

The World Bank

# **Growing Mali's Mango Exports:**

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Linking Farmers to Markets  
through Innovations in the Value Chain



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## Acronym and abbreviations

API-Mali	Agence pour la Promotion des Investissements au Mali
APROFA	Agence pour la Promotion des Filières Agricoles
CAE	Centre Agro-Entreprise
CIDA	Canadian International Development Agency
COLEACP	Comité de Liaison Europe-Pays ACP
FIAS	Foreign Investment Advisory Services
FRUITEMA	Compagnie Fruitière d'Exportation du Mali
GDP	Gross Domestic Product
HVAF	High Value Agricultural and Food Products
ICEM	Initiative Croissance Economique du Mali (USAID)
IDA	International Development Association
NTAE	Non Traditional Agricultural Exports
PAVCOPA	Projet d'Appui à la Valorisation et à la Commercialisation des Produits Agricoles
PCDA	Programme Compétitivité et Diversification Agricoles
PLAZA	Périmètre Logistique Aménagé en Zone Aéroportuaire
USAID	United States Agency for International Development

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## Abstract

Mali, a landlocked country of West Africa, has experienced a spectacular growth of its exports of fresh mangoes which have increased six-fold in volume between 1993 and 2008. As one of the poorest countries in the world, and with over 80% of the workforce engaged in agriculture, Mali had to overcome a number of very serious challenges to achieve such a result. Over a decade, Mali has been able to build on its comparative advantage and secure access to the fast-growing EU fresh fruit market, generating increasing revenues for its producers and exporters.

In the 1990s, in view of its heavy dependence on cotton, gold and livestock as sources of foreign exchange, Mali decided to adopt and implement a strategy of diversification of its export base, particularly toward high-value, non-traditional agricultural products such as horticulture products. Mango was a prime candidate because of both the excellent natural conditions existing for the crop in some regions of Mali and because of the fast-growing demand in European markets, opening up opportunities for countries of West Africa. In addition, mango being a smallholder crop, it was expected that developing the subsector would contribute to improving the livelihoods of many farmers and rural dwellers, and provide them with a desperately needed alternative cash crop other to cotton, thus contributing to reducing widespread rural poverty.

Mango trees grow naturally in Mali given the favorable agro-climatic conditions particularly in the southern regions of Bougouni and Sikasso, and mangoes have for long been collected and sold on the domestic market. In the 1970s, Mali developed a small fresh fruit air-freighted export sector targeting essentially the French market. This initiative was successful but remained limited in terms of volume due to the constraints of limited air cargo capacity and also market size.

The demand for fresh mangoes on the European market is strong and growing at more than 5% per year. More importantly, the market has changed drastically in recent years, becoming a volume market and sea-freight taking over as the main import channel through the major dispatching centers of the European ports.

The key innovation that allowed Mali to overcome obstacles arising from its situation as a landlocked country and secure access to this market was the testing and implementation - through a partnership with private operators - of a multi-modal transportation system for the export of fresh produce that would provide an alternative to air freight. Thanks to project intervention, the feasibility and profitability of using refrigerated containers all the way to the destination market in Europe, with a combination of road, rail and sea freight, was demonstrated. This innovation basically opened the way to accessing the large and growing market of sea-freighted export of perishables. This new means of transport is also good from an environmental point of view by drastically reducing the carbon foot print resulting from this trade.

With the support of donors such as the World Bank and USAID, Mali was able to start building up its mango industry to serve export markets on a much larger scale than it had been able to

do before, thus generating a growing stream of income and employment opportunities for the production areas. Once the initial innovation was tested and validated economies of scale could be achieved and the size of the potential market for Malian producers and exporters of mangoes changed dramatically. Creating the linkages between farmers and this market required the piloting of a new and stronger supply chain that has in turn brought innovative practices upstream and downstream.

Nevertheless, to continue on this path of growth, the mango industry faces today new challenges, and must continue to adapt to remain competitive in the global market. In particular, private sector investment for production in commercial orchards and in processing will be critical to see further increases in export revenues.

The story presented in this paper is an example of successful diversification in agriculture and offers very interesting lessons, particularly in terms of the critical role of innovation. It shows the importance of putting together a combination of ingredients – private investment and public/project funds, technical expertise and national capacities - that are likely to make innovation happen and produce lasting benefits. These lessons are relevant and can be used in other countries and contexts. It is part of a research study carried out in the Africa Region of the World Bank that aims at documenting recent African success stories across a broad range of topics with a view to broadening dissemination and knowledge within the region of the transformation processes that are taking place in many countries, examining what has worked and why, and get a better understanding of the drivers of success in the region. Such an exchange of ideas should help facilitate adaptation and experimentation in scaling up successful approaches and interventions.

## I. Introduction

Mali is a landlocked country in West Africa, bordering seven other countries: Algeria, Burkina Faso, Guinea, Cote d'Ivoire, Mauritania, Niger, and Senegal. Its total land mass is 1.24 million sq km, but only 3.76% of the land is arable, of which around 80,000 hectares are irrigated. The country has an estimated population of around 12.3 million and is among the poorest countries in the world according to the UNDP Human Development Index. In 2006, it is estimated that the share of the population living in poverty nationally was 47.5%.



Source: CIA World Factbook,

Agriculture is a major pillar of Mali's economy. It accounts for 45% of the country's GDP and employs 80% of its workforce. Industry represents 17% of the country's GDP, with food processing, construction, phosphate and gold mining as the principal industrial activities. Mali's main exports, since the 1970s, have been gold, cotton, and livestock. However, as a land-locked country, Mali was, and still is, very dependent on the transport infrastructure and other logistical arrangements of its neighbors for market access and trade.

Thanks to the excellent natural conditions prevailing in the southern part of the country, mangoes have always been abundant in Mali, particularly in the Bamako and Sikasso regions. The fruit was traditionally collected and sold mainly for the domestic market. During the 1970s, Mali was the first country in West Africa that began to focus on opportunities to export fresh mangoes. However, these exports were exclusively via air-freight, reaching a volume of between 1,000 and 1,500 tons per year, and targeted the niche market of the expensive retail shops selling tropical fruits in France.

This report describes the set of innovations and other transformation processes that took place in the mango sub-sector of Mali in the 1990s and 2000s which allowed the country to overcome logistical dependencies and constraints, expand his trade of fresh mangoes, and make major leaps forward toward developing a competitive horticulture export sector. As part of this story it highlights the role of successive agricultural diversification projects implemented during this period by the government of Mali with the support of the World Bank and other donors.

## II. Mali's Export Diversification Strategy

### *Thriving for Diversification*

A key objective of Mali's poverty reduction strategy was – and still is - to increase rural incomes and employment opportunities by promoting agricultural diversification and developing exports of high-value commodities. In the early 1990s, the Government of Mali recognized that there was a need to design policies to diversify exports and foreign exchange earnings, which had for years been heavily concentrated on only three export products: gold, cotton, and livestock. Due to this concentration, Mali's exports were very susceptible to fluctuations, and this

resulted in a high fiscal exposure. For example, gold varied from contributing as much as 60% of exports to as low as 1% of exports, in a 10 year period<sup>1</sup>. Another example is cotton, where exports dropped dramatically in 2008 to less than half of their previous level; also, due to several years of financial crisis, the contribution of the sector to fiscal revenues has been negative throughout the whole decade.

Therefore, the government identified high-value non-traditional agricultural products as one option to generate income and achieve greater diversification of exports, based on the country's comparative advantages. Several horticulture crops were looked at as possible targets for these efforts, including cashews, tomatoes, shallots, and mangoes. Mangoes were one of the prime candidates because of the excellent agro-climatic conditions in the southern regions of Bougouni and Sikasso, and because of the fast-growing demand for this produce in European markets (see Graph 1). Furthermore, mangoes were already produced by smallholders throughout the country. The sub-sector could therefore potentially contribute to rural livelihoods improvements and provide an alternative source of cash income for small farmers. However, despite the high quality of the country's fresh fruit and vegetables, the high cost of air-freight has limited marketing and exportation. In fact significant volumes of fruit were bought and processed for export by operators based in Côte d'Ivoire, thus leaving little value addition in Mali.

**Box 1: HVAFs (High Value Agricultural and Food Products) and NTAEs (Non Traditional Agricultural Exports)**

Smallholder access to markets for higher value or differentiated agricultural and food products is recognized as a vital opportunity to enhance and diversify the livelihoods of lower income farm households and reduce rural poverty more generally (World Bank 2008). Also, at a more macro-economic level, studies have demonstrated the potential of non-traditional agriculture exports (NTAEs), for countries often trapped in producing and exporting low value bulk commodities, particularly in Africa.

### *Early Efforts toward Agricultural Diversification*

The government of Mali started looking around at ways to make this diversification happen. In 1992, the Ministry of Agriculture prepared a strategy, the *Schéma Directeur du Développement Rural* (SDDR) in which commercial agriculture, export promotion and value addition were emphasized and government started investing resources to that effect through World Bank/IDA loans and indirectly through other donor project support (USAID).

In 1996, the Government of Mali contracted a loan from the International Development Association (IDA) in the amount of \$US6 million for an agricultural trading and processing promotion pilot project known by the French acronym PAVCOPA<sup>2</sup>. The rationale behind the project was to promote agribusiness and exports. The project's objectives were to: '(a) improve the enabling environment needed to enhance private sector business opportunities and encourage State disengagement from commercial activities; (b) improve technical support to producers through effective research and extension aimed at enhancing and diversifying

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<sup>1</sup> UN Comtrade

<sup>2</sup> Project d'appui à la valorisation et à la commercialisation des produits agricoles.



production and improving the international competitiveness of Malian exports, and (c) boost private investment in agricultural trading and processing.<sup>3</sup>

In order to implement the project, the Government of Mali had previously established the Agricultural Value Chain Promotion Agency (APROFA by its French acronym) in 1993, as the designated project executing agency. Its goal was to induce the sustainable growth of the agri-food sector by both increasing exports on the European and African regional markets and through import substitution activities. Further, the agency was to support the improvement of the technical, managerial, organizational and professional capacities of public and private actors engaged in agribusiness.

The PAVCOPA project aimed at supporting producers, processors and traders in the regions of Sikasso, Segou, Koulikoro and the Bamako district, providing technical and promotional assistance - including price information - and organizing commercial forums, supporting professional associations and carrying out studies on the markets for high value crops.

### *The Global Market for Fresh Mangoes*

In recent years, the imports of mangoes into the EU have increased from 136,000 tons in 2001 to over 230,000 tons in 2008. The leading exporter countries are Mexico, Brazil, Peru, India, Pakistan and the Philippines; together they represent around 75 percent of the market. Though African exports of mangoes did grow by 69 percent during the same period, the volumes have been far lower than those of the leading producers. In 2001, for example, Mexico exported a total of 194,500 metric tons of mangoes while the entire African continent accounted for 26,100 metrics tons only.

In Africa the leading producers are South Africa, Côte d'Ivoire, Sudan, Kenya, Egypt and Mali. Historically Côte d'Ivoire has exported significantly higher volumes of fruit than its closest competitors on the continent, apart from South Africa. In the early 2000s, before political events broke out, the country exported 12,000 metric tons; its closest African rival was Sudan with 5,100 metric tons exported. That same year Mali exported about 1,600 metric tons.

In fact, as mentioned above, exporters in Côte d'Ivoire had been dealing for years with buying agents from Mali<sup>4</sup> which partly explains the figure of mangoes exports from Côte d'Ivoire. Mango exporters in Côte d'Ivoire had established and were running pack houses in the northern part of the country sourcing mangoes across the border. These mangoes were then exported under an Ivorian label. This clearly inflated the exports figures out of West Africa in favor of Côte d'Ivoire.

Mangoes represented a clear opportunity to increase income of smallholders in Mali. However, by the early 1990s, air-freighted mangoes had reached a volume of only 1,500 metric tons, with the main destination market being France.

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<sup>3</sup> Report No.: 25884, Agricultural Trading and Process Promotion Pilot Project.

<sup>4</sup> The same phenomenon was also occurring in Burkina Faso.

Graph 1: Imports of Mangoes into the European Union, 2004 – 2008 (metric tons)

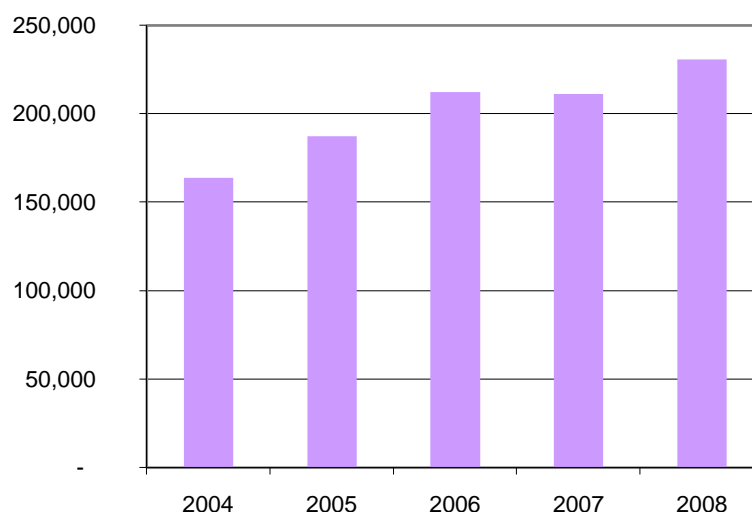


Table 1: Imports of Mangoes into the European Union, by origin, 2004 – 2009 (metric tons)

Suppliers	Years						Growth 04-08	
	2004	2005	2006	2007	2008	2009*	Annual	Total
Brazil	69,319	82,293	84,858	82,993	96,870	69,590	9%	40%
Peru	19,817	26,394	41,027	36,854	50,756	25,062	27%	156%
Pakistan	10,938	12,306	10,120	13,224	12,941	12,913	4%	18%
Israel	8,059	12,548	11,181	14,808	12,261	12,606	11%	52%
Cote d'Ivoire	11,426	9,856	14,428	14,706	11,249	11,659	0%	-2%
USA	7,612	6,894	5,971	7,404	7,516	5,536	0%	-1%
Senegal	2,810	3,011	6,194	4,702	6,034	6,219	21%	115%
Costa Rica	3,983	6,271	7,545	4,664	5,360	5,685	8%	35%
Mali	2,096	2,560	3,477	4,317	4,902	3,480	24%	134%
Dominican Rep.	1,228	1,591	1,618	2,767	4,307	4,179	37%	251%
India	915	1,720	2,472	2,425	2,577	2,470	30%	182%
Burkina	928	1,164	2,152	3,191	2,406	1,957	27%	159%
Others	23,516	20,035	19,786	19,003	13,209	12,893	-13%	-44%
<b>Total</b>	<b>162,646</b>	<b>186,643</b>	<b>210,829</b>	<b>211,057</b>	<b>230,388</b>	<b>174,248</b>	<b>9%</b>	<b>42%</b>

Source: Eurostat

\*Jan to Nov

### III. The Challenges

#### *Identifying Market Opportunities*

Côte d'Ivoire managed to capture and secure a significant share of the fresh fruit sea-freight market to Europe in the 1980s and 1990s. In Côte d'Ivoire, operators would source their mangoes directly from Malian buying agents, using pack houses located in their country but sufficiently close to the border to minimize transportation costs. These operators would export

their mangoes to Europe as products from Côte d'Ivoire. This dynamic has resulted in a surge of the Ivorian export of mangoes.

Because of logistical constraints, it has been difficult for Mali to compete with other countries on the international market for mangoes. Countries in Latin America were beginning to increase their market share in Europe because of greater economies of scale that Mali could not achieve with air freighted mangoes. Even within West Africa, despite being an initial leader in mangoes together with Burkina Faso, Mali lost this position by the early 1990s and its mango exports were surpassed by others competitors, such as Côte d'Ivoire. The table below demonstrates this progression (in metric tons exported).

Table 2: Export of mangoes from Mali, Burkina Faso and Côte d'Ivoire to the EU, 1970 – 1995 (metric tons)

Year	Mali	Burkina Faso	Cote d'Ivoire
1995	850	714	7107
1990	1300	2700	1000
1980	1172	2116	281
1970	35	122	N/A

Source: FAO-Stat

The main reason why Côte d'Ivoire made such a breakthrough in mango exports in the 1980s and 1990s is that Ivorian exporters had understood well before their competitors the major market trends, and anticipated the evolution in demand. Mango like some other tropical fruits, such as bananas and pineapples some years before, was leaving the mere specialty market to become a fruit that was in demand all year round by European customers and marketed in large volumes by the major supermarket chains and retailers in Europe.

To increase mango exports Mali began to look into alternatives to air-freight which would allow export of larger volumes, offer more competitive prices and get a share of the high volume market. However, the country faced a serious challenge due its landlocked status and logistics and transport issues prevented the mango sub-sector from being able to scale up exports.

### *Overcoming Transport and Logistics Constraints*

Mali, as a landlocked country, is able to ship via sea only by utilizing the port facilities of neighboring coastal countries. Historically, the country has relied mainly on Côte d'Ivoire for this purpose. Cotton lint and other products were exported through the port of Abidjan. The lack of direct access to a port meant that Mali had to rely on its neighbors' surface infrastructure as well as its own. Until the 1990s the only rail line with international linkages was run inefficiently, leading to uncompetitive prices and chronically high delays:

'...virtually all agricultural sectors, save cotton, suffer extremely high spoilage and shrinkage rates within the transport process. Producer's logistical costs are negatively

impacted by the cost of the consolidation of goods... poor business practices; and higher rates for smaller producers.<sup>5</sup>

Horticulture products being highly perishable and dependent on transit times, Mali appeared for long as forced to export its mangoes by air.

### *Other Challenges*

While critical, the infrastructure was not the only constraint limiting Mali's exports of fresh produce to distant markets. Besides the poor state of the infrastructure, Mali's most constraints to the development of fruit exports through Côte d'Ivoire centered on a lack of finance, and on insufficient management capacities.

The development of an alternative supply chain for Mali's mango exports faced three critical challenges: of infrastructure, management, and finance. More specifically the long list of constraints, other than transport, included:

- **Paucity of market information for growers and exporters.** Most exporters and others stakeholders in the industry did not have a good understanding of the increasingly stringent requirements of the intensely competitive European market, and of the gaps to be filled to access it.
- **Poor harvesting practices and post-harvest handling techniques.** Collection of the fruit was left by most owners of mango orchards to buying agents ("pisteurs") who against payment were allowed into the orchards once per season and took all of the fruit they could, regardless of its ripeness. Most growers did not manage their orchards, did not prune undergrowth, or clean the ground around the trees, which provided good habitats for various pests, among which the fruit fly.
- **Little or no investment at production level.** One manifestation of the low state of development of the mango sub-sector was the lack of investment in production, like the establishment of commercial orchards. Most of the mango orchards in Mali are five hectares or less. Traditionally farmers would not think of producing mangoes as a business and no consequent investment has been made during the last decades, save a few exceptions. Also specialists estimate that up to 50% of mango production was lost each year.<sup>6</sup>

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<sup>5</sup> Carana Corporation Report (2004), pg. 7

<sup>6</sup> L'économie locale de Sikasso, Club du Sahel/OECD, 1998.



- **Mali's unfavorable investment climate.** Many potential foreign investors are unfamiliar with the country, and the policies and procedures for conducting business, which leads them to feel that investing in Mali was high risk. In addition, due to the limited foreign direct investment in the country, coupled with poor enforcement of fair business practices, there was little competition in services.
- **Poor land titling and inexistent land market.** Until the Agriculture Orientation Law of 2006, there were no provisions for the establishment of commercial scale irrigated plots, nor was there the possibility of purchasing irrigated land, and therefore no opportunity to offer land as collateral against which to secure loans.<sup>7</sup>
- **Inadequate working capital and lack of supply chain financing** also impeded the development of the mango export industry in Mali. The growers did not have access to capital and exporters had to pre-finance costs before being paid by the client importers. Given the limited period of fruit availability and market demand – a few weeks – and the transit time of non air-freighted exports, exporters could not afford to wait to receive payment from previous dispatches in order to continue further

#### **Box 2. The mango export value chain**

For those mangoes that did get exported, the organization of the sub-sector involved producers, intermediaries, and exporters. Producers typically agreed to sell their mango crop to buying agents ("pisteurs"). Generally, a *pisteur* is an independent trader who selects, harvests, and transports the fruit from orchard to pack house, working more or less exclusively for a particular exporter. Conditioning of fruit (washing, drying, polishing, sorting, and boxing) was then done by the exporter, and neither modern conditioning nor proper cold storage facilities were available. The quality control was done by the exporter who sorted through the mangoes and selected those of export quality, returning the second grade mangos to the *pisteur* for sale on the domestic market.

<sup>7</sup> Jones and Livingston

shipments so that the availability of working capital and supply chain finance seriously limited this type of trade.

- Finally, the industry suffered from **poor organization**, hurting its ability to efficiently fulfill international orders. As one expert stated: “in general, the mango sub-sector in Mali suffers from poor organization, including a lack of cooperation among exporting firms and a lack of coordination between suppliers, government inspection officials, and exporters. As a result, there is inadequate aggregation of product ahead of time in order to meet the very narrow windows for transit and destination scheduling to be able to fill international orders. Organizational and transactional efficiencies will be difficult to realize until exporters are able to consistently aggregate two to three thousand metric tons of mangoes for export each year.”<sup>8</sup>

All this shows that breaking out of the vicious circle would require not only an initial change that would help lift the main constraint – transport – but also a series of transformations in the sector capacities and business practices.

## IV. Interventions

### *Supporting Agricultural Diversification*

The transformation of Mali’s mango export sector began with a pilot project funded by the Government of Mali and the World Bank. Before the project, mangoes in Mali were collected for local consumption and for the small scale air-freighted exports. Utilizing the existing facilities at the Bamako airport, operators managed to export about 1,500 metric tons to the European market each year. In the early 1990s access to the EU market became stiffer due to the presence of strong competitors. South American exporters, notably Brazil, began exporting sea freighted mangoes into Europe on a large scale. The advantage of exporting by sea comes from the economies of scale associated with bulk shipping and the resulting lower freight cost per weight unit. Air-freighted mangoes, on the other hand, whose price structure included higher transportation cost, became less and less competitive. It is true that air freighting allows for the fruit to be picked at a more advanced stage of maturity translating in the export of a sweeter product, but at a significantly much higher cost. The market has evolved into a narrow niche market for upscale retailers and restaurants already accustomed to particular air-freighted varieties, and able to sell them at the extra price.

As mentioned earlier, the PAVCOPA Project was implemented between 1996/1997 and 2003 by APROFA, the Value Chain Promotion Agency. In addition to the Government and World Bank initiatives that began in 1993, USAID contributed to jump-starting initial work in the mango sub-sector through its support to the Office de la Haute Vallée du Niger (OHVN) project, also focused on HAVFs. This program was an important starter while the preparation of PAVCOPA was ongoing. As a matter of fact, aid organizations have continued to be involved in the horticulture sector for the next 15 years.

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<sup>8</sup> Mali Trade Capacity Needs Assessment, USAID, 2005.

## *Rethinking and Redesigning the Mango Export Value Chain*

The first and critical step that triggered the whole process occurred when, thanks to the PAVCOPA project, a small but critical mass of competences were brought together to thoroughly analyze and assess the opportunities for agricultural diversification into higher value crops. PAVCOPA had not been a very successful project at that point and the preparation of its mid-term review in January 2000 provided the opportunity to reorganize the agency and restructure the project, and elaborate a new business plan for the rest of the duration of the project.

As far as the mango value chain was concerned, a critical point was reached when APROFA and its technical team of advisors started analyzing what had made Côte d'Ivoire successful in developing sea-freighted exports of mangoes. It was important to understand what the drivers of success in this country had been and draw useful lessons. Mali had been in the business of exporting mangoes for years but clearly this was not a broad based and growing activity but rather one limited to a narrow market and targeted to a somewhat exclusive club of exporters in the periphery of Bamako.

Observing and understanding the success of Côte d'Ivoire entailed in particular: (i) a thorough analysis of the global mango market demand and market trends, and (ii) an assessment of the characteristics and requirements of the efficient supply chain that had been put in place in Côte d'Ivoire. This led to the realization that there were three critical steps to be taken to change the perspectives for mango exports from Mali: (i) find a way to penetrate and compete in what was the growing market for fresh mangoes i.e. the sea-freighted trade to the European major ports and hubs (Rotterdam, Antwerpen, Algeiras, London), (ii) understand the requirements of this value chain and the needed drivers of change and competitiveness, and (iii) identify and work out solutions to overcome the first and major constraint – distance to the main ports in the sub-region - and develop an alternative and effective transport route.

## *A Key Innovation: Introduction of Multi-Modal Transport in the Export Value Chain*

The key innovation that allowed Mali to overcome the severe constraints arising from being a landlocked country, particularly when it comes to exporting perishable products to distant markets, was the design and implementation of a multi-modal transportation system, according to which mangoes are loaded into refrigerated containers that are then loaded onto trucks. The trucks transport the mangoes across the Malian/Ivorian border to the town of Ferkessedougou. In Ferkessedougou, the containers are transferred from the truck to the rail platform. They are, then, shipped directly to Abidjan via the recently renovated railway.<sup>9</sup> Once there, they are transferred to the port side and loaded on ships bound for the European destination points. The refrigerated containers are equipped with distributed generator units, or gensets, that ensure the continuity of the cold chain and allows the fresh fruit to be kept at a

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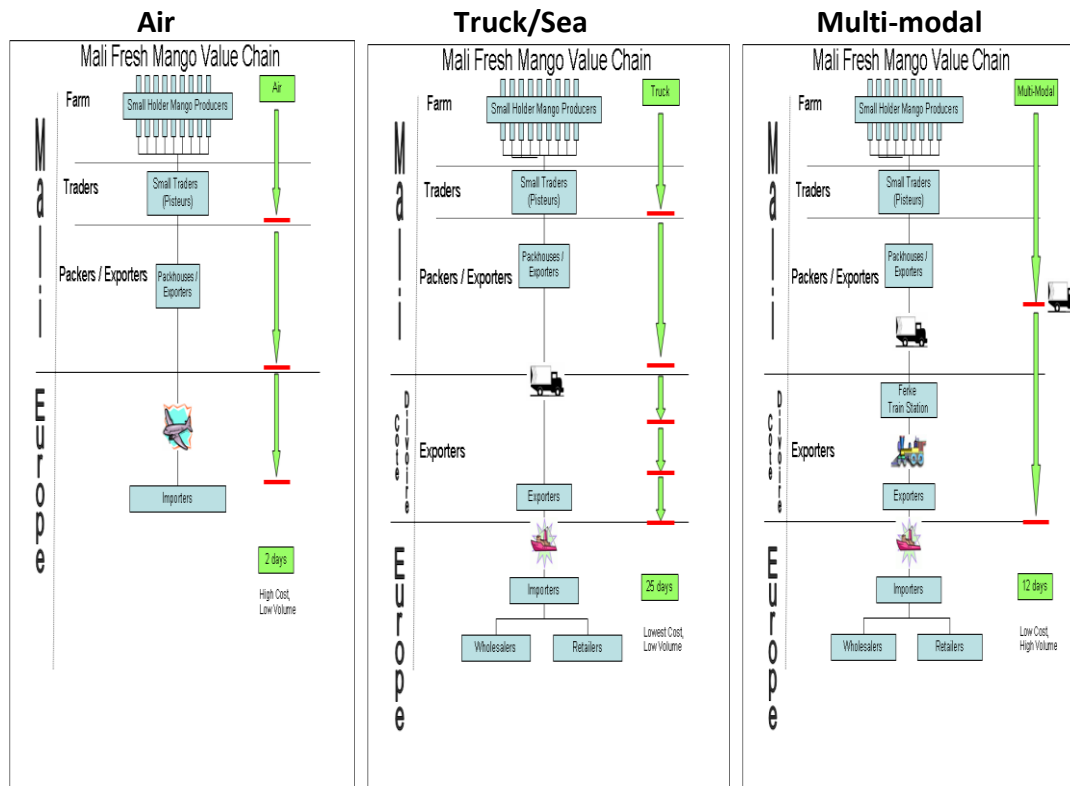
<sup>9</sup> The concession was issued in 1994; operations began in 1995.



controlled temperature. The sealed containers can be loaded onto trucks as well as trains and ships while keeping constant the temperature of the goods inside (around 5 degrees Celsius).

The surface only, multimodal shipping system was able to address Mali's problem of infrastructure and entailed using refrigerated containers all the way to final destination. Thanks to this new system, the transit time from Sikasso to Northern Europe that represented 25-30 days before could be halved to approximately 12-15 days.<sup>10</sup> Figure 1 below provides a representation of the various supply chains in mango export.

Figure 1: Alternative supply chains for mango export from in Mali



Source: Geomar International

- |                                                                                                                                   |                                                                                                                    |                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 2 days transit time</li> <li>• Cold chain not necessary</li> <li>• Low volume</li> </ul> | 25-30 days transit time<br>Lack of cold chain leads to post-harvest loss<br>Cannot not ensure export-quality fruit | 12-15 days transit time<br>Cold chain in place<br>High volumes of export-quality fruit |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

<sup>10</sup> Danielou, Morgane, Patrick Labaste, and Jean Michel Voisard, 'Good Practice Note - Linking Farmers to Markets : Exporting Malian Mangoes to Europe', October 2003



The key equipment involved in the multi-modal transport is the refrigerated containers. They are equipped with distributed generator units or gensets that allow content to be kept at a desired temperature. In addition, the containers can be loaded onto trucks as well as trains without affecting the temperature of the products inside. The result of this was the possibility of Mali to export its goods directly from Sikasso to a European port without further handling of the cargo once the container has been loaded and sealed at the pack-house site. Transit time was reduced from 25-30 days to 12-15 days. The gensets also have a major impact on the quality of the product reaching the European port. Because the goods are able to be kept at the same temperature from Sikasso to Europe without interruption, a continuous cold chain is ensured. The existence of this uninterrupted cold chain allows cooling fruits and vegetables quickly after harvest greatly which greatly decreases their rate of deterioration.

#### **Box 4. The Fair Trade Market Opportunities**

The most recent data from the Fairtrade Labelling Organisation show that about 8,000 tons of fair trade certified fruit was sold in Europe in 2005. This would include pineapples, mangoes and avocados, citrus and deciduous fruits, but not bananas. The UK led sales with 4,700 tons of fruit while per capita spend was highest in Switzerland. Sales of fair-trade products have grown strongly since 2005, and sales of bananas, for example, have more than doubled. If similar growth rates applied to other fresh fruit the total market remains very small.

As a brand, however, fair-trade is crossing into the mainstream now and being taken up by the supermarkets. Further expansion is likely in this sector, but with the same performance requirements as conventional products: year round supply and guarantees of quality and price levels are to be expected.

### *Designing the Innovation and Testing the System*

The technical team in APROFA, who was in charge of managing the PAVCOPA project, identified the solution and recognized the need for capacity and experience in testing and validating a new surface transport system with private partners that were interested in taking or at least sharing the risks inherent to such an operation. Through a network of professionals, APROFA contacted an Ivorian firm, SN Tropical Expressions, who was active in the fruit export business and interested in expanding their activity. However they had little scope for expansion in Côte d'Ivoire and were looking for opportunities to invest in - and operate from - Mali. The Ivorian firm was a prime candidate for testing the multimodal system because they already had the knowledge of the fruit business and export operations in Cote d'Ivoire, as well as of the legal and administrative procedures. They also had established relationships with various officials, and connections with the sea-freight shipping organization in Cote d'Ivoire and experience with the cross-border transport.

In order to test the new multimodal transportation system, it was necessary to share the risks inherent to such an innovation; therefore, APROFA negotiated and signed a partnership agreement with SN Tropical Expressions. According to this document, APROFA and the private partner agreed to share the costs, margins and risks associated with the first program of shipments of containers (200 tons). The Ivorian company was responsible for all logistics involved in transporting the goods to their ultimate port of destination in Europe, including packaging materials. A profit margin was built into the fixed price in the case that both parties would respect their mutual cost objectives. If the average selling price was greater than the

fixed price, APROFA and the Ivorian company would share the difference. The partnership with SN Tropical Expressions also provided a solution to the problem of lack of access to finance since the private partner had the necessary working capital to fund the operation. The pilot program was able to address this issue by establishing a partnership between APROFA and the Ivorian company with the necessary capital to support the operation. Under the same initiative, APROFA was able to obtain a guarantee from a local bank for the leasing of an existing pack house in Sikasso by the Ivorian firm. This pack house, which had previously been foreclosed, had the necessary equipment for pre-cooling of fruit pallets. In addition, SN Tropical Expressions seconded two experienced managers for the operation of the Sikasso facility.

The importance of pre-cooling mangoes at pack house stage is critical for the continuous cold chain. The establishment of continuous cold chains in the export of horticulture and other high value crops remains one of the most pertinent challenges of the development of exports out of Mali as from other Sub-Saharan African countries.

### *Early Success*

The test carried out in 2000 was a great success from many points of view, particularly in terms of quality. None of the 63,000 cartons of mangoes shipped to Holland was rejected. To the contrary the importer was enthusiastic and enquired about the volume that could be shipped on a regular basis by Mali. Both partners, SN Tropical Expressions and APROFA made a profit on the operation. The validation of the feasibility and profitability of the new value chain for mango exports represented a critical breakthrough and opened completely new horizons for the business and for operators in the sector. It triggered a complete change of paradigm.

The pilot project helped Malian producers and exporters address the three major constraints of Mali's export supply chain, i.e. finance, management, and infrastructure. At the end of the day, producers received a higher price for their mangoes at the farmgate level—the price increased from 50 to 125 FCFA or a 150 percent increase. The exporters, for their part, increased the volume of fruits they were able to ship from Mali, which translated into increased revenues.

This change to sea-freighted mangoes enabled farmers and other stakeholders to consider investments to achieve economies of scale. For example, Ahold, the Dutch supermarket chain, was a key commercial partner, attracted to the country by these innovations which now allowed the country to export in the volumes needed for supermarket sales. The sub-sector also became more organized and more attractive for potential investors with the success in multi-modal transportation. The World Bank's initial PAVCOPA project worked to support professional mango associations. In addition, other donor funded projects like USAID's Integrated Initiatives for Economic Growth in Mali (IICEM) program improved relationships between producers and exporters to better link supply to the final markets.

Due to the multi-modal transport innovation, mangoes could be shipped from Mali via sea freight instead of only air freight. This meant Malians could export in higher volumes, and could compete in the broader markets (supermarkets, for example, not only niche markets) since sea freighted mangoes are more cost competitive. An interesting fact to be noted is that the socio-political turmoil in Côte d'Ivoire as of 2002 did not result in the collapse of the multi-modal

transport chain and in the operation of the Mali mango export value chain, as some had predicted.

### *Consolidating Success: the Strategic Profile of Agricultural Exports in Mali*

In 2005 the government of Mali, with World Bank assistance and IDA funding, launched the implementation of the Agricultural Competitiveness and Diversification Project, a 6-year investment project, funded by a \$46.4 million credit to the Republic of Mali. The project's development objective is to improve the performance of supply chains for a range of non-traditional agricultural, livestock, fisheries, and gathering products, such as mangoes, cashews, shallots, potatoes, dairy products, beans, papayas, sesame, sheanuts for which Mali enjoys strong comparative advantage. The project aims at increasing the competitiveness of, and revenues from, a whole range of agricultural products with growing markets and strong demand, yet so far mostly untapped, thus diversifying the economy's foreign exchange earnings.

The project includes the following five components: (i) demonstration and dissemination of irrigation, post-harvest and value adding technologies; (ii) improvement of the performance of existing and emerging agricultural supply chains; (iii) facilitation of access to finance for producers and operators; (iv) investment in key collective, market-oriented infrastructure; and (v) managing, monitoring and evaluating project implementation.

In the framework of PCDA's implementation, and as part of the preparation and design studies, a very innovative approach to analyzing value chain development opportunities and prioritizing value chain support was introduced in Mali. The project team identified target sectors for support by comparing Mali's agricultural sector using a series of analytical tools with a broad range of data. Through this process, the team identified value chains for export markets, providing a basis for prioritized interventions that would ultimately create value, and improve livelihoods of Malian small farmers.

The review used five modules to assess the competitiveness of a range of non-traditional agricultural value chains (see Box 3). Each module built on the previous and helped practitioners progress from a comprehensive list of sectors to those with true marketability, competitive advantage, and comparative advantage. This process also took into account the demand in existing end markets, identifying new potential end markets, regional climate and growing factors, production capacity, access to finance, infrastructure, and other determinants.

#### **Box 3. The strategic profile approach**

The approach that was followed to identify and prioritize value chain interventions in Mali entailed the following sequence of modules, each one comprising several steps:

- Module 1: Defining Mali's Broad Portfolio of Agricultural Sectors
- Module 2: Analyzing Market Demand and Market Entry Conditions
- Module 3: Analyzing the Competitiveness of Potential Malian Offerings
- Module 4: Defining Priority Sectors
- Module 5: Competitiveness Planning: Putting the Analysis into Action

Through this process, a series of operational tools were developed for each of the selected value chains: Strategic Development Plan, Competitiveness Plan, Priority Action Plan. PCDA is now in the process of implementing these action plans with the respective value chain stakeholders.

The approach entailed first a very thorough and detailed study<sup>i</sup> followed by a series of stages combining expert analysis and consultation with stakeholders, and culminating with regional workshops and a 2-day national workshop that took place in December 2007 to discuss and adopt the priority value chains for intervention in each of the major production basins.

The chart below summarizes the continuum of projects and initiatives that have been supporting key stages of development of the mango industry in Mali over the last 15 years.

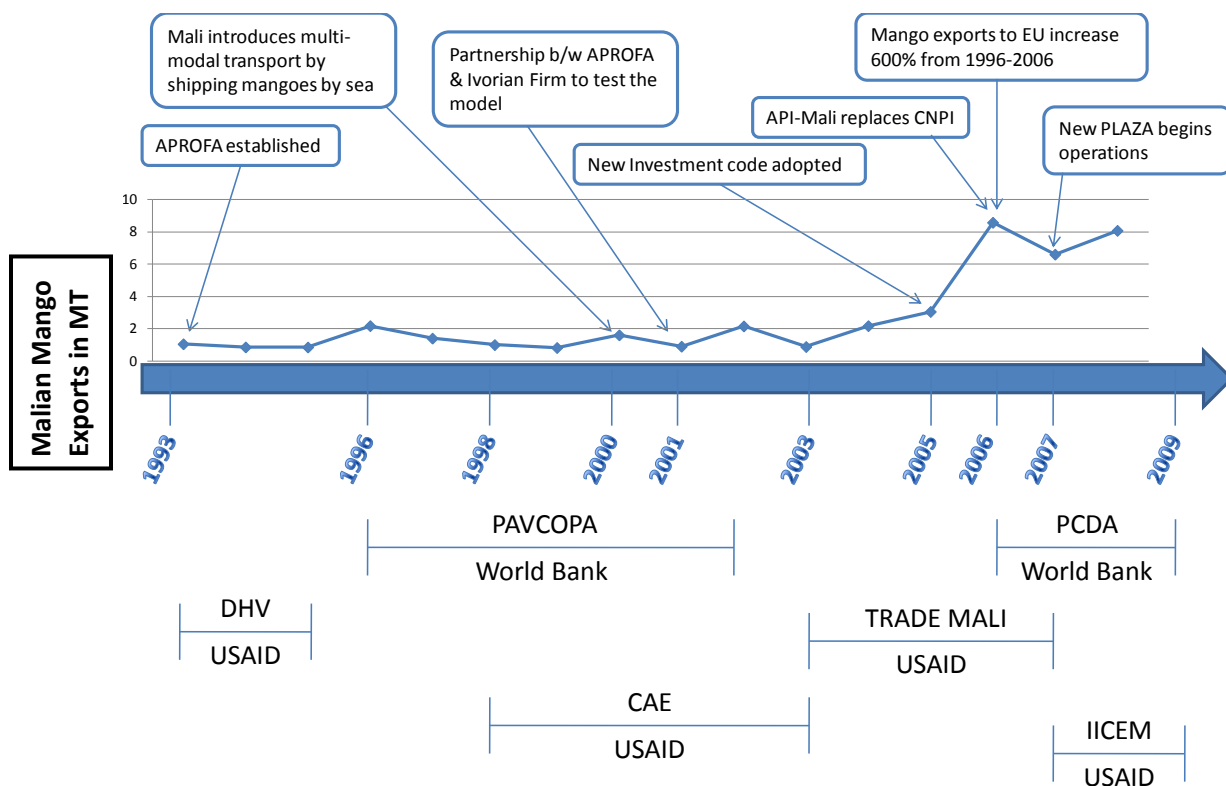


Figure 2. The stages of development of the mango export industry in Mali

### *Improving Quality by Investing in Infrastructure*

The surface transport system increased considerably the potential export capacity for Malian mangoes. Once the new transportation system was established and proved economically efficient and reliable, Mali realized that it would have difficulties in meeting the new demand for exports, and began to pursue additional interventions to increase the quality and quantity of mangoes exported. A number of successive agricultural diversification projects stepped in during the 2000s to provide support in the area of quality improvement, such as USAID's Centre Agro-Entreprise (CAE), Trade-Mali, and IICEM projects, The World Bank's Programme Compétitivité et Diversification Agricoles (PCDA) was launched in 2005. The range of interventions included, among others: cold chain and conditioning infrastructure

improvements, phytosanitary improvement programs (especially the control of fruit fly infestation), certification programs, traceability programs, training in orchard management practices, and post-harvest handling training programs.

In order to strengthen the capacities – human but also physical – and improve the competitiveness of mango exports a packhouse and logistics facility known as the PLAZA (Périmètre Logistique Aménagé en Zone Aéroportuaire), with capacity to handle 2,000 tons of fresh produce per year, was built in 2007 near the Bamako airport thanks to funding from the World Bank funded PCDA and Dutch embassy. The PLAZA has been used since then by professionals to prepare their products for export through pre-cooling and storage rooms, meet international standards for quality and safety, and get trained. Discussions are ongoing to transfer the management of the PLAZA to a specialized private operator and its ownership is due to be transferred to the nascent inter-professional organization.



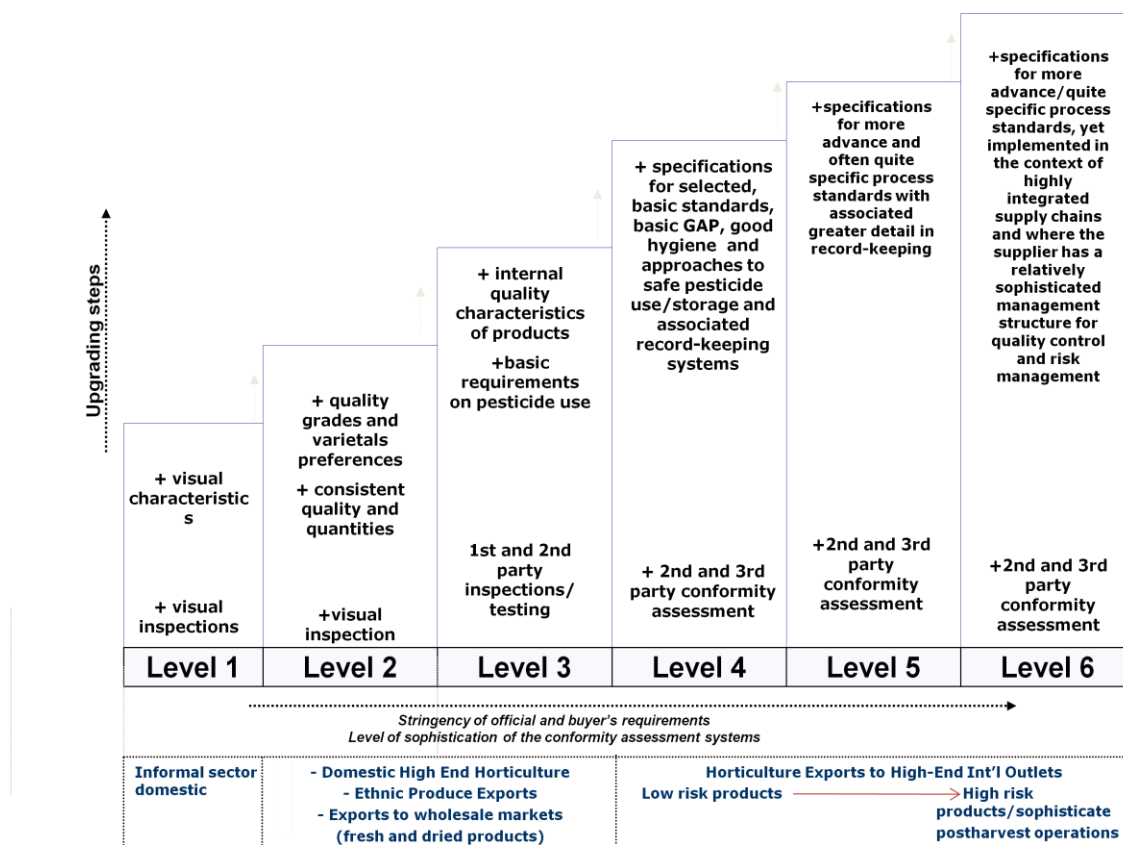
#### **Box 4. The PLAZA**

The World Bank project, PCDA, with funding from the Dutch Embassy, built a modern pack house in Bamako, near the airport, to help exporters improve their capacities in handling and shipping mangoes. PLAZA has proven to be an effective pack house despite its location, away from the growing region and the border with Cote d'Ivoire. However, PLAZA currently only operates during the mango season. PCDA is looking at other perishable export products for which to use the pack house like papaya and other fresh produce.

In 2007, the PCDA project built the PLAZA pack house in Bamako, a facility designed to provide conditioning services to the exporters. USAID's IICEM project also provided support to the PLAZA through technical assistance in efficient management of the facility. The PLAZA pack house is a modern pack house with electricity, cold storage and grading equipment. It has a throughput capacity of 40 metric tons per day and is used mainly by the sea freight exporters. PLAZA is so far the only real modern pack house for horticulture products in Mali and was built in Bamako to facilitate shipment of perishable through Bamako and Dakar. An additional Investment project in a new pre-cooling and shipping facility in Sikasso is currently being considered.

The figure below illustrates the stages of quality requirements in export horticulture.

Figure 3. Continuum of Commercial & Regulatory Requirements in Horticulture



Source: African Smallholders, Higher Value Agri-Food Markets and Measures to Achieve Compliance with Emerging Standards, S. Jaffee (World Bank), 2009

The export potential of Malian mango has yet to be determined. APROFA conducted a number of studies to assess the export potential of the Malian mango sub-sector. In the Sikasso region, for instance, where the production was estimated at 48,000 metric tons, it was predicted that the region could export 14,400 metric tons. The assumption was that only 30 percent of the mangoes would be of export-quality. In other words, only 30 percent of the mangoes produced would comply with the norms of the end-market. Subsequent estimates mostly stemming from APROFA put the total production of the entire country at around 200,000 metric tons. For export, they assume that only 25 percent of the total production would meet the requirements i.e. 50,000 metric tons. However, it is agreed across the industry that this potential is not fully known. Under the ongoing PCDA operation, a detailed study to assess the production potential has been undertaken.

### *Building Capacities in Finance and Business Management*

**Supply Chain (Including Input) Financing.** Another important step forward was made under the leadership of PCDA: getting local banks and other financial institutions regaining trust and interest in the horticulture business. In 2008, 150 million FCFA were lent to operators in the sub-sector, a record level when comparing to the last 10 years, in the form of credit for the



import cardboard boxes (CFA 56 million) and seasonal credit (CFA 90 million) for three exporters. For two years running (2007 and 2008) PCDA provided a guarantee to a commercial bank to fund the import of the boxes from Côte d'Ivoire; the bank held them in bond through a third party, releasing them on credit terms as and when the exporters needed to prepare an export shipment. In 2009 the same banks have agreed to pre-finance the import of boxes directly in favor of the exporters. These arrangements have allowed local banks to realize that these exporters did carry out genuine and profitable business activities. PCDA has established its credibility in this area and continues to play an important facilitative role between farmers, exporters and professional operators on the one hand, and the banks and financial institutions on the other hand.



**Training on business practices** for producers and operators has also contributed to improving standards of practice in the mango sub-sector. Extending business training to producers has helped them start to see their mango orchards as a potential business, rather than only a subsistence agriculture activity. Initiatives in this area focused primarily on training producers and assistance linking value chain actors to financing. International partners also provided assistance for small business development.

In the ongoing World Bank project, an importing firm in Europe, Bakker Barendrecht, teamed with five exporters operating at the PLAZA to help them improve their knowledge on how to export to European markets. Bakker invests in knowledge in mango production and pays a premium on the fruit if the exporters stick to a “cahier des charges”, or code

of practice, detailed in the contract. Varieties, ripeness, sizes, etc. are planned with exporters for the whole season with the possibility of fetching additional premiums if the mangoes sell well.

## V. Results and Impacts

Mali's development agenda places a high priority on agricultural growth and diversification. The achievements realized through this project have made a direct and tangible contribution to this agenda. A whole range of stakeholders participating in the value chain —small farmers, traders, agro-processors, exporters, service providers (technicians, financial and accounting specialists), input and equipment providers—have been involved since project launch and are benefiting from the expansion and improvements brought about by the project.



### *Quantitative Results*

Results achieved after a decade are summarized in the table below. The table below shows the significant gains made between 1993 and 2008 as measured by some key quantitative indicators.

This project and the innovations it has introduced and supported have prompted the strong growth of the export of fresh mangoes from Mali. Total exported volume of mangoes in 2008 reached 11,995 tons, an all time record (see Graph 2). At the beginning of the 2000s, Mali was not on the radar screen of fruit importers in the EU and categorized under “Others”. Now it is a recognized origin.



1993	2008	Impact
Mango exports were 1,050 metric tons	Exports are 11,995 metric tons	+1,042%
Sea-freighted mango exports are marginal; exports are not recorded as being sourced from Mali.	Sea-freighted exports are 4,600 metric tons	+460%
Mango revenue contribution to exports was USD\$460,000 <sup>11</sup>	Increased mango revenue contribution to exports by 484% <sup>12</sup>	+484%
Transit time from Sikasso to northern Europe was 25 days	Transit time from Sikasso to northern Europe was 12 days	-13 days
Farmgate price of 50 FCFA	Farmgate price of 125 FCFA	+150%
European imports were 237 metric tons	European imports increased to 4,560 metric tons	+1,824%

Estimated gross revenue generated in 2008 was 9.7 billion FCFA (\$25 million), already a significant fraction of the earnings generated by Mali's traditional exports like cotton lint. The graph below shows the evolution of exports to the EU between 2000 and 2008. The rate of increase has been an impressive 24 percent p.a.

In the mango value chain, which is one of the value chains targeted for PCDA's intervention, a range of stakeholders have been and are benefiting from the expansion in trade and value addition along the value chain—from farmers to harvesters to collectors to processors and exporters. This means increased market share, value creation, and improved prices at all stages of the marketing chain.

As far as one of the key development indicators is concerned, the producers are able to receive a higher price for their mangoes at farmgate level—these prices increased by 150%. This price increase also translated to other on-farm activities as farmers became aware of the margins to be gained from horticulture production.

The average quality of the fruit exported has improved. As an indication of the improvement in the quality, as well as the quantity, of mangoes exported, the number of sea container rejections due to fruit flies has been reduced from 14 containers in 2007 to 5 containers in 2008, while the fruit fly infestation nonetheless remains an issue.

Backward linkages at production level have tremendously improved over time. Relationships between the exporters and farmers have also improved. Exporters provide support services to the farmers such as helping to manage their plantations, fight against fruit flies, and implement certification or traceability programs on the plantation. In return, the exporters purchase the farmers' final product – often without a contract. This trust allows the exporters to obtain a higher quality product, because farmers are more willing to respect phytosanitary controls when provided assistance. An important, but less tangible, accomplishment of the mango sub-

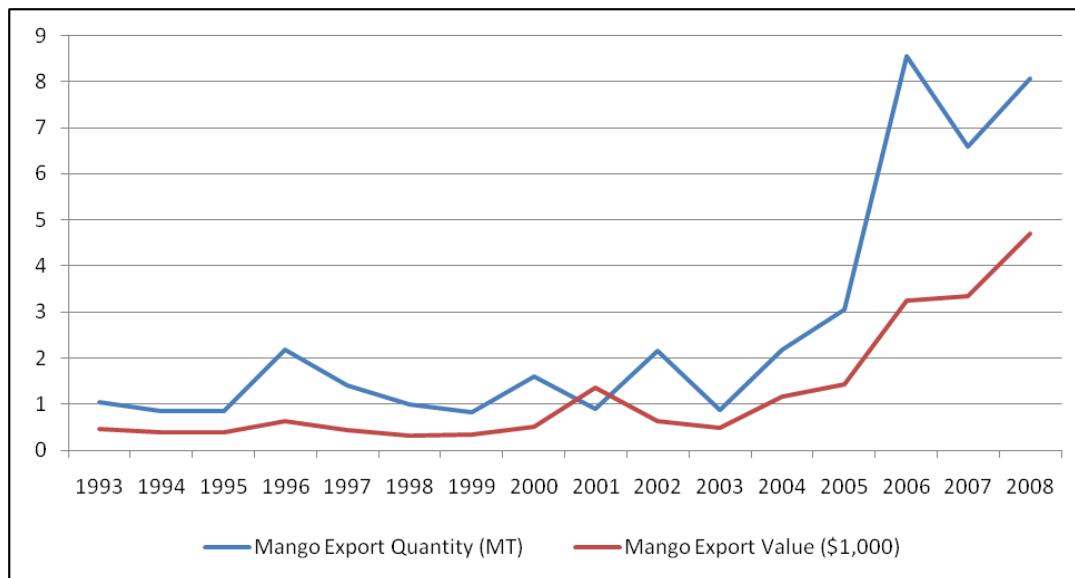
<sup>11</sup> *Ibid*

<sup>12</sup> FAOSTAT

sector from these initiatives is the degree of trust among the actors in the value chain that has been built over time.

Many other examples of these changes have been given in chapter IV.

**Graph 3: Mango Exports (1993 – 2008)**



Source: FAOSTAT

Also, regional cooperation has been enhanced. For example, the mango exporters in Mali have organized themselves to get multi-country support from donors to fight against fruit flies, and the multi-modal transport initiative also involved coordination among stakeholders across borders. These efforts have led to an improved value chain not only in Mali but for the mango value chains in Cote d'Ivoire, Senegal, and others as well.

### *Qualitative Changes*

The initial and now sustained take-off growth of mango exports has led to a complete transformation of the sub-sector, not only measured in quantitative terms but also qualitatively. The expansion of the sub-sector has brought about a progressive yet probably irreversible change in business practices, in the sense of more professionalism and attention to product quality management, better compliance with trade standards, and a regain of interest in private investment. For example:

- Some major players in the business are now present in Mali and show interest in expanding their operations and investing in the long-term in the sub-sector. AHOLD, a major Dutch supermarket retail chain, has been present in Mali since the PLAZA started operating and has been providing technical assistance to Malian exporters and PCDA during the last three campaigns;

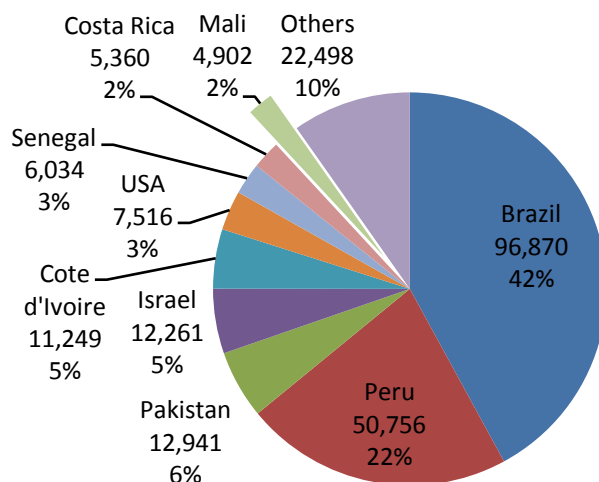
- Substantial work has been undertaken on the upstream/production level of the chain, something that had never been done before. Investment in mango orchard plantation is ongoing with the support of several projects. Mango is considered now as a production activity, not just a collection activity. PCDA has invested in a study that aims at a mapping of tree crop plantations using satellite imaging (Geosys/Pixela study);
- There is clearly renewed interest from financial institutions in the agricultural export value chains such as the mango export, as demonstrated by the increasing volume of credit to the sub-sector, the low default rates and the emergence of innovative financing instruments, like the input pre-financing. As volumes and turn-over have increased, this renewed interest from commercial banks and other financial institutions to do business has resulted in increased engagement and support to exporters and operators;
- Finally a Mango Task Force has been established and has been active for some years to improve coordination in the sub-sector, develop an agenda for collective action between professionals and provide a platform to address issues of common interest with the public sector.

## VI. The Way Forward

While there is now an emerging mango and horticulture industry in Mali, more stages of development are still ahead. Some of the main current priorities are listed below:

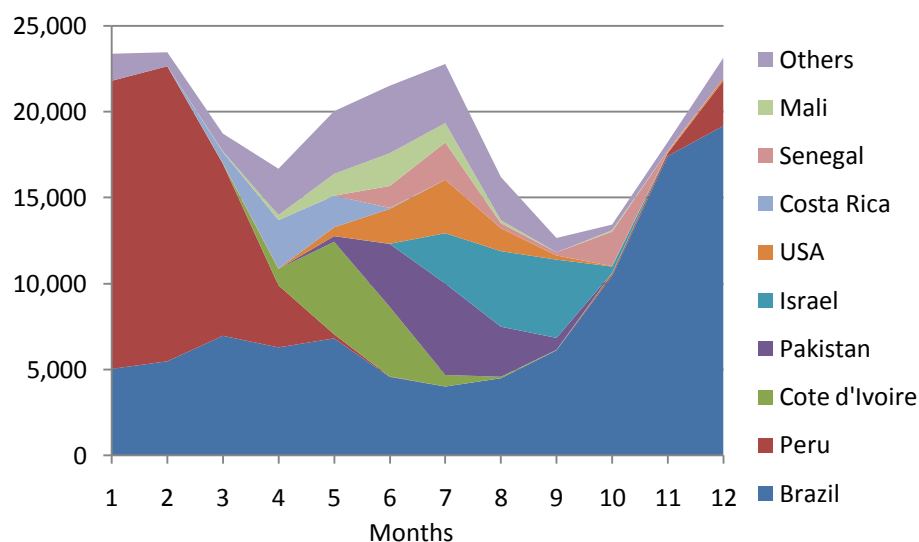
- **Improve/strengthen market positioning and diversify market outlets.** The current market position of Malian offer of mangoes has led to the spectacular surge in sea-freighted exports. However, this is not a deal done once for all. First of all, Mali, whose imports of mangoes into the EU do not represent more than 2% of the total imports, is still a marginal player in this global market. Second, the EU and other importing markets are dynamic meaning that there is a dire need for permanent adjustment and improvement. Mali is currently supplying the EU market based on the seasonality of its production which is concentrated between mid-May and early July, after Burkina Faso but before Senegal (see Graph 4). It would be important for Mali to expand the markets for its fresh mangoes both in time and space: irrigation of mango orchards is being tested by PCDA and this may offer opportunities to induce flowering and fructification at a different period of the year; operators have started looking at market opportunities outside the EU. A possible area for growth is to expand into new markets, such as the Middle East and North Africa - Mali is already beginning to export to Morocco. There are also substantial opportunities on the sub-regional (Mauritania) and national markets.

Graph 3. Share of mango imports to the EU by origin in 2008 (in metric tons)



Source: Eurostat

Graph 4. Seasonality of imports of mangoes into the EU market in 2008 (in metric tons)



Source: Eurostat

- Continue to invest on quality and product differentiation.** Importing markets and consumers demand certifications for the mangoes to enter the European market. The private sector pursued certifications like GlobalGap which is the level of certification required by supermarkets in the EU. Collaboration along the value chain led exporters to assist producers to achieve certification through training, with the support of PCDA. Some producers obtained the certification of mangoes as organic product. The market for organic fruit and vegetables is a growing one, particularly in countries of Northern Europe and Switzerland.

- **Ensure compliance with standards and phytosanitary requirements.** The continuing tightening of the EU food safety regulations implying ever more stringent phytosanitary requirements, coupled with demands for traceability, make it necessary to devise and deliver specific interventions in the developing countries from which the produce originates. A number of interventions have taken place over the years in this area, mostly financed through the various programs that were supporting the export value chains. Most recently the PCDA financed an intervention by COLEACP specific to the mango VC aimed at building capacities in health and phytosanitary risks control. A series of workshops, which brought together mango stakeholders of Mali and Burkina Faso, were held to train participants in the chain to the concepts of risk assessment and mitigation and led to the development of a “Self control guidebook for the mango value chain” that is now put in practice in both countries.

#### **Box 5. The Fair Trade Market Opportunities**

The most recent data from the Fairtrade Labelling Organisation show that about 8,000 tons of fair trade certified fruit was sold in Europe in 2005. This would include pineapples, mangoes and avocados, citrus and deciduous fruits, but not bananas. The UK led sales with 4,700 tons of fruit while per capita spend was highest in Switzerland. Sales of fair-trade products have grown strongly since 2005, and sales of bananas, for example, have more than doubled. If similar growth rates applied to other fresh fruit the total market remains very small.

As a brand, however, fair-trade is crossing into the mainstream now and being taken up by the supermarkets. Further expansion is likely in this sector, but with the same performance requirements as conventional products: year round supply and guarantees of quality and price levels are to be expected.

- **Control the fruit fly.** A key phytosanitary problem affecting mango production is the prevalence of fruit flies in many agro-ecological zones throughout the region that infest the fruit and make mangoes basically unfit for export. Containers are regularly rejected at European entry ports because of fruit fly infestations or other phytosanitary concerns. These problems are partly due to a lack of proper harvest and post-harvest handling techniques. Since the fruit fly affects many countries, there have been several regional initiatives. Over the last three years, the West African Fruit Fly Initiative (WAFFI), jointly financed by the World Bank, the EU and the WTO<sup>13</sup> has been piloting fruit fly surveillance and mitigation protocols in pilot orchards located in seven West African countries, including Mali. The knowledge and experience that has been acquired has led to the design of a West African Regional Action Plan to control fruit flies. Once the funding required to implement this program (€ 25 M) will have been raised, large-scale interventions under this program should translate in a much reduced prevalence of fruit flies in Mali’s mango orchards, thus contributing to improved quality of the marketed fruit.
- **Invest in production and secure higher volumes of high quality fruit.** One of the questions now is how to increase the existing production capacity. Experts reckon that Mali could export between 20,000 and 50,000 metric tons per year with improved management of existing mango plantations. However, in 2009, against an initial export program of 104

<sup>13</sup> Under their Standards and Trade Development Facility.

containers, the PLAZA could finally ship only 42 containers because of the lack of mangoes of exportable quality. Boosting production entails for example the introduction of new varieties, improved grafting and replanting of new trees for increased yields and quality, additional investments in pack houses and cold storage, renewed efforts in the control of fruit flies, and procurement of technical advisory services. It is interesting to note that the core group of exporters in Mali that have developed a close relationship with the importer in Belgium (BAKKER) have decided to invest in modern high density orchards in Mali. Dealing through BAKKER with multiple supermarket chains in the Netherlands made them realize the importance of being able to control their own supply of fruit, if they want to have a better chance of fulfilling their commitments with the end destination clients.

- **Attract capital.** Developing commercial value chains is a private sector business. It requires capital and know-how. If the sector does not manage to attract investors and capital, both national and foreign, it will be difficult to sustain growth in the future. Government should encourage commercial farming by facilitating access to land concessions. Government could also take steps to make financing more readily accessible and provide incentives to banks to lend to stakeholders in the mango sub-sector. This will stimulate private sector investment into value-addition activities such as drying, canning, and production of juices.
- **Diversify the offer to better utilize the PLAZA terminal.** The PCDA has been instrumental in getting new business flows off the ground by providing financial support to the fledgling infrastructure which translates in partly subsidized user fees. However commercial operators are keenly aware of the need to reach a situation where the operating costs of PLAZA are covered through commercial operations at the close of the project, i.e. by the end 2012. Several exporters are looking at opportunities to export green beans and other vegetables to be packed at the terminal. It is foreseen that a professional association should eventually take over the ownership of the PLAZA and contract a professional and independent company to manage it.
- **Further invest in marketing infrastructure.** In order to fulfill orders from supermarket chains in Europe, one of the key requisites is the ability to deliver both the required volume and meet the quality packing standards required by the client. To achieve this, it has become necessary to install a mechanical grading line to complement the cooling facilities at the PLAZA terminal. The equipment was ordered by PCDA and the calibrating machine should be installed for the 2010 season. This will also greatly improve the turnover of the terminal, and, assuming an adequate supply of fruit, the PLAZA should be able to deliver over 100 containers in the 12 to 14 week mango season.
- **Adding value is a priority to consolidate what has been achieved.** It is critical for the future growth of the sub-sector to go beyond the export of fresh mangoes, deepen and diversify the value chains in the mango sub-sector and valorize the large surplus of mango that is not exportable. Exporting fresh mangoes was an entry point and can remain an attractive market. However, it may not be the most profitable in the long run, and Malian professionals need to look at different ways to add value in the mango sub-sector. A recent

study<sup>14</sup> has shown the existing demand for dried mango, provided that a quality standard meeting the European consumer expectations can be produced. The technology exists and should be tested in Mali. Mali has the advantage over Burkina Faso of being relatively unencumbered by an obsolete technology, and enjoys a large surplus of mangoes in varieties that are not exportable as fresh. It has recently been agreed that PCDA will take up one of the study's recommendations and finance a test in Mali to produce dried mango based on South African technology, the origin that currently sets the quality standards in the EU markets.

- **Transport needs to be further improved.**

The railway to Dakar and the Dakar port are still underperforming, forcing Malian operators to continue to export through Côte d'Ivoire. This results in longer time to port, increased risks, and higher costs, while transit times are critical in such a competitive industry worldwide. A recent study<sup>15</sup> has shown that, given the current cost structure (via a single rail link), margins on exports are slim when compared with the risk associated with shipping a perishable product like fresh fruit. The best option would be for a viable and performing rail link from Bamako to Dakar to be developed so as to offer an alternative option to the Bamako- Ferke- Abidjan route, and further reduce costs and transit time.



- **Fostering cluster development.** To develop a vibrant and competitive export horticulture sector, Mali needs to encourage the development of related industries and services (certification services, packaging material, inputs, laboratory capacity). It is key to improving the competitiveness of the value chain(s) by reducing the cost of inputs, technology and services, and also providing an important source of revenue and employment in the country.
- **Joining forces at regional level.** Finally, when looking at trade figures, one realizes that the competition in West Africa does not come from neighboring countries, but from Central and South America. The concentration of mango exports from the West African region suggests advantages from coordinating the production and export of mangoes to Europe at sub-regional level. Mali and a number of countries in West Africa, including Cote d'Ivoire, Burkina Faso and Senegal, have an inherent interest in coordinating both their production and export of mangoes in order to fully benefit from the economies that such cooperation could provide. The benefits of such coordination are economies resulting from the increase in the scale of export, efficiencies developed in shipping, standardized quality control, better handling of traceability, and branding. All these factors will contribute to increased volumes

<sup>14</sup> L'amélioration des performances de la filière des produits séchés de la mangue au Burkina Faso et au Mali, Institut Royal des Tropiques aux Pays Bas, 2010.

<sup>15</sup> Aoufa Ezzine

of exported mangoes and ultimately increased revenues for the producers. One possibility would be to create a West African brand for mangoes.

## VII. Lessons and Replicability

### *Drivers of Success*

- (1) **Innovation is critical in triggering and driving change.** In the case of mango exports from Mali, the key initial innovation was in transport and logistics; this provided the opportunity to access the large EU market while Mali had been so far limited to air freighted exports. This creates the dynamics of change and initiates a learning process. The question is how to make innovation happen. There is no universal formula but rather a combination of factors depending on the specific country/sector context. In the case of the mango sub-sector of Mali, some key resources – expertise, entrepreneurship - were put together and created this innovation capacity. Creativity in funding mechanisms is another important lesson learned in the Mali mangoes case.
- (2) **Time is of the essence.** Building capacities – human, physical - in a new industry like this one in a country where capacities are generally considered very weak requires sustained efforts over time, especially when starting from scratch or from a very low base which was the case in the horticulture sector. There is no point in starting investing in such a venture or program if there is no commitment to sustain the effort over a multi-year period. This is what government, the Bank and some other donors like USAID had understood and they all stuck to their original commitment. There was no way to obtain significant and lasting results in the country's agricultural diversification agenda without accepting that it would be a long journey.
- (3) **Importance of high quality technical work.** It is not possible to overstress the paramount importance of high quality technical and economic work in areas such as market research, value chain cost analysis, benchmarking, assessment of constraints, etc. This work is a critical input in order to identify and design action plans, programs and business solutions. In this case, it was perhaps the most critical factor that contributed to launching the whole process of change by bringing innovations and opportunities, both from private and public, on which to build pilots and experiments
- (4) **Private sector leadership.** Even if in the case of the mango sector of Mali, the private sector was weak in the beginning, it was necessary to start working with the existing private operators and eventually bring in new ones, like the Ivoirian company that run the pilot export test. The partnership with SN Tropical Expressions was unique and provided a public/private sharing of risks for all partners involved including APROFA, as well a good model of what public/private partnerships (PPPs) can achieve.
- (5) **Ability to package and deliver knowledge and funding.** In order to really build capacities in an emerging sub-sector and industry takes not only time and perseverant efforts but also and capacity to combine and deliver investments in both hardware (infrastructure



and other means of production) and software (training and transfer of know-how) in a flexible manner. Capital investments such as PLAZA were key actions to improve the success of the mango sub-sector. Training cannot do it all. Projects to improve the cold chain, transportation, and conditioning facilities significantly improved Mali's capacity to export quality mangoes.

### *Lessons Learned*

Many lessons can be drawn from this experience. A few important ones can be highlighted:

(1) **Diversification of export agriculture into higher value crops can be achieved and small farmers can benefit from it.** There is no miraculous and universal solution, but sector and value chain analysis are essential tools to identify opportunities and articulate operational strategies to create greater value in agriculture and agribusiness. It is essential to find a key entry point that responds to market demand and helps to achieve scale. For Malian mangoes, this meant finding a more effective way to get the product to the market, and innovations in the transport and logistics system allowed farmers and exporters to achieve the economies of scale they needed. It requires a structured and holistic approach.

(2) **It is necessary to be able to sustain the development effort over time.** As already mentioned, this is one of the key drivers of success. None of the above could have been achieved if activities had not been pursued year after year. Building the type of capacities to build an industry takes years, not months. There is a lesson there for governments and development partners. If one is not prepared to dedicate time and resources over a long period of time, it is probably better not to start at all. Early success like the positive outcome of the mango multimodal export pilot launched by APROFA in 2000 is important but it can be only a beginning on which to build. Generating a significant flow of exports and building professional skills in the industry has taken a few more years and more stages of development still lay ahead.

(3) **Aid funds can play a catalytic role in change processes like this one.** This should not be underestimated. Project aid has the critical capacity to provide the financial resources - with the necessary flexibility - and know-how to share risks in order to facilitate innovation. Many of the technical assistance programs (such as on post-harvest handling, supply chain finance, export, etc.) are funded by donors, both in Mali and elsewhere. These programs have helped improve the performance of the mango value chain in Mali and are trying to do the same for other agricultural and non-agricultural products. In the difficult environment faced by these emerging value chains, they can help address market failures. This is not about edging out the private sector who as mentioned above has a leadership role to play but about combining efforts and interventions in a pro-active fashion. Hands off approaches ("letting a thousand flowers bloom") have proved not to be working in context such as Mali.

(4) **Collaboration/partnerships are part of the solution.** Partnerships between donor agencies and government, and the private sector, generally referred to as public/private partnerships (PPPs), such as the arrangement to build and manage the PLAZA, are important to develop the needed infrastructure. The emergence of the "Task Force Mangue" an embryo of

interprofession also helped to provide a space for public – private cooperation, as well as an opportunity for exporters to coordinate their respective shipments vis-à-vis a common buyer, i.e. the importer BAKKER acting for the AHOLD supermarket chain. This is also innovative in nature given that it had not happened before. The sharing of a common logo on box also militates for closer cooperation between shippers sharing the same brand “Mali Mango” as they have an interest in harmonizing the export standard to protect and enhance the brand.

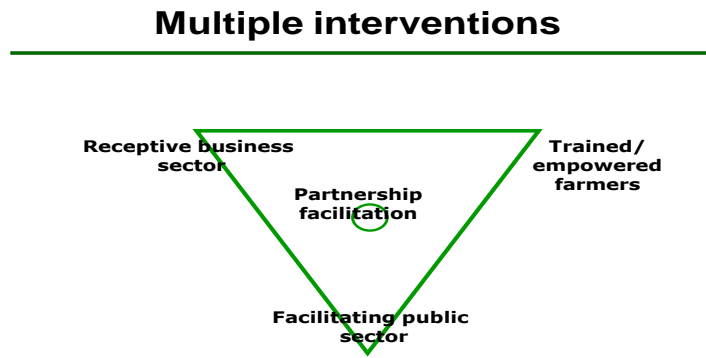
(5) **Investment climate and sound and favorable policies remain important.** So far no difficult policy choices have had to be made by decision makers in Mali. Government’s commitment has taken the form of engaging in a diversification strategy of its agriculture, requesting donors to provide resources to implement the strategy and basically trusting the technical teams in charge. However the growth in the industry is now unveiling a new generation of issues that will require decisions from authorities, like the improvement of the general business environment, the promotion of private sector investment – an investor conference for the export horticulture has been in works for two years – and improving access to land. The difficulties in implementing a FIAS technical assistance program on agribusiness (Investing in Agribusiness in Mali) do not bode well of the determination of government to move to the next stage of development of agribusiness value chains in Mali.

### *Scalability and Transferability*

Some generic lessons from this success story can definitely be applied to other countries:

- **Designing market-led strategies and investing in applied value chain analysis is a necessity** if the objective of creating (higher) value in agriculture, raising incomes and lifting rural dwellers out of poverty is to be achieved. General, cross-cutting programs on agricultural support are necessary, but in such cases not sufficient to make a difference. Specific information and analysis must be generated on the issues to be addressed throughout the value chain(s).
- **Sustainable market inclusion requires multiple interventions.** As demonstrated by the recently completed DFID-funded research program called “Re-governing Markets”, inclusion of small farmers in modern agricultural value chains does not happen by itself and requires multiple interventions, as summarized in the diagram below (Figure 4). Three major categories of actors need to be involved – farmers and farmer groups, receptive businesses and a facilitating public sector. It first requires these players to be willing and capacitated to play their role, and even then it needs some form of partnership facilitation to make things happen. This is the role that APROFA and the successive projects have been playing in the case of the mango sub-sector in Mali and the role that it is still playing for a number of other emerging value chains in the country (papaya, cashew, sesame, potato, onion).

**Figure 4: Sustainable market inclusion**



Source: Re-governing Markets (DFID)

## **VIII. Conclusion**

Mali has achieved a spectacular increase in its exports of fresh mangoes, seizing opportunities offered by an increasing market demand in Europe and managing to find solutions to overcome initial significant physical hurdles.

The initiatives in the mango sector in Mali clearly demonstrate that a physical constraint as immutable as being landlocked can be to some extent overcome through innovative solutions. In Mali, the entry point was the identification and economic validation of a new transport and logistics arrangement that allowed mangoes to be exported in large volumes and in good conditions.

The project is now focusing on consolidating and expanding the initial success by strengthening stakeholder involvement and private sector partnerships to ensure growth and sustainability. The mango task force has emerged as the sector professional organization, with potential to become a permanent trade/business association capable of handling the new issues facing the emerging horticulture industry.

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