

# Linking Farmers to Markets: *Exporting Malian Mangoes to Europe*

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## Abstract

European consumers were more likely, until recently, to eat Indian, Israeli or Brazilian mangoes rather than Malian ones. However, since 2001, sea-freighted Malian mangoes produced in the South of the country by small-scale farmers have been successfully exported and retailed in Northern Europe. This achievement was quite a challenge given the prior failure of different similar projects and the overall difficulty to find investors ready to embark on the exportation of perishables from landlocked countries like Mali, with poor transportation connections. The exportation of Malian products are controlled by Ivorian exporters leaving little returns to the producers on the other side of the border. Despite the high quality of its fresh fruit and vegetables, the high cost of air-freight was impeding the actual expansion of the production and exportation.

By establishing a multi-modal shipment system and improving every step of the supply-chain, the mango export pilot project not only proved how feasible but also how profitable such endeavor could be, thus

demonstrating the relevance of innovative strategies relying on connecting farmers to markets, promoting private investment in rural areas, furthering multiple and cross-border partnerships, while supporting agricultural diversification, and facilitating trade and export logistics.

This paper presents, through the Malian mangoes case-study, a successful example of agro-business development and rural private sector promotion. It sets out the factors and the role of the different actors that contributed to the results of the operation. This case can be used as an example in the setting up of operations in similar environments. The paper also wishes to highlight the need to promote innovative ways of designing development projects, emphasizing on a multi-sectoral approach (transportation, agriculture, trade), and on the value of indigenous resources (social capital), integrating their idiosyncrasies into new practices (local practices and values, work and business codes of conduct).

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**The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s), they do not necessarily represent the views of the World Bank Group, its Executive Directors, or the countries they represent and should not be attributed to them.**

## Good Practice Note

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By

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October, 2003

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# Exporting Malian Mangoes to Europe

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## ACRONYMS

<b>APROFA</b>	:	Agence pour la Promotion des Filières Agricoles
<b>BOA</b>	:	Bank of Africa
<b>CIDA</b>	:	Canadian International Development Agency
<b>OCAB</b>	:	Organisation Commune Ananas Banane
<b>PAVCOPA</b>	:	Projet d'Appui à la Valorisation et Commercialisation des Projets Agricoles
<b>SNTE</b>	:	Société Nouvelle Tropical Expressions™
<b>UEMOA</b>	:	Union Economique et Monétaire Ouest Africaine

## **INTRODUCTION**

### **LINKING FARMERS TO MARKETS**

Indigenous Amazonian groups selling natural dyes to an American cosmetic multinational for its lipstick range, the BodyShop buying shea butter from women farmer cooperatives in West Africa, Central American coffee growers providing for Starbucks: although the concept of “fair trade” has become, to a certain extent, the new buzz word in the development world dealing with trade from developing countries and market access, it has had the virtue of emphasizing on a new vision of the “suppliers” as a participative promoter of an efficient supply-chain. The new paradigm that emerged from such vision of the world market was that, if producers were more closely linked to their market, they would increase their revenues and improve their livelihood. The rationale being that their participation in the supply-chain would enable them to not only get greater returns from their production but also improve their production and marketing knowledge and thus be more efficient in addressing the needs of the market.

In Africa, the majority of producers are smallholder crop growers who represent the most vulnerable group, relying essentially on subsistence food crop or small-scale cash crop farming. The low levels of productivity, due to the lack of input and technology, and the lack of crop diversification are two endemic constraints preventing the farmers from providing adequately to the markets and elevating their income (through income diversification and higher returns on their production). The challenge of linking farmers to markets relies on the establishment of effective supply-chains successfully interconnecting improved and innovative practices upstream and downstream.

### **THE CASE OF MANGOES FROM MALI**

In Mali, a pilot operation was implemented with the support of the World Bank, with IDA funding, in order to export fresh mangoes from the Southern region of Sikasso to Europe. To this end, the project put in place an efficient supply-chain managed by a non-for-profit marketing agency, Agricultural Trading and Processing Promotion Agency (*Agence pour la Promotion des Filières Agricoles – APROFA*) and private business investors. The operation relied on a two-pronged intervention: upstream, assisting producers in improving their production and their knowledge of the marketing channels; downstream, establishing a partnership with an export company and improving export logistics.

One of the innovations of the operation was the setting up of a multi-modal shipping system aiming at directly linking the Malian production center of Sikasso, to the Northern European customer market; and coordinating efficiently the entire supply-chain for mangoes. The success of the operation, as measured by the actual returns to the producers, renders this case a good example of a successful strategy to connect farmers to market, promote private investment in rural areas, further multiple and cross-border

partnerships, while supporting agricultural diversification, facilitating trade and export logistics. Moreover, the operation demonstrates that such investments can not only break even but be profitable, thus proving that most constraints to marketing and export of agricultural products can be overcome with creative, adaptive, and professional approaches.

## 1. SETTING THE CONTEXT

### BACKGROUND

#### **Rural Poverty in Mali: Agriculture and Smallholders**

Mali is usually described as one of the poorest countries in the world, land-locked and with two thirds of its territory covered by desert. However, describing Mali could also start by saying that it is one of the world's five largest exporter of cotton, the first Sub-Saharan cotton producer (with an annual production of 500,000 tons), and by emphasizing on the role and potential of the agricultural sector in Mali's development strategy. 75 percent of Mali's 11 million inhabitants live in rural areas, relying on agriculture as their main source of income. Mali's agriculture is strongly dependent on a few major crops (such as cereals, rice, and cotton), and livestock. The economy relies on two main export commodities, cotton and gold, representing 85 percent of the exports. Most smallholders, the hundreds of thousand cotton growers, have been striving to diversify their production to other crops, such as horticultural products, as complementary cash commodities in the dry season, given the excellent quality of the fruit and vegetables. So far, this alternative production has remained anecdotal given the current little capacity of such sub-sectors (in terms of production shares and export returns). Promoting agricultural diversification, food security, high value export commodities are some of the priority areas of Mali's poverty reduction strategy.

#### **The Mango Market in Mali: Production and Marketing**

As part of these practices of diversification to horticultural production by the smallholders, mangoes have been particularly favored in orchard development for the past thirty years in the South of the country, because of excellent agro-climatic conditions. The region of Sikasso<sup>1</sup>, at the heart of the cotton region of South Mali, is also the most important center of horticultural production of the country, supplying the neighboring dryer zones and export markets. However, despite the good agro-climatic conditions, the sub-sector is still little known and developed. After the droughts of the 1970s, banana and pineapple gave way to citrus and mangoes as the most important fruit products. The average productivity of the mango orchards is estimated at 12 tons of fruit per hectare. The cost of the hectare of mango is estimated at 200,000 FCFA and the gross income at 125,000 FCFA per hectare. These figures, however, only reflect low-scale smallholder plantation production, where little investment is made. The lack of organization of the production impacts heavily on the productivity with an estimated 50 percent of the production lost every year<sup>2</sup>.

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<sup>1</sup> Sikasso is Mali's third largest city.

<sup>2</sup> *L'économie locale de Sikasso*, Etude de cas du programme « Relance des Economies Locales en Afrique de l'Ouest », Bureau Urbain du Ministère des Affaires Etrangères, Coopération et Francophonie, ORSTOM, OCDE, Club du Sahel, PDM, Juillet 1998 (p39).

Grafted varieties<sup>3</sup> are cultivated for the export market. Malian mangoes are considered of superior quality in this market. Malian growers consider the tree crop a high value crop because it provides export earnings and high levels of return in terms of foreign currencies, since airfreight mangoes are higher-priced. Mali's specificity, with regards to mango cultivation, is the large share of smallholders in the production (with the majority of the plantations representing less than 5 hectares), as opposed to industrial plantations that are common for most of the world's major growers (Brazil, Mexico, Israel or South Africa). These growers are part of a trade network comprising village associations and traders intervening in the production, collection, packing and shipment phases of the commercialization towards external markets (France is the main importer). However, another specificity of this export chain is the role of Ivorian exporters. They have been responsible for the export logistics<sup>4</sup>, since all Malian products used to pass through Ivory Coast before being exported to Europe (through the many pack-houses established at the Northern border with Mali, the major export platform of the region), thus reducing significantly the returns to the Malian producers<sup>5</sup>.

In general terms (without taking into account the results of the pilot operation), the exported volume of mangoes is comprised of 1000 tons air-freight at FOB 300 CFA per kilo (on average), and 4000 tons (farm gate) sourced by the Ivorian packers at FOB 100 CFA per kilo; that is to say that total mango exports today represent a 700 million FCFA (1,200,665 US\$<sup>6</sup>) business. However, the actual potential of the business, in the short term, could be twice that size, if packing operations were optimized and more export margin was kept in Mali.

## **OBSTACLES TO THE EXPANSION OF MANGO PRODUCTION IN MALI**

### **Post-Reform Bottlenecks**

For the past ten years, Mali has been battling to reform its economy, towards market liberalization, with a series of privatization that have led to the expectation that the private sector would be stepping in, especially in the commercial and trading sector. The involvement of private operators willing to invest has, however, been timid. It has particularly been the case in the field of agricultural exports, and more specifically fresh products exports, deemed as a risky sector after unsuccessful past interventions with perishables. Besides the lack of private capital for investment, the development of agricultural exports has been hindered by the existence of informal commercial networks disrupting the setting up of streamlined distribution channels for local and cross-border trade, and lobbying for the maintenance of high levels of subsidies and of programs favoring speculative activities. These actions are particularly disadvantageous to small growers. The provision of extension and research services has been affected by an inadequate approach to crop diversification, promoting little concrete suggestions for

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<sup>3</sup> Mostly Amélie, Kent and Keitt.

<sup>4</sup> It is estimated that 60 percent of the mangoes exported by Ivory Coast are from Mali and Burkina Faso.

<sup>5</sup> 3 to 4000 tons of mangoes are sourced by Ivorian packers, with farm-gate prices established at 100 CFA/kg.

<sup>6</sup> Communauté Financière Africaine Francs BEAC, 1USD = 583.010 XAF

widening the range of crops produced, especially for the export market; and ignoring the demand requirements not only in terms of commodities but also in terms of compliance with regulations and certification. When dealing with perishables, the enforcement of quality and safety standards, through a regulatory framework, is critical.

## **Export Logistics**

The exportation of perishables in Africa is generally problematic in terms of logistics. Some countries, like Ivory Coast or South Africa, have developed successful export activities. However, other countries, have been unable to organize an effective export logistics system, especially those deprived from coast lines and port infrastructures such as Mali; thus hindering their production potential and trading capacity. Mangoes had only been exported by air in low volumes until the nineties, when South American exporters explored the possibility to decrease the sea-freight shipment delays, thus multiplying the volume of exportation by a hundred percent (from a 10,000 to more than 100,000T industry in Europe). In Western Africa, Ivory Coast adapted its know-how (marketing networks and financial resources) acquired in the banana and pineapple sectors for other perishables and became the major platform for fresh product exports in the region (all exports destined to the French market), without, however, applying it to mangoes.

Mali did not manage to improve its infrastructure and logistics to be able to develop an efficient supply-chain for fresh produce exports, despite a once dynamic horticultural production, a comparative advantage in a number of products, and a long experience in the export sector with cotton. This situation can be explained by the fact that Mali did not adopt a market strategy defining horticultural exports as a trading opportunity for the agricultural sector. Moreover, the experience and knowledge accumulated in the cotton sector by CMDT<sup>7</sup> was not widely disseminated. Sea shipment logistics for the exportation of its mangoes was not deemed as a potential for increasing the participation of this sector as an export earning provider, thus restraining the exportation of mangoes to the small market of air-freighted fruit. These commercial limitations added to the little attention given to this sector (lack of organization of the producers, inexistence of extension services, no incentive to private operators) led to the gradual abandonment of the orchard production.

### **PAST PRACTICE**

For the past ten years, Malian mangoes had been exported through Ivorian middlemen, who selected the export mangoes and paid the growers. Little or no technical assistance was given to the farmers. Full payment was often haphazard. This arrangement resulted in little investment in the horticultural sector<sup>8</sup> and, more specifically, in the plantations (no replanting). As a consequence, field productivity, export yields<sup>9</sup> and

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<sup>7</sup> *Compagnie Malienne des Textiles-CMDT*

<sup>8</sup> As opposed to Ivory Coast and Senegal. Both countries have invested in extensions that are currently underway, financed by higher margins generated by a more integrated supply-chain.

<sup>9</sup> Estimated at 4,000T per year of mangoes exported from Mali

grower revenues diminished significantly. Current yields are estimated to represent only 20 percent of the export potential. Pack-houses have an important role to play in the supply-chain but, in Mali, there are few, of which many have gone bankrupt. Almost all exports are processed through Ivorian exporters. Ivory Coast is considered to be the only country with efficient sea logistics. Mali, though, did not take advantage of the logistical capacity of its neighbor, and decided to remain in the market niche of air-freighted mangoes (with very low volumes and returns to the producers), whilst still operating through Ivorian exporters. This situation can be explained by the dismal results of previous attempts to establish a sea shipment transportation system from Mali, as well as the constraints to such development, such as geographic distances from Sikasso (where a pack-house had been established<sup>10</sup>) to Abidjan, poor communication infrastructures, restrictive administrative regulations for exportation (customs documentation), poor participation from Malian exporters in important trade organizations, and the lack of experience and visibility of the latter in organizing sophisticated cross-border trade logistics, which implies major changes in commercial practices<sup>11</sup>.

### **OBJECTIVES OF THE PROJECT**

Taking stock of the potential of horticultural exports, the good positioning of Mali in the mango sector, and the growing demand of the European market for the fruit; APROFA, a non-profit promotion agency, decided to design and implement an export promotion test for Malian mangoes with four main objectives.

The first objective was to improve the supply-chain for the export market at the local level, involving the farmers in the export process, and, thus, strengthening the linkages between the small producers and the local and international markets, with a particular focus on local-level private entrepreneurship.

The second objective was to capture or “repatriate” the returns from value-added production to Mali by developing new communication channels for trade exchanges, in particular sea-freight logistics. Instead of only concentrating on supplying Malian mangoes to Ivorian pack-houses - with the latter not only bearing the risks but also the benefits associated to the actual marketing; the possibility of developing a new chain for mango exports out of Mali seemed particularly strategic with the expectation of the following benefits: (i) providing employment and increasing revenues with the set up of domestic logistics (grower services and packing operation), (ii) becoming a regular supplier to Ivory Coast, (iii) raising Mali’s market share, (iv) reducing the number of intermediaries, and (v) increasing the growers’ direct gains by improving sales prices.

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<sup>10</sup> Several tests to ship by sea from Mali had been conducted with dismal results. A private operator invested in a pack-house in Sikasso and went bankrupt, with outside debt in excess of 200 million CFA. The first PAVCOFA (Agro-Processing Trading Pilot Project) experience also failed, thus comforting the assumption that such operation was risky and money-losing.

<sup>11</sup> Informal trade practices are incompatible with the trust, transparency, accountability and predictability required by the modern fresh produce export sector.

The third objective was to encourage crop diversification. Mali's economy relies largely on export commodities and, in this sector, is highly dependent on few products. Only two commodities - cotton and gold - represent 85 percent of its exports. A further 10 percent is concentrated in livestock. Mali is, thus, highly vulnerable to external shocks. The substantial restructuring of the cotton sector added to the volatility of the prices for the commodity on the world market render crop diversification all the more necessary for the advent of economic growth in the rural and agricultural sector. Diversifying towards horticultural export and higher value crops would contribute to securing more sustainable revenues for smallholders and rural dwellers.

The last objective was to prove that despite the constraints (economic, cultural, geographical, etc...), the operation could not only work but could also be extremely profitable. One of the goals of this experience was to demonstrate a case that could later not only be used as an example for operations in similar environments (Mauritania, Burkina Faso, Mali through Senegal), but also suggest more innovative ways of designing development projects emphasizing on the value of indigenous resources (social capital), and integrating their idiosyncrasies into new practices (local practices and values, work and business codes of conduct).



*Packing activities in the Sikasso pack-house*

### **THE MANGO EXPORT PILOT OPERATION**

At the origin of the operation was the Agro-Processing Trading Project (*Projet d'Appui à la Valorisation et Commercialisation des Projets Agricoles – PAVCOPA*), financed by the World Bank. The objective of the project was to provide technical support (technical assistance, studies, and training) to the Agricultural Trading and Processing Promotion Agency (*Agence pour la Promotion des Filières Agricoles - APROFA*), a non-profit, government-funded agency, responsible for providing marketing opportunities for smallholders' agricultural products for the local, regional and international markets. In 2000, PAVCOPA supported a test-and-trial with a mango export operation which ended up with 60 million CFA (102,916 US\$) of debts and the bankruptcy of the private operator. The pack-house was thus shut down, becoming the property of the Bank of Africa (BOA). Under the impulse of the World Bank supervision and with the technical assistance of an international consulting firm, APROFA undertook drastic restructuring. Part of the new operation plan for the 2000-20001 campaign was an innovative pilot operation with mango exports. The objective was to significantly

increase the volume of mangoes exported from Mali to Europe by, on the production side, improving the product quality to be adapted to market requirement (production and processing); and on the commercialization side, overcoming transportation bottlenecks by developing sea shipment logistics to connect Sikasso (where the Malian pack-house is located) to the importing markets of Northern Europe, through Ivory Coast (one of the trading ports to Europe).

The operation was set up at two levels: upstream, APROFA assisted small growers in developing an efficient supply-chain; downstream, the agency facilitated the creation of a joint-venture with an Ivorian private operator (with no existing operations in the mango sector or in Mali) to resume the activities of the closed pack-house, and manage the exportation process through the Ivory Coast to Northern Europe. By setting up a multi-modal logistical system and a cross-border partnership, shipping delays between Sikasso and Northern Europe were divided by two (from 25 to 12 days). As a result, grower unit prices progressed by 25 percent. Employment in the pack-houses reached 150 persons (of which more than 60 percent are women with adequate working conditions and pay exceeding national labor benchmarks). The Malian mangoes exported are marketed under the brand *Société Nouvelle Tropical Expressions*<sup>TM</sup>, marketed in the Netherlands, Germany, and Scandinavia<sup>12</sup>.

#### **ACTORS INVOLVED IN THE PROJECT**

The pilot operation of exporting sea-freighted mangoes from Sikasso is the result a successful partnership between all stakeholders, with the particular catalytic and coordinating role of APROFA.

#### **Agence pour la Promotion des Filières Agricoles (APROFA)**

The *Agence pour la Promotion des Filières Agricoles* (Agricultural Trading and Processing Promotion Agency), APROFA, was established by the Government of Mali and the Permanent assembly of Chambers of Agriculture in Bamako in 1996 with the specific objective of encouraging Mali's production capacity to compete with Western Africa's main regional centers (Abidjan, Dakar, Nouakchott). To achieve this objective, APROFA's mission is to restructure supply-chains for diversification crops; develop commercialization channels for these crops by creating linkages between the supply (smallholders) and the demand (destination markets, especially the export one); build business partnerships, and promote the application of research and technology. APROFA has representation in the three main agricultural regions, where it has established Agribusiness Centers. This decentralization reflects the concern of APROFA to target supply-chain weaknesses, especially at the production level, which limit the returns to the producers. Since its creation, APROFA has been promoting the potato and shallot sectors with significant increases in traded volumes and producer prices. In the mango project, APROFA has acted as the main broker between the different partners, Malian and

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<sup>12</sup> See p. 16 for the complete review of the results.

Ivorian. It has facilitated the negotiations and formalization of contracts, through its status, and access to transportation partners.

### **Village-Level Organizations and Intermediaries**

The operation has highlighted that an important success factor for the improvement of specific supply-chains is the involvement of growers' organizations and intermediaries. The producers' associations worked closely with APROFA at every step of the supply-chain by pooling production, negotiating contracts, and also providing training and technical assistance, such as, for instance, organizing production planning, conducting field level diversification experiments, and supplying quick alert information on crop performance. Intermediaries, such as field-men, middle-men and collectors, form an important part of the supply-chains by performing the financial connection between commercial agents and growers. Although they are often looked down upon because of their usurious practices, they can be a strong vector of transmission, especially for the transfer of technical skills to the growers - as a means to adapt the production to the market needs. Because of their strong presence as vectors of information dissemination, these intermediaries got involved in the project from the design stages.

### **The Private Sector**

The private sector has been involved from the incipient phases of the project as an important stakeholder. When embracing the supply-chain concepts, the role of private operators is multiple: providing resources, managing pack-houses, organizing the exportation, but also giving technical assistance, ensuring proper pesticide use, and introducing innovations at all levels of the supply-chain. The exportation of mangoes relied specifically on the involvement of an Ivorian fruit exporting company and of a Malian pack-house. Both operators have brought along their capital, experience and competence in the export sector, especially regarding supply and quality requirements. They have been active in the task of securing crop financing and getting a vested interest in technological transfer to enhance quality (traceability, supply base management, integration, as well as streamlining logistics and monitoring markets).

### **Technical Assistance (Geomar International Consulting Firm)**

In addition to its in-house capabilities, APROFA secured international technical assistance for the pilot phase program and hired a consultant specialized in value chain management and hands-on technical assistance.

The technical assistance intervened in the operation at the following levels:

- setting up of the contractual framework between the different partners: APROFA-SNTE/SOCOFRUIT, BOA – Tropex-MALI, TFC-Holland-Tropex-MALI;
- defining the multi-modal logistics parameters and costs;
- establishing the commercial and financial feasibility as well as cash-flow projections;

- brokering the contract scheme between APROFA and the Ivorian exporter;
- providing outside assessment of the reliability of parties to the importers resulting in actual cash advances;
- establishing pack-house management systems adapted to the specific Malian product sourcing system: inventory management, cold chain protocol, hygiene practices, payroll management, financial summaries;
- securing of point of arrival independent produce evaluation (quality reports).

Intervention took the form of three field missions at the start, middle and end of the program; and of on-going distance monitoring and advice. The focus was on setting up the operational system and transferring it to local management rather than implementing it on a day-to-day basis. It capitalized strongly on GEOMAR International know-how, developed through comparable hands-on export programs in Ivory Coast and Senegal co-financed by Canadian International Development Agency (CIDA) and the World Bank.

## **The World Bank**

The Bank initially started working in the sector through the Agricultural Trading and Processing Promotion Pilot project (PAVCOPA - *Projet d'Appui à la Valorisation et Commercialisation des Produits Agricoles* - Cr. 2737- US\$ 6 million<sup>13</sup>). The five year pilot project was to address key sectoral constraints to private investment in agricultural processing and marketing while focusing primarily on capacity-building and on the transfer of know-how to the private sector through information networks, training, specialized technical assistance, and study tours. Project management was entrusted to an "Agricultural Trading and Processing Promotion Agency", APROFA. The Bank particularly intervened after the failure of the first campaigns by holding up the disbursement of the funds until the resolution of the situation, supporting the restructuring of the APROFA (renewal of the management team), and advising the contracting of the consulting firm. Another important input of the bank was its impartiality as a partner to the operation. The project could have been captured by a number of vested interests safeguarding the privileges of settled Malian exporters, and maintaining the established French partners. Contrary to European donors that can be under strong pressure from importer lobbies, the Bank had no end-market interests in this project.

### **INTERVENING AT EVERY STEP OF THE CHAIN : SERVICES SET UP BY THE OPERATION**

## **Improvement of the Supply-Chain**

The improvement of the supply-chain is considered the main success of the operation. An efficient supply-chain embraces not only the ability to produce and commercialize a product through value-adding operations, but also ensuring a sustainable

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<sup>13</sup> Project ID: P001755

investment climate and innovation cycle, which are also part of the process of benefit distribution as developing values and increasing competitiveness. This improvement meant putting in place a number of services for the small growers to be able to respond to the requirements needed for the chain to function efficiently, on the production and commercialization sides.

### ***Services to the Production Level: Extension and Training***

On the production side, the following services got established:

- Training and technical assistance (field services, agricultural inputs, quality management, conservation techniques, harvesting techniques, improvement of seedling sourcing system)
- Data collection the plantation and the growers (plantations, varieties, surfaces, zones of production)
- Incentives for the establishment of producers' organizations
- Production adaptation to demand requirements (varieties, orchard restructuring), quality control and certification (more than 400ha certified organic), and national regulations (labor laws and other regulatory frameworks).

Besides, the organic certification of the fields as well as the extensive orchard census have not only been important learning exercises that will yield their benefits over time (access to new markets, higher levels of certification), but has also been a powerful marketing tool to demonstrate the level of organization and monitoring of the out-grower supply, thus easing the concerns of the importers (especially with regards to pesticide residues). These steps are part of a base work that APROFA has undertaken for the eventual implementation of a full traceability system.

### ***On the Marketing side***

The priority services established for the commercialization of the mangoes were the following:

- Organization of the primary marketing actors (*Association des pisteurs de Sikasso*, Mango Collectors' Group from Sikasso) and their active participation into the collection stage of the chain (through training and trials at the local market level with cooperatives)
- Training in export standards application (selection and conditioning of the mangoes, quality control),
- Strong focus on logistics improvement (identification of transportation subcontractors, packing to reduce the losses, container shipment, dialogue with local customs and regulatory authorities)
- Financial arrangements to finance the operations (involvement of a local bank), an
- Creation of partnerships with specialized export companies.

## Specific Areas of Intervention

### *Quality Control*

The exportation of perishable food products is an activity that requires mastering a whole set of standards and methods imposed by the importers to maximize shelf-life (phyto-sanitary, quality, aspect of the product, fruit maturity stages, pre-cooling protocols). Exporting fruit to the European Union is a particularly risky business because of the levels of compliance required for the products to enter the market. Quality control was, thus, defined by the project as a key area of intervention. The producers, middlemen, pack-houses staff received training on quality standards including the following elements: timing for harvesting (ripeness levels), information on the market (sizes, varieties, presentation), and transportation requirements (time lapse, storage). A set of internal control systems were put in place on the collection and processing sites.

### *Multimodal Shipping System*

The second major field of intervention of the project was the establishment of the “multi-modal transportation system” to connect directly Sikasso, the largest center of mango production in Mali<sup>14</sup>, to Rotterdam (“flying over Ivory Coast”). Multimodal transportation is a continuous chain linking origin to destination through multiple transportation means (rail, road, air, sea). This system is commonly used in the shipping business, however, it had seldom been tested for perishables in West Africa and never from Mali. The country had always been characterized as remote from major trading routes and inaccessible. This logistical innovation was, first, made possible because of the new custom regulation set up after the harmonization of the custom regimes for the member countries of the West African Economic and Monetary Union (*Union Economique et Monétaire Ouest Africaine-UEMOA*)<sup>15</sup>. In the case of the route Sikasso-Rotterdam, the availability of the newly renovated railway line linking nearby Ferkessedougou to Abidjan made the operation possible. At the initiation of the project, the “Common Banana Pineapple Organisation” (*Organisation Commune Ananas Banane-OCAB*) railway line was a new service that had so far not been contracted by any Ivorian exporter. The Ivorian export partner of the project signed a shipping contract using the Northern Europe line Abidjan-Antwerp.

The multimodal system is based on the conditioning of the product at its point of origin with no modification before its final arrival. In the case of the mangoes, the conservation of the fruit is guaranteed by a cold chain management system relying on containers fitted with “gensets” (clipped generator units required to keep the refrigeration going). These containers are sent from Abidjan to Ferkessedougou, where they are transferred to a Malian platform truck. This truck takes them into Mali to the Sikasso pack-house where the mangoes are waiting in cold storage. When the containers arrive,

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<sup>14</sup> The sourcing area covers 150 km around the city of Sikasso.

<sup>15</sup> Formerly, rules would require customs inspections of the shipment at all border crossings and require duty exoneration to go through to Mali. The multimodal customs regime does not require inspection in transit countries since shipment is deemed “continuous” even though multiple carriers are used. It falls within the Interstate Transit Convention of 1982.

the pallets are transferred from cold storage directly into the container. Once loaded and closed, the container is not opened until it reaches Rotterdam. After loading, the containers are sent back to Ferkessedougou, where they are transferred to a rail platform and carried by rail to Abidjan in 15 hour-time. The containers are, then, put on the reefer ship deck until they are discharged in Antwerp and trucked to the Dutch importer in Rotterdam.

The operation succeeded after different multi-modal commercial tests that had preliminarily identified the cost and logistic delay parameters to be taken into account in order to use the Sikasso-Ferke-Abidjan route. This logistical innovation managed to reduce the transportation time two-fold (from 21 to 12 days), not only by reducing the transportation delays but also limiting considerably administrative hassles and delays which have an adverse effect on quality, perishability and profitability.



*In the Sikasso pack-house, mango pallets waiting to be stored in the cool storage room*

## **Managerial and Financial Model**

### ***Joint Venture with an Ivorian Export Company***

The project got started with the need to assess the availability of financial resources in Mali to finance the pilot operation. However, because of well-known past failed experiences, the risks involved in the operation (perishables, export shipment, complex transportation logistics), and the significant seed capital required, it was impossible to find a Malian company willing to invest in the project. APROFA turned to Mali's neighbor and West Africa's leader in agricultural export, Ivory Coast, and identified an Ivorian exporter not yet involved in the mango sector willing to set up a joint-venture and, thus, split the risks along the Malian-Ivorian border. APROFA would guarantee a fixed price to the Ivorian importer. This latter would then bear the logistic and commercial risks associated with exporting the product. If average selling prices exceeded a fixed amount, the differential would equally be split between APROFA and the Ivorian company. The Ivorian firm secured the financing of the fruit purchase to the growers, packaging material, forwarding and in-land logistics. Furthermore, it assigned

two experienced pack-house managers (administrative and packing) to implement proper packing, accounting and shipping procedures. Following this agreement, APROFA, who intervened as a broker, obtained from the local bank the rental agreement of the foreclosed Sikasso pack-house which enabled access to an efficient pre-cooling capability essential for container shipments.

### ***A financial Innovation***

One of the most important and innovative features of the project was that financing did not rely on banking sources. In order to facilitate administrative procedures and support local entrepreneurship, a Malian company was first created, as a subsidiary of the Ivorian company under the name *Société Nouvelle Tropical Expressions*<sup>TM</sup> (SNTE). The restructuring of Sikasso pack-house was engaged and the required working capital was, thus, constituted. All the capital, 60 million FCFA, was raised by the private operator, without any commercial credit, through his internal resources and its “trust-equity” network with its supply-chain partners based on a value proposition:

- Malian investors coming from the traditional commercial sector got involved and contracted the rental of the existing pack-house facilities from the local Bank of Africa (BOA)
- APROFA’s endorsement helped secure the initial Bank Of Africa rental agreement as well as credit with the Malian trucking company
- Importers provided cash advances to help finance freight and box purchases
- The Ivorian partner was liable for financing the fruit purchase to growers, the packaging material at the pack-house, securing forwarding and in-land logistics
- Growers were paid cash upon sorting at the pack-house, which corresponds to a mere 1 day credit.

In the end, all costs were born by the commercial program, with no subsidies from APROFA (except technical assistance and its own services). In terms of returns, the project made 26 million FCFA (44,598 US\$) of net profit, securing an Internal Rate of Return of 70 percent. Moreover, the benefits contributed to securing APROFA’s own financial sustainability through net revenues from its services, because of a joint agreement between APROFA and the *Société Nouvelle Tropical Expressions*<sup>TM</sup> that provides a “royalty” per kilo exported from the pack-house to APROFA. This royalty payment was an unprecedented case in Mali.

**Total financial resources set up for the operations are the following:  
Direct Costs of Initial 220 ton pilot operation (2001)**

Working capital	Units	Cost	Funding Source	<b>Total costs for 11 FCL pilot program</b>
Fruit purchase and harvest	4 FCL = 80 tons	12,0 m CFA	TFC <sup>16</sup> /SNTE seed money	29,0 M CFA
Inland freight	4 FCL	1,6 m CFA	SNTE/Aprofa guarantee	5,5 M CFA
Rail freight and container handling ABJ	4 FCL	4,0 m CFA	SNTE supplier credit	11,0 M CFA
Sea freight	4 FCL	8,5 m CFA	TFC guarantee	27,0 M CFA
Packaging	25.000 units	10,0 m CFA	SNTE supplier credit and seed money	25,0 M CFA
Packing labor	One month	1,5 m CFA	APROFA/SNTE	3,0 M CFA
Other operating costs			APROFA/SNTE	3,0 M CFA
Pack-house management		2,0 m CFA	SNTE	2,0 M CFA
APROFA royalty	20 CFA per kg	4,0 m FCFA		4,0 M CFA
<b>TOTAL WC</b>		<b>38,1 m CFA</b>		<b>104,5 M CFA</b>
<b>Equipment</b>				
Rental of pack-house and equipment	15 CFA per kg	3,5 m CFA	BOA credit and APROFA guarantee	3,5 m CFA
Harvest boxes	500 boxes	1,5 m CFA	APROFA equipment	--
Other				
<b>Tech assistance</b>	20 man days	10.000 USD	APROFA	10,0 M CFA

<sup>16</sup> European (Dutch) importing partner

## 2. IMPACT OF THE PROJECT

### RESULTS

The operation outperformed its expected objectives with a surplus volume exported and earnings, securing the profitability of the investment for all partners. This success is all the more interesting since the initial performance occurred in a rather bad market environment with an over-production and subsequent low market prices. The actions carried out under the operation and entailing production, quality, commercialization improved practices, have benefited significantly to the mango growers. Rural smallholders have been able to exploit again their abandoned orchards, and raise their income through this new form of revenue. The impact of the operation also went beyond the initial stakeholders, inspiring the establishment of other partnerships between exporters expecting to increase their sourcing capacity and Malian producers. Besides, this pilot operation was an important test for follow-up operations aiming at linking farmers to markets. APROFA has been able to develop a valuable knowledge on production and commercialization practices for the export market. After completing with success the pilot phase, the mango project has been upgraded to a regular operation with improved performances over the last year. After the initial shipments to Antwerp and Rotterdam, subsequent exportation shipped the Malian mangoes to the UK

Given the success of this operation, APROFA's brokering activities should grow rapidly. New Ivorian operators are already interested in the present demonstration of the functionality of multi-modal shipping. Senegalese investors are expected to come in once the Dakar-Bamako railway is fully established. It could also be foreseen that international operators will be willing to invest once Mali develops a strong presence in popular horticultural products, such as melons and tomatoes.

In the subsequent year, the Technical Assistant from the international consulting firm, Geomar International, was brought in to start the operation by *Tropical Expressions*<sup>TM</sup>, who contracted him on a private basis, at no cost for APROFA.

### Production and Marketing Results

- Initial shipments: First year (2001), 220 tons exported over 8 weeks. Second year (2002), 600 tons
- Despite the coup in Ivory Coast: 1,000 tons have still been exported (2003)
- Outstanding Internal Rate of Return: 70 percent
- Net profits: 25 million FCFA
- Shipping delays were brought to 10-12 days into Northern Europe, which represents half the usual transit time and amongst the lowest in the world for mangoes.
- Quality levels were high, with no loss in terms of repacking or discarded produce (none of the 56,000 boxes that arrived in Rotterdam was rejected by the importer)
- Excellent customer response to the Malian produce (taste, general aspect)

- Good performance of the Malian pack-house personnel and field-men: improved quality levels with an average of 80 percent export yield on incoming produce (starting levels were 60 percent)
- Perfect inventory control, with all produce and packaging inventory movements accounted for
- Efficient fund flow between importer and exporter resulting in reliable and timely payment of growers and field-men, and consequent decrease in working capital requirements
- Grower unit prices progressed by 25 percent
- Employment in the pack houses reached 150 persons of which more than 60 percent are women with adequate working conditions and pay exceeding national labor benchmarks
- Access to new markets: the mangoes are exported mainly to Northern non-French speaking countries. This represents a major challenge for a Malian-Ivorian joint-venture usually constrained to direct their products to the French commercial channels. The marketing of the mangoes in the UK is also a major success, since the UK is the most demanding European market, where almost no fruit and vegetables from West Africa are marketed
- Contribution to APROFA's financial stability by respecting the royalty system

These results encouraged the Ivorian importer to reinvest the gains and additional resources into a more important operation for 2002, aiming for 1000 tons. Over time, the objective is to develop a 5,000 tons activity with a range of different products with a revenue target of 3 million US\$.

### **BENEFITS: IMPACT ON RURAL POVERTY**

#### **On-Farm Impacts**

Because of the increased production of mangoes, exported volumes, and farm-gate prices (from 50 to 125 CFA francs the kilo, due to higher quality fruits), the mango producers benefited from a significant **increase in their revenues**. They were able to re-invest in orchard production and diversify their sources of income from cotton to mango, and subsequently other crops such as sweet potatoes, melons and tomatoes. This **crop diversification** has a number of benefits, especially in terms of financial sustainability, spreading the risks by having multiple forms of cash crops. Having set the example, this diversification process will be promoted towards other horticultural products, being now able to use the same transportation axle. The extension services that were brought to the producers enabled them to get acquainted with more efficient farming practices and be introduced to **technological applications**, in particular through alternative irrigation methods, promoted by APROFA under different programs. The organized producers, through their entities, became the direct partners to the commercial operators in charge of the packing and exportation. The growers' association independently negotiates the prices of the commercial services provided by private operators. Credit schemes are now available to the farmers for the importation of quality seed stock. Gradually, the operation

is contributing to the creation of an out-grower model between the growers and the pack-house.



*Mango producers and the APROFA representative*

### **Off-Farm Impacts**

The impact of the operation had trickling-down effects on the production side but also on the whole processing and marketing ones. First, the operation led to the creation of employment in diversified sectors of the mango supply-chain: supervising personnel (young trained individuals) and pack-house personnel (mainly women). All jobs created abide by international and national labor laws, which should, in the future, set new standards in the area for such operations. In terms of technology development, the project was directly responsible for the development and dissemination of conservation and warehousing methods, which can be particularly complex when it comes to horticultural fresh exports. The newly acquired know-how will find applications in the development of similar linkages for other fresh products (sweet potato, green beans), in other regions, and with new partners.

### **3. RATIONALE**

#### **LESSONS LEARNED**

##### **Effectively Linking Farmers to Market**

The important lesson to be learnt from the case of the Malian mangoes is the actual impact of successfully linking farmers to their market. Beyond the generation of higher revenues for the smallholders, a long-term result will be their ability to respond to market demands, and to maintain a regular production (volumes and product quality). These new skills present the advantage of having major replication effects because they are not restrictively applicable to a single sector. The experience has proved that prior failures can be overcome, that doomed sectors can be promoted again, and that such operation is feasible.

##### **Overcoming the Constraints and Finding Innovative Solutions**

The list of constraints that could be identified to prohibit the implementation of the operation would have been extremely long: from the unorganized production, to the absence of transportation linkages. Each step of the supply-chain had to undergo minor or major changes that contributed, eventually, not only to the actual functioning of the operation (all previous attempts had failed and gone bankrupt) but also to the profitable returns. These changes relied on the simultaneous application of innovative and locally adapted tools or knowledge. For example, some of the principal actors of the project identified management as the key to success. Through the restructuring of PAVCOPA and establishment of APROFA, the new team in place was the engine of success of the operation. The absence of expatriate personnel and the reliance on local and national social capital was crucial to the success of the operation by not only alleviating the cost of such human resource (a heavy burden for the budget of the company), but also by promoting local know-how which resulted in more effective management and operational practices.

#### **CHALLENGES AHEAD**

##### **Maintaining Competitive Commercial Network**

In the coming years, one of the priorities for APROFA will be to ensure that the pack-houses develop a tighter and more efficient trading network in order to be able to compete effectively in Europe with industrial type plantations from South and Central America. The priority area for further investment will be field productivity, product adequacy (varieties), pesticide control, and full traceability. APROFA will also have to promote further diversification of activities in order to transform the seasonal packing activity in a year-round operation. Finally, it will have to promote the new best practice

guidelines, particularly those linked with equitable treatment and respect of labor laws and regulation by exporting companies.

### **Strengthening the Growers' Organizations and Networks**

The increase in export yields will be a priority for the constant development of the operation. A number of services will remain crucial to maintain the productive performances at a competitive level, especially research and extension, such as technical assistance, field services and agricultural inputs. This assistance will enable small growers to constantly keep up with the demand requirements, in particular for product varieties, growing techniques, traceability, and conditioning; thus maintaining the link with the markets. The role of middle-men is central in this respect. The objective is to raise the revenues per hectare while maintaining unit price at a low level thus ensuring price competitiveness. Pack-houses have a vested interest in increasing farm yields through technical assistance and pre-financing of orchard improvements.

### **Giving Incentives to Private Sector Involvement**

The inclusion of local businessmen in the supply-chain in a “grass roots – friendly” way will need to be furthered in order to bring in the capital required to develop and maintain an effective supply-chain with specific services requiring larger investment, such as cold chain management or organic certification. While the stronger involvement of Malian private enterprises will be crucial for the sustainability of the project, the operation might be criticized for the lack of participation of national entrepreneurs in favor of Ivorian partners. APROFA should avoid preferential or subsidized treatment for national entrepreneurs if foreign investments is respectful of Malian commerce and labor rules.

### **Certification and Corporate Responsibility**

Part of APROFA's new mandate is the exploration and potential introduction of higher levels of certification and compliance mechanisms, for instance the “Good Agricultural Practice”, fair trade, corporate responsibility, pesticide use reduction, especially in the perspective of applying European standards. Beyond the first level of compliance for exportation permits, the project obtained Bio-certification on a series of producing zones. This certification permits the exportation of certified organic products to Europe. However, further certification will require significant investment, especially in order to set the pack-house to the standards. Currently, nearly 300 hectares have been bio-certified by Ecocert (representing 400T of mangoes) until 2004.

## RECOMMENDATIONS FOR IMPROVEMENT AND SCALING-UP

### Improvement in Infrastructure

The infrastructure is still to be improved. The Malian telecommunication network is “below par” technically and very costly if compared with countries like the Ivory Coast and Senegal. Mali would equally gain by improving its connection to coastal ports. Presently, access to Abidjan for outbound freight has been established. However, the outlet through Dakar still awaits significant improvements in the road and rail links with Bamako.

### Opening the road to Dakar: Exporting through Senegal and Scaling-up in the Bougouni Region

Given the on-going positive results of the project, its success could be expanded to other regions and other sectors. Presently, because of the current situation in the Ivory Coast, the capacity of the operation to operate is impeded, although *Tropical Expressions*<sup>TM</sup> has already planned a 1,000 tons export for 2003. This crisis actually reveals the need for Mali to develop alternative trade routes which could, eventually, become more cost-effective. The most obvious option is through Senegal. So far, the route Bamako-Dakar has not really been exploited because of the interruption of the railway connections and the unreliable logistics. The railway company has been taken in concession recently by a Canadian company, which should resume its operations shortly. The challenge will be to connect Bamako to Dakar in 10 to 15 hours instead of the current four days. Another impediment is the unwillingness of the major shipment companies to become partners of an operation deemed risky because unprecedented. However, *Société Nouvelle Tropical Expressions*<sup>TM</sup> is currently overviewing the itinerary and the different partnerships to put in place for the shipment to succeed. This new route would also transfer the production from Sikasso to the region of Bougouni in South-Central Mali, which would provide new opportunities to this unprivileged zone. This operation would significantly reduce shipment delays, passing from 12-13 to less than 10 days<sup>17</sup>.

### Promoting the use of Information Technology

The dissemination of information to stakeholders, especially small growers, is a factor of success for the long-term generation of knowledge and skills. For this reason, APROFA has given particular emphasis on the use of information technology through its *Agrobusiness centers* where various product exhibits can take place, linked with a reference center and an Internet café and an effective Internet connection. These centers will gradually serve as a posting place for all outputs coming from APROFA’s many programs. APROFA also relies on local radio programs, as well as “audio-technical books” (many villages at least have a cassette recorder running on batteries) to disseminate information to the growers, especially on topics such as production methods.

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<sup>17</sup> Dakar-Rotterdam is four days and all boats leaving Abidjan stop in Dakar.

There is still scope, however, for development of the technology. GSM technology, for example, will be useful for communicating market prices and disseminating production pooling systems. Another challenge will be the development of management information systems, especially at the grassroots level. More urgently, traceability databases and management systems will have to be developed in innovative ways to track down production, while taking into account low literacy ratios.

### **CONCLUSION: Justification for Investment in Similar Projects**

The study of the Malian mangoes case is an interesting example of a successful approach to agro-business development, and rural private sector promotion. The wide range of activities that surround the different concepts of logistical shipment systems, supply-chain management and cross-border trade, shows accurately that the layers of intervention are numerous when it comes to actually trying to link farmers to markets. However, the operation also proves that the methodology of drawing lists of constraints that is often preliminary to the design of new projects can be extremely counterproductive by rendering most operations unfeasible. This is particularly the case when one looks at export projects with perishables from Sub-Saharan countries where the absence of good infrastructure and logistics and the little experience in the field is usually seen as a definite hurdle.

The Mango case study suggests, on the other hand, examining the supply-chain in its details, identifying every step and every limitation to its full performance and looking for the most adequate solutions. This approach requires an excellent knowledge of the situation in place, but also a creative and innovative perspective on how to either adopt or adapt new methodologies addressing the identified problems. In the present case, the role of the APROFA as an institutional support was instrumental in setting up the methodology that led to the identification of two main impediments: the management structure and the building of business partnerships; and also in assisting in the operationalization of the project. Finally, the operation proved that investing in fresh produce exports from Mali can be a very profitable business, with a rate of return largely superior to most current NASDAQ investment.

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