Andean countries. The United Nations Industrial Development Organization (UNIDO) launched in 2001 a programme called "Development of Clusters and Networks of SMEs Program" to foster inter-enterprise linkages and collaborative relations with local support institutions. To date, UNIDO has worked with SME industrial clusters in India, Indonesia, Malaysia, Mexico, Nicaragua, Honduras, Jamaica, Bolivia, Madagascar, Morocco and Tunisia. The International Trade Centre UNCTAD/WTO (ITC) is currently developing and implementing export-led poverty reduction projects (EPRP) focused on sectors/clusters showing high potential to contribute to poverty reduction through exports, such as agricultural products (fresh and processed); community-based tourism; and textiles (fibres and clothing). The EPRP approach has been implemented in Bolivia, Brazil, Cambodia, El Salvador, Ethiopia, Kenya, Mongolia, South Africa and Viet Nam.

The approaches of these international institutions to cluster development have some common and distinct features, which are presented in Table 2.

15 http://www.isc.hbs.edu/econ-student_projects.htm

Table 2. Commonalities and differences of approaches to support clusters in developing countries

Similarities	Differences
<p>Similar methodology, including participatory processes: The diverse clustering approaches follow a similar methodology, namely, conduct diagnostic studies, identify priorities and design, and implement an action plan. Moreover, the latest cluster initiatives share an emphasis on participatory strategic planning processes to develop policies and strategies for strengthening national competitiveness.</p> <p>Scope beyond providing support to a single cluster or single economic sectors: The cluster interventions of donors and international organizations have often evolved from providing support to individual clusters to launching national country programmes involving various clusters and industry sectors. As an example, until 2002 IDB provided grants of about US\$100 000 through its Multilateral Investment Fund to foster the development of specific clusters. Since that year, IDB has approved major cluster initiatives for several million dollars in Panama, Bolivia, Honduras, Colombia, Brazil, Argentina and Guyana (See Annex 1). UNIDO has also started to concentrate cluster initiatives in a number of countries and has assumed a more integrated national perspective.</p>	<p>Preferred implementing partners (public and/or the private sector): The World Bank and the IDB have, as their counterparts, the host country governments, while USAID, UNIDO and the United Kingdom's Department for International Development (DFID) work mostly with the private sector. Private or public-sector counterparts leave different marks on the design and implementation of cluster projects. Nevertheless, these institutional arrangements are becoming increasingly flexible in order to recognize the importance of the private sector in cluster development. IDB has recently started to select private not-for-profit organizations to act as their national counterparts for cluster programmes (USAID 2003).</p> <p>Focus on different sectors and/or target groups: Each organization places the focus of its cluster programmes on different issues: IDB on SME clusters in the tourism, agro-industrial, ICT and other sectors; UNIDO on SME industrial clusters in developing countries; ITC on the importance of clusters for national export strategies; DFID on making business services meet the needs of firms owned by or a source of employment for the poor; and USAID on promoting competitiveness in various economic sectors through clustering, with a special interest in programmes in transition economies and post-war recovery.</p> <p>Cluster-driven policy reform efforts or as part of a broader reform puzzle: While for the World Bank cluster initiatives are just a small piece of a broader policy reform puzzle, for UNIDO, USAID and other organizations clusters are the centrepiece of their projects and, consequently, their policy reform efforts are cluster-driven (USAID 2003).</p>

Source: Author's elaboration.

3.4 AN INTRODUCTION TO AGRO-BASED CLUSTERS FROM DEVELOPING COUNTRIES

The promotion, and inducement, of industrial clusters has become a key feature of industrial policy in many developing countries. And, while the track record on a global basis may have been mixed, clustering has, in a significant number of countries, lent substantial momentum to the national drive towards greater international competitiveness and improved business performance. Why then, when the argument in favour of replicating such value networks in the agricultural sector appears so compelling, have small-scale producers and agribusiness in developing countries not engaged before and more vigorously in clustering activity?

Nowadays, AC initiatives are starting to be seen as a key approach to help promote the agricultural sector of developing countries. The promotion or inducement of such clusters has

various advantages relative to other approaches. In particular, cluster approaches recognize that all the actors in the agricultural value chain are often more innovative and successful when they interact with supporting institutions and other actors in the supply chain. By promoting vertical and horizontal links between local agricultural enterprises, as well as supporting relationships between them and facilitating organizations (e.g. local governments, research institutes and NGOs), cluster policies promote the diffusion of innovation, as well as the use and generation of important local externalities. ACs can also enhance access to markets and information. Cluster policies are argued to be crucial, especially for small-scale farmers and agribusiness, as they enable them to engage in higher productivity, more market-oriented and higher value-added production. Accordingly, central and local governments have discovered that cluster promotion is a valuable tool to support agricultural enterprises in their territory and help them link to global agricultural value chains in a more efficient and sustainable manner.

In the following chapters, all these issues regarding ACs in developing clusters will be further analysed. Various examples of clusters are presented from Latin America, Asia and Africa. These deal mainly with high-value, export-oriented agricultural products such as cut flowers, fish, fresh fruit and vegetables, and wine. Special attention will be given to the development and upgrading of these clusters, and to the role played by collective action and the support of government and other facilitating institutions in each case.

4. Agro-based clusters in Latin America

4.1 INTRODUCTION TO LATIN AMERICAN AGRO-BASED CLUSTERS

Researchers are far from reaching a consensus on the degree of development and competitiveness of Latin American ACs. According to Bisang and Gutman (2005) several agrifood product lines in Mercosur countries have expanded and attained higher level of competitiveness thanks to the organization of these product lines in clusters or networks. Thus, they have become “focal points (axes) of accumulation and economic growth”. Amighini (2003) says that Latin America enjoys a comparative advantage for developing industries based on natural resources, including agro-industrial activities (e.g. fruit, sugar, wine, salmon, milk) and some mining industries. Dirven’s work on dairy clusters in Central America (ECLAC, 2001) shows a more pessimistic view about the development of these clusters. She states that clusters tend to be “moderately competitive, increasingly in foreign hands, with core decision-making in the capital city or abroad, shallow as to local supply chains, embryonic as to their stage of development, users and not generators of technology, and with low innovative capacity”. Guaipatín (2003) limits himself to saying that the more interesting fact about Latin American ACs is simply that they exist, in spite of “their agricultural structure based on small producers with difficult access to credit, information and knowledge [...] and the current absence of public support”.

The present report tries to shed some light on this subject. It focuses on clusters of high-value agricultural products that have been documented in the region, namely: wine, fruits and vegetables, fish, cut flowers and coffee.

4.2 WINE CLUSTERS

The Latin American wine clusters (illustrated in Figure 3) have been extensively studied in the past years, coinciding with the “wine revolution” of the 1990s. Such a revolution has been led mainly by southern hemisphere countries, such as Chile, Argentina, Australia and South Africa.

The Chilean wine cluster has captured attention far and wide because of its meteoric rise in international markets (Figueroa and González, 1998; Giuliani, 2003b; Giuliani and Bell, 2004; CORFO, 2004; Visser, 2004). Other Latin American wine clusters studied, though to a lesser degree, are the Cuyo wine cluster (in particular, Mendoza and San Juan provinces) in Argentina (McDermott, 2005), the Bolivian wine and *singani* (brandy) cluster (USAID, 2002; Paniagua Requena, 2002) and the wine cluster of southern Brazil (Vargas, 2001; Oliveira, 2003; Zylbersztajn and Miele, 2005).

Figure 3. Map of Latin American wine clusters



4.2.1 Latin American wine clusters: some figures

Some key characteristics of the South American wine clusters in terms of production, market orientation, number and size of firms, governance and investments can be found in Table 3 and Annex 2.

The favourable soil and climate conditions for winemaking in various *terroirs* in Latin America's countries have led to the establishment of several wine clusters over many decades. These clusters, dominated by a large number of vertically integrated small- and medium-size firms, have traditionally produced low-quality bulk wine mainly oriented to the domestic and regional markets. This panorama changed quickly and profoundly in the 1990s, when

Table 3. Wine production and marketing in Latin America

Country	Wine production (MT)	Domestic market (MT)	Exports (MT)	Domestic market (%)	Exports (%)
Argentina	1 332 500	1 139 450	193 050	86	14
Bolivia	2 048	2 019	29	99	1
Brazil	262 000	260 416	1 584	99	1
Chile	668 100	277 100	391 000	41	59
Uruguay	81 814	80 052	1 762	98	2

Source: FAOSTAT, year 2003 | © FAO Statistics Division 2006 | 30 August 2006.

these wine clusters underwent a major technological overhaul, experienced an increase in firm concentration and went from mass production to the production of small quantities of high-quality wines.

Annex 2 also shows the magnitude of foreign direct investment (FDI) flows into the region's wine clusters since the 1990s, when the global wine industry cast its eyes on the New World wine clusters and started to establish their own vineyards or to buy or work together with local wineries in Latin America.

4.2.2 Wine clusters' evolution over time

Latin American wine clusters were traditionally formed by a myriad of small wine growers and family-run wineries that used to produce and sell bulk wine in the domestic market. Throughout the 1970s and into the 1980s, exports accounted for very little of the production – most of it remained on the domestic market – and Latin American wines were largely unknown overseas.

A drastic turnaround happened in the 1990s when a “quality over quantity” approach was adopted, resulting in a shift from bulk wine for the domestic market to premium wines for demanding export markets. As a result, nowadays in Argentina only 2.4 percent of the volumes are sold in bulk, in comparison with 80 percent before 1995; and 85 percent of the export revenues of the Argentinian wine industry come from fine wines. Chile has also decreased its exports of bulk wine to a quarter of total wine exports (Miremont, 2000).

The causes of this strategic move were multiple: excess production regionally and globally; high worldwide demand for premium wine; creation of brands from Latin America and the establishment of Controlled Denomination of Origin (CDO) in Chile and Argentina; ban on bulk wine exports within Mercosur; industry's globalization of production, distribution and marketing; and consistent advancements in product quality and innovation at the regional level (Miremont, 2000; Sawyer, 2004).

Significant investments on the production side made this jump in quality possible. Between 1998 and 2000, direct investments in wine production in the clusters studied amounted to about US\$500–600 million (Miremont, 2000). Much of this capital came from foreign companies that invested in the creation of vineyards or in buying or setting up joint ventures with national companies. The arrival of foreign investors energized Latin American wine clusters not only from a financial point of view, but also because of the innovations and vision that these investors brought along with them. Sawyer (2004) enumerates some innovations introduced both at the vineyard level (e.g. use of cover crops, increased vine density planting, introduction/rediscovery of new varieties, drip irrigation) and the cellar level, where French, Californian and Australian winemaking techniques were put in practice. New management and marketing styles were also adopted: state-of-the-art product development (from varieties to blending) and quality control, co-design and co-benchmarking processes (development of new systems to document practices and products, share the information and evaluate the results over time and space), and emphasis on regional identity and branding, and launching of collective communication campaigns, among others (McDermott, 2005).

Table 4. Wine export values from 1995 to 2004

Country	1995 (1 000 \$)	2004 (1 000 \$)	Δ (%)
Argentina	73 825	221 438	+200
Bolivia	27	61	+126
Brazil	12 609	1 828	-86
Chile	181 763	835 486	+360
Uruguay	403	3 160	+684

Source: FAOSTAT | © FAO Statistics Division 2008 | 4 November 2008.

Latin American wine clusters have consolidated their presence in the international wine business (Paniagua Requena, 2002; Giuliani and Bell, 2004; Langman, 2002; McDermott, 2005; Penn, 2001; Sawyer, 2004; USAID, 2002) both in terms of quantity and quality. In only ten years Chile's wine exports exploded from US\$182 million in 1995 to US\$835 million in 2004. Likewise, Argentina's wine exports surged to US\$221 million from US\$74 million in the same period. Bolivia and Uruguay also experienced a significant increase in wine exports. Brazil was the exception in the region (Table 4).

Regarding quality recognition, Visser (2004) states that Chilean wineries are increasingly penetrating ultra-premium market segments (Chile won 8 percent of awards and 7 percent of all medals at the London International Wine Challenge Rewards 2003). Chile's Colchagua Valley was awarded Wine Enthusiast's "Wine Region of the Year" for 2005, and a recent article in a wine magazine described the *cabernet sauvignon* of the largest Chilean winemaking company as "the best-value *cabernet sauvignon* on the planet" (Hojman, 2006a; *Decanter* magazine, May 2006). Likewise, McDermott (2005) shows that major trade magazines now rate an increasing broad base of high quality Argentinian wines of many different varieties and distinctive blends. Uruguay is also achieving increasing success with its Tannat grape variety, grown only in France and Uruguay. Another country determined to find its niche market in Europe and elsewhere overseas is Bolivia, which has concentrated on fine wines and is holding onto the concept of the "highest wine in the world" or "high-altitude vineyards"¹⁶.

4.2.3 The upgrading of the Latin American wine clusters

Latin American wine clusters have embarked upon this upgrading path mainly because of:

- the attractive environment for investment in this sector, favoured by the improved macro-economic conditions, including trade and fiscal policies;

¹⁶ Apparently, the high altitude contributes to a higher concentration of flavour and bouquet that increase the quality of wine (Lobato and Prudencio, 2002).

- the arrival of foreign investors who introduced modern winemaking, marketing and management techniques;
- the emergence of collective actions undertaken by cluster stakeholders;
- the institutional support to wine clusters by public agencies, universities, R&D institutions, etc.

The two latter factors are considered crucial by many authors. In this regard, Visser (2004) suggests that conscious collective action by local stakeholders to solve common problems of the industry in Chile has created a shared basis for upgrading. McDermott (2005) also refers to voluntary networking and government support, which follow the principles of inclusion of a wide variety of relevant stakeholder groups and deliberative governance that promote collective problem-solving, as main contributors to institutional change and upgrading in Argentinian wine clusters. Giuliani (2003) shows empirical evidence that the accumulation of knowledge by individual firms and the development of knowledge linkages among cluster members (firms tend to exchange knowledge quite extensively across the cluster) and with supporting institutions are the main drivers for upgrading and knowledge acquisition in the Colchagua Valley cluster.

Emergence of collective actions: Such actions are of a double nature: collective learning, and marketing and promotion initiatives.

Collective learning: In various clusters, winemakers have joined efforts to bring in international consultants. For instance, in the early 1980s, a group of Uruguayan wineries jointly hired French wine experts to advise them on the development of a common strategy to improve their wines. Benavente (2004) also mentions that a group of local firms in Chile invited a foreign oenologist to work with them in order to absorb the latest foreign technology. McDermott (2005) mentions that elite firms from Mendoza organized two main forms of collective learning based on past professional and local ties. First, elite firms created learning groups formed by 8–10 firms that shared the cost of a consultant and met regularly to share tacit knowledge and help solve common problems of upgrading vineyards. Second, annual wine and label evaluation competitions were launched.

Collective marketing and promotion: McDermott (2005) cites two examples of collective marketing in Argentina. The first example refers to Fecovita, the federation of cooperatives from Mendoza, which has improved its members' access to markets through combined bargaining power and alliances with domestic and international distributors. The second case makes reference to wine cellars of Argentina, the association of the largest and most refined wineries, which has created its own foundation (Wines of Argentina) to launch international marketing campaigns to promote Argentinian wine, often in collaboration with ProMendoza (public agency in charge of the international promotion of Argentinian wines) in order to build up the country image "Origen Argentina".

Vargas (2001) quotes the example of the Associação dos Produtores de Vinhos Finos do Vale dos Vinhedos (APROVALE), an association of Brazilian wine cellars of fine wines that aims at making possible the creation of a regional brand. Similarly, Penn (2001) cites the Wines of Uruguay Exporters' Association, a commercial group created in 1999 that nowadays

congregates 24 member organizations working together to compete in international markets. Benavente (2004) and Visser (2004) mention that business/sectoral associations from Chile, such as the Chilean Wine Association (CCV – Association of grape producers, wineries and suppliers) and ChileVid (Association of producers of export fine wines) contribute significantly to the marketing, promotion and the internationalization regimes. Another association is “Viñas de Chile”, which provides marketing support (including wine tasting, market research, promotion strategies, research studies on the health benefits of moderate wine consumption and trade shows and technical conferences) to its 45 member wineries.

Institutional support to clusters: Several studies show that different types of institutions support the region’s wine clusters, the most important being governments (at local, regional and national levels), and universities and research institutions.

Government support: In Chile and Argentina, government support has been decisive for the development of the wine clusters. Chile has provided institutional support in three ways: a) through the liberalization of grape and wine production and exports; b) the promotion of technological learning for exports, especially biased towards small producers; and c) support to export promotion activities and collective marketing initiatives by SMEs. The government’s role in the grape and wine sector has been mostly to address market failures, especially those related with information generation and coordination between SMEs in order to exploit economies of scale and of scope (Benavente, 2004). The central Government of Argentina has followed an approach similar to that of Chile, but some differences can be found at the provincial level. McDermott (2005) praised in particular the strategy adopted by the province of Mendoza based on the promotion of public-private partnerships (PPPs) and the combination of rules of inclusion and participatory governance, which helped to solve collective problems and pushed mutual monitoring.

In Uruguay, government support to the wine cluster has been mainly channelled through the Uruguayan National Institute of Viticulture (INAVI) that initially facilitated industry rationalization and is gradually taking on new responsibilities, such as quality control and international promotion of fine wines (Unikowsky, 2005). In Brazil, a similar function is fulfilled by the Brazilian Institute of Wine (IBRAVIN), created in the 1990s with the aim of managing and executing a series of projects approved through the Fund for Support to the Wine Sector (Fundovitis). IBRAVIN’s key areas of work are: a) to provide market information; b) to improve winegrape quality and viticulture practices; c) to enhance cooperation between growers and wineries; d) to accomplish a viticulture directory in the region; e) to promote the region geographical indicators; f) to promote a new proposal of legislation for the cluster/sector. Both INAVI and IBRAVIN are seen as a potential body of regulation and control of the sector.

Conversely, the Government of Bolivia has not developed a specific institutional framework to support the wine cluster, except for the national research institute, National Centre of Viticulture (CENAVIT) (Paniagua Requena, 2002).

Other supporting institutions: Developing linkages with educational and research institutes is critical to the success of wine clusters, as the wine industry is particularly knowledge-driven. In spite of this, in Latin America and the Caribbean (LAC), the above-mentioned linkages

are fairly underdeveloped in wine clusters in comparison with those of the Californian¹⁷ or the Australian wine clusters. In this sense, Benavente (2004) adds that: “Chilean firm-university linkages are very weak compared to countries such as Australia and the United States, where governments invest the equivalent of 1 percent of total sales in applied research executed by the university” – a statement that is applicable to the whole region.

Fortunately, positive changes are currently underway in this area. In Chile, two technological research and innovation consortia: Vinnova and CCDV (Technological-Entrepreneurial Consortium) have been created with government support. Vinnova is a limited-liability company formed by the promotional body Viñas de Chile (55 percent), the Pontificia Universidad Católica de Chile (39 percent) and the Universidad de Concepción (6 percent), supported by Innova Chile, a CORFO’s programme that funds 60 percent of the total budget, i.e. about US\$3 millions. Vinnova is currently working on 12 research projects with topics ranging from consumers’ preferences, red wine quality, and technological transfer policies to fungus and mycotoxins, among others (www.corfo.cl). Before the creation of Vinnova in 2006, Viñas de Chile and the Universidad Católica de Chile were already collaborating in the implementation of a three-year project with a total budget of US\$1.5 million with the purpose of solving wine industry production problems (Benavente, 2004). Similarly, CCDV is formed by ChileVid, the Universidad de Talca, the Universidad de Chile, the Universidad Federico Santa María, CCV and the firm Tonelería Nacional. (www.corfo.cl), and receives the financial support of the Chilean Government (about US\$3 million).

In the late 1990s, the two major universities of Mendoza, Argentina – the National University of Cuyo (UNCuyo) and the Universidad Maza – created new degree programmes in oenology and viticulture or expanded their existing ones. Additionally, the UNCuyo started to undertake applied agronomy research directly with firms or through joint research projects with public agencies. Moreover, two public-private teaching institutions were created: the Technological Institute of Mendoza (ITU) and the Industrial and Technological Development Institute (IDIT), to satisfy the demands of the Mendoza wine cluster in the areas of management, and applied operations research in engineering and manufacturing, respectively (McDermott, 2005).

In Brazil, two institutions carry out research and training programs for the wine cluster. The National Centre for Research on Grape and Wine (CNPUV) of the Agricultural Research Corporation (EMBRAPA) performs most viticulture R&D activities for the cluster. The JK Agrotechnical Federal School is the only educational institution in the country offering training for oenology technicians at the intermediate degree level. The Agrotechnical School has established collaboration with other universities with expertise in this field, such as the French National School for Agronomic Formation in Toulouse and the Federal University of Rio Grande do Sul (Vargas, 2001; IDB, 2005b).

All the above shows the role played by industry associations, public agencies and research and academic institutes in upgrading wine clusters, but the list of institutions that support

17 Porter and Bond (1999) studied the linkages developed between the Californian wine industry, the Wine Institute, the University of California at Davis and culinary institutes.

and influence agricultural clusters may be endless. Below, Table 5, serves as an example of the different types of institutions that contribute to the development of the Chilean wine clusters, and what kind of support they provide.

Table 5. Supporting and related institutions: the case of the Chilean wine cluster

Type of support	Supporting institutions
Wine associations	Corporación Chilena del Vino: www.ccv.cl Chilevid: www.chilevid.cl
Industry-supporting institutions	Consultores Vitivinícolas: www.consultoresvitivnicolas.cl Servicio Nacional de Agricultura: www.sna.cl Corporación de Fomento de la Producción (CORFO): www.corfo.cl Servicio Para la Innovación Agraria (FIA): www.fia.cl Servicio Agrícola Ganadero (SAG): www.sag.cl Oficinas de Estudios y Políticas Agrarias: www.odepa.cl Dirección de Promoción de Exportaciones: www.prochile.cl Agroeconómico: www.agroeconomico.cl Agronomía y Forestal UC: www.faif.puc.cl
International promotion	Wines of Chile: www.winesofchile.org Asociación Viñas de Chile: www.vinasdechile.com
Training	Otic: www.vinasdechile.com
Research and development	Programa Ciencia, Vino y Salud: www.bio.puc.cl/vinsalud Programa Alimentario Mediterráneo en Chile: www.pam-chile.cl Research and Development consortium: www.vinnova.cl
Wine routes	Casablanca: www.casablancavalley.cl Valle del Maule: www.valledelmaule.cl Valle del Cachapoal: www.cachapoalwineroute.cl
National specialized press	Chile Vinos: www.chilevinos.com Toro Rojo: www.tororojo.cl Vendimia: www.vendimia.cl Revista la Cav: www.lacav.cl Revista Vitivinicultura: www.vitivinicultura.cl Revista Platos y Copas: www.platosycopas.cl Planeta Vino: www.planetavino.com Revista De Novios: www.denovios.com La Vinoteca: www.lavinoteca.cl Andes Wines: www.andeswines.com Todovinos: www.todovinos.cl

Source: *Viñas de Chile* (www.vinasdechile.com).

4.3 FRUIT CLUSTERS

A few fruit clusters in LAC have received considerable attention, namely: in Brazil, the mango and grape clusters of Petrolina Juazeiro (Guaipatín, 2004; Damiani, 1999 and 2001; Locke, 2001; Gomes, 2000), the apple cluster in Santa Catarina (Guaipatín, 2004; Gomes, 2000), and the melon cluster in Rio Grande do Norte (Gomes, 2000); in Chile, the raspberry cluster (Guaipatín, 2004); and in Mexico, the pineapple, avocado and lemon clusters (Guaipatín, 2004; Dussel, 2002; Merchand, 2005). Other clusters studied, though less thoroughly, are: the fruit cluster in the north of Minas Gerais, Brazil (Gonçalves, 2001); the Antioquia's horticultural cluster (CID, 2003) in Colombia; the Maule raspberry cluster in Chile (Katz and Sánchez-Douglas, 2004) and the fruit cluster in Argentina and Chile (Casaburi, 1999) Figure 4.

All the clusters analysed produce fresh and/or processed fruits for the domestic and the export markets.

4.3.1 Latin American fruit clusters: some figures

Some key characteristics of these clusters in terms of production, market orientation and size of firms are shown in Table 6. Large growers have a strong presence in the fruit clusters

Figure 4. Map of Latin American fruit clusters



Source: Author's elaboration.

studied, but medium and small producers have also managed to remain successful in business, accounting for 30 to 60 percent of total production.

Table 6. Quantitative description of fruit clusters in Latin America

Location	Product	Area planted (ha)	Share of national production (%) ^{a)}	Share of output that is exported (%) ^{b)}	Share of total exports (%) ^{c)}	Producer size (%) ^{d)}		
						Large	Medium	Small
Brazil, Rio Grande do N.	Melon	4 545	38	50	70	65	30	5
Brazil, Santa Catarina	Apple	13 046	51	7	96	65	25	10
Brazil, Petrolina Juazeiro	Mango	10 432	26	35	90		40	
Brazil, Petrolina Juazeiro	Grape	5 683	8	11	30		60	
Brazil, Minas Gerais	Tropical fruits							
Chile, Maule	Raspberry	8 330	80	80	-			78
Chile, Valparaíso	Avocado	12 000	70	-	-	73		
Mexico, Michoacán	Avocado	83 055	88	17	-	1.5	5	92.5
Mexico, Colima	Lemon		35	18	18			
Mexico, Veracruz	Pineapple	7 221	64	5	5			

Source: Brazil: Gomes, 2000. Mexico, lemon and pineapple: Guaipatín, 2004; avocado: Aguirre and Medina, 2006. Chile, raspberry: Katz and Sánchez-Douglas, 2004; Secretaría Regional Ministerial de Agricultura de la Región de Maule, 2005; Chile, avocado: Alfaro, 2006.

a) Refers to share in the total production of each crop in a given country.

b) Refers to share of total output in each case that is exported.

c) Refers to share of exports from each case in total country exports of that crop.

d) These data reflect the percentage of production of each crop that is produced by medium growers. The definition of "medium-size" grower varies in each case, depending on the financial, management, production and post-harvest requirements for cultivating each crop. For example, a grower cultivating 50 ha of grapes may be considered large, whereas a grower cultivating the same surface of melons may be considered small, because the requirements per hectare are much greater for grapes than for melons.

4.3.2 Evolution over time of the Latin American fruit clusters

The development of the Latin American fruit clusters has followed different paths:

- Some clusters were the result of centralized government planning, such as the mango and grape clusters in Petrolina Juazeiro.
- Other clusters were the consequence of the collaboration between pioneer entrepreneurs and the public sector, such as the apple cluster in Santa Catarina.
- In other cases, clusters were generated by the initiative of large entrepreneurs alone, as in the case of melon production in Rio Grande do Norte.

Today, fruit clusters in LAC are under a strong pressure to upgrade exerted by the tighter profit margins and the increasing demands from buyers. This is a consequence of various factors that are transforming the global market for fresh fruits, including the rise of supermarkets in the region that account for as much as 50–60 percent of national food retail, and the stringent food safety measures imposed by industrialized countries on food imports.

4.3.3 Factors contributing to the success of Latin American fruit clusters

The small and medium growers that populate the LAC fruit clusters have found different ways to meet market pressures. First, some growers have engaged in contractual arrangements with grower-exporters or with dedicated wholesalers who contract out for supermarkets. A good example of this is the case of about 2 000 smallholder raspberry producers (less than 2 ha) from the Maule and Bío-Bío regions in Chile who have established long-term supply agreements with larger firms that produce, pack/process and export raspberries (Katz and Sánchez-Douglas, 2004). Second, small- and medium-scale producers have established direct sourcing arrangements with small supermarkets or, to a lesser extent, participate in ethical production and marketing networks. And third, and more importantly, they have taken joint action to meet threats and challenges collectively.

Collective actions: There are abundant examples of how collective action has proven to be crucial to the development of fruit clusters in the region. For instance, the Brazilian Apple Producer Association (ABPM) located in Fraiburgo, Santa Catarina¹⁸, has fostered the development of a so-called apple integrated production system, has introduced a quality and grading system, and has contributed to the establishment of a public competitive grant programme to finance training and laboratory equipment for research on Brazilian fruit exports.

Another example from Brazil is the case of VALEXPORT, an association that represents the fruit and vegetable growers and exporters of Petrolina-Juazeiro. VALEXPORT has

18 ABPM defends the interests of apple growers and exporters from Rio Grande do Sul, Santa Catarina, Paraná and São Paulo. Its 35 members, including two provincial associations and four cooperatives, produce 85 percent of the apples sold in the domestic market and 95 percent of the apples exported.

greatly contributed to increasing the cluster export performance. The association has signed technical and trade agreements with entities, public and private enterprises, nationally and internationally related to the production, handling, shipping, warehouse services, trading, exports and promotion of vegetables and fruits. It has also been actively involved in organizing the cluster participation in fairs and expositions.

Chilealimentos (Asociación de Empresas de Alimentos de Chile, ex-FEPACH), a privately-owned association that includes all major agroprocessors and exporters of frozen and other processed fruits and vegetables, has played a pivotal role in mobilizing collective action in the Maule's raspberry cluster. Among other things, Chilealimentos has helped the raspberry cluster to comply with quality standards and to achieve economies of scale in export logistics and in the purchase of inputs. It has also been instrumental in supporting the international promotion of raspberries and in promoting collective action to defend the cluster's interests, for instance, against the accusation of dumping made by raspberry producers in the United States.

One case that deserves a special mention is the Michoacán avocado cluster, Mexico, where the Mexican Ministry of Agriculture has empowered producers organized in regional committees and local phytosanitary boards¹⁹ to implement and monitor their own phytosanitary policies and programmes. The fact that these boards composed mainly by small farmers are competent to issue phytosanitary certificates to export avocado, gives them control over the marketing of their produce. According to Aguirre and Medina (2006) this has been possible thanks to the high degree of organization of avocado producers and their willingness to comply with export quality and safety standards, and the support of the public authorities.

Institutional support to fruit clusters: The Brazilian cluster policy has favoured the participation of small- and medium-size fruit growers in the clusters, and has tried to ensure that they benefit from the cluster development and upgrading. This pro-small grower public support has taken many shapes and forms over the years. For instance the Government of Santa Catarina has provided extension services to smallholder producers of apples and other temperate fruits and has facilitated their access to credit, marketing, research and training. Gomes (2000) points out that the structure of Santa Catarina's agricultural research and extension system benefited particularly small and medium growers because it provided at least one extensionist for every 20 growers, and one of the two state's research experimental stations maintained very strong ties with small growers, while the other focused more on the needs of large growers.

In the Petrolina-Juazeiro mango and grape clusters, the San Francisco River Valley Development Agency (CODEVASF) – a public institution that was actually responsible for the creation of the cluster – allocated lots of irrigated land to smallholders with the idea of achieving a critical mass of small and medium growers to produce irrigated fruits, and supported the creation of a grower association.

In both of the previous examples, public-sector research agencies have explicitly included small growers in their research projects as a means of making the technology and research relevant to the small grower and to disseminate findings to small-scale producers.

¹⁹ Called "Comités Regionales and Juntas Locales de Sanidad Vegetal".

The consistency and continuity of public support varies from case to case, with the subsequent impact on effectiveness. The Santa Catarina apple cluster is an example of how a sustained public support is able to boost public-private collaboration and other factors determining cluster competitiveness and growth. In contrast, other clusters have received rather discontinuous public support. Katz and Sánchez-Douglas (2004) believe this is the case of the Maule raspberry cluster. During the 1980s and 1990s only isolated initiatives to support the cluster were undertaken by several public agencies, such as research (modified atmosphere packaging, molecular markers for varietal identification), technical assistance and technology transfer to producer groups, and credit lines to ensure compliance with international standards. It was not until 2003 that a concerted action to support the raspberry cluster finally emerged. A cluster association (Mesa Regional de Berries) bringing together several public-sector organizations was created to collectively address production and marketing issues hampering the development of the cluster.

Bearing in mind the need for concerted public support to ACs, Chile has launched a new tool called Integrated Territorial Programmes (ITP). This tool aims at aligning the actions of businesses and regional governments to develop projects that raise the productivity and competitiveness of a given productive sector as well as develop the productive potential of a given territory (Cox, 2008). Examples of these ITPs in the agricultural sector are:

- the “Frutas de Chile 2010” programme²⁰ that supports the development of the Maule fruit cluster (apples, kiwis and cherries);
- the Valparaiso ITP that aims at fostering the development of the avocado cluster;
- the O’Higgins ITP that supports the development of the fresh and processed fruit cluster (apples, table grapes and plums) in the O’Higgins region;
- the Coquimbo ITP (table grape, avocado and citrus fruits).

These ITPs have many goals in common, such as to: a) increase production areas; b) improve and develop qualified labour force; c) enhance public-private cooperation; d) ensure the compliance of quality and environmental standards; and e) improve research and technology transfer and dissemination.

4.4 THE SALMON CLUSTER IN CHILE

One of the most outstanding clusters in the region is the Chilean salmon industry, which has captured the attention of many authors, including Achurra (1995); Maggi (2002); Iizuka (2004); Montero (2004); IDB (2005b); Bañados and Alvial (2006); and Ulloa (2005).

²⁰ www.frutasdechile2010.cl

Table 7. Quantitative description of the Chilean salmon and trout cluster

Location	Product	Volume (1000 round tonnes) ^{a)}	Share of national production (%) ^{b)}	Value of exports (millions of US\$ FOB) ^{c)}	Number of firms		
					Producers and suppliers	Service providers	Input providers
X region (Región de los Lagos), Chile	Cultivated salmon & trout	628	87	2 207	70–80	350	150

Source: a) and c) *SalmonChile, 2007 for year 2006*; b) *Montero, 2004*.

4.4.1 Chilean salmon cluster: some figures

In little more than two decades, this cluster has achieved a leading position in the global salmon industry. Nowadays, Chile is competing with Norway for the number-one position in production of cultivated salmon and trout, with a global market share of 38.2 and 39.7 percent respectively in 2006²¹. Chilean exports of these products have experienced a giant leap from US\$668 million in 1997 to US\$2 207 million in 2006, more than a threefold increase in 10 years.

This cluster first developed in the lakes of the X region (Los Lagos), which in 2005 concentrated 87 percent of the national salmon industry, and it is currently expanding southwards to the XI region (Aisén). See Table 7 for more information.

4.4.2 Chilean salmon clusters' evolution over time

The Chilean salmon cluster is the rare case of an industry that has gone from zero to second worldwide producer in just a few years. According to ECLAC, all the phases of the productive process and related services were developed in the arc of 10 years. Bañados and Alvial (2006) mention various phases of development, starting with a testing and learning phase (1960–1973), a formation and maturation phase (1974–1995), an internalization phase (1996–2002) and the current consolidation phase (2002–present), as shown in Table 8.

4.4.3 The upgrading of the Chilean salmon clusters

The Chilean salmon cluster benefited from the beginning from steady government support and a high degree of associativity. This latter was crucial to defend the cluster against international accusations of illegal dumping.

21 www.salmonchile.cl

Table 8. Evolution of the Chilean salmon cluster

Life cycle	Initial learning	Formation and maturation	Internalization	Consolidation
Years	1960–1973	1974–1995	1996–2002	2002–present
Production (round tonnes)	900	1 350–143 000	150 000–300 000	487 900
Milestones	Technology adaptation and transfer	Scale-up to a commercial level	Asian crisis; dumping accusations; merging and vertical integration; establishment of forward linkages; salmon's cycle control; new rules and regulations	Integrated management system for producers and suppliers (SIGES); Industry monitoring systems; Clean production agreement (APL); Integrated Territorial Programme (PTI); Salmon Cluster
Main challenge	Initial push and survival	Associativity and specialization; Creation of a technical institution, INTESAL	Market and product penetration and diversification; Public-private cooperation;	Increase value-adding in the supply chain; Establishment of alliances with key suppliers;
Business competitiveness	Production	Quality standardization; Backward linkages; R&D investments	Efficiency: cost reduction	Technological innovation and R&D in breeding, logistics and vaccine development;
Human capital	Entrepreneurs and non-skilled workers	Industrial engineers, managers and semi-skilled workers	System engineers, skilled workers, technicians, researchers and experts;	Process and labour-competency certification specialists
Social capital	International public-private cooperation	Associativity among producers	Productive system connected to the global supply and marketing chain	Local public-private cooperation. Social capital strengthening

Source: Bañados and Alvial, 2006.

Emergence of collective actions: Very early in its development the Chilean salmon industry tried to promote associative approaches in order to face upstream and downstream challenges. No wonder, thus, that today there is a plethora of associations in the cluster. The Chilean

salmon farming association (SalmonChile) that groups the main producers and suppliers of the cluster and its technological branch of the association, the “Instituto Tecnológico del Salmón” (INTESAL) are the most influential associations, but there are others in diverse fields of specialization such as: the Ship-owners and Maritime Services, the Association of Diving Companies, the Association of Veterinarian Laboratories and the Nets Companies Association.

Bañados and Alvial (2006) suggest that the multiplication of associative efforts in the cluster may have its origin in the physical proximity among the cluster agents and the high degree of vertical integration that characterized pioneer firms, where many technicians and professionals were trained and then left to set up their own service-provision companies.

Among the most outstanding collective initiatives carried out by cluster agents are:

- The development of a pioneer quality seal to face stringent quality market requirements.
- The launching of a phytoplankton vigilance programme.
- The monitoring of a series of environment, market and regulation variables.
- The establishment of geographic and good management practices tools.
- The development of a labour-competency certification system for various subsectors of the salmon cluster by SalmonChile, INTESAL and the Chile Califica programme²².
- The implementation of a “Clean Production Agreement” for the salmon industry (APL) and a Vigilance and Management Model that serves the principal producers and suppliers in the industry, both coordinated by SalmonChile and INTESAL.

Institutional support to the Chilean salmon cluster: The Chilean Government has played an important role as a facilitator and catalytic element promoting joint actions and building trust among the cluster agents. Along these lines, various public agencies have collaborated among each other and with INTESAL to solve key issues for the upgrading of the salmon cluster such as: registration procedures concerning vaccines; the use of the coastal zones; enforcement of regulations; and the mitigation of environmental impacts.

Recently in order to strengthen the-above mentioned associative efforts, a significant cluster reinforcement programme, an ITP for the salmon cluster, has been established under the INTESAL umbrella. This programme actively promotes R&D and innovation initiatives by emphasizing producer-supplier cooperation. This programme has three action lines:

- The creation of an innovation and knowledge platform to coordinate public and private efforts on areas such as fish health, genetics, animal feeding, environment and clean production, development of new technologies, production management, supplier management and certification. These initiatives represent so far a total

²² A permanent education and training programme implemented by the Ministries of Economy, Education and Labour and Social Security of Chile.

investment of more than US\$14 million, with contributions from both the public (48 percent) and the private (52 percent) sectors.

- The establishment of public-private coordination *fora* dealing with four themes: enhanced sea transport; improved animal health; creation of a registry for fishing nets; and the expansion of the cluster to the XI region.
- The promotion of alliances and networks to coordinate initiatives linked to the development of suppliers. Such initiatives include the creation of a registry of suppliers, the development of a training programme on business management for suppliers, and an integrated management system for producers and suppliers (SIGES-provededores).

With the implementation of this ITP, the salmon cluster has achieved the highest ratio ever of investment in R&D to total industry sales.

Another important initiative in support of the salmon cluster is the Directive Skills Diploma under the Universidad de Chile and SalmonChile that seeks to build qualified human resources by opening new strategic avenues for the industry.

4.5 CUT-FLOWER CLUSTERS

4.5.1 Cut-flower clusters: some figures

Ecuador and Colombia have relatively cheap labour, fertile land available and optimal sunlight for flower cultivation because of their privileged location straddling the equator. National entrepreneurs and multinational corporations decided to avail of such comparative advantages and developed a whole new flower industry in the late 1960s in Colombia and 20 years later in Ecuador.

The area cultivated in Colombia with fresh cut flowers for export nearly reaches 7 300 ha, of which 79 percent are located in the savannah of Bogotá. The Ecuadorian cut-flower cluster is concentrated in the northcentral highlands, especially in the neighbouring provinces of Pichincha (66 percent of total surface) and Cotopaxi (12, 1 percent). Nowadays, Colombia (16 percent) and Ecuador (6 percent) are respectively the second and third world exporters

Table 9. Latin American flower clusters: some figures

Country	Location	Cultivated surface (ha)	No. of firms		Jobs	
			Domestic	Export-oriented	Direct	Indirect
Colombia	Bogotá (79%)*	7 266			182 000	83 500
Ecuador	Pichincha (70%)**	2 250	1 398	525	76 800	38 500

Source: Asocolflores, 2005, 2006; Expoflores, 2007; * percent of national cultivated surface; ** percent of national production, (US\$).

Table 10. Latin American flower clusters' growth

Cut flower exports from	Ecuador			Colombia		
	1996	2006	Δ (%)	1996	2006	Δ (%)
Hectares	1 485	2 250	52	4 500	7 266	61
Exports (MT)	65 225	104 164	60		231 943	n.a.
Exports ('000 US\$ FOB)	104 650	435 842	316	99 083	966 000	875

Source: *Expoflores, 2007; Asocolflores, 2007.*

of cut flowers²³ (Hornberger *et al.*, 2007), after having experienced a remarkable surge in their export revenues: tenfold increase in Colombia and fourfold in Ecuador from 1996 to 2006 (Table 10).

4.5.2 Cut-flower clusters' evolution over time

The Colombian flower cluster has known periods of growth and retraction since its beginnings in the 1960s:

- 1962–1974. Flower growing started in Colombia in the early 1960s driven by just a few pioneers. In the 1970s growth rates averaged 75 percent fuelled by some government incentives for non-traditional exports, namely: (a) export credits provided by Proexpo; (b) duty exemptions for imports of raw materials and other inputs used in creating goods for export; (c) export bonds (Export Tax Credits) that exporters could use to pay taxes or sell them in the financial market; and (d) a devaluation policy that aided the local currency against the dollar. (Arbeláez *et al.*, 2007).
- 1975–1983: In 1974 export benefits were discontinued because of the dumping claims made by the United States. As a result, from 1975 until 1983, exports increased at lower rates.
- 1984–1989: In 1984 the Colombian Government established again export incentives (e.g. cuts in import restrictions and currency devaluation), which resulted in a surge of flower exports (20 percent of average increase in the 1980s).
- 1990–present: This period is marked by the establishment of two preferential trade agreements, both enacted in 1991, which provided duty-free access to the markets of the United States (Andean Trade Preference Act) and the European Union (Andean Generalized System of Preferences). During the 1990s flower exports continued to increase with an average growth of 10 percent, with fluctuations in response to real exchange rate movements.

23 The US\$5.7 billion cut flowers world market is dominated by the Netherlands, which accounted for 54 percent of exports in 2005, followed by Colombia (16 percent), Ecuador (6 percent) and Kenya (6 percent).

Ecuador is a relatively latecomer in the flower industry: Its first modern flower growing initiative dates back from 1982. Two years later, flower growers decided to come together and organize themselves, forming the Association of Flower Producers and Exporters of Ecuador (EXPOFLORES, www.expoflores.com). Since 1984 to our days, the flower cluster has gone through three distinctive periods:

- The cluster formation period (1984–90) when the numbers of firms grew to 20 and critical transportation issues were solved.
- The massive growth period (1990–98) that ended with more than 150 firms enduring a price war and cost increases in land and skilled labour force.
- The restructuring period (1998–present) with several firms going out of business, while the remaining ones started to collaborate among each other and with the public sector to develop joint initiatives.

4.5.3 The upgrading of cut-flower clusters

Emergence of collective actions: The Colombian flower cluster was favoured by export promotion policies, but it owes much of its development to the collective action promoted by Asocolflores: the Colombian growers and exporters associations created in 1973 (Asociación Colombiana de Exportadores de Flores, www.asocolflores.org). Asocolflores groups 215 firms, 308 farms, representing 66 percent of the total cultivated area and 75 percent of Colombian floral exports (Asocolflores, Fact Sheet 2005).

Asocolflores has efficiently promoted coordination and cooperation among cluster participants on key issues of common interest, such as scientific research, marketing, transportation, environmental sustainability and workers' welfare. For instance, the association has worked to increase the cluster bargain power with suppliers; negotiate air freight fees; provide advice to the government for the negotiation of trade agreements; represent the cluster in international disputes; and to improve logistics and distribution in foreign markets. Other key interventions of Asocolflores have been:

- The creation in 1996 of a voluntary socio-environment standard called “Florverde” to ensure continuous improvement of members companies, through a dynamic system that measures social and environment performance. In June 2008 almost half the surface of fresh cut flowers was cultivated following this standard, which covers worker health, social issues, pesticide/chemical usage and environmental conservation, and is benchmarked to Global Partnership for Good Agricultural Practices (GLOBALGAP).
- The creation of an association of floriculture experts called ACOPAFLOR in 1992.
- The undertaking of joint marketing activities, including: a) the organization of the flower show Proflora (www.proflora.org.co), with nearly 300 exhibitors, and more than 4 000 visitors; b) the participation in international fairs with a stand called “Colombia, Land of Flowers”; c) joint marketing campaigns in different countries (e.g. “Viva”

Campaign in the United Kingdom); and d) the creation of the Colombian Flower Council to promote the consumption of Colombian flowers in the United States.

- The creation of the Colombian Center for Innovation in Floriculture (Ceniflores, www.ceniflores.org) in 2004, to support research, promote technological development and enhance the competitiveness of Colombian floriculture. This centre looks into issues such as promoting organic production, creating a weather monitoring system in the Bogotá savannah, promoting native flower species, innovative practices in soil and water management.

As described above, Ecuador has a similar organization that promotes the cluster collective action, which is called EXPOFLORES and groups flower growers, exporters and plant dissemination companies. It develops training and technical assistance programmes, enters into agreement with public and private institutions, compiles and disseminates statistics and information on markets and social and environmental issues. The first collective actions of the Ecuadorian flower cluster aimed at solving basic common issues, such as problems with airline shipments²⁴, input provision (e.g. seeds, fertilizers, cardboard boxes²⁵), and foreign currency remittances by the Central Bank. EXPOFLORES also provided advice for the negotiation of trade agreements above mentioned.

Institutional support: For many the most significant role that the public sector has played in support of the Colombian and Ecuadorian flower clusters was the negotiation and maintenance of preferential market access. As mentioned above, the export promotion policies adopted by the Colombian Government played as well an important role in the development of the flower cluster.

More recent public interventions are targeted at improving the competitiveness of the flower cluster by enhancing infrastructure; upgrading regulation and ensuring its compliance; co-investing in R&D, among other initiatives, all of them carried out in close collaboration with the private sector. Colombia has institutionalized this public-private sector cooperation through the signature of a Competitiveness Agreement that comprises all public and private bodies related to the flower cluster. For the first time, the Agreement includes a set of principles intended to guide the relationships between the members of the cluster and encourage joint activities to achieve the objectives of the Agreement. The activities are grouped into four main strategic areas: a) air transport and logistics; b) R&D; c) environmental standards; and d) territorial planning. In particular, research on native species has been identified as essential to overcome the dependency on the global flower industry: Nowadays, half of all the operational inputs required are imported, and the cost of seeds, bulbs and cuttings (mostly royalties) can represent up to 85 percent of the total production cost (Alvarado, 2002).

24 EXPOFLORES negotiated with the Government the provision of the required number of flights, crucial to assure exports, through the State airline, Ecuatoriana de Aviación.

25 Cardboard companies were owned by banana exporters and supplied the flower cluster with boxes only after having met the demand from banana packers.

4.6 COFFEE CLUSTER IN NICARAGUA

4.6.1 Some figures

During the first half of the twentieth century, coffee was Nicaragua's principle crop. It was hit especially hard by the civil war in the 1970s and the policies of the Sandinista Government. In 1990 coffee production was only 27 600 tonnes/year. This is a dramatic reduction compared to the 73 600 tonnes produced in 1978.

Subsequent policies to promote the cluster have been undermined by banking and financial crises; hurricanes (Hurricane Mitch destroyed 15 percent of the country's coffee plantations in 1998); and sharp declines in world market prices. On a positive note, the country experienced the highest yield increase of all Central American coffee producing countries during 1995–2001.

Production is divided between: large, productive farms that are responsible for 1 percent of workers but 36 percent of production; and small farms that account for most of the work force. In the value chain, power is concentrated among the top five buyers, who purchase 45 percent of all export coffee. The value chain itself is relatively complex. Most goes from producers to intermediaries (responsible for drying, milling, etc.) to exporters, traders and foreign exporters. Less than 2 percent goes directly from producers to foreign importers.

4.6.2 The evolution of the coffee cluster over time

In some respects, the coffee cluster still remains relatively underdeveloped. This can be seen in terms of links to related industries. For instance, within the agrochemical product market, the coffee industry is served only by a very few large-scale importers. As a result, fertilizer costs are high. Additionally, within the cluster there are very few firms towards the more value-added end of the value chain and a large portion of the roasting is carried out abroad. Meanwhile, there is little coordination between producers and buyers in upgrading coffee quality. Small-scale farmers also lack links between them.

This coffee cluster has evolved to a limited extent though in recent years. This can be seen particularly in government attempts to promote the cluster.

Institutional support to the cluster: Government support: In 2002 the country adopted a new economic strategy explicitly based upon clusters. This strategy included a Presidential Coffee Commission, as a public-private collaboration to develop the coffee cluster. Although initially this scheme produced only modest proposals, efforts soon intensified. The exact policy was detailed in a 2004 publication (Nicaragua, 2004). Various methods are to be used to position the cluster towards the higher value end of the market. Included in this drive was the creation of the Specialty Coffee Association of Nicaragua. The latter has helped define grades for coffee thus aiding exports to higher value markets. In addition, government agencies work with the private sector to coordinate R&D, market information and technical education. It is too soon to judge the success of these policies.

Other institutions: A number of trade associations have emerged and developed over time. However, there still remain large gaps in terms of consolidating small producers, raising environmental standards, and equalizing the power and knowledge imbalances between producers and intermediaries.

5. Agro-based clusters in Asia²⁶

5.1 INTRODUCTION TO CLUSTERS IN ASIA

Unsurprisingly for such a large and diverse continent, there is considerable variety in ACs in Asia. While ACs are almost non-existent in countries such as Uzbekistan and Tajikistan (Ji-Hyeon *et al.*, 2007), they play a central role in the development of agriculture and agro-based industry in other countries (Malaysia, 2006). They differ in the extent of their dynamism; some are largely “dormant” or “embryonic” while others are highly dynamic (Sandee, 1998). Similarly, some owe much of their growth to explicit state initiatives, some to other institutions such as development agencies and universities, while others have grown in a more bottom-up fashion. The case studies in this chapter highlight these and other areas of difference.

There are, however, some elements of commonality to be found when looking at ACs in Asia. One of these elements is the context within which studies of these clusters have been carried out. The majority of studies of ACs do not study them as distinct phenomena but have seen them as examples of industrial clusters more generally.

This treatment of ACs as no different from other industrial clusters partly reflects the context within which much policy action in this area occurs. For example, in Indonesia, there is no explicit government policy for the promotion of agro-industrial clusters. Instead, promotion of ACs occurs through programmes promoting SME clusters more generally. Likewise, most of the literature on Indonesian ACs reviewing the success of these programmes makes little distinction between ACs and industrial clusters (for example, Sandee, 1998 and Tambunan, 2005); similarly the lack of differentiation is apparent in much of the work undertaken by intergovernmental organizations. UNIDO’s work in promoting the food-processing cluster of Pune in India, for example, is undertaken as part of a more general programme to develop industrial clusters in India. Its subsequent research publications (UNIDO 2000, 2001) reflect this treatment of ACs as just another example of industrial clustering. In this respect, the Indian and Thai examples highlighted in this chapter represent exceptions to, rather than examples of, the general trend.

²⁶ This chapter is based on a contribution of Harry Hewlett, Volunteer, Agricultural Management, Marketing and Finance Service, FAO Rural Infrastructure and Agro-industries Division.

5.2 GAP CLUSTER IN THAILAND

5.2.1 The Western GAP Cluster and its context: some figures

The first Thai agricultural region to take an active cluster approach to GAP was an area made up of four provinces near to Kasetsart University in the west of the country (Figure 5). This area is mainly characterized by vegetable production and has a total vegetable area of 35 200 ha (Korpraditskul, 2005). Little data exists on how the total production of this area has changed over time.

The development of the cluster needs to be seen in relation to the changing fate of Thai fruits and vegetables in the export market. While exports from the sector's competitors in China, Viet Nam and the Philippines have increased, Thailand's exports of fresh fruits and vegetables to the European Union market have fallen from US\$9.5 million in 2000 to just US\$3.6 million in 2005 (GTZ, 2008).

5.2.2 The emergence of collective action

The roots of the coordinated cluster action can be found in concerns over the future of Thai agricultural and agro-industrial exports. Given a lack of stringent supervision controlling agricultural production, there was concern that Thai agricultural exports were suffering because of an apparent failure in relation to international health standards. In 2002, the agricultural department of Kasetsart University commenced initiatives in the regions around its campus in order to tackle this issue. An additional concern was to promote the spread of new technology (Korpraditskul, 2005). Overall, it appears that the university has been key in sparking the collective action within the cluster.

Figure 5. The Western GAP Cluster of Thailand



The first cluster meeting occurred in August 2002 in collaboration with the Kenan Institute of Asia. Four exporters, numerous collectors, 90 farmers and 4 farmer group leaders were in attendance. Subsequent monthly meetings were held to discuss issues affecting the fresh vegetable supply chain. A key development occurred in 2004 when the Ministry of Agriculture launched the Food Safety Year, publishing GAP for a range of commodities. This initiative became a key driver for the cluster to develop its own system of quality assurance. It was thought that it was necessary to comply not just with the Ministry of Agriculture's GAP but also EurepGAP (now GLOBALGAP), as the latter would further facilitate access to markets. The farmers were brought together by the cluster so that there could be common learning about their normal practices and the constraints they faced in trying to meet the GAP of the Ministry of Agriculture and EurepGAP. A common cluster GAP was produced in the Thai language within three months. The GAP itself was made as accessible to the relevant parties as possible. Not only was it in Thai, but any part that was not applicable to the normal practices of each relevant actor was deleted and the whole GAP was made simple to understand. Acting as a cluster aided the whole process, allowing exchange of information between the different actors (farmers, exporters, distributors, research institutes, etc.) (Korpraditskul, 2005).

While the production of a common GAP was a key step in raising the quality levels of the cluster's produce, other action was clearly necessary to ensure that it was understood and kept to. The cluster has a GAP assessment and checking system that includes farm advisors, government officials, farm leaders, trained internal auditors and various other cluster stakeholders. Recent research on small farmers' implementation of GAP revealed a general lack of understanding of the system (Korpraditskul, 2005). For this reason, training courses were developed, relevant to each area. The cluster has taken on many other related tasks. It is now committed, *inter alia*, to providing training to all parts of the cluster and promoting public-private dialogue. It also launched a symbol for products that achieve the GAP requirements.

Overall, the cluster's work appears to have been largely successful in promoting GAP in the region. Indeed, the approach taken in this cluster is being extended to areas in the rest of Thailand. This extension (called ThaiGAP) is being driven by a PPP. The main actors are the Thai Chamber of Commerce and the agricultural department of Kasetsart University. It aims to build on the Western GAP cluster's work in improving agricultural practice, and also raise the profile of Thai agricultural exports internationally (Chuenprayoth, 2007). Importantly, despite being a national initiative, this new action still has a cluster-based approach at its core. The scheme focuses upon acting in eight key clusters around the country²⁷. Similar to the Western GAP cluster, it hopes to use the dynamics of collective action by supply chain members and support institutions to promote SMEs in these areas.

5.2.3 The future of the cluster

While the Western GAP cluster has had much success in raising the quality and health standards of the cluster's produce, there are questions over its sustainability. In particular these questions arise because of the necessity of outside sources of funding for many of

the initiatives. Although the act of bringing together different cluster members is relatively costless, initiatives such as providing training are not. For example, when these initiatives were introduced, they were dependent upon a Provincial Project grant. The nationwide ThaiGAP initiative has similar limitations. One of the first processes that its committee highlights as important is to ask for budget support from the Office of Small and Medium Enterprises Promotion (part of the Ministry of Industry) (Chuenprayoth, 2007), thus indicating the inability for these clusters to act without external support. Additionally, although there is much sharing of knowledge between various members of the cluster, there is also a high dependence on the agricultural department of Kasetsart University and bodies external to the cluster for knowledge inputs.

However, these weaknesses of the cluster initiatives do not necessarily undermine the cluster projects. This is especially true for funding in the short term. For instance, the ThaiGAP initiative now has funding from the Office of Small and Medium Enterprises Promotion, the Thai Chamber of Commerce and the Thai Fruit and Vegetable Producers' Association (GTZ, 2008). Moreover, as the cluster develops, one might argue that the dependence on external actors may decline as the capabilities of the cluster members are increased.

The cluster project overlaps with some donor backed initiatives. For example, GTZ has an active programme in Thailand aiming to enhance the competitiveness of SMEs in certain fruit and vegetable subsectors through the promotion of technological advisory services. Through cooperation with institutions such as the Thai Chamber of Commerce and the National Technical Working Group, GTZ has also explicitly aided and supported the development of ThaiGAP (GTZ, 2008).

5.3 ROOT CROP PROCESSING CLUSTER IN DONG LIEU, VIET NAM

Dong Lieu is a peri-urban area around 30 km from Hanoi. Two-thirds of its 2 193 households are engaged in some part of the root crop processing value chain (Peters *et al.*, 2002). It is a useful example of how clusters can contribute to the success of a product and the diffusion of innovation. It is also of interest as the cluster has developed largely endogenously.

5.3.1 The Dong Lieu root crop processing cluster: some figures

The main activity undertaken in the cluster is starch processing from cassava and canna roots. The increase in the production of these products can be taken as an indication of the dynamism of the cluster. Cassava starch processing started in the region in 1978 with an average production of 0.05 tonnes/household/year. Today it has grown to 3 tonnes/household/year. When canna starch processing commenced in 1960, the average production/household/year was 0.04 tonnes. Now it is 9 tonnes/household/year (Peters *et al.*, 2002.)

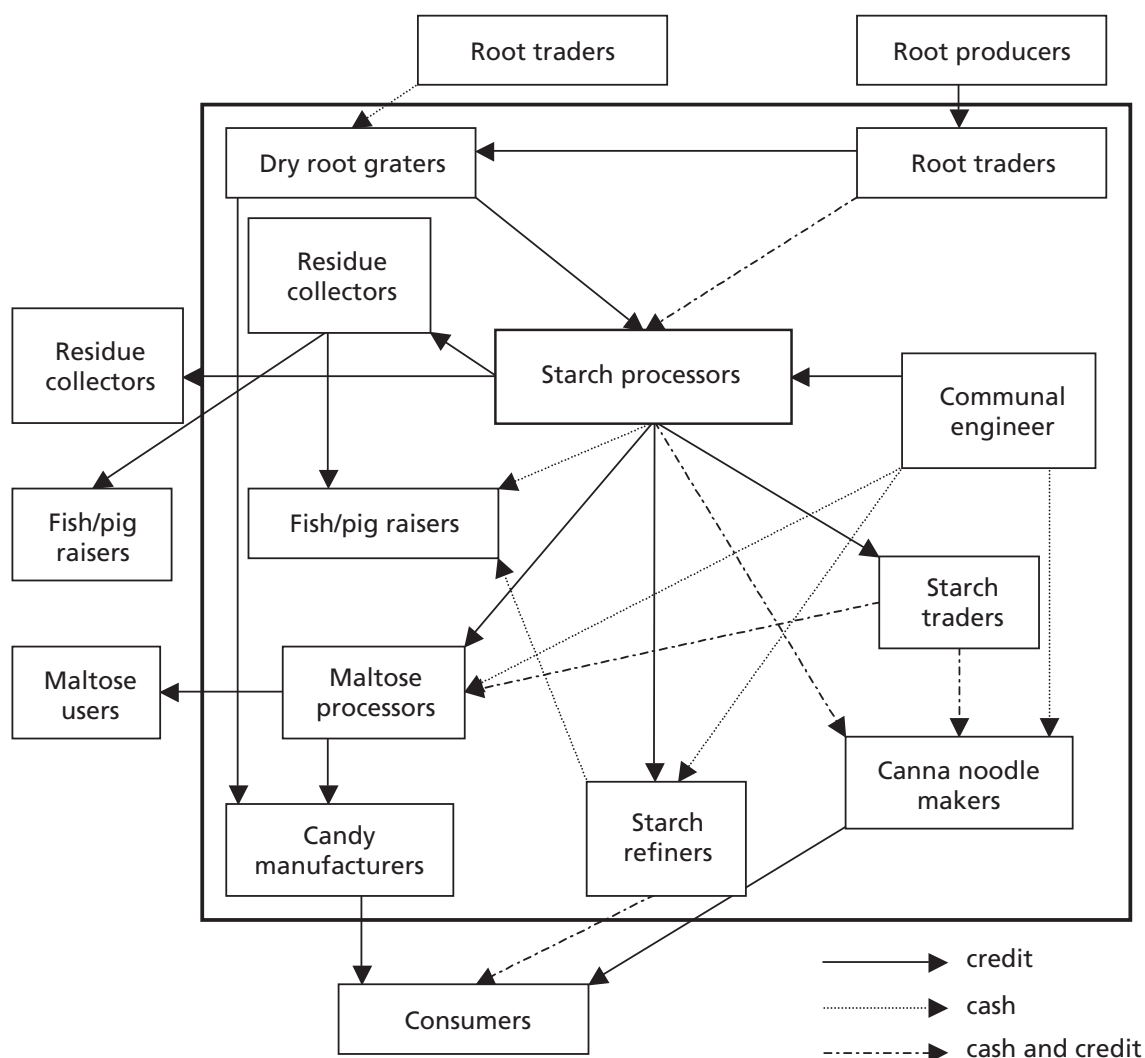
The success of the cluster can be seen in other ways too. For example, the cluster has now moved into new markets (such as textiles and pharmaceuticals) innovating new products (such as refined dry starch) and technologies in order to do so.

5.3.2 The structure of the cluster

The raw materials, fresh cassava and canna roots, are sold to individual household processors at a daily market. These households extract the starch through a process of grating, filtering and sedimentation. These processes lead to the production of wet starch (30–35 percent moisture content). In some cases, other households purchase this wet starch and refine and dry it. This produces a second product, refined dry starch, of greater value.

The households mentioned above form the core of the cluster, but there exist other important actors whose presence is dependent on the clustering of the firms. A local equipment manufacture and repair industry has grown up to serve the increasing demand of the cluster. There are those who organize the sale of starch to markets further away but of higher value.

Figure 6. Map of Latin American fruit clusters



Source: Author's elaboration.

Other households use some of the wet cassava starch in the manufacture of maltose, which in turn is used by local candy producers or (the majority) exported. The manufacture of maltose uses rice seedlings, produced within the cluster by certain households. Other activities within the cluster include the production of noodles and the collection of the residue from the starch processing process in order to use it for pig raising both inside and outside of the cluster. There is also some fish raising. All these spin-off enterprises are a product of the clustering of the core starch processing enterprises. The structure of the cluster itself can be seen in Figure 6.

5.3.3 The upgrading of the cluster

The links between the various members of the Dong Lieu root crop industry have been crucial to its success, thus further demonstrating the importance of clustering. The importance of these links can be demonstrated by looking at the diffusion of new technology throughout the cluster's households. These new technologies have driven the dramatic increase in production, and include the introduction of mechanical filtration equipment, root washers, water filters and the tiling of their tank walls with ceramic tiles. That these technologies arrived and spread rapidly through the cluster is primarily because of the links between the producers and the local engineers. Through these links local workshops were able to develop, manufacture and market equipment that was appropriate to the needs of the cluster. Meanwhile, the links between the households and the engineers also provided a quick way for the household enterprises to become aware of the new innovations. In addition, links between each household enterprise further accelerated the diffusion of new technology. Of the 48 households surveyed by Peters *et al.* (2002), 39 said that they discussed new technologies with their neighbours, indicating a considerable flow of information around the community.

5.3.4 Limitations of the cluster

While the clustering of the root crop processing has been beneficial, particularly as it has supported the growth of related industries and as it has allowed the rapid diffusion of innovation, the cluster does face some limitations. In particular, the clustering of the enterprises also means a clustering of their waste. Waste water and the root crop residues that cannot be used as feed are both major pollutants, and the contamination of local rivers and streams is an issue. This problem rebounds on the producers because they depend on the availability of clean water, and there is also a major public health issue. Technical solutions, such as communal treatment facilities, are proposed to tackle this problem. A second limitation of the cluster concerns space. A lack of space is already limiting the growth of some enterprises, thus hindering the dynamism of the area. Clustering may thus have been advantageous to the development of the root crop processing industry, but it is not without problems.

5.4 GRAPE CLUSTER IN MAHARASHTRA, INDIA

Although one of the largest producers of fruit and vegetables in the world, India has had little success in the export of these products. Despite being the world's third biggest producer of fruits and the second largest producer of vegetables, India's share of world horticultural trade was just 2.3 percent in 2004 (Roy and Thorat, 2008). One of the major factors limiting the growth of its agro-export industries, particularly given the reduction of many trade barriers, is the inability of its smallholder dominated production systems to meet the food safety requirements of export markets. In addition, there is little knowledge among smallholders about the feasibility of producing for exports and the necessary processes for doing so. The case study of the Maharashtra grape cluster is, however, a success story in highlighting how smallholders can overcome these constraints.

5.4.1 The Maharashtra grape cluster: some figures

Although traditionally grape production in India has largely been for the domestic market in table grapes, its export sector has been growing rapidly. In 1971, Indian grapes made up only 0.1 percent of global grape exports in terms of both quantity and value. By 2005 it had rapidly increased its contribution, accounting for 1.5 percent of the quantity and 1.2 percent of the value of global grape exports (FAOSTAT). Maharashtra State has played a key and increasingly central role within the Indian grape sector. In the 1987/88 season the state produced 19.6 percent of India's total grape production, a figure that grew to 75 percent in 2002 (Naik, 2006). It also dominates the export market. In 2005, the state's largest grape production area, Nasik, accounted for 80 percent of Indian grape exports (FAO, 2008).

5.4.2 The evolution of the grape cluster

In 1961 the Maharashtra State Grape Growers' Association (MRDBS) was formed by a group of 25 grape producers from across the state. The aim of this association was to improve cultivation practices. By the 1970s the association was seeking technical advice from scientists (both from India and abroad). This advice was of a highly practical nature, with a heavy involvement of the farmers themselves and field research (Hall *et al.*, 2001). A good example of the improvements this research produced is the introduction of gibberellic acid to the cultivation process. This began when researchers discovered that it could increase yields substantially. Because the acid was not available locally, the association facilitated its importation by getting the import duty reduced and supplying the chemical to members at cost (Naik, 2006).

The improved cultivation practices helped to raise production levels. However, by 1985 the domestic market was oversupplied and prices for grapes had declined. In response, the formation of cooperatives was encouraged by MRDBS as a way of assisting the marketing of the grapes (Hall *et al.*, 2001). In addition, producers and traders began to investigate other markets. These included domestic ones such as Ahmedabad, Delhi and Kolkata. However, transport bottlenecks and middlemen in the terminal markets reduced the profitability of these domestic markets (Naik, 2006). Markets in the Near East and Europe were also

investigated. Research into these markets was done through a variety of methods, from an individual farmer experimenting by exporting a few cartons to tours and delegations sponsored by the state and/or MRDBS (Naik, 2006). These investigations highlighted the presence of a market. At the same time, developments at the national level aided the Maharashtra grape cluster. The central government acted to encourage the development of infrastructure and established the National Horticulture Board (NHB) and the Agricultural and Processed Food Products Export Development Authority (APEDA).

By 1991 it had become apparent that there was an export market for Indian grapes, but also it became clear that action needed to be taken to improve the quality of the grapes as well as building and upgrading the value chains. In order to facilitate these tasks, Mahagrapes was formed. It represents a public-private partnership (PPP), being owned and governed by its members (grape cooperatives) but with considerable public support in its set-up. For example, the state marketing board paid the salaries of the governing body for the first three years and provided for consultancy services, while the National Cooperative Development Corporation (NCDC) and the state government provided loans (Roy and Thorat, 2008).

5.4.3 Factors contributing to the success of Maharashtra grape cluster

Through various bodies such as MRDBS and Mahagrapes, the grape producers themselves have been crucial to the cluster's success. However, only concentrating on producers (and the institutions of which they are members) risks suggesting that the success of the cluster has simply been because of the producers acting in a collective fashion. By highlighting the role of different actors in the supply chain, this section hopes to highlight how success of the Maharashtra grape cluster has been driven by the interaction between all the different members of the cluster, thus highlighting the benefits of clustering.

Grape producers and their associations: The actions of some individual farmers have been important to the growth of the cluster. For example, in 1986 a single farmer undertook an experimental export of a few cartons of grapes to the United Kingdom. The relative success of this experiment was one of the factors that encouraged others to explore this market (Naik, 2006). There are also some independent producers who have had success in the export market. However, it is when the producers act in a coordinated way, especially through various institutions set up to facilitate these actions, that the success of the cluster is really driven.

As the discussion of the evolution of the cluster highlights, MRDBS has been crucial to the development of the cluster. By grouping the producers together, it has allowed them to do three things. First, it has allowed them to benefit from economies of scale when importing specialized inputs, such as gibberellic acid, thus making it more economical to produce higher quality grapes. Second, it has facilitated the investigation of new markets. Such investigations are difficult and expensive for individual farmers to undertake, but MRDBS has aided this exploration, for example, through sponsored tours. It should be noted that the state government and national agencies such as APEDA have also been actively helping farmers in this market research. Finally, through its own research and coordination with other research institutions, MRDBS has been able to supply actors with the Maharashtra cluster with important information relevant to various stages of the value chain.

In 1991 the activities of MRDBS were supplemented by the formation of Mahagrapes. The specific mandate of Mahagrapes is to locate internationally acceptable quality grapes from growers; identify lucrative foreign markets; and to access and develop pre-cooling and storage facilities using imported technology (Hall *et al.*, 2001). Mahagrapes undertook a number of activities that have helped to upgrade the Maharashtra grape cluster. As soon as it was set up it used loans (mostly from the NCDC and state government) to build pre-cooling and cold storage facilities for each cooperative (Naik, 2006). These are vital for the export of the grapes and previously were almost completely unavailable. Additionally by marketing all the grapes under one brand name, Mahagrapes has helped to establish an international reputation for the produce (FAO, 2008).

The most important activities undertaken by Mahagrapes are in relation to the creation of a knowledge base and in aiding the implementation and application of new knowledge. One of the biggest barriers to Indian exports to Europe is voluntary standards such as GLOBALGAP (Roy and Thorat, 2008). Especially for smallholders, acquiring information on the complex and often changing standards involves high-fixed costs. Mahagrapes helps to overcome this information barrier by finding the information and disseminating it free of cost to its member farmers. It continually updates lists of pesticides and fertilizers that are approved or banned by the standards and distributes these to farmers in a yearly handbook. Through workshops and field demonstrations, farmers and grape handlers/sorters are informed about the latest methods. Mahagrapes also helps farmers in the implementation and application of this new knowledge. It provides materials, such as specially imported packaging materials that comply with international norms. It purchases and produces inputs, such as biofertilizers in bulk so as to help producers economically meet GLOBALGAP requirements. Meanwhile, the grape plant is regularly monitored by farmers themselves but with organized help from scientists from the National Research Centre in Pune. In addition, the whole GLOBALGAP certification process was made cheaper when Mahagrapes managed to provide entire cooperatives with certification (previously each farmer would pay for certification). In all these ways, the collective action facilitated via Mahagrapes has enabled grape producers in Maharashtra to overcome the constraints to the export market (Roy and Thorat, 2008).

Research institutions: As part of its efforts to improve the practices of its members, MRDBS established contact with agricultural universities and other Indian Council of Agricultural Research (ICAR) centres. These contacts have not only provided the Maharashtra grape sector with knowledge already in existence, but has also helped to promote research that is relevant to the local conditions. The Indian Institute of Horticulture Research, through its fruit research station in Pune (Maharashtra's second largest city), is a good example of this process. It has used field trials to adapt to local conditions knowledge about the production of export-quality grapes that was available from elsewhere (Naik, 2006). Other ICAR institutes and the state agricultural university have also developed locally relevant pre-harvest, harvest and post-harvest technologies. The degree of interaction between these research institutions and the grape producers is best exemplified by the National Research Centre for Grapes. This centre was established by ICAR but is located within the building of the MRDBS (Hall *et al.*, 2001). It conducts research on both the vineyards managed by MRDBS and those owned by individual farmers, while it undertakes all of these activities with close collaboration with exporters (Naik, 2006). Given that the gap between Indian

grapes and the standards necessary for the export markets was initially very wide, the collaboration between these research institutions and other cluster members has been vital in upgrading the grape cluster.

Government and other public institutions: The public sector has been of crucial importance to the success of the grape cluster. For example, as described above, the state government and other public institutions were crucial in the formation of Mahagrapes. They have also provided loans and expertise to support it. State institutions support the cluster in other ways. Among other actions, the state marketing board collects technical and market information for producers. Meanwhile, the Maharashtra Industrial Development Corporation (MIDC) also acts to promote the sector, and the state's department of horticulture implements a residue monitoring plan involving 5 979 vineyards (Naik, 2006).

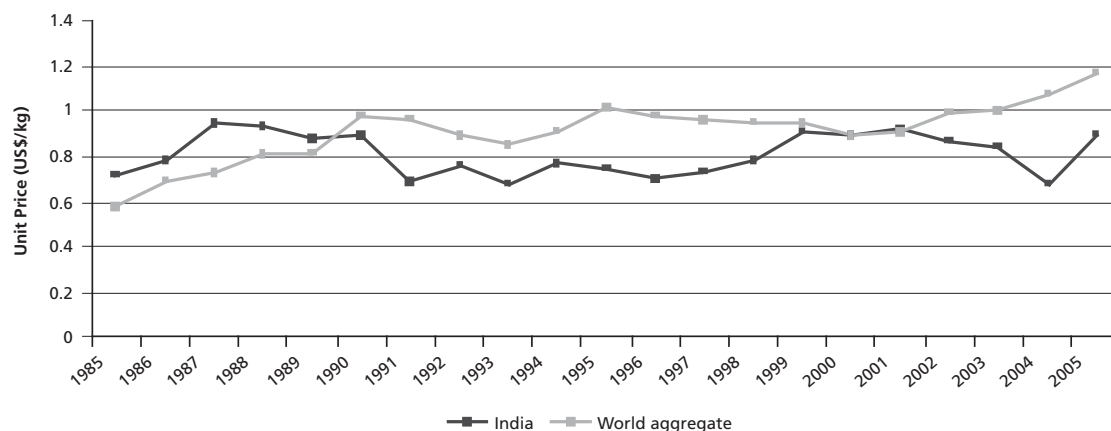
Outside of the cluster, it is important to note the role of the national government. It has established various institutions, such as the National Horticulture Board and the Agricultural and Processed Food Products Export Development Authority, which have acted to support the export of grapes from Maharashtra. Once the feasibility of the export of grapes became apparent, it also supported the industry through the creation of cold storage facilities and the development of infrastructure (Naik, 2006). In addition, Agri-Export Zones have been set up in the grape growing areas of Maharashtra State (these also involve the state government).

Other actors: Other actors have played an important role in the success of the cluster, albeit in less formal ways. For example, the presence of a good credit system is important for the cluster, as grape related activity is capital intensive. The area has a good network of commercial and cooperative banks, and this has helped to promote (and has been promoted by) the success of the cluster.

5.4.4 Limitations of the cluster

At times the actions of those within the cluster have been costly and mistaken. For example, when Mahagrapes started to promote the export of grapes to Europe, the various initiatives to ensure that producers met the required standards were insufficient. Indeed, the rejection rate of the early Mahagrape consignments to Europe was at times as high as 80 percent, because of failure to reach standards (Roy and Thorat, 2008). An especially costly rejection occurred in 1992, leading to 20 million rupees (approximately US\$400 000) worth of losses. Many cooperatives left Mahagrapes as a result of this loss and concentrated instead upon the domestic market. These problems have now been overcome. The rejection rates were brought down to 10 percent by 1995 and were down to less than 1 percent by 2001 (Roy and Thorat, 2008). However, the early rejections do show that mistakes have been made.

Another limitation of the cluster relates to the links that are present in the cluster. While there are clear horizontal links (between producers) as well as clear links between producers and facilitating organizations (such as the research institutes), the presence of vertical links with other elements of the value chain are less clear. It is hard to be certain about these links, as they may simply be informal or undocumented. Moreover, initiatives such as the

Figure 7. The unit price of Indian and world aggregate grape exports

Source: Author's elaboration.

Agri-Export Zones (which aims to help to facilitate coordination between all the different activities in the value chain) may help to tackle this weakness, if there is one.

A related point concerns the increased involvement of private enterprises in the export supply chain. Mahindra Shubhlabh Services Ltd, the agribusiness arm of the large Mahindra Group conglomerate, has recently become involved in the cluster (FAO, 2008). Among other activities, the company collaborates with the research institutes to help improve quality levels; uses extension officers to help its contracted producers meet GLOBALGAP requirements; and it helps coordinate and improve the complex supply chain necessary for the export of the grapes (FAO, 2008). In these different ways, the company may help promote beneficial linkages throughout the cluster, though it is too soon to judge whether this is the case.

Finally, while the cluster has played a large part in expanding export levels of Indian grapes, it still has work to do to maintain the unit price for exports. Roy and Thorat (2008) found that producers who were affiliated to Mahagrapes (largely producing for the export market) earned significantly higher profits than those not affiliated (largely producing for the domestic market). This conclusion held even when other factors, such as skill levels, were controlled for. Additionally they found that there was no bias against smallholders in terms of membership of Mahagrapes. However, the profit levels may be reduced if the price that Indian grapes can demand declines. Figure 7 demonstrates how the unit price of Indian grape exports has declined to below the world aggregated price. Clearly, this price is the unit price of all the grapes exported from India. Yet, given the importance of the region to the country's grape export sector, this decline in unit price does suggest that the Maharashtra cluster still has work to do to retain its profitability.

5.5 CHINESE LIVESTOCK CLUSTERS

5.5.1 Chinese livestock clusters: some figures

In 2007, mainland China was responsible for over 30 percent of global meat production (FAOSTAT). With production levels now providing China with a clear surplus, increasing attention is being paid to raising the quality of the produce and increasing the sector's international competitiveness. The approach taken by the Chinese livestock sector is increasingly one that shares many commonalities with the cluster approach. The case also highlights the changing nature of agricultural policy in general in China. Little literature is easily available on this cluster; much of the factual content of this section comes from Brown *et al.* (2007).

5.5.2 The evolution of Chinese livestock clusters

State policies have in the past hindered the development of agricultural clusters. The communes and brigades of the central planning era concentrated instead upon increasing the quantity of output, and in such a centrally planned economy unsurprisingly there was little emphasis upon developing links between different members of the value chain. In the post reform era there has been little action to coordinate the different parts of the value chain. Indeed, until recently, each part of the value chain had its own ministry and there was little coordination between them. The inputs, production, processing, marketing and trade sectors were all administered in different ways by a variety of ministries. Taking a cluster-based approach, looking at the interaction between all the members of the value chain, this rarely occurred. Similarly, interaction between non-governmental actors in the agricultural sector was limited. This can be seen clearly at the household level (where most of the activity in the livestock value chain now takes place). Following the move away from the centrally planned economy, "extreme collectivism was replaced with extreme individualism on a household level" (Brown *et al.*, 2007). Neither left room for the "co-opetition", i.e. the cooperation and competition between cluster members that characterizes clusters.

Recently, however, the agricultural system has become more "cluster like". In particular, there has been a change in emphasis on looking at the whole value chain, rather than treating it different parts separately. There has also been a move away from households acting individually. The following section underscores that changes in state policy has been central to the move, and also how the sector still does not completely conform to the ideal cluster type.

5.5.3 The upgrading of the clusters

Institutional support: Government action is largely responsible for the recent moves in the livestock sector towards a more cluster-style system. At the most basic level, the new focus on the value chain as a whole can be seen by the changes in the ministries concerned. With exception of the Ministry of Agriculture, government reforms have either downgraded or abolished all of the ministries involved in the agricultural sector. This has left the Ministry

Table 11. Details of the “Advantaged area programme” related to the sheep and goat industry**The aims of the programme are to:**

- Increase sheep or goat production by more than 38% in the 61 advantaged areas by 2007.
- Increase the proportion of “high quality” sheep or goat meat to over 20%.
- “Standardize” production and management practices (such as homogenous lines of livestock and feed and veterinary regimes).
- Establish reputable brands of sheep and goat meat.
- Replace imports and increase exports.
- Develop grading and food safety systems.

The measures and structures to achieve these aims are:

- Breed improvement.
- Pre-production systems (including the development of “base projects” in feed production and regulation, extension, veterinary services and disease control).
- Production (sheep or goat “bases”). These bases should develop:
 - 100 large households per county with 50 to 100 head ewes and 25 mu in land.
 - 15 small livestock raising areas per county, each with 500 to 2000 ewes and 250 mu of land.
 - 5 feedlots per county, each with over 2 000 head in stock.
 - 20 000 silage pits per county.
- Quality improvement projects (disease control and quarantine, cold storage at company level and 29 (provincial level) quality monitoring centres for breeding livestock, feed and meat.
- Dragon head enterprises (centralized and accredited slaughtering, marketing or processing companies, integrated companies or new markets).

Source: Chinese Ministry of Agriculture (2003) cited in Brown et al. (2007).

of Agriculture in a position to be able to coordinate the different parts of the agricultural system in a much more effective fashion. Below this new overarching, the livestock industry has its own department, the Animal Husbandry Bureau.

It is in specific policies that the cluster style approach to agriculture is becoming increasingly apparent. One example of such policies is the “Advantaged area programme”. This programme was introduced by the Ministry of Agriculture and covers 11 broad commodity types. One of these commodity types combines beef cattle, sheep meat and goat meat and thus includes much of the livestock sector. Broad geographical areas are identified as priority areas for promoting these livestock types, and then programmes are targeted at smaller administrative areas (cities or counties) within these areas. Table 11 details the programmes that are to be carried out in the sheep and goat sectors. Three aspects of these programmes should be of note. First, similarly to many of the other clusters featured in this document, the focus is upon quality. Second, attention is paid to all of the different parts of the value chain, from pre-production to the marketing and processing by “Dragon head enterprises” (see next paragraph). Such an integrated approach is key to cluster policies. Last, all of this activity is to take place within geographical proximity. Again, this is one of the features of clusters.

One of the central aspects of the changes to the Chinese agricultural system is the pursuit of vertical integration. In the Chinese context, vertical integration essentially aims to reduce the lengths of supply chains, to move into higher value segments and to develop large,

vertically integrated enterprises (“Dragon head enterprises”). The way that these Dragon head enterprises engage with other actors in the sector is enlightening. The idea behind Dragon head enterprises is that they help to lead the rest of the dragon (i.e. the industry value chain and its participants). Formal contracts or informal relationships are used to connect the households and other enterprises in the sector to the Dragon head enterprises. In this sense, this system in many ways resembles a cluster; firms are linked formally and informally throughout the value chain in order to help coordinate action. The key difference this system has to the ideal-type cluster is that here the coordination process is less the result of the actions of many individual firms and more centred upon one enterprise. However, one is beginning to see an emergence of collective action taking place within levels of the vertical integrated enterprises.

Collective action: Collective action in the Chinese livestock sector can be divided into two loose groupings: industry associations and local groups. Industry associations exist largely to facilitate links between the government and enterprises (households, larger firms, etc.). Indeed many were formerly government departments. One recent development is that companies have taken a role in developing industry associations. For example, the Hengdian Company organized the Dongying Beef Association in Shandong. Such company-developed associations have become a way of organizing inputs and coordinating households as well as other industry stakeholders.

Local groups exist at the next spatial level down from industry associations. They form a central part of the vertical integration programme. They are generally small and locally based, predominantly being village or township groups mainly made up of households. Their role in the integration programme is to act as a linking mechanism. They first, link Dragon’s head enterprises to households to enable the former to source the services and inputs of the latter. Second, they serve to improve household’s access to markets and services. They also play an important role in disease control and food safety, information and quality assurance.

The number of local groups has increased rapidly in recent years. Their exact form varies. One type of group, and one that the government has been trying to promote, is the specialized “small livestock raising areas”. These are normally groups of between 5 and 15 specialized households, usually located in close proximity. They elect a head who helps coordinate action. They usually use the same type of stock, have similar or common facilities, use common veterinary and feed regimes, and sell through the same marketing channels. At a large scale, there are also specialized village groups. Organization on such a scale allows the large enterprises to enter into purchase agreements at this village level through the leaders of these groups. Such grouping and specialization also occurs outside of the primary production sector. For example, some groups at the village level specialize in sheep or goat slaughtering, while others are specialized in marketing. Other types of grouping exist, including less formal groups. They all share a common rationale; clustering together enables them to gain from scale economies, particularly in marketing.

6. Agro-based clusters in Africa²⁸

6.1 INTRODUCTION TO CLUSTERS IN AFRICA

Cluster work in Africa is in an infant stage of development. Some descriptive work has been done in a few English-speaking countries where cluster initiatives are just starting to develop. The analysis so far suggests that there is vast scope for positive AC interventions at both policy and programme levels.

Pioneers in analysing clusters in Africa are McCormick (1998, 1999) and Mitullah (1999), who started collecting material on clusters and explored whether the benefits that clustering provided in other parts of the world could also be applied in Africa.²⁹

The existing literature shows that African clusters vary tremendously in internal structure and level of industrialization. In fact, the literature suggests the existence of three types of clusters in Africa. The first type is the so-called groundwork cluster that provides a basis for development by improving producers' access to markets. The second one is the industrializing cluster, which has started the process of specialization and differentiation. The third type is the complex cluster that has already diversified its size structure and linkages and is able to tap wider national or international markets.

Groundwork clusters are more common in Africa, followed by industrializing clusters, whereas only a few complex clusters are found. Those in the last category are less developed than in other parts of the world mainly because: a) trading networks are underdeveloped in Africa; b) clustering has taken place in the context of an overabundance of labour, which means that labour market pooling effects have not worked as expected; c) clustering has occurred in environments of weak political and economic institutions; and d) large-scale industries (including agro-industries) are in disarray as a result of a rapid market liberalization while small and medium firms continue to offer low-value, low-quality products that have difficulty competing with the widely available imports (McCormick, 1998, 2003).

The World Bank Institute (WBI) started some work on African clusters with its initiative "Knowledge, Technology and Growth in Africa" in 2005–06 (Zeng, 2008). The initiative delivered 11 case studies, 3 of which are in the agricultural sector: fish clusters in Uganda, a Kenyan cut-flower cluster and a South African wine cluster. The general conclusions were that African clusters face enormous challenges, and that their sustainability depends on how successfully they can overcome them. Resource-based clusters, especially those in the agricultural sector, need

²⁸ This chapter is based on a contribution of Alexandra Röttger, Agricultural Management Officer, Agricultural Management, Marketing and Finance Service, FAO Rural Infrastructure and Agro-industries Division.

²⁹ The research was part of a project on collective efficiency and small-scale industry, implemented by the Institute of Development Studies at the University of Sussex, and funded by DFID.

Figure 8. Lake Victoria fish clusters



Source: Author's elaboration. The circles represent the five existing Lake Victoria fish subclusters.

to find solutions to avoid resource depletion and to upgrade their products. Most importantly, the public sector needs both to establish a favourable regulatory and incentive environment, facilitating knowledge and technology learning and innovation, and to provide high-quality public goods, notably infrastructure, that the private sector can benefit from (Zeng, 2008).

6.2 FISH PROCESSING CLUSTERS AROUND LAKE VICTORIA

There are several studies documenting fish clusters around the Lake Victoria. These include the Kisumu and Uhanya Beach (about 60 km from Kisumu) clusters in Kenya, and the Entebbe and Jinja ones in Uganda (McCormick, 1999; Mitulla, 1998; and Bolo, 2006). Fish clusters in Tanzania, however, have not been recorded in the literature, despite the fact that Tanzania has become the most important African exporter of fish to the European Union.

6.2.1 Lake Victoria fish clusters: some figures

Lake Victoria is the biggest fish reserve on the African continent, yielding about 25 percent of the total catch of all inland fisheries. These abundant fish resources have led to the development of fish clusters around this lake. The introduction of the Nile perch into the lake in the 1950s by British settlers underpinned the growth of the fish clusters. The fish clusters developed as a result of the rising overseas demand for fish, mainly in Europe, as fish supplies in northern waters dwindled (Jansen, 1997).

The total catch of all fish species in Lake Victoria increased from about 100 000 tonnes in 1979 to about 500 000 tonnes in 1989 and to an estimated 840 000 tonnes in 2006³⁰. Nile perch fillet exports grew tremendously from 1999, with Tanzania being the leading exporter.

Kenyan fish catches on Lake Victoria peaked in 1988–1992, but then declined until 1999. In 2001 about 80 000 tonnes of Nile perch, 50 000 tonnes of *dagaa*³¹ and 20 000 tonnes of tilapia were landed on Kenyan shores. Ugandan fish landings have been around the 200 000 tonnes mark, except in 2000. Exports peaked in 1996 with 16 000 tonnes and again in 2004 and 2005 with 18 000 tonnes and 24 000 tonnes respectively (Balagadde, 2005; www.eurofish.dk).

6.2.2 Fish cluster evolution over time

Lake Victoria has a long fishing history. The growing international demand for Nile perch in industrialized countries triggered the phenomenal growth of the fishing industry in the early 1980s. In response to the increased landings of Nile perch during this time, more fishermen were drawn into the fishery. The number increased from about 11 000 in 1971 to 22 000 in 1989 and 24 000 in 1992 on the Kenyan part of Lake Victoria. An estimate is that 180 000 additional jobs were created in the 1980s. (Adeya, 2006). Processing factories were established along the shoreline of Lake Victoria. The first plants in Kenya were set up in the early and mid-1980s to process Nile perch and export its fillets to markets overseas. They proved to be so profitable that more factories were soon set up in Kenya, Uganda and Tanzania. In the mid-1990s there were about 35 factories spread around the lake. Many of the factories have been financed by international development banks and received support from government development aid agencies of the industrialized countries (Adeya, 2006).

The industry suffered a severe shock when fish exports to the European Union were banned in 1997 over a lack of conformity to sanitary and safety regulations. Most factories closed down for a number of years, but had reopened by the end of the decade.

Nowadays, fish catches from the lake are at risk because of a sharp decline in fish stocks. Tanzania is still the main exporter of Nile perch fillets to the European Union market. Kenya has reported some cuts in its Nile perch fillet exports. Uganda is now very close to Tanzania as top Nile perch exporter to the European Union market, and has further invested recently in its Nile perch processing industry despite the indications of declines in fish resources.

6.2.3 Upgrading of the Lake Victoria fish cluster

It is questionable whether the Lake Victoria cluster has potential for upgrading. The cluster itself is fragile mainly because of weak mechanisms for joint action, unequal power relationships and decreasing fish supplies. However, the crisis caused by the European import ban of 1997 spurred collective action in the form of information sharing, which led to a sensible upgrading of the fish cluster (McCormick, 1999).

Emergence of collective action: In recent years, the Lake Victoria cluster has faced two challenges that have led to collective action: the falling fish stock and the European Union import ban.

31 *Dagaa* is the collective name in Kenya and Tanzania for various types of sardine-like fish eaten in a dried form by poor- and middle-income groups throughout eastern and southern Africa.

The falling fish stocks have been an issue since the early twentieth century despite the absence of reliable stock assessment measures. The average size of landed fish has declined from over 50 kg in the 1980s to 10 kg in 2006³². This is mainly a result of over-fishing and the use of illegal fishing gear that destroys nursery grounds and water hyacinth. Over-fishing results from fishermen's failure to observe existing regulations (e.g. catching undersized fish late at night) as well as from the fierce competition among legions of fishermen in limited waters. Processors have responded to declining fish catches by expanding their catchment area from Kenya to Uganda and Tanzania. Other players, such as fishermen cooperatives, did little to respond to falling supplies; the Fisheries Department failed to enforce regulations and manage the fisheries (Mitullah, 1999).

The lack of joint action on fish supplies contrasts with the decisive response to the second shock to the fish cluster. The European Union banned the importation of Nile perch from East Africa in April 1997 when two people died after eating salmonella-infected fish from Uganda. The ban almost killed the fish processing industry, but on the other hand opened the door especially for horizontal information sharing in order to meet European Union health and safety requirements. In addition, processors jointly improved their logistics, and traders joined forces and invested into hygienic reception sheds on the beaches (Mitullah, 1999). Across the cluster, firms invested substantially in process upgrading, laboratory capacities and Hazard Analysis and Critical Control Point (HACCP) procedures, among other things, which led to Uganda being allowed to resume exports of fishery products to the European Union (Adeya, 2006).

Institutional support to the fish cluster: Institutional support to the fish cluster remains weak. This holds for all levels of support at local, national and regional levels. To address some of the common problems of the lake, the Governments of Kenya, Uganda and Tanzania established the Lake Victoria Fisheries Organization (LVFO) in 1994. The aim of LVFO is to foster cooperation among the partner states by harmonizing national measures, developing and adopting conservation and management measures for the sustainable utilization of living resources of Lake Victoria. The organization is doing its best to coordinate management efforts.

Uganda used to have a number of state enterprises and projects in the production of fish-nets, fish trawling, processing and trucking. However, they were rather unsuccessful and were eventually privatized. The situation further deteriorated as the prolonged economic and political problems of the country fostered illegal fishing practices, and the Department of Fisheries did not have surveillance capacities. Hence, guidelines and standards were lacking in the country (Adeya, 2006).

Kenya's support to the fish cluster is equally weak and the Fisheries Department failed to enforce regulations and manage the natural resource base. According to Mitulla (1999), the organization is weak and unequal in law enforcement. However, because of the weakness of the Fisheries Department, the Kenya Bureau of Standards introduced its own two sets of standards for fish processing and export, namely; Kenya Fish handling standards KS05-1516 and Specification for Drinking Water KS05-459.

32 <http://www.eurofish.dk/dynamiskSub.php4?id=3276>

Table 12. Kenya's flower exports from 1995 to 2003

Year	Exports (tonnes)
1995	29 373
1996	35 212
1997	35 850
1998	30 220
1999	36 992
2000	38 756
2001	41 396
2002	52 106
2003	60 982

Source: Horticultural Crops Development Authority.

The most significant regulations for the fisheries sector, however, are those of the European Union. These standards are enforced through the competent authority approved by the European Union, which are the Fisheries Departments in each country with periodic audits by European Union inspectors. The fish export sector in Kenya has also organized itself into a professional industry association, the Association of Fish Processors and Exporters of Kenya (AFIPEK) (FAO, 2003b).

6.3 KENYA CUT-FLOWER CLUSTER

6.3.1 Kenya's flower industry: some figures

Kenya's cut-flower industry is a thriving business that has witnessed a rapid growth: Exports doubled between 1995 and 2003. The Kenya Flower Council estimates that the sector contributes some US\$200 million of export earnings and employs about 2 million people directly and indirectly. Kenya is the largest flower exporter into the European Union (Table 12) and the world's fourth exporter of cut flowers (with a 6 percent of world market share).

Because of its capital and knowledge-intensive nature, the cluster is dominated by large-scale companies that constitute about 97 percent of total flower exports. There are about 24 large companies that own on average 20–100 ha and employ 250–6 000 people each. Marketing arms to Europe have been established as sister companies and are the norm.

6.3.2 The upgrading of the cluster

Lake Naivasha is the centre of the flower industry in Kenya. The emergence of the cluster can be attributed to: a) the availability of fresh water resources; b) existence of large-scale farms; c) conducive soils and climates; d) proximity to the country's international airport in Nairobi; and e) international trade agreements (Bolo, 2006). Apart from these factors, the sector growth can be attributed to high skills, technical competence and strong links to overseas expertise.

Emergence of collective actions: The cluster has shown a number of examples of cooperation and collaboration mainly in the field of policy support, environmental conservation and corporate social responsibility programmes. Social amenities for communities have increased through private investment. Infrastructure development has jointly been undertaken, such as the establishment and maintenance of roads, pre-cooling facilities and cold stores. Policy support is provided by key industrial associations that maintain standards, exchange information and facilitate market access.

Other associations were created to address labour and environmental issues. Thus, the unsatisfactory working conditions for employees in the flower industry pushed the creation of the Horticultural Ethical Business Initiative in 2003. Its objective is to promote the social welfare of workers, improving social accountability in the industry. Two other associations watch over environmental conservation and the sustainable development of the lake, namely: the Lake Naivasha Growers Group (organization formed by a small group of large commercial flower growers) and the Lake Naivasha Riparian Association (local voluntary association that manages the lands around the lake).

Institutional support: Government support to the Kenyan flower cluster has been limited and has mainly been geared to facilitating infrastructure development, incentives and support services. Kenya's horticultural export expansion has also been helped by the preferential duty-free access to European Union markets under the Lomé Agreement that ran until 2008³³.

Other supporting institutions: Compliance to GAPs is enforced through codes of practice and enforced by certification through industry associations, such as the Kenya Flower Council, the Fresh Produce Exporters Association of Kenya, the Lake Naivasha Riparian Association and the Kenya Bureau of Standards (Bolo, 2006). Several academic and research institutions offer training courses, such as Jomo Kenyatta University, which offers a degree in ornamental science, and Maseno University, which offers a degree in floriculture. However, the industry has not fully exploited the existing research capacity, but rather relies on foreigners for technical advice and assistance. The above information is briefly presented in Table 13 below.

Table 13. Support to the Kenyan Flower Cluster

Type of intervention	Some examples of support interventions
Research and development	<ul style="list-style-type: none"> Private sector firms such as Dudutech (Flamingo Holdings UK) Ltd in training and research in Integrated Pest Management.
Laboratory analysis	<ul style="list-style-type: none"> Société Générale de Surveillance (SGS) and Bureau Veritas.
Regulations and standards	<ul style="list-style-type: none"> Kenya Bureau of Standards: sets industry standards.
Sector development	<ul style="list-style-type: none"> Horticultural Crops Development Authority: government parastatal in charge of promoting horticultural crop development, licensing of exporters and dissemination of information on marketing. Fresh Produce Exporters Association: training, industry development and lobbying for sector.
Conforming to ethical standards	<ul style="list-style-type: none"> Kenya Flower Council: self regulation and promotion of industry.
Foreign cooperation in training and capacity building	<ul style="list-style-type: none"> The Netherlands: training programme on enhanced access of local horticultural products into markets in industrialized countries; Germany: Flower Labour Programme with the International Centre for Insect Physiology and Ecology and the Horticultural Ethical Business Initiative.

Source: Adapted from Bolo, 2006.

6.4 SOUTH AFRICAN WINE CLUSTER

6.4.1 Some figures

South Africa's wine cluster is based around the Western Cape and produces mainly quality wines. More than 4 340 farmers cultivate some 108 000 ha of land under vines. The total work force, including farm workers and cooperative cellar staff together with their dependants, constitutes some 345 500 people. Wine tourism employs some 48 350 of these people. In 2003, 703 million litres of drinking wine were produced. This makes South Africa the ninth largest wine producer in the world. Within the New World wine countries, South Africa has a production share of 9 percent and an export share of 13.7 percent. The main export markets are the United Kingdom and the Netherlands, with shares of 45 and 17 percent, respectively. South Africa's average export prices are about the lowest of the major exporters and about half of the average export price of Australian wine. The lack of premium brands is a barrier to surpassing price points in the export market (Rabobank, 2004).

6.4.2 Evolution over time³⁴

The wine industry in the Cape started to flourish in the nineteenth century, but it was soon brought to a halt by disease problems and the Anglo-Boer war. Nevertheless, by the beginning of the twentieth century and with the formation of the Cooperative Viniculture Organization

³⁴ This chapter is based on www.sa-weine.de

(KWV)³⁵ in 1917, stability and prosperity were brought again into the industry. KWV organized the wine industry into cooperative producers and growers. It established quality standards and controls, limited the production, set the minimum price and controlled all exports. KWV's traditional focus was on basic wine sold in bulk. The first farmers' winery was formed in 1935 in Stellenbosch and in 1945 another producers' organization, Distillers, was formed.

The end of Apartheid in 1993–94 meant a new era of growth and improved quality for the South African wine industry. The number of small wineries also increased as a result of the ending of the quota system. This made it possible for start-ups to enter the industry and it paved the way for cooperative growers to market their wines independently. The best and most expensive wines today are *cuvées* from typical Bordeaux grapes.

6.4.3 Factors contributing to the success of the wine cluster

Collective actions: One of the most important success factors of the South African wine cluster has been that key actors in the industry have recognized that innovation at technical and organizational level is crucial. Support service institutions have focused their attention on expanding the volume of export wines in super premium segments. As marketing functions were seen as being weak, various forms of cooperation between producers and institutions have emerged to support marketing activities (Abiola, 2006). Furthermore, producers have engaged in production innovation and knowledge sharing with various support bodies.

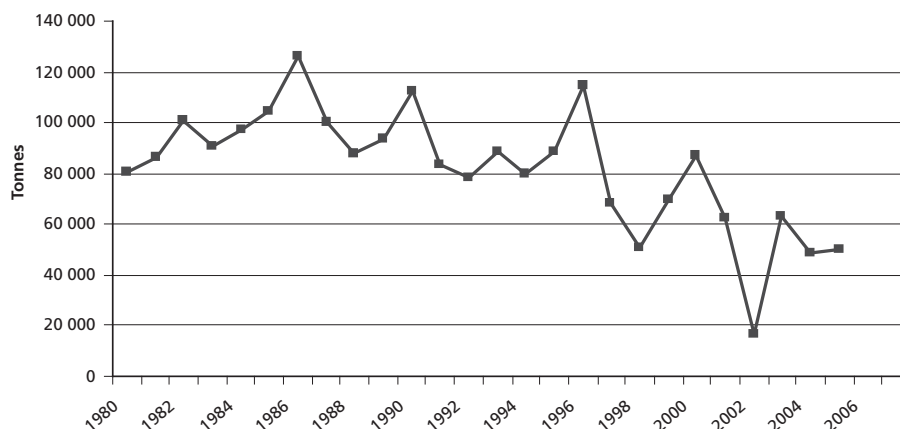
Institutional support: Government support: The South African wine cluster developed under strict government control since the beginning of the twentieth century with the formation of KWV in the 1910s. The sector remained under state control with stabilized prices and production volumes until 1993. Today, the South African wine industry is backed by a state-funded research body, the Nietvoorbij Institute for Viticulture and Oenology of the Agricultural Research Council, employing some 250 staff.

Other supporting institutions: A coordinating role in wine research is played by the Wine Industry Network for Expertise and Technology, which is controlled by the South African Wine and Brandy Company. It is a network formed by industry, scientists and technicians.

Since 2000, Wines of South Africa, an independent non-profit entity, has been responsible for the international promotion of South African wines. Another important support institution is the South African Wine Information Service (SAWIS), a not-for-profit organization that collects, processes and disseminates industry information. It is also responsible for the administration of the industries' Wine of Origin system.

Academic and research support to the cluster is provided by the Departments of viticulture and viticulture at the University of Stellenbosch, and the Elsenburg Agricultural College, which offers courses in cellar technology.

35 Koöperatieve Wijnbouwers Vereniging van Zuid-Afrika Bpkt

Figure 9. Kenyan coffee exports by year

Source: FAOSTAT | © FAO Statistics Division 2008 | 20 November 2008.

6.5 COFFEE CLUSTER IN KENYA

6.5.1 Some figures

The Kenyan coffee industry thrived in the early 1980s. Production peaked at 129 000 tonnes, 40 percent of total exports in Kenya. However, since then the industry has declined in terms of both output and quality. Exports have fallen dramatically (Figure 9) and Kenya's world market share has fallen from 3.15 to 0.6 percent (1986–2006). Around 20 percent of Kenya's coffee production in 1993 was premium grade; in 2003 it was 10 percent (Condliffe *et al.*, 2008).

6.5.2 The structure of the cluster

Coffee is produced on estates and by a large number smallholder farms. The value chain is less fragmented for estate owners because they own their own processing factories and because their size allows them some negotiating power with marketing agents. They are also now able, because of liberalization policies, to sell directly to exporters.

Smallholders face a much more complicated marketing channel. They have to sell their coffee through local cooperatives. It is then milled and sold at coffee auctions through marketing agents. (Condliffe *et al.*, 2008).

At the export stage, four companies control 40 percent of exports. Similarly at the (latter) roasting stage, other four companies control 45 percent of the market. Because of these levels of consolidation, the balance of power in the value chain heavily favours the exporters and roasters. This is reflected in the share of the final retail price that goes to the coffee growers. In 1975 they captured 30 percent, in 2000 they captured only 10 percent (Talbot, 2004).

6.5.3 The emergence of collective action

Within the Kenyan coffee cluster there appears to be little collective action. There are some institutions that have played a role in facilitating links between members of the cluster. For instance, in 1937 the Kenya Planters Co-operative Union (KPCU) was set up to represent the interests of small farmers. However, upon purchasing the Nairobi Curing Company in 1941 it took on a dual status as a private company and a non-profit union. This dual status has raised conflict of interest questions (Condliffe *et al.*, 2008). Additionally, there are the cooperatives themselves. However, it is unclear whether these cooperatives have contributed much to the upgrading of the cluster.

In terms of links to related and supporting industries, these appear to be minimal. These related and supporting industries are present, but the linkages themselves are generally weak and without much depth (Condliffe *et al.*, 2008).

Institutions to support the coffee cluster. There are numerous institutions for collaboration, but few play an active role. One exception is the Coffee Research Foundation (CRF). It is a body made up of growers' groups, the Ministry of Agriculture and other research universities. In the past it has been central to research: disseminating new technology and information, conducting research directly, providing training, bringing together research institutes and industry players, etc. (Condliffe *et al.*, 2008). However, its performance has declined since privatization because of lack of adequate funding. Other institutions for collaboration exist but are similarly underfunded.

In general, the Kenyan Government has a history of protectionism and intervention in the cluster. Historically, this led to a lack of competition between firms. Recent privatization of the industry was meant to increase competition, but high levels of corruption, weak management capacity and a complex market structure have limited the reform's effectiveness (Condliffe *et al.*, 2008). There have, however, been some recent attempts to promote the cluster. For instance, the Coffee Development Agency (an Agriculture Ministry agency) announced in late 2008 that it would spend US\$11.83 million over two years in loans to small-scale coffee growers (Reuters, 2008).

7. Conclusions and recommendations

7.1 MAIN FINDINGS REGARDING AGRO-BASED CLUSTERS

Among the key findings of this research on ACs are the following:

- (1) **Clustering in the agricultural sector presents many benefits:** Clustering seems to ignite a virtuous circle of development. It can further the industrialization process and facilitate the dissemination of innovations and the upgrading of agribusiness firms. Clusters attract foreign investors, who in their turn bring with them new business and technological skills that contribute to upgrading cluster stakeholders.

In addition, clustering promotes an active dialogue between the private and public sectors fostering new agricultural policies and support institutions. Moreover, governments frequently find that organizing their support activities around clusters is easier and more focused and effective than other strategies to support the development of the agricultural sector. Governments and NGOs can assist in the development of collective efficiency (McCormick, 1998) and can encourage clustering by providing infrastructure and other incentives to producers, processors and service providers, to locate in certain areas, as well as providing an enabling environment for formation and growth (McCormick, 1999).

In short, ACs: a) create a fertile environment for the establishment of interfirm cooperation; b) work as systems that facilitate the diffusion of innovations (both technical and organizational); and c) are a means to channel public support to increase the competitiveness of the agricultural and agro-industrial sectors in a given territory. Indeed, AC seems to be the ideal vehicle to tap new opportunities for agriculture, which according to the World Development Report 2008 “requires a comprehensive policy approach to foster growth, including providing better producer incentives, increasing public and private investment, and strengthening the supporting institutions, underpinned by macroeconomic and political stability” (World Bank, 2007).

- (2) **Farmers and small- and medium-sized agribusiness can benefit from participating in ACs:** Cluster-based policies are often used to support SMEs and smallholder farmers. Clusters are seen as being particularly beneficial for this group, as it allows them to achieve scale economies and share costs related to training, info sharing, certification and technology application.

The case study of export grape growers in the Indian state of Maharashtra provides a good example. While there are large-scale producers in the area, many of the grape producers are smallholders. In order to be competitive in the export market they must meet certain rigorous standards. For example, in order to export into the European Union they must meet the strict GLOBALGAP standard. To meet such a standard, individual producers

would have to invest considerable amounts into research concerning what the standards entail and how best to meet them. They would also have to invest large amounts into the necessary infrastructure, such as cold-storage facilities. Such investments are beyond the scope of individual producers. However, by acting as a cluster, the producers are able to be competitive. First, there are horizontal links between the producers that allow them to pool their resources. Such pooling allows them to carry out common functions such as group marketing, research and input provision. Second, there are other links within the cluster that support the producers. For example, links to public institutions, such as the state government, allows public support (for example infrastructure development) to these clusters to be appropriate and timely. Most importantly, strong links between producers and local research institutions generate vital information that the producers need in order to be competitive.

The above example also shows that ACs help small farmers innovate and adapt more quickly to changes in the agrifood system (PSU, 2005). In particular, participation in ACs affects farm management, new technology adoption and environmental practices, profitability and smallholder farmers' access to markets. The adoption of social standards in several of the flower clusters studied has benefited small farmers as well. In some cases, producers directly benefit from Corporate Social Responsibility initiatives collectively undertaken by cluster firms or associations³⁶.

While agro-based clusters do have the potential to support SMEs, it does not follow that they are necessarily always to their advantage. Some clusters, for example the cluster of firms centred on cut-flower exports in Kenya, are totally dominated by large firms. Additionally, some clusters are becoming increasingly dominated by larger firms.

- (3) **Clustering in the agricultural sector will most likely need to be induced:** In most developing countries, it is doubtful that agricultural clusters will evolve naturally. ECLAC (2005) explains that agricultural clusters – and for that matter, all natural resource-based clusters – do not develop spontaneously because even if natural resources are abundant, as is often the case, they tend to follow an unsatisfactory development pattern. Some of the essential ingredients of a viable and sustainable cluster are rare in farm communities and, therefore, have to be “imported”. Two of the most obvious are managerial competence and information³⁷.

Additionally, the generally precarious financial position of farmers and a built-in bias against risk-taking and innovation are likely to preserve the rural status quo in the absence of outside intervention. Furthermore, unlike industrial clusters, where the key

36 For instance, Asocolflores in Colombia has: a) assisted nearly 6 000 families to acquire or renovate their house in the framework of the “Hogar” programme; b) created the School of Floriculture, which has trained persons displaced by or vulnerable to violence in the countryside in flower-growing techniques and found jobs on flower farms; c) established childcare centres where children were looked after while their parents worked in Asocolflores companies; and d) funded oral health campaigns and social community investments.

37 There are, of course, instances of very successful agricultural clusters evolving in farm communities populated by religious groupings or sects, such as the Mennonite clusters in Belize. Much can undoubtedly be learned from the experience of these clusters, but for the purpose of this paper, they are seen as special cases that probably cannot be replicated in communities with dissimilar demographics.

factors determining success are entrepreneurship, technology and finance, the pivotal factor in an agricultural setting is land, which the small-scale producers are unlikely to be able to get more of if they rely exclusively on own resources, and which, in comparative terms, lacks flexibility as to what can be produced on it.

As a consequence, clustering in the agricultural sector will most likely need to be induced by an external agent, which according to the research undertaken could be the government, large local firms and international investors (FDI), or a mix of these three types of actors.

Governments, on their own, are unlikely to create an AC from scratch. The Brazilian Petrolina-Juazeiro mango and grape clusters provide rare examples of a cluster that has been created unilaterally by a public institution. Here – as described earlier – the San Francisco River Valley Development Agency allocated lots of irrigated land to smallholders with the idea of achieving a critical mass of small and medium growers to produce irrigated fruits. It also supported the creation of a grower association. However, such a creation is extremely rare. Clusters are dependent not only upon the co-location of various actors within the value chain, but also the development of formal and informal links between them. Such links develop over time and are hard to produce through external creation.

It is more likely that the driving force inducing a cluster would be a combination of public and private efforts. For instance, the Colombian cut-flower cluster was partially induced by local and international investors and partially by the government through the provision of export incentives for non-traditional export products, particularly flowers. Likewise, the flower cluster in Ecuador and the apple cluster in Santa Catarina (Brazil) were the consequence of the collaboration between the public sector and pioneer entrepreneurs.

In many other cases, ACs have been induced by entrepreneurs – both local and foreign capital-based firms – and it is only after these clusters are relatively developed that the public sector starts to collaborate with pioneering firms in order to overcome bottlenecks that the private sector alone could not resolve.

Exceptionally, the cluster inducer happens to be an academic and research institution, as in the case of the Kasetsart University, which seems to have been key in initiating the collective action within the GAP cluster in Thailand.

No matter how an agricultural cluster has been created, at some point in time it will be necessary to undertake concerted actions to support it and upgrade it. These concerted actions consisting of strategies, policies and programmes to support ACs are called “cluster initiatives”. Cluster initiatives can be either sponsored by public-sector actors, private firms, academic institutions, financial intermediary institutions or by other actors. Cluster initiative activities usually involve a range of support actions including:

- Actions to promote cooperation between individual firms by creating conditions for more alliances and partnerships; this requires a “cluster champion”.

- Support to education and training in order to build capacity of all cluster members.
- Policy actions to redesign the economy via cluster development and through strategic public policy support to industry, such as public investment in infrastructure.
- Innovation and technology actions to enhance technological capacity in all clusters, by, among other things, building stronger technology and applied research institutions (Sölvell *et al.*, 2003).

The basic principle of clustering is the observation that firms that operate close to related firms and supporting institutions are often more innovative and, therefore, more successful in raising productivity than firms that operate in isolation. Hence, cluster initiatives have concentrated on removing the isolation of agribusinesses within a locality and building alignment between the firms within the cluster, the public sector, R&D institutions, and academic institutions.

- (4) **Governments can play an important role in cluster development:** As ITC puts it: “Governments need to address supply-side constraints to improving (cluster) competitiveness. They need to take steps that can help agribusiness firms improve productivity, quality, compliance with international standards, saleable designs and environmentally acceptable packaging and so forth” (ITC, 2001). In many cases, governments will need to catalyse the process of cluster development, facilitate it, and to some extent bankroll it. As part of this facilitating role, the public sector will need to provide an enabling environment for cluster development and upgrading. Governments will need to ensure sound domestic policies and export strategies, adequate infrastructure, provision of effective support services and targeted firm-level support. At the policy level, the enabling factors include a stable macroeconomic environment, clear agro-industrial and agricultural trade rules, sustained investment in human capital, a proactive foreign investment strategy, access to finance at competitive interest rates, comprehensive technology support for cluster SMEs, and an efficient and cost-competitive infrastructure covering everything from irrigation to cargo services to Internet access.

Annex 3 provides a non-exhaustive summary of the types of interventions that governments from the three regions studied have implemented in support of agricultural clusters, including: information collection and diffusion; promotion of associations and networks; development of PPPs; design and implementation of cluster (and/or sector) export strategies; provision of training and technical assistance to the cluster stakeholders; provision of finance; policy support and regulatory functions; creation of enabling environments; and R&D.

- (5) **FDI plays an important role in the development of agricultural clusters:** The role of FDI as a funding source for long-term economic growth and as a vehicle for transferring knowledge and technology is widely recognized. Consequently, FDI is a key contribution to the restructuring and modernization of ACs in developing countries. In fact, the development of ACs is often “implanted” by investments from non-local entrepreneurs: This has been the case of many Latin American ACs, such as the wine, salmon, cut flower and the oilseed clusters where there is a strong international presence, apart from

a few important local-capital agribusiness groups. In Africa, the Kenyan flower and the Lake Victoria fish clusters are also good illustrations of this phenomenon.

However, in developing world ACs the presence of local- and foreign-capital firms is uneven. In Chile, the dairy cluster displays a strong international presence, while in Paraguay and Uruguay it is centred on two cooperatives. Argentina and Brazil ACs have achieved more balance between large local-capital firms and subsidiaries of international companies. The presence of foreign capital in fruit clusters is limited to particular niches or processes in most of the countries.

While FDI, together with some large local economic groups, has contributed enormously to the adoption of innovation, technological change and global strategies within ACs, it has also brought about a reconfiguration of hierarchies within the AC that in many cases has increased the inequalities between smaller and larger agribusiness (Bisang and Gutman, 2005).

Comparatively the agricultural sector does not seem to be attracting much FDI. According to FAO (2004a), only 9 percent of the total FDI flow received by LAC in 1998–2000 was channelled into the agriculture and rural sector, and most of this investment was absorbed by modern food retailing, provision of inputs and industrial processing. It seems there is still significant room for improvement to foster enabling environments capable of attracting FDI to agricultural clusters in developing countries³⁸.

- (6) **Academic and research institutes are key to cluster development:** Bisang and Gutman (2005) recognized that public institutions specialized in technology and innovation are “key actors for the adaptation, appropriation and dissemination of the main technologies” in each AC. However, they also criticized public research institutes for missing the opportunity to work with other public agencies towards the development of a common strategy for enhancing ACs’ competitiveness, and for having a “strong flavour of the past” that prioritize technical production problems at the farm level. They also referred to the steep decline in resources available, especially after the financial crisis of recent years. Fortunately, it seems that these trends are now reversing, and public research institutes are making better use of their scarce resources, and are launching more business-oriented research initiatives thanks to closer collaboration with other public agencies and private firms.

Universities in developing countries have also played a fundamental role in the development of ACs. Cooperation between industry and universities and higher education institutions facilitates the orientation of curricula in directions that are useful for the ACs. Examples of this are the oenology, and the floriculture and ornamental horticulture degree programmes in the wine and flower clusters studied.

Perhaps the only downside of this kind of arrangement linking the industry to research and/or educational institutions is that they tend to report a large-firm bias. These

38 FDI in the agrifood sector in LAC, www.fias.net

institutions should concentrate on redressing the imbalance created by the ownership of some of the main technological packages by multinational corporations, through the provision of support for creating or enhancing local technological capabilities and the design of specific instruments to ensure a stronger spillover effect throughout the AC.

- (7) **Private sector institutional support is important to the development of ACs:** International agroprocessors, retailers and input suppliers have become major providers of finance, products and services to smallholder producers in recent years. According to Bisang and Gutman (2005) “these private sector firms are often in a better position than other actors, including the public sector, to invest in R&D, disseminate technological innovations and provide technical assistance to the primary sector”.

Moreover, large local companies and public research institutes have ceased being the main generators of innovations, in favour of input suppliers and large modern retailers, which nowadays incorporate highly codified technological packages into the supply chain. These technological packages are linked to plant and animal genetics or to initiatives to better meet final consumer demands, such as traceability systems. Indeed, large domestic firms and cooperatives are losing ground to multinational corporations as the latter create and adopt new technologies at a faster pace and have in place more efficient systems to distribute agricultural innovations (Bisang and Gutman, 2005).

Accordingly, innovation processes in the agricultural sector rely for the most part upon the innovative impulses of global value-chain actors. This is precisely why local research addressing specific AC's needs is more important than ever. Otherwise, without investment in agricultural R&D, developing country clusters will be kept dependent on more advanced clusters: e.g. Southern Hemisphere wine clusters will depend on the technological innovations of the Californian wine cluster; Latin American flower clusters will have to keep paying royalties to and depend technologically on the Dutch flower industry, unless they invest in varietal diversification.

- (8) **Collective actions are the cornerstone of ACs' competitiveness:** All the above-mentioned actors (governments, farmers, local and foreign agribusiness firms and their associations, academic research institutes and non-public institutional support providers) could benefit from the design and implementation of collective actions. Examples of collective actions to increase the competitiveness of agricultural clusters include the following: a) the resolution of coordination problems (logistics, agricultural inputs supply, access to financial services, etc.); b) the creation of public cluster/sectoral goods, particularly in the areas of infrastructure and research; c) the establishment and maintenance of production and logistic cluster planning and monitoring systems; d) the design and implementation of business intelligence strategies, including collective marketing and promotion, market research and the development of a product-country brand; e) the undertaking of collaborative technology research and transfer; and f) (collective) compliance with quality and safety, environmental and social standards.

In particular this latter element, collective compliance with food quality and safety, environmental and social standards, is often a critical catalytic factor for the creation or development of ACs. The analysis carried out shows that complying with quality

and safety requirements (e.g. GAP, traceability) acts as a catalyst for collective action in ACs (ECLAC, 2005): Examples of this are the salmon cluster in Chile and the fish cluster around Lake Victoria, and the adoption of GAP standards in the Latin America fruit clusters, to name just a few. Moreover, the collective adoption of environmental and social standards has been an important step in the development of the cut-flower clusters in Kenya, Colombia (Florverde) and Ecuador.

In many cases, these standards can be the centrepiece of agricultural clusters. ACs may be formed around commodities, such as wine, rice, meat or dairy, but also around agricultural practices or philosophies, such as GAP (e.g. GAP cluster in Thailand) or organic versus non-organic foodstuff (Eades, 2006); or social or ethnic networks, such as quality linked to origin signs (e.g. CDO or Protected Geographical Indication), female, disadvantaged, mountain communities or Fairtrade (PSU, 2005).

- (9) **ACs tend to develop, by and large, around high-value export-oriented agricultural products:** ACs focused on local markets remain relatively underdeveloped in comparison to those focussing on exports. Indeed, export-oriented ACs tend to be more dynamic, as the incentive to cooperate is much greater because of the fact that: a) the demand curve is more elastic; b) intra-cluster competition is limited (except perhaps for particular clients); c) cooperation provides a way of managing risk; and d) cooperation helps to defray costs associated with meeting quality and safety requirements, which are higher for export markets.

Conversely, ACs that target the local market: a) have fewer incentives for inter-firm cooperation because they compete for the same limited pool of consumers; b) are very fragmented, making collaboration among myriad of farmers and firms less likely; c) have fewer firms with a solid financial position that allows them to invest in collective actions and participate in joint ventures with the public sector; d) critically need various types of core public goods that require a very high level of investment, and are practically unattainable and almost impossible to prioritize.

Moreover, many domestic-oriented incipient clusters (e.g. Central American dairy clusters) do not seem to have a bright future ahead of them because many supply chain links, essential for an endogenous development, are not being strengthened. Instead, they are disappearing as a result of disequilibrium in the geographical concentration of productive activities, property concentration and the domination of multinational corporations (ECLAC, 2001).

All the clusters presented in this paper are built around high-value export-oriented products, the so-called non-traditional commodities, with the exception of the coffee clusters in Kenya and Nicaragua, which nonetheless were not doing very well, and the Viet Nam root crop cluster. However, even for the traditional commodities studied (coffee) new markets have opened (premium coffees). Similarly, domestic-oriented clusters can evolve if new high-value local markets are identified, such as supermarkets. One example of this is the palm sugar processing industry in Indonesia, which traditionally has been a part-time activity, with a low-input process sufficient to produce low-quality sugar for the local market, and limited inter-firm cooperation (Kameo, 1999). However,

in recent times a subset of producers has started to produce high-quality palm sugar that is good enough to be sold in urban retail outlets and to food processors. Such quality upgrade has required costly labour and equipment changes, and has triggered cluster inter-firm cooperation in transport and marketing issues, although on the production side cooperation still remains weak (Burger *et al.*, 2001).

- (10) **ACs are rapidly evolving to meet the challenges of the new agriculture:** ACs are undergoing rapid and considerable changes regarding diversification (including bio-energy production), integration, intensification and increases in scale. According to LEI (2006) ACs need increases in scale to cut costs and to offer financial scope for investments for sustainability, implying that small-size farmers and firms are clearly at a disadvantage.

One of the main challenges for today's ACs is better meeting consumer demands, while at the same time increasing efficiency and productivity. ACs need to make organizational changes (e.g. knowledge, logistics, space, ICT, cluster organization, entrepreneurship) so that all parties (primary producers, processors, logistical operators, retailers, service organizations and knowledge institutes) can develop competitive and innovative products that meet market demands rapidly and successfully. For instance, the Colombian flower cluster is nowadays investing more on developing new varieties and colours demanded in the different markets and building the cluster's brand, while it is simultaneously making investments for improving logistics and reducing costs in order to be able to better compete in the global flower value chain.

Other challenges confronting ACs are: a) the need to introduce market-driven innovations in fresh and convenience products; b) the need to further improve the control of food safety risks; c) foreign competition; d) the increasingly stringent environmental regulations; and e) energy and water issues.

- (11) **Agricultural cluster policies are not isolated:** They relate to multiple subjects, including knowledge and innovation, spatial planning and agricultural logistics. For example, AC policies are strongly related to agricultural export strategies and policies: Strengthening ACs can help developing countries to achieve greater export competitiveness. According to ITC (2005), "a cluster-based export strategy can build strong and competitive regional economies within the country, while concurrently achieving economic, social and commercial objectives at the national level". The most recent export promotion strategies, in both the agricultural and non-agricultural sectors, focus on strengthening relationships and cooperation among SMEs, and on promoting linkages between SMEs and multinational corporations. However, large local agribusiness firms can also make substantial contributions to national agricultural trade strategies by empowering export clusters and inclining the governance of global value chains in favour of local actors. PPPs can be essential in managing the integration of large local companies in export initiatives (Limburg, 2004).

Furthermore, AC programmes and policies might be closely linked to the tourism sector. For instance, the California wine cluster has numerous connections with other clusters in agriculture, wine-country tourism, and food and restaurants (Porter and Bond, 1999). The same thing applies to Chilean, Argentinian and the South African wine clusters.

(12) ACs can contribute considerably to local and regional development: The progress and growth of ACs seem to have many spillover benefits on local and rural development. Besides, clusters are vital in the globalization era because globalization has highlighted the importance of providing local and regional answers (e.g. local and regional agricultural programmes and policies) to competitiveness issues in the agricultural sector.

ACs can contribute to create national/regional brand identity. In the current competitive marketplace where product differentiation is essential to agribusiness' prosperity, ACs are crucial to creating national or regional brand identities. ACs facilitate the transition from producing basic commodities, such as table wine, to producing premium-quality wine or even to "providing sophisticated consumers with lasting experiences such as wine-tasting and hosting heritage trails organized around vineyards" (PSU, 2005).

7.2 RESPONDING TO THE CHALLENGE: BEST PRACTICE RECOMMENDATIONS

Many clusters have developed independent of support from government or donor agencies, as mentioned in the previous section. Moreover, government policies in some cases have hindered rather than supported cluster growth. For example, one study in Indonesia highlighted how attempts to promote a cluster by installing common service facilities failed because it undermined the development of intra-cluster linkages. The facilities remained government controlled and the dynamism resulting from firms working together was reduced. However, it is clear that government and other bodies external to the cluster can aid cluster development. Indeed, many Latin American clusters, some of the world's most developed, received important government and (to a lesser extent) donor agency support. Support, therefore, can and should be provided to clusters, but the benefits and disadvantages of such support need to be addressed for each case.

The present research has come out with best practices recommendations to ensure that governments and other facilitating institutions provide effective support to agricultural clusters, especially in the developing world. These recommendations relate to areas where government support is necessary and beneficial, and principles that should guide public interventions related to ACs.

7.2.1 Best practices regarding the scope of government interventions

In a nutshell, the present research has shown that in order to achieve their intended positive effects, AC initiatives should: a) improve incentives for producers and agribusiness; b) provide core public goods; c) enhance the climate for private investment in agriculture; d) build effective institutions; and e) reduce the environmental drag³⁹.

³⁹ Based on the elements of a sound agricultural policy highlighted by the World Bank (World Bank, 2007).

- (1) **Getting the right mix of incentives** for agribusiness firms and farmers is essential to drive positive behaviour and motivate cluster participants. Incentives established to support AC development can be of market, financial or investment nature. In particular, market incentives appear to be of great importance, as seen in the cases of the Colombian, Kenyan and Ecuadorian flower clusters, where the negotiation of preferential trade agreements and the provision of export promotion incentives were decisive factors in their development and achievements.

Decisions regarding the type of incentives provided and the way they are managed should be made on a case-by-case basis. However, some general remarks can be made:

- The provision of incentives as a stand-alone measure can prove inefficient, and even counterproductive, if insufficient attention has been paid to ensuring an enabling environment for private sector's involvement in ACs.
- It is vital to find the right balance in taxation and incentives in ACs to avoid policy biases against agriculture.
- Ensuring that a given set of incentives will not harm the links established among the different cluster actors is also important. Nonetheless, incentives may be biased in favour of small and medium farmers and firms, and in fact, they can be fundamental to improve governance in the cluster/value chain by strengthening the capacities and bargaining position of disadvantaged actors or those risking exclusion.

- (2) **Providing core public goods:** The development of ACs depends critically on investments in rural infrastructure (e.g. irrigation, roads, transport, power, and telecommunications), as well as on investments in markets, rural finance, and research and extension. The magnitude of the infrastructure gap in the agriculture sector is the most obvious, and possibly the single greatest deterrent to the development of ACs. Inadequate irrigation, distribution, storage and handling systems represent fundamental barriers to production development and value-chain integration. They minimize market opportunities and they act as a major disincentive to the entry of new high-value addition participants (such as processors) and to the formation of value networks. Coordinated investments in core public goods among national, state and local governments are therefore fundamental to bridging the infrastructure gap.

But the infrastructure issue is more complex than this. Often, within the context of clusters, success is dependent upon the availability of financing for the infrastructure that will not just facilitate the formation of value networks but, as indicated above, will actually provide the "raison d'être" for creating the value network. It is here where considerable scope exists for innovative, public- and private-sector financing schemes. In fact, PPPs are growing in importance as a funding source for cluster infrastructure improvements in developing countries (ITC, 2005).

- (3) **Creating a favourable climate for private sector investment in agricultural clusters:** Following the line of thought of the World Bank (2007), much of the needed investments for ACs' development "will have to come from rural savings and the private sector, with the rural

investment climate an important determining factor”. In order to enhance the investment climate for the private sector, the government will have to provide public goods such as infrastructure; promote well-functioning institutions and regulations to make markets work better (e.g. market regulation and information systems, financial institutions and risk-management tools); and secure property rights for land and water to motivate private investments in agriculture, especially those with a longer-term payoff. It is essential as well to ensure adequate social and environmental regulations, both in terms of legislation and enforcement; and to create an enabling environment for attracting FDI.

Governments in many developing countries seem to have recognized the contribution that the private sector, with its vast resources and liquidity, and managerial expertise, can make to facilitate the implementation of agro-based cluster policies. The public sector is, accordingly, demonstrating greater readiness to enter into new relationships, and partnerships, with the private sector and, as a consequence, the “top down” model of decision-taking and decision-implementation is giving way to more innovative and flexible public-private undertakings.⁴⁰

A related observation is that the government in general, and the public-sector organizations usually associated with agriculture development in particular, are not good at managing cluster initiatives; although there has been success in some cases. Some non-traditional form of PPP will, therefore, be required if national policy is to achieve, through cluster promotion, the dual objective of improved economic performance and increased prosperity within the agricultural sector. Such a partnership should place decision-making authority within the membership of the cluster, while assigning responsibility for managing the process to private-sector managers.

PPP is a formula adopted in various domains related to agricultural cluster support, but mostly in infrastructure development⁴¹, collective compliance with standards, and research and promotion. In the latter case, educational institutions, the industry and the public sector join efforts to fund and cooperate in R&D for the benefit of the agro-enterprise cluster. Interesting experiences in this area are the Chilean R&D technological consortia to promote upgrading and innovation in the wine and fruit clusters, as described in Chapter 4.

For Gomes (2000), PPPs are most often established when agricultural clusters face a crisis. He stresses that “effective (public-private) partnerships emerge precisely through an institutional innovation that emerges in response to crises (pest outbreak, the demand for a given variety), which requires a substantially different institutional approach, including redefining priorities or aligning with different actors”. Indeed, PPPs were introduced to help lift import bans in the fish clusters studied, or to respond to anti-dumping claims in the case of cut-flower clusters.

40 “Although it is the Government’s responsibility to provide public goods, this does not always happen simply because of the sheer magnitude (of the challenge). Sometimes companies do raise questions about appropriate boundaries, but today the debate is less about public vs. private – it is accepted that companies should supplement the Government’s effort to bring about all-round development” (Sushanta Sen, Deputy Director General, Confederation of Indian Industries).

41 As the ITC highlights: “There is more to infrastructure financing than public sector funds».

Not everything that glitters is gold, and PPPs are not the exception. In Brazil, much of the public-private collaboration in research resulted from the availability of competitive research grants from the federal government, which required researchers to submit proposals endorsed by grower associations. The experience of these Brazilian programmes has been mixed, with particular success in Santa Catarina, but allegations of misuse of funds for several associations in Petrolina-Juazeiro and Rio Grande do Nord. Placing public funds in private hands does not therefore necessarily improve the efficiency and effectiveness with which these funds are used. Therefore, monitoring mechanisms to ensure the adequate performance of PPPs have to be put in place.

- (4) **Building effective institutions:** Three groups of institutions are important for developing ACs: a) collective actions performed under different organizational schemes; b) umbrella institutions and programmes that support ACs at the national level; and c) regional AC umbrella institutions and programmes.

4.a) Institutions that promote collective actions within an agricultural cluster: As stated in the previous section, the implementation of collective actions is crucial to ensure the competitiveness of an AC. Collective actions can be promoted by different actors or institutions, including: informal groups within the agricultural cluster; a formally constituted association member of the AC (i.e. farmer/exporter or industry association); a consortium or related structure linked to an AC; or a formally established cluster structure.

Collective actions undertaken by informal groups are most common in the first stages of development of agricultural clusters. In relatively developed ACs, collective work is more frequently promoted by organized farmers and agribusiness firms through well-performing farmer and industry/cluster associations to reduce transactions' costs, connect farmers to markets and improve their bargaining position in those markets. This points out to the potential role of the public sector in building the capacity of such associations to promote and undertake collective actions.

Collective work can also be promoted by a consortium or related structure linked to an AC. An example of this is the figure of the Chilean "biotechnology consortia" tied to agricultural clusters. Such consortia for business and biotechnology research are the natural next step to add value to the country's most dynamic agricultural clusters, namely fruit growing, winemaking and salmon production. Some of the issues that these biotech consortia could help to solve would be how to obtain anti-oxidants from blueberries, to discover more efficient treatments to fight vine diseases, or to use the tools of genomics and proteomics to improve quality and delay ripening in varieties of grape, peaches and nectarines. The creation of a biotechnology consortium tied to an AC is also an effective tool for researching the supply of global technology and for identifying and establishing international collaboration (e.g. with international corporations and institutional investors, such as banks and investment funds) that will enable the cluster to have quick access to the latest technology available worldwide.

This scheme of biotech consortia linked to ACs has many advantages. First, it is an inclusive approach that addresses the productive needs of all the cluster participants, benefiting in particular small and medium firms that otherwise would have not been able to access biotech innovations. Second, it enhances the competitiveness of ACs through the establishment of meaningful industry-academia interactions that may benefit the country's biotechnology industry as a whole. Third, it promotes private-public collaboration: Initial public funds are allocated to each consortium to leverage private-sector funds. Ideally, government participation would be larger at the beginning (seed capital) and then would be progressively reduced given way to the private sector, reaching almost virtual levels of participation in the long term. Private firms are not only economically bound to the consortium, but they also contribute with valuable feedback on their needs and on the commercial feasibility of proposed technical solutions. Altogether, the idea of positioning Chilean biotechnology under the umbrella of successful clusters follows the United States model with agricultural biotechnology companies that firstly worked for seed corporations (Hernández-Cuevas and Valenzuela, 2004).

Finally, there is even the possibility of "formalizing" collective actions by establishing the agricultural cluster as some form of legal entity, creating a formal structure around the cluster's assets (i.e. facilities) and liabilities (and debts), and implementing some form of operations and maintenance mechanism by which the cluster's common facilities are managed. All this involves coordinating the inputs, responsibilities and rights of the host of possible stakeholders in the cluster, who range from farmers, agribusiness, operators of private, value-added facilities, processors, and the various levels of government and commercial banks that are contributing financing. It also means to put a legal framework and financial package together, and to ensure that the framework and package address the concerns and requirements of all stakeholders. Under this type of scheme, there is a key role for the state to foster the establishment of seed capital and long-term financing as well as agricultural insurance schemes. More or less formal types of such formal cluster structures have been established in Colombia (Competitiveness Agreements), Chile (ITPs) and India (generally referred to as "Special purpose vehicle").

- 4.b) The creation of umbrella agricultural cluster institutions and programmes at the national level:** Some governments have promoted the creation of an institution or programme that coordinates the work of all their agricultural clusters. An example of this is the megacluster "Chile Potencia Alimentaria", or umbrella institution that groups all the Chilean ACs⁴². Chile has structured its agrifood sector strategy around the development of dynamic export clusters (e.g. horticulture, wine, salmon and dairy/meat clusters) and has complemented this strategy with the creation of a megacluster. Chile Potencia Alimentaria is a private-public entity composed of 30 representatives from various public agencies (e.g. Agriculture, Health, Fisheries, Customs), industry associations (e.g. association of exporters and industry associations from the wine, salmon, horticultural and dairy clusters),

42 www.chilepotenciaalimentaria.cl

producer associations, and academic and research centres belonging to various agrifood clusters. Altogether, this umbrella organization tries to address in a coordinated manner cross-cutting issues of concern to all agricultural clusters (e.g. the modernization and strengthening of the Ministry of Agriculture, market access improvement, competitiveness and innovation, and key infrastructure developments), and provides advice to the Ministry of Agriculture on the design and implementation of the national agrifood industry strategy, with the overall objective of exporting more than US\$20 000 million per year of food products by 2015⁴³.

4.c) The creation of umbrella agricultural cluster institution/programme at the regional level: Donors and international organizations have seen the need to converge their efforts and models towards joint initiatives to promote clusters at a regional level. DFID, USAID and other donors that are funding cluster competitiveness programmes in Caribbean and Latin American countries are negotiating to launch a Caribbean-wide competitiveness umbrella to facilitate synergies and alliances between clusters in the region (DFID, 2001). Similarly, DFID and the Canadian International Development Agency (CIDA) are implementing a cluster competitiveness programme in Guyana. UNIDO and the ITC have also initiated discussions to join efforts in various areas in countries of the Southern African Development Community, including competitiveness programmes. Several national and regional governments and chambers of commerce have also piloted cluster initiatives across a wide range of industries throughout the developing world.

(5) Ensuring sustainable use of natural resources: In many ACs, long-term productivity growth could have been higher if the cost of natural resources degradation had been reduced, as in the case of the Lake Victoria cluster. The uncontrolled growth of an agricultural cluster can impact very negatively on the sustainability of natural resources (soil and water, among others).

7.2.2 Principles that should guide any public intervention related to agro-based clusters:

A set of principles that should guide the design and implementation of AC programmes and policies, by both governments and international donors and organizations, follows:

(1) The principle of inclusion should be present in all AC initiatives: Governments should be guided by the principle of inclusion of small farmers and agribusiness, and should be able to forge alliances with large firms without compromising support for small growers. CODEVASF followed this principle of inclusion in Brazil and mixed medium-size firms and small farmers in the Petrolina-Juazeiro irrigation project, promoted small farmers' access to crop and post-harvest technologies and helped growers' associations to solve collective problems associated with exporting. The Government of Mendoza has also applied the inclusion principle and has worked with small grape and wine producers from more backward areas.

⁴³ <http://www.chilealimentos.com/link.cgi/Ventajas/31>

The principle of inclusion is particularly important, because according to many authors on agricultural and other natural resources-based clusters, global leaders do not normally foster and support the SME upgrading process. In contrast, in non-agricultural industries, process and product upgrading are often facilitated by large international buyers, given the crucial role played by the transfer of tacit knowledge and the need for more intense buyer-producer interaction (IDB, 2005b). However, the present research has produced counter-evidence showing that FDI has had positive spillover effects on domestic small- and medium-scale firms in the Colombian flower cluster (which nowadays has a comparatively large number of small firms and is less concentrated than in the past decade) and the Latin American wine clusters.

- (2) **AC initiatives should promote “clusterpreneurship” and linkages among cluster participants:** The main problem confronting cluster creation is the lack of pioneer “clusterpreneurs” – who will articulate the vision, and through their own actions instil enthusiasm for the vision among other potential cluster participants. This is particularly true when it comes to the agriculture sector, where the role of pioneer clusterpreneur must often be assumed by an external agent (government, donor, multinational corporation, among others) or by an “upstream” (processor) stakeholder.

In more advanced stages of AC development, the emphasis of governments should be on promoting “clusterpreneurship” at all levels, but especially on generating a “bottom up” enthusiasm for pursuing horizontal and vertical relationships among cluster participants.

- (3) **It is essential to avoid the one-size-fits-all approach:** AC initiatives in developing countries should acknowledge that the primary reasons behind the competitiveness of their ACs are likely to be factor conditions (e.g. natural, human and capital resources), whereas in developed nations other factors, such as demand conditions, related and supporting industries, and local rivalry are relatively more significant (Van der Linde, 2003). Consequently, developing economies can learn from agricultural clusters in more industrialized countries, but they will have to adapt the approach to their own set of conditions.

Furthermore, there are significant differences among developing countries in terms of geographical location, country size, industrial experience, resource base, economic and political system, level of institutional development, skill base and government capabilities, which result in different characteristics and level of development of clusters (ITC, 2005). All the above considerations emphasize the need to tailor support measures to the characteristics of each cluster/country. Even when talking about the global flower industry, responses at the local level might be different: One strategy that is appropriate in Kenya could be completely inadequate in Ecuador or Colombia.

- (4) **AC initiatives need to have a strategic sector dimension:** Cluster support policies have to be tailor-made to fit the agricultural sector. First, food has a dual nature; it is both a basic good without which people are unable to live, and a commodity to be produced and traded. Therefore, more so than for policy concerning other forms of clusters, agro-based cluster policies need especially to consider food security issues. Second, from a practical point of view, because of the nature of agricultural production, the material

input into agro-based clusters can be more unpredictable compared to the inputs into other types of clusters. Third, agricultural clusters will have to operate in mature and very competitive markets, which are characterized by relatively slow growth and a long-term trend of declining prices and profits. And last, ACs are located in rural areas where they cannot take advantage of the concentration of human and financial resources, infrastructure and services, and their access to markets is more limited. The strategy that best works in this context is to capture more value and to maintain competitive advantage by innovating processes. Therefore, cluster- support policies in the agricultural sector should be aimed in this direction (ECLAC, 2005).

Cluster upgrading is also sector specific⁴⁴. Because of this, IDB (2005) argues that cluster-support policies need to have a strategic sector dimension. In the case of agricultural and other natural resource-based clusters, as upgrading is fostered by collective efficiency and technology improvements and diffusion, “policies should promote public-private collaboration in research and disseminate research results to SMEs, improve skills and abilities of producers in agriculture, and facilitate the entry of SMEs”.

(5) Involvement of decentralized government agencies in AC initiatives is most recommended:

An AC is by definition a tool to improve the economic dynamics of a given territory. The close link with territorial development makes almost compulsory the participation of local (state or provincial) governments in the process of cluster inducement and development. A good practice identified is the collaboration and co-sharing of responsibilities of both central and local government agencies. Examples of wine clusters in Latin America and the grape cluster in India, have provided evidence of this.

Other examples of collaboration between central and decentralized government agencies are the cases of the Malaysian palm-oil industrial clusters and the export-oriented agricultural clusters (also called agri-export zones) in India. Palm-oil industrial clusters in Malaysia (POICs) are essentially areas set aside within palm-oil producing areas for post-harvest palm-oil enterprises. They aim particularly to promote the post-harvest aspects of the palm-oil value chain, as these are currently relatively weak. Support, e.g. infrastructure, is often provided. While POICs appeared in the Ninth Malaysia plan⁴⁵ and the policy was formulated at the central government level, they are state-run initiatives. It is the states that are responsible for setting up and administering the clusters.

The idea behind export-oriented ACs in India is to use a cluster approach to promote agricultural exports; attention is paid to all the actors in the value chain and the linkages between them, and government activity (research, financial assistance and fiscal incentives) is closely coordinated. The responsibilities for promoting these clusters are shared between the central government – through an agency called APEDA⁴⁶ – and the state government. The state government identifies a potential export product and region suitable for promoting with a cluster approach, details relevant projects for the

44 Breschi and Malerba (2005) also agree with this idea and they add that cluster upgrading is sector specific because innovation and learning regimes differ across sectors.

45 <http://www.epu.gov.my/web/guest/ninth>

46 APEDA is a central government agency, which is part of the Ministry of Commerce & Industry (www.apeda.com)

cluster initiative and then forwards such proposals to APEDA for initial scrutiny. A detailed project report is then written by the state government (with guidance from APEDA) for submission to a Steering Committee. Finally, if approved, a memorandum of understanding is signed between APEDA (on behalf of the central government) and the state government for providing possible assistance at each stage of the project. Once the cluster is running it is essentially a state responsibility but in close partnership with APEDA. Additionally, the assistance to the AC itself (research, financial assistance, fiscal incentives) is from both state and central government.

- (6) **In order to effectively promote agricultural clusters, a public-sector agency should have both flexibility and institutional continuity:** A large degree of flexibility is required to continually adapt to events and changing priorities. For example, public research agencies should be able to adapt and broaden their research agenda as needed to help growers and other agricultural cluster stakeholders cope with market changes.

In addition, developing ACs is a long-term effort that requires strong institutional continuity⁴⁷. In any case, it is crucial to avoid piecemeal public support to small and medium producers that does not enable a core group of producers to adopt a new crop or upgrade processes nor creates institutions to support them.

- (7) **Policies and strategies to support ACs will necessarily have to take into account crop characteristics:** Crop characteristics determine the cost associated with upgrading, grower's incentives to undertake activities collectively and the need of public support for R&D. Short-term crops, such as melons and strawberries, require less investment than perennial crops and have a shorter and less expensive research process. Consequently, growers of short-term crops usually carry out much of the R&D independently or with guidance from buyers, input suppliers and consultants. In contrast, experimenting with perennial crops, such as grapes, lemon, mango, involve more risk and a longer learning process and, as a result, small and medium growers of perennial crops most definitely need public support for upgrading. Growers' need for financial support, infrastructure needs and other elements will also differ from one crop to another.
- (8) **Decision-making mechanisms relative to resource allocation in the AC initiative should be as transparent and participatory as possible:** There is the risk that political pressure interferes with cluster processes and resource allocation resulting in the adoption of inadequate strategies. Groups of producers, multinational corporations and large local firms that control a large portion of cluster/sectoral wealth often have the means to influence public agricultural-cluster programmes and policies on their benefit. In addition, external agents supporting AC initiatives (donors, international organizations and multinational companies) can also interfere with resource allocation (Anderson *et al.*, 2004). There are different ways to minimize the political pressure on spending decisions. One way to do so is to strengthen the collaboration between the public sector and a range of private-sector actors by the adoption of collective decision-making

⁴⁷ Examples of this are provided in section 4.3.3, when describing the institutional support to Latin American fruit clusters, in particular the cases of the Santa Catarina (Brazil) apple cluster and the Maule (Chile) raspberry cluster.

mechanisms, such as the Colombian “Competitiveness agreement” or the Chilean ITPs. Another way to handle this is by promoting administrative and political decentralization (as suggested in a previous principle) that puts decisions on resource allocation closer to local governments and local civil society actors.

7.3 LIMITATIONS AND POTENTIAL RISKS POSED BY INADEQUATE CLUSTER POLICIES

Potential environmental damage: A number of the case studies in this document have had negative environmental impacts. Given that ACs are intrinsically dependent on their physical environment, this degradation is not only worrying in itself, but also could ultimately undermine the sustainability of the clusters. On the other hand, the dynamics of clustering also allows collective action to be taken to reduce this environmental impact.

The example of the Kenyan cut-flower cluster is demonstrative in showing both of these considerations. While not the only actor responsible, there is evidence to suggest that the cut-flower industry has contributed to the environmental degradation of its surroundings. There is particular concern about the decline in the water levels of Lake Naivasha. Unless water is abstracted in a more efficient and sustainable manner, the long-term future of the flower cluster is in question, as the industry depends upon the lake for irrigation. Recently there have been various examples of collective action to tackle such degradation. For example, the Lake Naivasha Riparian Association, an association mostly made up of local landholders, has been instrumental in the formation of a Management Plan for the area. This plan is now executed and reviewed through a multi-stakeholder body that includes national ministries, local government, growers groups, other associations and NGOs (Becht *et al.*, 2005). Meanwhile, a voluntary producer association, the Kenyan Flower Council, is helping to improve the practices of the producers. These actions have not been completely effective (Becht *et al.*, 2005), but overall the cluster highlights an example of the environmental impact clusters can have and how cluster dynamics can help to try and reduce such impact.

Impact on land tenure and labour standards: The growth of ACs can stop the process of out-migration in rural areas, and can even trigger an inflow of migrants from urban areas. However, the rapid growth of a cluster can cut the ties of small growers with land as the pressure on land tenure grows and smallholders sell their piece of land to large firms and become their paid workers. Korovkin (2005) showed the example of the flower cluster in Ecuador where the percentage of flower workers that owned more than 1 ha went from one-third to one-tenth in just a few years.

The growth of ACs has had an ambiguous impact on labour standards. On the one hand, there may be rises in wages, increased levels of human capital as new processes are learned, and better meeting of labour rights (particularly as meeting these rights is increasingly becoming included in the standards necessary for export to high-value export markets). Damiani (1999), for example, found that the growth of an agri-export cluster in Brazil was associated with increases in employment and wages, the upskilling of labour and the improvement of labour standards. Yet Damiani (1999) also emphasizes the role played by

unions and the Ministry of Labour in helping to bring about these results. That there is a need for such a role and carefully tailored policy is evinced from some other clusters where wages are low and labour rights not met (for example, see FIDH, 2008).

Impact on small- and medium-sized farmers and agribusinesses: As the start of this chapter noted, these actors potentially have much to gain from clusters and cluster initiatives. However, such gains are not guaranteed and the formation of policy needs to bare this in mind. Indeed it is noticeable that some of the clusters in this document are dominated by large firms. The Kenyan coffee cluster shows the danger of such dominance. Here the later levels of the value chain are highly consolidated. Four companies control 40 percent of exports, while at the roasting stage other four companies control 45 percent of the market. As a result of such consolidation, the balance of power in the value chain heavily favours the exporters and roasters. Consequently, the large numbers of coffee growers at the start of the value chain are increasingly suffering. For example, in 1975 the growers captured 30 percent of the final retail price of the coffee. By 2000 they captured only 10 percent (Talbot, 2004). Additionally, while they can be important sources of innovation, large (and particularly multinational) companies in some cases have acted to hinder the movement of local actors further up the value chain (Talbot, 2002). Such examples demonstrate how cluster development, with inadequate policies, is not always to the benefit of smallholders.

Overdependence on one product or group of products: By concentrating upon one product or group of products, an area becomes especially vulnerable to changes in the market for that product. Clusters are dynamic and can help to promote innovation that enables access to new product markets. However, clusters are not always successful and they can be hit by changes in the product market beyond their control. As there may be little diversity to the cluster's industry, these impacts can be especially harsh. A related point is that the importance of agro-industries to the economy of some countries can in some cases give them disproportionate influence.

Neglect of important links to actors outside the cluster: The cluster approach emphasizes the importance of links between all of the actors within an area. In focusing upon these links it is important not to forget that external links can also be important. For instance, this document has highlighted the role of FDI in helping many of the clusters develop; similarly with knowledge inputs. Interaction between cluster members can promote learning and innovation within the cluster, but outside sources of knowledge can also be useful. This argument is summed up well by Bathelt *et al.* (2004): "it is not just the links within the local area that are important, but also the "pipes" connecting the cluster to external actors".

Food security issues: Cluster strategies seem to work best when dealing with high-value export-oriented products. As a consequence, they seem to have limited scope in holding down the soaring prices of grains and other staple foods.

A premise of many cluster policies is that clusters will raise employment levels, increase wages and make the area's industries more profitable, thus improving the ability of the area's inhabitants to purchase food and be more food secure. However, such assumptions do not necessarily always hold, as the development of the export focused fish cluster around Lake Victoria demonstrates (FAO, 2003a). While the cluster has been a source of export

earnings for Kenya, such earnings are of little benefit to the local people. As the industry has developed, local people have been progressively edged out of production, pricing, marketing and processing. These activities are now largely controlled by fish factories and their agents, with local people benefiting little from their activities. Meanwhile local fishermen are suffering as their yields are declining. The demand for fish from fish factories, producing for the export market, has raised the price of most fish beyond the reach of local inhabitants. With the development of a fishmeal industry, even the bits of the fish left over after they have been processed by fish factories (the “frame”) are no longer affordable for poor consumers. Overall, the development of the fish cluster has increased food insecurity for many in the region. Indeed, it is telling that this region, the producer of the majority of Kenya’s fish, has the highest rate of protein deficiency in Kenya. Cluster policies need to carefully consider food security implications and not simply assume that the development of clusters will automatically improve food security.

7.4 FUTURE RESEARCH QUESTIONS

Almost all of the clusters mentioned in this document initially developed of their own accord and without or with little support of a government cluster programme. Yet at the same time, once these clusters had initially developed, it appears that government support has been an important factor in their success. The most successful clusters in this document have been those in Latin America. Here there are higher levels of government support, especially in comparison with the levels of support provided to the relatively less successful African clusters. This raises questions about the role of government in promoting clusters and at what stage they should act. This document has highlighted some examples of external inducement of clusters, but more research is needed. There is a particular shortage of research looking at the impacts of cluster policies over the longer term.

Another feature common to all of the clusters in this document (with the exception of the Viet Nam root crop cluster) is their emphasis upon the export market. This situation raises the question of whether clusters focused upon the domestic market can be viably promoted. On the one hand, the apparent lack of successful domestically oriented clusters may simply be a reflection of the focus of the existing literature. Further research might therefore turn its attention to domestic clusters. On the other hand, there are reasons to believe that it is only externally oriented clusters that can really be dynamic. Berger *et al.*'s (2001) argument, based on their experience in Indonesia, is useful in this regard. They argue that inter-firm cooperation is one of the key drivers of cluster dynamism. In clusters focused upon the local market there is little inter-firm cooperation because the firms are competing for the same limited pool of consumers. Clusters focused upon external markets tend to be more dynamic, as the incentive to cooperate is much greater. Cooperation is much more likely in these clusters because of the fact that intra-cluster competition is limited, the demand curve is more elastic, cooperation provides a way of managing risk, and the need for cooperation and coordination is much higher for export markets requiring strict adherence to standards. While Berger *et al.*'s (2001) argument is persuasive, its position on the need to produce for export markets is less clear, as their research focuses only upon local as compared to non-

local markets, not whether these non-local markets are export or simply other domestic markets. Further research is therefore needed to investigate the exact importance of the market in determining cluster efficiency and whether clusters can only be dynamic if they are oriented towards the external market.

Another area for future research is the promotion of “inter-professional” or industry associations as cluster promoters or coordinators. To this effect, FAO (2009) has examined the lessons learned from the experiences to date with such associations, compared the inter-professional approach with alternative types of commodity association and considered the feasibility of further promotion of commodity associations in other countries.

Finally, in the definition of ACs used in this document, it was noted that cluster members “inter-connect and build value networks, either formally or informally”. In the case studies used in this document, there has been a concentration on the formal links between cluster members. These appear to have been crucial to the success of many of the ACs studied. However, further research may want to investigate the role of informal links and whether such links, if important, can be promoted through public policies. Such investigations might build upon research on sub-national innovation systems (for example, Yim, 2007) and industrial districts (for example, Saxenian 1994), where informal links between cluster members have been found to be important. In Saxenian’s (1994) work, she found that one of the key reasons for Silicon Valley’s success was the movement of workers around firms and the social culture that encouraged talking about work while socializing, both of which helped to spread innovation. Whether such informal links play a role in agricultural clusters is unclear, and further research may be useful to clarify this issue. Such research would be particularly useful in the context of an increasing number of AC policies that are attempting to formalize clusters.

8. Annexes

Annex 1. Cluster projects approved by IDB since 2002

Country	Name	Project No.	Approval date	Approved amount (US\$ 000)
Guyana	Support for Competitiveness	GY-L1006	JUN 28, 2006	26 650
Argentina	Strengthening Competitiveness of Clusters in Central Region of Santa Fe Province	AR-M1012	JUN 14, 2006	1 900
Brazil	Strengthening of the Entrepreneurial Activity Program Estado de Bahía	BR-L1023	JUN 1, 2006	10 000
Argentina	Technological Modernization Program III	AR-L1012	APR 26, 2006	280 000
Brazil	Competitiveness Support Program for Software SMESs	BR-M1015	APR 27, 2005	1 300
Brazil	Technological Innovation & New Manag. Approaches in Agricultural Research AGROFUTURO	BR-L1001	DEC 1, 2004	33 000
Colombia	Program to Support Clusters Competitiveness	CO-M1002	AUG 4, 2004	3 450
Honduras	Program to Foster Business Competitiveness	HO0221	MAY 6, 2003	10 000
Bolivia	Institutional Support to Strengthen Trade	BO0212	NOV 27, 2002	5 000
Panama	Program to Foster Competitiveness	PN0145	JUN 19, 2002	7 000

Source: IDB. <http://www.iadb.org/projects>; for projects with an approved amount \geq US\$1 million.

Annex 2. Characteristics of Latin American wine clusters

Country	Cluster (% of national production)	Cluster cultivated surface (ha)	No. of firms		
			Vineyards	Winemakers	Exporters
Argentina	Province of Mendoza (70%)	140 000	16 000	683	200
Bolivia	Tarija Central and Cinti Valleys (98%)	3 000	1 800	30	n/a
Brazil	Southern Brazil, especially the State of Rio Grande do Sul (93%)	45 000	14 000	400	n/a
Chile	Colchagua Valley, a sub-cluster of the Maule and the Libertador Bernardo O'Higgins regions (72%)	23 000 ha of fine vineyards		100	25
Uruguay	Department of Canelones (60%)	8 600	270	375	30

Source: Argentina (McDermott, 2005); Bolivia (USAID, 2002; Paniagua Requena, 2002); Brazil (Vargas, 2001); Chile (Giuliani & Bell, 2004; www.rutadelvino.cl); Uruguay (www.vino-uruguay.com)

Firm size			Governance	Investments
<i>Vineyards</i>	<i>Winemakers</i>	<i>Wine export/ distribution firms</i>		
Small- and medium-size firms: 18 largest vineyards total 5% of total area dedicated to wine grape; 1 100 owners controlled about 50%	Small- and medium-size firms: 10% of total firms are cooperatives	Medium-and large-size firms: the top 5 export firms account for 40% of total wine export sales and the top 20 for about 70%	Concentrated marketing and distribution: 7 companies account for 80% of cheap table wine, and 50 premium wineries account for about 45% of fine wine volume and 70% of fine wine exports. Subcontracting is commonplace	US\$530 million (300 in wineries and 230 in vineyards) from 1999 to 2004 in Mendoza. FDI: 62% of the investment in export-oriented wineries.
Small firms except for winery-owned vineyards	8 industrial wineries; 9 small wineries; 14 artisanal wineries	Medium-and large-size firms	Vertically integrated wine production and marketing	US\$75 million (30 vineyards; 45 processing plants) invested in the 1990s
Predominantly small firms (intensive use of family labour)	Predominantly small- and medium-size wineries or cooperatives; 2% of total firms are large wineries that control 30% of wine production;	Domestically owned firms and MNCs that entered the cluster in the 1970s (mainly through alliances with national firms) attracted by the growth of the domestic market	High degree of associative schemes between growers and wineries: 23 cooperatives wineries that account for approximately 35% of the whole Brazilian wine production	n/a
Predominantly micro- and small-grape growers	28 (22 national; 6 foreign) medium and large firms make branded bottled wine; 72 small and medium wineries produce bulk wine	Domestically owned and foreign medium- and large-size firms	Vertical integration predominates: 72 integrated bulk supplier; 21 vertically integrated, locally based firms producing fine wines. Very few non-integrated small-scale growers and local subsidiaries of large national wineries	FDI in the Chilean wine industry amounted to US\$48.7 million in 1998–1999
Small firms: 86% of vineyards have up to 5 ha	Family businesses	24 wineries are members of the Uruguayan association of wine exporters (ABE)		n/a

Annex 3. Examples of government support to agro-based clusters

Type of intervention	Some examples of support interventions
Information collection and diffusion	<p>Argentina. Several public agencies (<i>Instituto de Desarrollo Rural [IDR]</i>, <i>Instituto Nacional de Tecnología Agropecuaria [INTA]</i> and the national wine regulatory agency: <i>Instituto Nacional de Vitivinicultura [INV]</i>) collaborate with each other and with relevant associations to deliver timely information on international and domestic harvests and market prices. The IDR, INTA and the Agricultural Quality and Safety Institute of the province of Mendoza (ISCAMEN) implement joint projects on data collection in the more backward zones and develop new food safety and pest-prevention regulations that better address Mendoza's diversity of microclimates and agricultural products. Other public-sector activities in this field include the design of detailed mappings of the microclimates for grapes and other agricultural products, the creation of databases on best practices on harvesting, product markets, and the development of training programmes for different sectors, zones and segments of the value chain.</p> <p>Brazil. IBRAVIN also provides market information to the wine cluster. The government has also produced a viticulture directory of the wine cluster.</p> <p>Chile. The Phytosanitary and Agriculture Service, SAG, collects and disseminates information on diseases and potential plague threats, and on planted surface to help wine grape producers make timely and informed decisions.</p> <p>India. Several public agencies cooperate with each other and with relevant producer associations (especially MRDBS) to provide the Maharashtra grape cluster with information relevant to cultivation techniques. These agencies include the Indian Institute of Horticulture Research, the National Research Centre for Grapes, the state agricultural university and other research institutes.</p> <p>Thailand. Publication of GAP for a variety of commodities.</p>
Promotion of associations and networks and development of PPPs	<p>Argentina. The Government of Argentina and the major wine and grape producers created the <i>Fondo Vitivinícola</i> in 1994 to oversee the new regulatory regime and use the proceeds of a new penalty for non-compliance to promote the wine industry and wine consumption. An Interprovincial Consultative Council with representatives of wine cluster firms was created to decentralize decision-making (McDermott, 2005).</p> <p>Argentina (Mendoza). In the 1990s the Government of Mendoza worked closely with the federation of cooperatives, Fecovita. The Fecovita experiment helped to strengthen collaboration between the public sector and socio-economic partners.</p> <p>Brazil. IBRAVIN fosters cooperation between growers and wineries in the Brazilian wine cluster.</p> <p>Chile. In the 1990s, CORFO financed and supported Centres of Business Development (CDEs) to create a critical mass of firms to compete in export markets. Two consortia of wine firms: Chile Vid and the CCV were initially financed by this programme (Benavente 2004).</p> <p>Chile. The Government of Maule organized the Berries Concertation Table to bring together cluster stakeholders to collectively address production and marketing challenges (Katz and Sánchez-Douglas, 2004).</p> <p>Chile. Chile has launched several ITPs in the agricultural sector, such as the Valparaíso avocado ITP, and ITPs in the Coquimbo, Maule and O'Higgins regions in support of their fruit clusters.</p> <p>India. One of the central institutions for collective action in the Maharashtra grape cluster is Mahagrapes. Several agencies, both state and federal, supported its formation. It not only helps coordinate collective action by producers, it also is a key institution for facilitating public-private action.</p>

Annex 3. Examples of government support to agro-based clusters (continued)

Type of intervention	Some examples of support interventions
Support to export activities and collective marketing initiatives	<p>Argentina (Mendoza). <i>ProMendoza</i>, the provincial export agency of Mendoza: a) helps firms from various clusters/sectors, including the wine cluster, to participate in international trade fairs; b) carries out promotional activities and built new data bases to include over 40 foreign markets for wine and other products; c) organizes annual tours for foreign journalists to visit winemakers from various zones.</p> <p>Chile. <i>Pro Chile</i> (the export promotion office of Chile) has financed nearly half of total costs related to promotional activities of the wine cluster, including fairs, travel costs and marketing activities (Benavente, 2004).</p> <p>Uruguay. INAVI is in charge of the international promotion of fine wines (Unikowsky, 2005).</p> <p>Government support has been decisive in most Latin American wine clusters to obtain DOCs.</p>
Provision of training and technical assistance to cluster stakeholders	<p>Bolivia. CENAVIT) provides technical assistance to wine grape producers and winemakers in order to improve quality and increase the planted area.</p> <p>Brazil. IBRAVIN provides support to improve wine grape quality and viticulture practices.</p> <p>Brazil. The Government of Santa Catarina provides extension services to smallholder producers from the apple cluster.</p> <p>Chile. The Chilean Government has promoted and financed technological learning, especially among small producers, through CORFO and other programmes (Benavente, 2004).</p>
Improvement of access to finance	<p>Argentina. The FTC fund (<i>Fondo para la Transformación y el Crecimiento</i>) has provided direct credit support to about 5 000 firms belonging to the wine cluster (US\$50 million) and has collaborated with local banks and relevant associations to reduce approval time, codify new forms of loan security, and help finance a greater number of small firms for grape harvests and vineyard conversion (McDermott, 2005).</p>
Policy support and regulatory function	<p>Argentina (Mendoza). Argentina has made an important effort (at both central and provincial levels) to create new policies and institutions with socio-economic partners to support the wine cluster. As an example, Mendoza developed over 75 programmes and policies (from credit, to insurance, to R&D, to health standards and pest prevention) in the 1990s that have directly and indirectly assisted firms in the wine cluster (McDermott, 2005).</p> <p>Bolivia. CENAVIT provides quality certification services to the wine cluster.</p> <p>Brazil. The government has prepared new legislation for the wine cluster in order to improve its competitiveness.</p> <p>Chile. The country liberalized grape and wine production and exports.</p> <p>Chile. SAG enforces the legislation related to wineries and vineyards according to rules and laws previously established.</p> <p>Uruguay. INAVI controls the quality of fine wines and the DOC indication (Unikowsky, 2005).</p> <p>India. The government has supported the development of the agri-business sector in general through a variety of policies. These include the relaxing of FDI norms and the deregulation of the sector from licenses and import duties. Additionally, the Agricultural Produce Marketing Committee (APMC) Act has been modified to allow the private sector to procure directly from farmers, and the new Food Safety and Standards Act has harmonized the large amount of previously existing food safety regulations.</p>

Annex 3. Examples of government support to agro-based clusters (continued)

Type of intervention	Some examples of support interventions
Creation of an enabling environment, including public investment in infrastructure	<p>Brazil. CODEVASF developed the irrigation infrastructure needed to induce the Petrolina-Juazeiro mango and grape clusters.</p> <p>Chile. In order to attract FDI to the wine and fruit clusters, Chile has worked hard towards streamlining its bureaucracy and established clear rules supported by a well-established property rights system (Benavente, 2004).</p> <p>Uruguay. INAVI has supported industry rationalization and the renovation of 3 000 ha of vineyards (Unikowsky, 2005).</p> <p>India. The Ministry of Food Processing has undertaken several initiatives to upgrade the relevant infrastructure. It has schemes for packaging centres, modernized abattoirs, integrated cold chain facilities and value-added centres. It has also supported the setting up of food parks; sites where common facilities (such as cold storage, laboratories, processing facilities, and power supply) can be assisted (FAO, 2007 – Punjabi).</p>
Research and development	<p>Bolivia. CENAVIT works in research and diffusion areas of interest to the wine cluster.</p> <p>Brazil. EMBRAPA created in 1975 the National Centre for Research on Grape and Wine of Brazil.</p> <p>Chile. The CORFO programme <i>Innova Chile</i> has promoted the creation of two research and innovation consortia formed by industry associations and universities related to the wine cluster: VINNOVA and CCDV.</p>

Source: Author's elaboration with examples from various sources.

Annex 4. Examples of support from universities to agro-based clusters

Type of intervention	Some examples of support interventions
Provision of training and technical assistance to cluster stakeholders	Indonesia. From the late 1970s the Indonesian Government supported SME clusters with technical training. Particularly through the small industries development program (BIPIK), training courses were provided by extension workers.
Creation of an enabling environment, including public investment in infrastructure	Malaysia. Recent attempts to promote the palm oil industry have included the establishment of POICs. These are zones that aim to attract downstream palm oil processing industries and often include much infrastructure investment.
Research and development	Taiwan. The government has invested heavily in its workforce's human capital, while it has also provided funding for building research infrastructure. Such investment has helped the Taiwanese cut-flower sector move into new, more profitable, flower varieties (Chaminade and Vang, 2006).

Source: Author's elaboration with examples from various sources.

9. References and further reading

- Abiola, B.** 2006. Knowledge, Technology and Growth: The Case Study of Wine Cluster in South Africa. WBI Africa Cluster Case Study. World Bank Institute, World Bank, Washington, D.C.
- Achurra, M.** 1995. El caso de un producto de exportación exitoso: El Salmón. Colección Estudios Cieplan. Chile.
- Adeya, N.** 2006. Knowledge, technology and growth: the case of Lake Victoria Fishing Cluster in Uganda (draft). WBI Africa Cluster Case Study. World Bank Institute, World Bank, Washington, D.C.
- Agriculture and Agri-Food Canada.** 2006a. Bi-weekly Bulletin, 14 July 2006 Vol.19 (10) Brazil.
- Agriculture and Agri-Food Canada.** 2006b. Bi-weekly Bulletin, 4 August 2006 Vol.19 (11) Argentina.
- Aguirre, M. & Medina, R.** 2006. La inclusión de los pequeños y medianos productores en el cluster del aguacate en la región de Uruapan, Michoacán, México, y sus efectos en el desarrollo rural. Paper presented at the International Seminar “Territorios rurales en movimiento” held in Chile on 23 April 2006.
- Alfaro, R.** 2006. Segundo informe de avance sobre la actividad 1. Desarrollo del programa “Chile piensa su inserción internacional desde las regiones mediante la identificación y elaboración de planes de acción de clusters exportadores regionales”. Dirección Regional de Valparaíso de ProChile, Dirección General de Relaciones Económicas Internacionales. Chile.
- Alvarado, S.** 2002. El caso del comercio exterior de la flor ecuatoriana como una alternativa para la comercialización. CEAS. Quito, Ecuador.
- Amighini, A.** 2003. *Upgrading in the Global Economy: Evidence from Selected Sectors in Latin America*. Agorà 2000 mimeo for IDB. Washington, D.C.
- Anderson, T., Schwaag, S., Sörvik J. & Wise, E.** 2004. The Cluster Policy Whitebook. International Organization for Knowledge and Enterprise Development. IKED, Malmö, Sweden.
- Arbeláez, M.A., Meléndez, M. & Nicolás León, N.** 2007. The emergence of new successful export activities in Colombia. Final Draft, January 2007. Fedesarrollo. IDB Project – Latin American Research Network. Bogotá, Colombia.

Balagadde, S. 2005. Fish Safety and Quality Assurance: Uganda's Experience. Uganda National Bureau of Standards. Document presented at the FAO FAO/WHO Workshop "Effective Food Control Systems: Practical Approaches for the African region" 24-25 January 2005, FAO, Rome.

Bañados, F. & Alvial A. 2006. Challenges in Chilean Salmon Cluster Consolidation: Integrated Territorial Program (PTI) Contribution. *Desafíos en la Consolidación del Cluster del Salmón Chileno: Contribución del Programa Territorial Integrado (PTI)*. Programa Territorial Integrado (PTI) Cluster del Salmón, CORFO Xª Región de los Lagos, and INTESAL de SalmonChile. Available at: <http://www.salmonchile.cl/salmociencia/>.

Bathelt, H., Malmberg, A. & Maskell, P. 2004 Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28 (1): 31–56.

Becht, R., Odada, E.O., & Higgins, S. 2005. "Lake Naivasha: experiences and lessons learned briefs". In ILEC, *Lake Basin Management Initiative: experience and lessons learned briefs*, International Lake Environment Committee Foundation, Kusatsu, Japan. pp. 277–298. Available at: www.iwlearn.net/publications/ll/lakenaivasha_2005.pdf.

Benavente, J.M. 2004. Technological change in Chile's grape and wine producing industry. Department of Economics, University of Chile, Santiago de Chile, Chile.

Bennell, P. 1998. Industrial restructuring in Africa during the 1990s: outcomes and prospects. Background Paper for the African Development Report 1998. University of Sussex: Brighton, UK.

Berger, S., Kurz, C., Sturgeon, T., Voskamp, U. & Wittke, V. 2001 Globalization, Production Networks, and National Models of Capitalism - On the Possibilities of New Productive Systems and Institutional Diversity in an Enlarging Europe. SOFI-Mitteilungen Nr. 29/2001: 59-72.

Bertels, P. 1998. Agricultural Transportation Challenges for the 21st Century. Infrastructure Improvements by International Competitors. Agricultural Marketing Service of the United States Department of Agriculture. Available at: <http://www.ams.usda.gov/tmd/summit/ch4h.pdf>

Bisang, R. & Gutman, G.E. 2005. The accumulation process and agrofood networks in Latin America. *CEPAL Review* 87, December 2005. Argentina. Available at: <http://www.eclac.cl/cgi-bin/getProd.asp?xml=/revista/noticias/articuloCEPAL/5/25585/P25585.xml&xsl=/revista/tpl-i/p39f.xsl&base=/revista/tpl-i/top-bottom.xsl>

Boladale, A. 2006. Knowledge, technology and growth: the case of wine cluster in South Africa, 2006, WBI, Knowledge for Development Program (draft). WBI Africa Cluster Case Study. World Bank Institute, World Bank, Washington, D.C.

- Bolo, M.** 2006. Knowledge, technology and growth: the case of Lake Naivasha cut-flower cluster in Kenya (draft). WBI Africa Cluster Case Study. World Bank Institute, World Bank, Washington, D.C.
- Bosworth, B. & Broun, D.** 1996. Connect the Dots: Using Cluster-Based Strategies to Create Urban Employment. *Firm Connections* 4(2): 1–6.
- Brannstrom, C.** 2005. Environmental policy reform on northeastern Brazil's agricultural frontier. *Geoforum* 36(2): 257–271
- Breschi S. & Malerba F.** 2005. Clusters, networks and innovation: research results and new directions. In: *Clusters, networks and innovation*. Breschi S., Malerba F. (Eds.), Oxford University Press: Oxford, 2005: 1–26.
- Brown, C., Longworth, J., Waldron, S. & Zhang C.** 2007. China's livestock revolution: agribusiness and policy developments in the sheep meat industry. CAB International, Wallingford, UK.
- Burger, K., Kameo, D. & Sandee, H.** 2001. Clustering of small agro-processing firms in Indonesia. In: *International Food and Agribusiness Management Review*, 2: 289–299.
- Casaburi, G.** 1999. *Dynamic Agroindustrial Clusters: The Political Economy of Competitive Sectors in Argentina and Chile*. St. Martin's Press. New York.
- Chinese Ministry of Agriculture.** 2003. *Program of Advantaged Areas in Agricultural Products*. Available at: www.agri.gov.cn
- Chuenprayoth, C.** 2007. ThaiGAP. Paper presented at Global GAP Asian Conference in Bangkok, Thailand, 6–7 September 2007. Available at: http://www.globalgap.org/cms/upload/Resources/Presentations/Bangkok/10_Chusak.pdf
- CID.** 2003. *Metodología para la referenciación competitiva de clusters estratégicos regionales: Aplicación al cluster frutas y verduras con valor agregado en Antioquia*. Centro de Investigaciones para el Desarrollo. Universidad Nacional de Colombia, Bogotá, Colombia.
- Condliffe, K., Kebuchi, W., Love, C., Ruparell, R. & Porter, M.E.** 2008. Kenya Coffee: A Cluster Analysis. Microeconomics of Competitiveness. Cambridge, Massachusetts, Harvard, Harvard Business School, USA.
- CORFO.** 2005. *Estudio para el desarrollo de un programa de apoyo a la innovación en la industria vitivinícola*. Hernández A. & Vallejos C. Corporación de Fomento de la Producción (CORFO), Chile.
- Cox, M.** 2008. Desarrollo Territorial en Chile: Instrumentos del Estado. *Documento de Trabajo N° 3*. Programa Dinámicas Territoriales Rurales, Rimisp – Centro Latinoamericano para el Desarrollo Rural, Santiago de Chile, Chile.

Dahl, M. & DRUID/IKE-Group. 2000. Synopsis for the Danish Cluster studies. Department of Business Studies, Aalborg University, Denmark.

Damiani, O. 1999. *Beyond market failures: irrigation, the state and non-traditional agriculture in Northeast Brazil*. Massachusetts, Massachusetts Institute of Technology. (PhD thesis), USA.

Damiani, O. 2001. *Diversification of Agriculture and Poverty Reduction: How small farmers and rural wageworkers are affected by the introduction of non-traditional high-value crops in Northeast Brazil*. Paper No. 5, the Japan Program Working Paper Series on: Priorities and Strategies in Rural Poverty Reduction: Experiences from Latin America and Asia. Presented at the Japan Program/INDES 2001 Conference – Japan.

De Wilt, J.G., van Oosten, H.J. & Sterrenberg, L. 2000. *Agroproduction parks: perspectives and dilemmas*. Innovatienetwerk Groene Ruimte en Agrocluster. Innovation Network Report. The Hague, the Netherlands.

Department of Trade and Industry, UK. 2003. *A Practical Guide to Cluster Development. A Report to the Department of Trade and Industry and the English RDAs by Ecotec Research & Consulting*. DTI, UK.

DFID. 2001. *Jamaica Cluster Competitiveness Programme*. Project Memorandum (final). London.

Dussel, E. 2002. *Territorio y competitividad en la agroindustria en México: Condiciones y propuestas de política para los clusters del limón mexicano en Colima y la piña en Veracruz*. ECLAC, Santiago de Chile, Chile.

Eades D. 2006 *Identifying Spatial Clusters within U.S. Organic Agriculture*. Thesis submitted to the Davis College of Agriculture, Forestry and Consumer Sciences Agricultural and Resource Economics Program, Division of Resource Management, Morgantown, West Virginia, USA.

ECLAC. 2001. *Apertura económica y (des)encadenamientos productivos*. Economic Commission for Latin America and the Caribbean. Libros de la CEPAL, Santiago de Chile, Chile.

ECLAC. 2005. *Aglomeraciones en torno a los recursos naturales en América Latina y el Caribe: políticas de articulación y articulación de políticas*. Economic Commission for Latin America and the Caribbean. Libros de la CEPAL, Santiago de Chile.

European Commission. 2002a. *Final report of the expert group on enterprise clusters and networks. Observatory of European SMEs*. The MAP Project 2002. Promotion of entrepreneurship and SMEs: Improving business support measures, Enterprise Directorate-General, European Commission. Brussels. Available at: http://ec.europa.eu/enterprise/entrepreneurship/support_measures/cluster/final_report_clusters_en.pdf

European Commission. 2002b. Regional Clusters in Europe. *Observatory of European SMEs, No. 3*. Brussels.

FAO. 2003a. *Current and Emerging Issues for Economic Analysis and Policy Research (CUREMIS II). Volume I: Latin America and the Caribbean*. Edited by Benjamin Davis. Economic and Social Department. Rome.

FAO. 2003b. Report of the Expert Consultation on International Fish Trade and Food Security. Casablanca, Morocco, 27 – 30 January 2003. *FAO Fisheries Report*. No. 708. Rome.

FAO. 2004a. *Round Table: Financing for Agricultural and Rural Development*. Prepared for the 28th FAO Regional Conference for Latin America and the Caribbean. Guatemala City (Guatemala), 26–30 April 2004. Rome.

FAO. 2004b. Proceedings of the regional workshop on forests for poverty reduction: can community forestry make money? Sim, H.C. (ed.); Appanah, S. (ed.); Lu, W.M. (ed.). *RAP Publication-2004/04*. Regional Office for Asia and the Pacific. Bangkok, Thailand.

FAO. 2006a. Twenty-Ninth FAO Regional Conference for Latin America and the Caribbean. Caracas, Venezuela, 24–28 April 2006. *Trends and Challenges in Agriculture, Forestry, Fisheries and Food Security in Latin America and the Caribbean. LARC/06/INF/6*. Available at: <http://www.rlc.fao.org/larc06/pdf/inf06e.pdf>

FAO. 2006b. Food Outlook: Global Market Analysis, No. 2. *Food Outlook – GIEWS (2)* December 2006. <http://www.fao.org/docrep/009/j8126e/j8126e00.HTM>

FAO. 2006c. Agro-industrial parks. Experience from India. Laxminarayana Rao, K. *Agricultural and Food Engineering Working Document No 3*. Available at: http://www.fao.org/ag/ags/publications/docs/AGST_WorkingDocuments/J7714_e.pdf

FAO. 2008. Grape Exports with GLOBALGAP Certification: Case Study of Mahindra & Mahindra Initiative in India (Draft). Available at: <http://www.fao.org/world/regional/rap/agro-industries/Mahindra%20GLOBALGAP%20Grape%20Export.pdf>

FAO. 2009. *Commodity associations: a tool for supply chain development?* Shepherd, A., Cadilhon, J. & Gálvez-Nogales, E. AGS Occasional Paper No. 24. Rome.

FIDH. 2008. Asia: Observatory for the Protection of Human Right Defenders. Annual Report 2009. Fédération Internationale des Ligues des Droits de l'Homme.

Figueroa, L.R. & González, A. 1998. *Análisis de Experiencias Exitosas en Chile y California: Lecciones para los Agronegocios en Centroamérica*. INCAE, San José de Costa Rica. Available at: <http://conocimiento.incae.edu/ES/clacds/nuestras-investigaciones/pdf/cen500fil.pdf>

Flowcs-Williams, I. 2004. *Cluster Development, Red Lights and Green Lights*. Paper pre-argued for ANZRSAI's Sustaining Regions, Cluster Navigators. Australia.

Fold, N. Globalization, state regulation and industrial upgrading of the oilseed industries in Malaysia and Brazil. Institute of Geography, University of Copenhagen, Denmark. *Singapore Journal of Tropical Geography*, 21(3), 2000: 263–278.

Frankline, D. & Arize-Nino, E. 2003. *Competitiveness of the Cotton/Textile Cluster in Namibia* for USAID. Sigma One Corporation, Windhoek, Namibia. Available at: http://www.globelics2005africa.org.za/papers/p0031/Globelics2005_Timothy.pdf

Giuliani, E. 2003a. Cluster Absorptive Capacity: a comparative study between Chile and Italy, paper presented at the conference in honour of Keith Pavitt: What Do We Know About Innovation? Freeman Centre, University of Sussex: Brighton, UK, 13-15 November.

Giuliani, E. 2003b. *How clusters learn: Evidence from a Chilean wine cluster*. University of Pisa and SPRU, University of Sussex: Brighton, UK.

Giuliani, E. & Bell, M. 2004. *When micro shapes the meso: Learning networks in a Chilean wine cluster*. Paper No. 115 (SPRU), The Freeman Centre, University of Sussex: Brighton, UK.

Gomes, R. 2000. *Upgrading without exclusion: Lessons from SMEs in fresh fruit clusters in Brazil*. AGORÀ 2000 mimeo for the IDB. WBI Africa Cluster Case Study. World Bank Institute, World Bank, Washington, D.C.

Gonçalves, M.E. 2001. O cluster da Fruticultura no Norte de Minas Gerais: o caso do Projeto Jaíba (área empresarial). Departamento de Economia da UNIMONTES, Minas Gerais, Brazil. Available at: http://www.bdmg.mg.gov.br/estudos/arquivo/cadernos/Caderno_05.5_BDMG.pdf

GTZ 2008. Thailand to develop globally recognized Good Agricultural Practice (GAP) “ThaiGAP” http://www.thai-german-cooperation.info/press/pr_thaigap_en.pdf

Guaipatín, C. 2003. *Recursos del Desarrollo: Lecciones de Seis Aglomeraciones Agroindustriales en América Latina*, paper presented at the International Seminar “Cadenas de Producción para el Desarrollo Económico Local y el Uso Sostenible de la Biodiversidad”. 17–19 March 2003, Managua, Nicaragua.

Guaipatín, C. 2004. *Los recursos del desarrollo: Lecciones de seis aglomeraciones agroindustriales de América Latina*. ECLAC. Santiago de Chile, Chile.

Hales, M., den Hertog, P., Leyten, J., Limpens, I. & Whalley, J. 1999. *Approaches to cluster analysis and its rationale as a basis of policy*. Literature review for the Reference Information Specifications for Europe (RISE) project funded by the European Commission. Chapter 5.

Hall, A., Bockett, G., Taylor, S., Sivamohan, M.V.K. & Clark, N. 2001. Why Research Partnerships Really Matter: Innovation Theory, Institutional Arrangements and Implications for Developing New Technology for the Poor. *World Development* 29(5): 783–797.

- Hernández, I., Cely, N., González, F., Muñoz, E. & Prieto, I.** 2007. The Discovery of New Export Products in Ecuador. *Stratega Business Development Services*. January 2007. Guayaquil, Ecuador.
- Hernández-Cuevas, C. & Valenzuela, P.** 2004. Strategies to capture biotechnology opportunities in Chile. *Electronic Journal of Biotechnology*, Vol. 7 No. 2, Issue of 15 August 2004. Pontificia Universidad Católica de Valparaíso, Chile.
- Hojman, D.E.** 2006a. What makes a wine internationally successful? *Determinants of awards to Chilean reds in London's International Wine Challenge*. Research Paper Series No. 2006/23. The School of Management, University of Liverpool, UK.
- Hojman, D.E.** 2006b. *Network learning and principal-agent conflict: Wine-makers in Chile's Colchagua Valley*. The School of Management, University of Liverpool, UK.
- Hornberger, K., Ndiritu, N., Ponce-Brito, L., Tashu, M. & Watt, T.** 2007. Kenya's Cut-Flower Cluster. Final Paper for Microeconomics of Competitiveness. 4 May 2007. Available at: http://www.isc.hbs.edu/pdf/Student_Projects/Kenya_Cut-FlowerCluster_2007.pdf
- IDB.** 2004. *Orientaciones para la evaluación de proyectos de integración productiva*. Carlos Guaipatín. Inter- American Development Bank. Washington, D.C.
- IDB.** 2005a. *Fomento de la integración productiva en América Latina y el Caribe: Sugerencias para la formulación de proyectos*. Sustainable Development Department Best Practices Series. Marco Dini, Carlos Guaipatín & Gonzalo Rivas. Inter-American Development Bank. Washington, D.C.
- IDB.** 2005b. *Upgrading in Clusters and Value Chains in Latin America: The Role of Policies*. Sustainable Development Department Best Practices Series. Carlo Pietrobelli & Roberta Rabellotti. Inter- American Development Bank. Washington, D.C.
- IFHR.** 2008. *Economic Development or Human Rights? Assessing the Impact of Kenya's trade and Investment Policies and Agreements on Human Rights: International Fact-Finding Mission*. International Federation for Human Rights. Available at http://www2.ohchr.org/english/bodies/cescr/docs/ngos/FIDH_Kenya41.pdf
- IICA.** 2003. *El enfoque territorial del desarrollo rural*. Sepúlveda S., Rodríguez, A., Echeverri, R., & Portilla, M. Dirección de Desarrollo Rural Sostenible. Inter-American Institute for Cooperation on Agriculture. San José, Costa Rica.
- Iizuka, M.** 2004. Organizational capability and export performance: the salmon industry in Chile. Paper presented at the DRUID Winter Conference, 22-24 January 2004. SPRU, Science & Technology Policy Research, University of Sussex: Brighton, UK.
- ITC.** 2001. LDC Export Successes: How to Make the Exception the Rule. *International Trade Forum* – Issue 3/2001. Geneva, Switzerland.

- ITC.** 2004. *Building Business Competitiveness in a Globalized World*. Discussion paper for the session “*Building Business Competitiveness*” at UNCTAD XI, Sao Paulo, Brazil 17 June 2004. ITC Executive Forum, International Trade Centre UNCTAD/WTO. Geneva, Switzerland.
- ITC.** 2005. *Innovations in Export Strategy: Competitiveness through Export Clustering*. ITC Executive Forum, International Trade Centre UNCTAD/WTO. Geneva, Switzerland.
- ITC.** 2006a. *Bringing the Poor into the Export Process: Is Linking Small Producers and Big Exporters a Solution?* Agrawal, S.; India Trade Promotion Organization. ITC Executive Forum, International Trade Centre UNCTAD/WTO. Geneva, Switzerland.
- ITC.** 2006b. *Sustainable Agriculture and Value Networks: An Opportunity for Small Growers to Export Successfully?* Alvarez, G. ITC Executive Forum 2006, International Trade Centre UNCTAD/WTO. Geneva, Switzerland.
- ITC.** 2006c. *Peru: Practical Cases: CPF and Productive Chains of Structured Financial Products (SFPs)* Krüger, C. and Krüger, R. ITC Executive Forum 2006, International Trade Centre UNCTAD/WTO. Geneva, Switzerland.
- Jansen E.G.** 1997. Rich Fisheries, Poor Fisherfolk: Some Preliminary Observations about Effects of Trade and Aid in the Lake Victoria Fisheries. IUCN East African Program, Socio-economics of the Lake Victoria/fisheries report No.1. The World Conservation Union, Nairobi, Kenya.
- Ji-Hyeon, C., Jang, H. & Byung-Joon, W.** 2007. Agro-industry Cluster Development in Five Transition Economies. *Journal of Rural Development*, 29(6): 85–119.
- Kameo, D.** 1999. “The Coconut—Sugar Industry in Central Java, Indonesia: Production Structure, Marketing and Contribution to the Household Economy”. Armidale: University of New England (unpublished Ph.D. Dissertation).
- Katz, J. & Sánchez-Douglas, L.** 2004. *Cluster como Estrategia de Desarrollo y Mecanismo de Apoyo a las PyME: Evidencia en el Mundo*. Facultad de Ciencias Económicas y Administrativas, Universidad de Chile, Santiago de Chile, Chile.
- Ketels, C.** 2004. *Innovative City and Business Regions – Structural Change in Europe 3*. Hagbarth Publications.
- Kiggundu, R.** 2004. Learning to close deficiencies in local innovation systems: Case study of fisheries in Uganda. In *Proceedings of Regional Conference on innovative systems and innovative clusters in Africa*, Tanzania 2004.
- Korovkin, T.** 2005. Creating a social wasteland? Non-traditional agricultural exports and rural poverty in Ecuador. *Revista Europea de Estudios Latinoamericanos y del Caribe* 79, October 2005, pp. 47–67.

- Korpraditskul, R.** 2005. *Experience of Compliance to GAP: Initiative of Cluster of Western GAP in Thailand*. Paper presented at EurepGAP Asia 05: Potential and challenges of EurepGAP in Asia, Manila, Philippines, 29–30 November 2005. Available at: http://www.unctad.org/trade_env/test1/meetings/eurepgap/Dr%20Korpraditsukul%20Report.pdf
- KPCU.** No date. *Vision and Strategy*. Available at: http://www.kpcu.co.ke/about_Us/vision.asp
- Langman, J.** 2002. Chile. *Wine Business Monthly*, February 01, 2002. Available at: <http://www.winebusiness.com/wbm/?go=getArticle&dataId=15151>
- Lapsley, J.** *Propuesta para una Licenciatura en Enología*. Department of Viticulture and Enology. Agriculture and Natural Resources. University of California at Davis, USA.
- LEI.** 2006. *A survey of the Eastern agricultural cluster*. Oosterkamp E.B., Leeuwen, M.G.A De Bont C.J.A.M., Wisman J.H. & Kuhlman J.W. Agricultural Economics Research Institute LEI, Wageningen University and Research Centre, the Netherlands.
- LeVeen, J.** 1998. *Industry cluster literature review: urban and regional development*, in: *Urban and Regional Development* 261 (www.unc.edu).
- Limburg, L.** 2004. *Large local enterprises and trade initiatives in developing countries*. Background paper presented at the ITC UNCTAD/WTO Executive Forum 2004: Competitiveness through Public–Private Partnership: Successes and Lessons Learned. 28–29 September 2004, Montreux, Switzerland.
- Lobato, A & Prudencio, S.** 2002. Analysis of table grape production in Bolivia. Market Access and Poverty Alleviation Programme. USAID Bolivia.
- Locke R.** 2001. *Building Trust*. Massachusetts Institute of Technology, Massachusetts, USA. Paper presented at the 2001 Annual Meetings of the American Political Science Association. Available at: http://web.mit.edu/polisci/research/locke/building_trust.pdf
- McCormick, D.** 1998. Enterprise Cluster in Africa: On the way to Industrialisation? *IDS Discussion paper* 366, Institute of Development Studies, Sussex, UK.
- McCormick, D.** 1999. African enterprise clusters and industrialisation: theory and reality. *World Development* 27(9): 1531–1551.
- McCormick, D.** 2003. “Can Africa Industrialise Through Enterprise Clusters?” *The Courier*, 196, January–February 2003, pp. 33–35.
- McDermott, G.A.** 2005. *The Politics of Institutional Renovation and Economic Upgrading: Lessons from the Argentine Wine Industry*. The Wharton School, University of Pennsylvania, USA.

Merchand, M.A. 2005. La dinámica transnacional de la agroindustria del limón y su hinterland agrícola en el valle de Tecmán. *Análisis Económico, Segundo cuatrimestre, año/vol. XX*, No. 044. pp. 215–248. Universidad Autónoma Metropolitana. Azcapotzalco. Distrito Federal, Mexico.

Meyer-Stamer, J. & Harmes-Liedtke, U. 2005. *How to Promote Clusters*. Mesopartner. Duisburg, Germany, and Buenos Aires, Argentina. 2005. Available at: http://www.mesopartner.com/fileadmin/user_files/working_papers/mp-wp8_cluster_e.pdf

Miremont, V. 2000. South American Bulk Wine: Will Producers Find A Solution for Excess Production? *Wine Business Monthly*, 1 July 2000. Available at: <http://www.winebusiness.com/wbm/?go=getArticle&dataId=740>

Mitullah, W. 1999. Lake Victoria's Nile perch fish cluster: institutions, politics and joint action. IDS Working Paper 87. Institute of Development Studies, Sussex, UK.

Moguillansky, G., Salas, J.C. & Cares, G. 2006. *Capacidad de innovación en industrias exportadoras de Chile: la industria del vino y la agroindustria hortofrutícola*. Serie comercio internacional, No. 79. División de Comercio Internacional e Integración. CEPAL/ECLAC, Santiago de Chile. November 2006.

Montero, C. 2004 Formación y desarrollo de un cluster globalizado: El caso de la industria del salmón en Chile. *CEPAL serie desarrollo productivo 145*. CEPAL/ECLAC, Santiago de Chile.

Naik, G. 2006. Bridging the Knowledge Gap in Competitive Agriculture: Grapes in India. In Chandra, V., ed. *Technology, Adaptation and Exports: How Some Developing Countries Got it Right*. pp. 243–274. The World Bank. Washington, D.C.

Nicaraguan Ministry of Agriculture and Forestry. 2004. *Estrategia para la Reconversión y la Diversificación Competitiva de la Caficultura en Nicaragua*. Nicaragua.

OECD. 2001. *Innovative clusters. Drivers of national innovation systems*. Organisation for Economic Co-operation and Development. Paris.

Oliveira-Wilk, E. 2003. *Resource-Based View, Industrial Clusters and Collective Competitive Capabilities: A Case Study in South Brazilian Wineries*. UFRGS – Universidade Federal do Rio Grande do Sul. CEPAN – Agribusiness Research Centre, Brazil.

Otero, G. 2002. Clusters productivos de la provincial de Buenos Aires. Segunda Parte. Grupo de investigación económica, Ministerio de Economía de la provincia de Buenos Aires, Argentina. <http://www.ec.gba.gov.ar/GIE/Investigacion/Archivos/Cuaderno64.pdf>

Paniagua Requena, A. 2002. Identificación, Mapeo y Análisis Competitivo del Cluster de Uvas, Vinos y Singanis en Bolivia. Informe Preliminar. Corporación Andina de Fomento y Programa Andino de Competitividad. Bolivia.

Penn, C. 2001. Uruguay is Ready! *Wine Business Monthly*, 25 July 2001. Available at: <http://www.winebusiness.com/wbm/?go=getArticle&dataId=9811>

Peters, D., Wheatley, C., Prain, G., Slaats, J. & Best, R. 2002. *Improving agro-enterprise clusters: root crop processing and piglet production clusters in peri-urban Hanoi, strategic initiative on urban and peri-urban agriculture*. Presented at symposium, Local agrifood systems: products, enterprises and the local dynamics. 16–18 October 2002. CIRAD, Montpellier, France.

Pietrobelli, C. & Rabellotti, R. 2007. *Upgrading to Compete: SMEs, Clusters and Value Chains in Latin America*, Cambridge, Mass.: Harvard University Press.

Porter, M. 1990. *The Competitive Advantage of Nations*. The Free Press, New York.

Porter, M. 1998. Clusters and the New Economics of Competition. *Harvard Business Review*. Available at: <http://hbr.org/product/clusters-and-the-new-economics-of-competition/an/98609-PDF-ENG>

Porter, M. 2000. Location, Competition, and Economic Development: Local Clusters in a Global Economy. *Economic Development Quarterly*, 14 (1): 15–34, February 2000.

Porter, M. & Bond, G. 1999. *The California Wine Cluster*. Harvard Business Online. Available at: <http://hbr.org/product/california-wine-cluster/an/799124-PDF-ENG>

Porter, M. & Ketels, C. 2003. *UK Competitiveness: Moving to the next stage*. Department of Trade and Industry, UK.

Porter, M. & Schwab, K. 2002. *The Global Competitiveness Report 2002–2003*. World Economic Forum, Oxford University Press, New York.

PSU. 2005. *The Small Farms Industry Clusters (SFIC) Project*. Funded by the USDA/CSREES National Research Initiative, Small Farms and Rural Community Vitality Initiative, Grant No. 05-55618-15744 and supported by The Northeastern Regional Center for Rural Development, located at The Pennsylvania State University. Pennsylvania, USA.

Rabobank International. 2004. *The South African Wine Industry: Between Past and Future*. Rabobank International, Utrecht, the Netherlands.

Reuters. 2008. *Kenya Aims to More Than Double Coffee Output by 2012*. 17 November 2008. Reuters. Accessed November 2008. <http://www.flex-news-food.com/console/PageViewer.aspx?page=20512&str=COFFEE%20and%20KENYA>

Rocha, A., Monteiro, J., Kury, B. & Darzé, A. 2007. *The Emergence of New and Successful Export Activities in Brazil: Four Case Studies from the Manufacturing and the Agricultural Sector*. A Report Prepared by NUPIN/COPPEAD/UFRJ for the Interamerican Development Bank. <http://www.iadb.org/res/laresnetwork/projects/pr281finaldraft.pdf>

- Rodrik, D.** 2004. Industry policy for the twenty-first century. UNIDO Working Papers. September 2004. UNIDO. Vienna, Austria. Available at: <http://www.cepr.org/pubs/dps/DP4767.asp>
- Roy, D. & Thorat, A.** 2008. Success in High-Value Horticultural Export Markets for Small Farmers: The Case of Mahagrapes in India. *World Development* 36(10): 1874–1890.
- Saegaert, J., Khrenov, E. & Díez, N.** 2004. *Competitiveness through export clusters that work*. Background paper presented at the ITC UNCTAD/WTO Executive Forum 2004 *Competitiveness through Public–Private Partnership: Successes and Lessons Learned*. Geneva, Switzerland.
- Sandee, H.** 1998. The Impact of the Crisis on Small-Scale Industries in Indonesia: some Preliminary Findings from Central Java. Discussion paper, Vrije University, Amsterdam, the Netherlands.
- Sawyer, C.** 2004. Chile Moves from Quantity to Quality: from tradition to technology and light to ripe. *Wine Business Monthly*, 15 December 2004. Available at: <http://www.winebusiness.com/wbm/?go=getArticle&dataId=36261>
- Saxenian, A.** 1994. Regional advantage: culture and competition in Silicon Valley and Route 128. Harvard, *Harvard University Press*, Cambridge, Massachusetts, USA:
- Simons, A.E., Hoogerwerf, A. & Reinders, M.P.** 1992. *Management of agribusiness complexes*. Paper presented at the European Workshop on Integrated Systems in Agricultural Informatics, 13–14 Feb 1992. ILB. Bonn, Germany.
- Sölvell, Ö., Lindqvist, G. & Ketels, C.** 2003. *The Cluster Initiative Greenbook*. Paper prepared for the 6th Global TCI Conference, Gothenburg, Sweden, 17–19 September 2003. Available at: <http://www.cluster-research.org/greenbook.htm>
- Sölvell, Ö., Malmberg, A. & Lindqvist, G.** 2008. *Swedish Cluster Maps. A statistical inventory of clusters in Sweden in 2002* (English translation of Svenska klusterkartor, 2003). Available at: [http://www.hhs.se/CSC/Publications/Documents/Swedish_Cluster_Maps__Eng_\[1\].pdf](http://www.hhs.se/CSC/Publications/Documents/Swedish_Cluster_Maps__Eng_[1].pdf)
- Souza, J.C.** 2005. *Agricultural and Livestock Policy: Science and Technology Applied to the Food Chain*, presented at the 14th Inter-American Meeting, at the Ministerial Level, on Health and Agriculture. Mexico City, D.F., Mexico, 21–22 April 2005. Pan American Health Organization – World Health Organization. Available at: <http://www.ops-oms.org/English/AD/DPC/VP/rimsa14-21-e.pdf>
- SRI International.** 2001. *The Illinois Model of Technology Driven Economic Development*. Study prepared for the Illinois Department of Commerce, Technology and Industrial Competitiveness (TIC) Bureau Document. USA.
- Svensson, G.** 2001. “Glocalization” of business activities: a “glocal strategy” approach. *Management Decision Journal* 39(1): 6–18. 2001.

Talbot, J.M. 2002. Tropical commodity chains, forward integration strategies and international inequality: coffee, cocoa and tea. *Review of International Political Economy* 9(4): 701–734.

Talbot, J.M. 2004. *Grounds for agreement: the political economy of the coffee commodity chain*. Rowman & Littlefield Publishers, Inc. Lanham, Maryland. USA.

Tambunan, T. 2005. Promoting Small and Medium Enterprises with a Clustering Approach: a Policy Experience from Indonesia. *Journal of Small Business Management*, 43 (2): 138-154.

Timothy, E. 2005. Collaborative learning in firm upgrading in Uganda's fish and floriculture, clusters and export value chains. University of Cape Town, Graduate School of Business. A paper to be presented at the 3rd Globelics Africa Conference: 31 October-4 November, 2005: Tshwane University of Technology, Tshwane, Pretoria (South Africa). Available at: http://www.globelics2005africa.org.za/papers/p0031/Globelics2005_Timothy.pdf

Ulloa, A. 2005. Documento de trabajo. *Diseño de un sistema de información sobre variables e indicadores al interior del cluster del salmón*. Departamento de Ingeniería Industrial. Universidad de Chile, Chile.

UNIDO. 2000. Promoting Enterprise through Networked Regional Development. United Nations Industrial Development Organization. Vienna, Austria.

UNIDO. 2001. Development of clusters and networks of SMEs: The UNIDO programme. United Nations Industrial Development Organization. Vienna, Austria.

UNIDO. 2003. Development of clusters and networks of SMEs: The UNIDO programme. A guide to export consortia. United Nations Industrial Development Organization. Vienna, Austria.

Unikowsky, S. R. 2005. *As estratégias empresariais para os vinhos finos no Brasil e no Uruguai: uma análise comparada*. Secretaria da Coordenação e Planejamento Fundação de Economia e Estatística. Porto Alegre, Brazil.

USAID. 2002. *Analysis of Table Grape Production in Bolivia / Análisis de la Viticultura de Mesa en Bolivia*. Lobato A. & Prudencio S. Market Access and Poverty Alleviation (MAPA) USAID/Bolivia. Economic Opportunities Office, Bolivia.

USAID. 2003. *Promoting competitiveness in practice: An assessment of cluster-based approaches*. Prepared by The Mitchell Group, Inc. for The United States Agency for International Development, USA.

USDA. 2006. *Argentina Wine Annual 2006*. Approved by Robert Hoff, U.S. Embassy, and prepared by Francisco Pirovano. *Global Agriculture Information Network (GAIN) Report Number: AR6021*. USDA Foreign Agricultural Service, USA.

Uzor, O. 2004. *Small- and medium-scale enterprise cluster development in Southeastern Region of Nigeria*. University of Bremen, Germany.

Van der Linde, C. 2003. The Demography of Clusters – Findings from the Cluster Meta-Study. In Bröker, J., Dohse, D. & Soltwedel, R. (eds.) *Innovation Clusters and Interregional Competition*. Berlin, Heidelberg, New York, 2003, pp. 130–149. Available at: http://www.isc.hbs.edu/cp/van_der_Linde_Demography_of_Clusters1.pdf

Vargas, M.A. 2001. *Local Systems of Innovation in Developing Countries: A Study of Technological Learning in Local Productive Arrangements in Brazil*. Economics of Innovation Group, Institute of Economics, Federal University of Rio de Janeiro – GEI-IE/UFRJ, Brazil. Institute of Development Studies – IDS, Falmer, UK Paper prepared for the DRUID's Winter Conference on Industrial Dynamics. First Draft.

Villanueva, L., Maradiaga-Blandon, F., Goh, K., Gerwin, L., Broughton, P.D. & Porter, M.E. 2006. *The Nicaraguan Coffee Cluster: History, Challenges and Recommendations for Improving Competitiveness*. Microeconomics of Competitiveness, Harvard Business School. Available at: http://www.isc.hbs.edu/pdf/Student_Projects/Nicaragua_Coffee_2006.pdf

Visser, E. J. 2004. *A Chilean wine cluster? Governance and upgrading in the phase of internationalization*. Serie desarrollo productivo No. 156. Division of Production, Productivity and Management. ECLAC/GTZ project on Natural Resource-based Strategies Development (GER 99/128). Santiago de Chile, Chile. Available at: <http://www.eclac.org/publicaciones/xml/8/20498/LCL2138.pdf>

Vorley, B. & Fox, T. 2004. *Global Food Chains – Constraints and Opportunities for Smallholders*. Prepared for the OECD DAC POVNET. Agriculture and Pro-Poor Growth Task Team. Helsinki Workshop, 17–18 June 2004, Finland.

World Bank. 2007. *World Development Report 2008. Agriculture for Development*. The World Bank. Washington, D.C.

Yim, D. 2007. Study on Subnational Innovation System Policy to Enhance Local SMEs Competitiveness. In UNESCAP *Enhancing the competitiveness of SMEs: Subnational Innovation Systems and technological capacity-building policies*, pp. 27–62. United Nations Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand. Available at: <http://www.unescap.org/tid/publication/indpub2435.pdf>

Zeng D. 2008. Knowledge, technology and cluster-based growth in Africa. *WBI Learning Resources Series*. The International Bank for Reconstruction and Development and the World Bank, Washington, D.C.

Zylbersztajn, D. & Miele, M. 2005. *Stability of contracts in the Brazilian wine industry*. Faculdade do Economia, Administração e Contabilidade da Universidade de São Paulo, Pesquisador CNPq, Centro de Conhecimento em Agronegócios, PENSA. Brazil.

On the web

Institute for Strategy and Competitiveness, Harvard Business School: www.isc.hbs.edu

The Competitiveness Institute: <http://www.competitiveness.org>

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Agro-based clusters in developing countries: staying competitive in a globalized economy

An agro-based cluster is a concentration of producers, agribusinesses and institutions that are engaged in the same agricultural or agro-industrial subsector, and interconnect and build value networks when addressing common challenges and pursuing common opportunities.

Cluster approaches recognize that all the actors in the agricultural value chain are often more innovative and successful when they interact with supporting institutions and other actors in the supply chain. By promoting vertical and horizontal links between local agricultural enterprises, as well as supporting relationships between them and facilitating organizations (e.g. local governments, research institutes and universities), cluster policies promote the diffusion of innovation, as well as the use and generation of important local externalities. Agro-based clusters can also enhance access to markets and information. Cluster policies are argued to be crucial for small-scale farmers and agribusiness, as they enable them to engage in higher productivity, and more market-oriented and higher value-added production. Accordingly, central and local governments have discovered that cluster promotion is a valuable tool to support agricultural enterprises in their territory and help them link to global agricultural value chains in a more efficient and sustainable manner.

The present paper presents existing literature and methodologies on agro-based cluster development, and provides insights into cluster promotion in Latin America, Asia and Africa. It offers as well a series of best practices recommendations to ensure that governments and other facilitating institutions provide effective support to agricultural clusters in the developing world. These recommendations relate to areas where government support is necessary and beneficial, and principles that should guide public interventions concerning agricultural clusters. However, as with everything out in the real world, all about agricultural clusters is not perfect. Consequently, the report ends with a discussion of the limitations and potential risks posed by inadequate agricultural cluster policies.

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