



Global Horticultural Initiative video conference on

**Post-Harvest and Transport Technologies  
Reducing Losses and Improving Quality in  
Fruits and Vegetables in Eastern and  
Southern Africa**

**Madagascar Position Paper**

**22 June, 2010**

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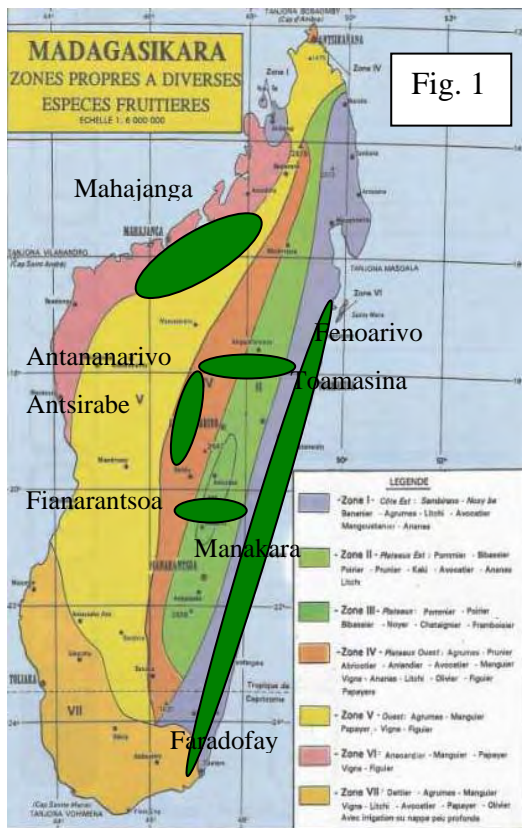
## **List of acronyms**

<b>ACM</b>	:	Aviation Civile de Madagascar
<b>APMF</b>	:	Agence Portuaire Maritime et Fluviale
<b>ATT</b>	:	Agence des Transports Terrestres
<b>CBO</b>	:	Community Based Organization
<b>CODAL</b>	:	COmptoir industriel De produits Alimentaires
<b>CTHT</b>	:	Centre Technique et Horticultural de Toamasina
<b>MADARAIL</b>	:	MADAgascar RAILways
<b>MAMABIO</b>	:	MAlagasy Mamboly Anana BIOlijika
<b>PCL</b>	:	Plateforme de Concertation Litchi
<b>MIT</b>	:	Moyen Intermédiaire de Transport
<b>PROFEL</b>	:	PROmotion de Fruits Et Legumes
<b>PST</b>	:	Programme Sectoriel de Transport
<b>SME</b>	:	Small and Medium Entreprise
<b>UE</b>	:	Union Européen
<b>UPFL</b>	:	Union des Professionnels en Fruit et Légumes

# 1. Introduction

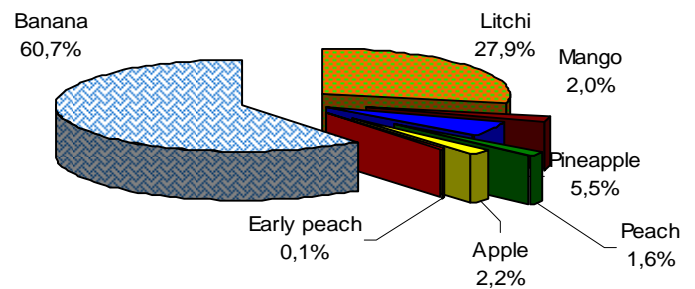
## 1.1. Background of Madagascar Horticultural sub sectors

Madagascar is one of the countries in the world having the opportunity to produce diversified crops with its diversified agro ecological conditions. Rice, cassava and maize are the main staple crops for foods. Vanilla, coffee, gloves are among the export products since the colonialism period. Fruits and vegetables take more and more important places in term of foods and market as each farmer has at least plants trees and vegetable home garden from small farmers to big foreign farm investments.



Fruits and vegetables are found over Madagascar with their appropriate agro ecological zones for some specific species and with more important production around 8 areas such as Mahajanga, Toamasina, Manakara, Fenoarivo, Antananarivo, Antsirabe, Fianarantsoa, Taolagnaro as shown in the figure 1. The recorded annual production for the main products reach more than 600,000 tons with banana and litchi domination (figure 2)

Fig. 2: Main fruits production

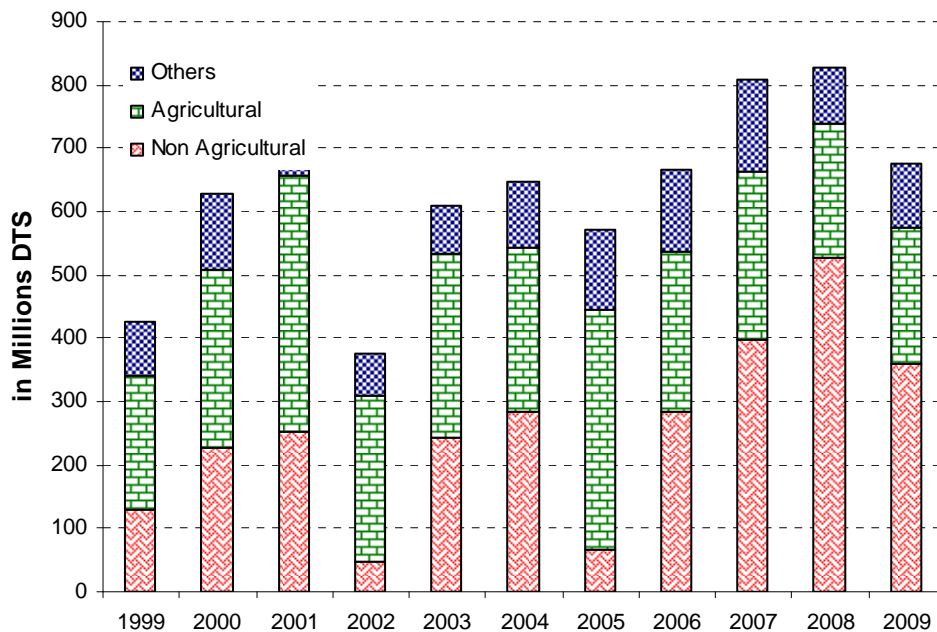


Source: Ministry of Agriculture presentation during week fruits celebration

## 1.2. Trends of fruits and vegetables market

Fruits and vegetables are more or less neglected in term of data management as national statistic shows limited figures. However, fruits and vegetables are grown over Madagascar for local market and for regional and/or international exports. One of the export dominating fruits is litchi with its renown of taste. Export trends increase the last 10 years with reduction during political crisis in 2002 and 2009 (figure 3).

**Figure 3: Export trends**



Source: Central Bank through Ministry of Trade

## 2. Challenges on Horticultural sub sectors

In the context of post harvest and transport technology, Madagascar is facing with many constraints due to internal and external challenges. For the internal challenge, crops in the field have a low quality due to plant materials, seeds, pest and diseases during the growing season affecting the quality and reducing the marketable products according to the norms. Quantity and regularity requested by markets need to be respected. Most of rural production areas are isolated without road and individual human transports are mainly the transportation available. Transportations at national level are categorized in many types from individual heading to trucks with or without cooling system. Any formal regulation for perishable transports is operational in place. Storage facilities and cooling system for perishable products are very limited. As an island, all exports or imports should be done by cargo through air or sea. Freight costs are expensive compared to others countries, putting Madagascar in a bad position for competition despite the important number of countries Madagascar could export. More than 50 countries constitute the Regional and International markets for Madagascar with 21 very potential and 10 for fruits and vegetables.

### 2.1. Post harvest issues

#### 2.1.1. Post harvest status.

Challenges affecting the perishable products quality are not only occurred during and after harvest. A process from quality seeds/planting materials; agronomy and phyto sanitary management during the cropping season contributes to the quality of harvested products and should be considered which are more or less neglected. Products are harvested with more or less attention according to the destination. Handlings are practiced at different level, i.e. at farmer level, at collector level, at company level. Only crops for seed productions and for export have a phyto sanitary control from the field to the packaging before custom.

Mechanical damage, water and temperature losses and decay during transport and in short storage are registered for all perishable products due to the limited availability of cooling storage system. One of the big challenges is the isolation of some production areas due to the lack of infrastructures.

### **2.1.2. Post harvest management**

Products are consumed at national level, processed and exported. The common process starts by washing and shorting. The next managements depend on the final destination of the products.

Products are sold once harvested with traditional handling. Harvesting the evening to avoid losses due to the temperature and water loss and selling early in the morning are common harvest management at farmers' level to reduce loss. Fresh products are stored in cool conditions for supermarket with a daily supply from the fields or suppliers.

Products are managed by diverse networks such as litchi, apple, mandarin, onion.... For the litchi for export, fruits are harvested very early in the morning, put under shade and transported to sulfur station at the end of the day.

Some products are processed. Solar drying fruits and vegetables are developed and produced by some formal and informal Small and Medium Enterprises (SME). Dried products are found in the local markets from small to supermarket. These products are packed in different packaging quality. Some SMEs produce jams and some vegetables in vinegar and supply the markets. 26 private companies and 24 others SMEs, as UPFL (Fruits and Vegetables Professional Union) members work on fruits and vegetables production and processing. Many Small and Medium Enterprise (SME) not unregistered, rise over Madagascar, supplying local and national market. As cool storage is very limited, horticulture export is less developed, except the litchi which is more organized.

Some renown's companies intervene all over the value chain from production to export. They produce under contract farmers who sort and calibrate the vegetables, buy and pack their own products for export such as LECOFRUIT (LEgumes CONDiments FRUIT of Madagascar). Some go for processing in juice and jams such as CODAL (COMptoir Industriel de proDUits ALimentaires), TIKO and BONGOU. Those big companies have their cooling system, storage room and air conditioner trucks. CHT (Toamasina Technical Horticulture Center), financed by EU (European Union) develops post harvest technology on fruits and vegetables. Such initiative could be disseminated over others regions.

## **2.2. Transport issues**

### **2.2.1. Transport status**

Madagascar has its national route served by many types of transportations. Existing infrastructures are shown in table 1 bellow.

Diversified transport types covers from rickshaw, cart, small car, public transport, truck, railway, small boat, ship and flight. Land transportation has not any restriction to transport perishable products, affecting the products sold in the markets.

Transport industries decrease except for the air transport which keeps more or less constant. The country has no more ship owner for the last 10 years.

**Table 1: Existing infrastructures**

Type	Unit	Number	Comments
Railways	Km	836	Some are reopened recently by MADARAIL (MADAgascar RAILways)
Roads	Km	49 250	3% good road
Canals	Km	580	Only at the East coast
Sea ports	Unit	19	6 international ports
Airports (2008)	Unit	44	6 international airports

Source : [www.mintransport.gov.mg](http://www.mintransport.gov.mg)

### 2.2.2. Transport organization

Transports are organized into 3 institutional structures: APMF (Agence Portuaire Maritime et Fluviale), ACM (Aviation Civile de Madagascar) and ATT (Agence de Transport Terrestre), respectively for sea, air and land transport with their autonomous management. APMF and ACM are members of International Organization and should meet the international regulation.

Five (5) air transport Companies are available for cargo from and to Madagascar for fruits and vegetable exportation: Air Madagascar, Air Mauritius, Air France, Air Austral, Kenya Airways. Cargoes embark mainly at International Ivato Airport, at the capital, which has neither pre-cooling nor cool storage facility. Perishable products to be exported to regional and international countries are transported in “expensive rented reefers” which wait for at the airport until the embarkation. The freight arrives in regional market within 10 hours and in the European markets within 18 to 24 hours.

Five (5) shipping companies deserve the Malagasy sea ports: SAFMARINE, MSC, CMA CGM, DELMAS, and MAERSK. Ships insure the regional and international transport. Regional transits take two (2) to five (5) days, European Mediterranean arrival within twenty (20) days and European Atlantic on thirty (30) days. Conventional cargoes are used for litchi exclusively during the campaign in November December. Except the litchi, which is one of the most organized fruit export in Madagascar, airway transports are the most used for perishable agri products.

For land transport, the MIT (Moyen Intermédiaire de Transport – Intermediate Transport Means) is developed to serve rural transport in difficult area. Rickshaw and small car served for in-town transfer. Public transport insures from peri urban to the main markets. Trucks without cooling system transport from production zones to the capital, the other provinces and others potential consumers’ cities such as the tourism areas and mining company areas. Railway liaise central south center to the east cost of Madagascar passing through fruits potential isolated and difficult locality productions. Small boats serve some isolated cities with difficult access to vehicles in some coastal areas - through sea for west coast and through Pangalane channel in east coast – and the neighboring near island in Indian Ocean.

## 2.3. Market dynamic

### 2.3.1. Domestic market

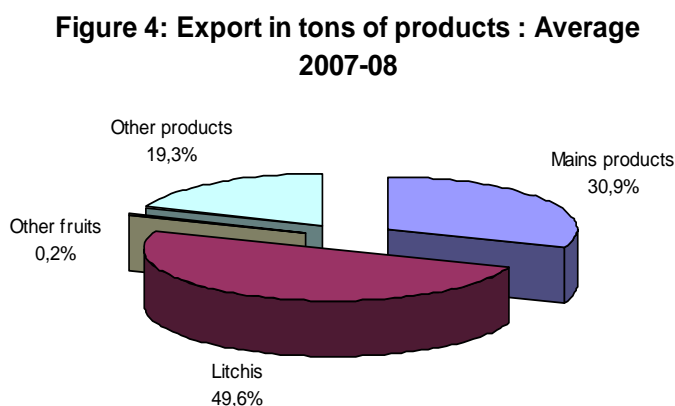
Products are harvested late afternoon, transported by different type of means and sold immediately at the open market very early in the morning without any storage facility. Means of transport are variable; depend on the distant from the field to the market (by hand/head, rickshaw, carts, vehicles, public transport, and trucks). Middlemen are quite developed and re work on shorting to improve visual quality. They get the maximum benefit beside the producers by supplying the supermarkets. For Shoprite for example, only 26% of fresh fruits and vegetables demand is covered by national producers due to low quality of products and supply irregularity. Market organization need to be improved and efforts should be focused more and more on quality and regularity of supply to meet the market demand and to reduce fruits imported from South Africa. Actors within horticulture value chain should consider “win-win” principle for a sustainable market.

Some products are sold at some processing companies and to SMEs for their raw materials for processing. Final products are packaged and are also found in diversified local markets. SMEs are facing to packaging quality and availability. Recycled bottles are still re used. Equipments and materials for packaging are imported.

The costs of transport depend on the distance and the product. The main cost varies from 50 to 100 US\$ per ton as general cost unit according to the distance from 200 to 500km. Isotherm trucks cost have 50 to 100% higher than the normal trucks. Perishable products are transported by normal trucks during the night for long distance to manage losses by temperature.

### 2.3.2. Regional and international markets

As an island, flights and ships are the means of transport for regional and international markets. With an average of 47,922 tons of exported products in 2007 – 08 (2 years), exports are dominated mainly by litchi for Europe but others fruits and vegetables are exported to the neighboring islands. Onion, garlic, dry and green bean, tomato and hot pepper are the most important for vegetable and litchi and banana for the fruits. 25 societies export fruits and vegetables. Leucofruit exports green bean produced under contract farmers, a model to be developed.



Transports are affected by the fuel crisis and insecurity. The cost of transport rises significantly for all routes (air, sea, land). For the air freight for example, beyond the fixed cost, 34 to 37% per kilogram of overhead and insurance are added, increasing the price of product to the final users, reducing chance of competitiveness for Madagascar.

Source: Ministry of Trade



The table 2 below show the freight cost per kilogram per destination (Euros/kg) for a minimum of 500kg per departure.

**Table 2: Freight cost in Euros per kg**

	Company	Comoros	Reunion	Mauritius	Europe	Variable insurance*
Air	Air Madagascar	1.1	1.1	1.1	1.8	0.50-0.70
	Air Mauritius			1.15	2.15	0.65
	Air France				2.37	0.77
	Air Austral	1.1	1.2	1.05		
	Kenya Airways					
Sea	General		0.14	0.14	0.18	

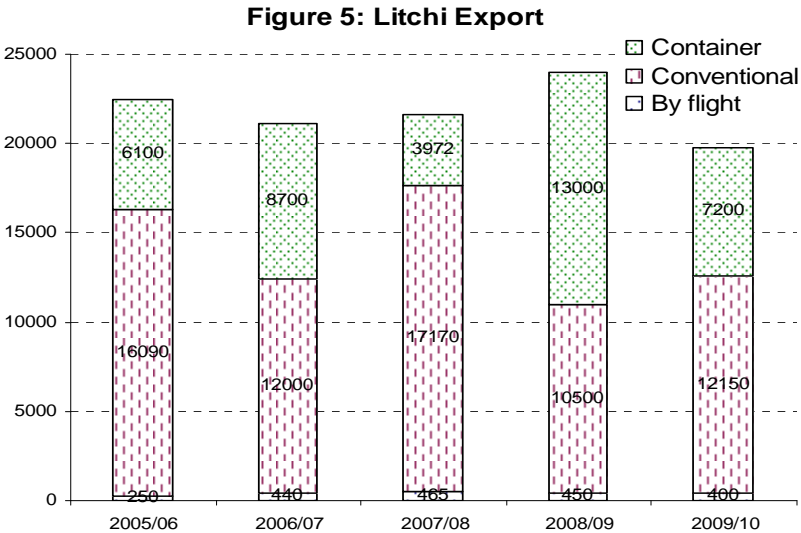
\*: Fuel variable cost and security insurance

Source: Gargo offices

Sea freight could be explored with an organized “grouping system”. The freight cost is only 10% of air freight. However, investment on cooling chain would be more efficient to keep products fresh from the harvest until the international market.

**2.3.3. Litchis of Madagascar**

First word export of litchi, Madagascar produces more than 100 000 tons per year and exports around 20,000 tons to Europe.



Special cargoes participate punctually for transport during litchi exportation to reach European Market before Christmas. Transport by flight turns around 400 tons against 10,500 to 17,000 tons by conventional shipping and 4,000 to 13,000 tons by container (figure 5).

Source : rapport de campagne litchi 2009/2010, CHTT website

This is one of the market model that others products could be leaded by Madagascar according to the country’s potentiality.

**3. Future trends**

According to our diversified agro ecological zones and the available resources such as land and water, diversified fruits and vegetables could be produced. In addition of the existing plantation, the Ministry of Agriculture put the fruits and vegetables as emergency cash crops

and programs to plant 1,500,000 newly fruit plants trees during this year over the country. New products could be developed taking in account the potential markets at regional and international level. Producers would be more professional to commit as well the quality, the diversity as the quantity to meet market demand and to extend products over the year within national, regional and international norms.

Malagasy products are “natural” with its low chemical fertilizer and spray use. Some initiatives are developed under CBOs for bio vegetable production (MAMABIO) which would be developed by others structures due to the quality and health effect of bio foods. Research, training and regional exchanges would help the promotion of fruits and vegetables for their diverse forms (fresh, packaged, processed) to meet the international market standard.

Fruits and vegetables processing factories would be developed at different locations avoiding that fruits and vegetables from Madagascar are processed at the others countries and re imported to Madagascar at the supermarket. International companies would be solicited to invest on food processing factories. Medium enterprise factories could be an option by importing from India or others countries fruits and vegetables post harvest technology equipments.

Cooling system which is actually absent would be developed at many locations of the country. The Ministry of Economy and Industry is on way to develop the cooling chain mainly at all transit locations such as airports, seaports to improve the quality of perishable products to be sold in the market. Organisation throughout the value chain would be intensified to challenge the neighbouring countries organisation.

Sea ports development program is in under way. Geographical position of Malagasy port would give the country an advantage for shipping to Europe and Asia. Passing through Eden gulf route is actually a risk to be avoided. Once the products to be exported are available continuously, and cooling system facilities are met, more shipping companies would be interested and frequency could be increased. This could be justified by others agricultural products under development and promotion such as onion, bean, green grams .....

Initiatives are developed within many platforms such as for litchi, vanilla, apple, potato, mandarin, onion, and join fruits and vegetables National network. Such initiatives might link within regional and international networks to improve collaboration, organisation, coordination, sharing information, information flow, products traceability....

The actual statistic shows a limited data mainly for fruits and vegetables. Information’s need to be recorded at different domain level such as agriculture, trade, industry..., centralized and managed at one data base management institute through network to meet the complementarities and synergy between each domain which could help for making right decisions.

Despite the liberalisation of the economy, public service will take their responsibility of “regulator” to keep in “trust” a win-win principle between private companies and producers within a formal status. These producers would be integrated in Community Based Organisation to strengthen their power to control the market at their level and to ensure sustainable market collaboration.