GHANA

National Mango Study

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With the support of the PACT II program & the International Trade Centre (Geneva)
April I 2012
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<td>Agricultural Development Bank</td>
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<td>ADRA</td>
<td>Adventist Development and Relief Agency</td>
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<tr>
<td>ADVANCE</td>
<td>Agricultural Development and Value Chain Enhancement Project</td>
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<tr>
<td>AfDB</td>
<td>African Development Bank</td>
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<tr>
<td>AGOA</td>
<td>African Growth and Opportunity Act</td>
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<td>AgSSIP</td>
<td>Agricultural Services Sub-Sector Investment Programme</td>
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<td>CEPS</td>
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<td>COLEACP</td>
<td>Comité pour Liaison Europe ACP</td>
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<tr>
<td>ECOWAS</td>
<td>Economic Community of West African States</td>
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<td>Export Marketing and Quality Awareness Project</td>
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<td>GIS</td>
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<td>Acronym</td>
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<td>GSB</td>
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<td>PIP</td>
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<td>PPRSD</td>
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<td>SPEG</td>
<td>Sea-Freight Pineapple Exporters of Ghana</td>
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<td>SSA</td>
<td>Sub- Saharan Africa</td>
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<tr>
<td>TIPCEE</td>
<td>Trade Investment Program for a Competitive Export Economy</td>
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<td>TIRP</td>
<td>Trade and Investment Reform Programme</td>
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<td>UAE</td>
<td>United Arab Emirate</td>
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<td>UNIDO</td>
<td>United Nations Industrial Development Organisation</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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INTRODUCTION

In the last 20 years, Ghana has developed its exports of fresh produce to Europe and other destination markets, although earnings have been undulating. Total earnings from fresh edible fruits in 2003 amounted to about US$ 44 million, US$ 144 million in 2006 and dropped to about US$ 23 million in 2010, mainly due to the Ghanaian pineapple loosing substantial market shares against Costa Rican suppliers in Europe. Pineapples, mangoes and papayas lead the fruit exports while yams, chillies and Asian vegetables (aurbergines, okra, etc) head the shipments of vegetables. These “non-traditional” agriculture exports make a notable contribution to the economy in terms of employment, fiscal revenues and foreign exchange. As a result, policy makers and development partners have looked to support horticulture exports as a diversification mean of the export base and an opportunity to improve rural livelihoods. In 1998 the World Bank and the Ministry of Food and Agriculture (MOFA), commissioned a short study of the sector in order to assess the opportunities, identify constraints and suggest strategies and infra-structural improvements to take fresh produce exports forward. A similar exercise was conducted in 2003 as part of the restructuring of the World Bank-funded Agricultural Services Sub-Sector Investment Programme (AgSSIP) within MoFA. This second appraisal of the industry led to the development of a strong horticultural component to the AgSSIP under the title Horticultural Exports Industry Initiative (HEII) within (MoFA).

Since 2003 the horticultural export sector in Ghana has lost market share to competing countries such as Costa Rica after Chiquita introduced the MD2 pineapple variety in the European market. The slump in pineapples, the leading product in the horticulture export portfolio, affected the entire fruit exports sector. Although the pineapple segment continues to dominate the horticultural export portfolio of the nation, mango is projected to make significant contribution to the basket in the foreseeable future. Recent development within the mango sector has raised considerable interest among economic analysts, such as the Export Development and Investment Fund efforts to implement a US$ 50 million mango plantation project in the Northern Region. Interventions by technical and donor institutions such as United Stated Agency for International Development (USAID) through the Trade and Investment Project for a Competitive Export Economy (TIPCEE), have led to structuring of the sector. At the same time, market diversification strategies are being championed by actors such as the Ghana Export Promotion Authority (GEPA) with the view to moving away from Ghana’s traditional market, which is the European market.

This study takes into cognizance the value chain of mangoes from production to exports. In this vein, the value chain of fresh mangoes as well as that of transformed and dried ones were looked at extensively, assessing the main actors, past and ongoing interventions in the sector, problems militating against each value chain segment and a host of other factors. Notable operators that have been profiled in this work include Blue Skies, Sunripe, Ebenut and FMSL.

It should also be emphasized that this work falls in line with the strategic objective of the ECOWAS Commission to streamline and strategically position flagship agricultural products within the sub-region of which mango is one. Realizing this significance, the Commission with technical support from the International Trade Centre (ITC) embarked on a policy that will see to the development of a strategy document for the entire region. This work therefore is in furtherance to that objective. It will augment similar works being undertaken in Nigeria, Mali, Burkina Faso and Cote d’Ivoire.
ASSESSING MANGO VALUE CHAINS IN GHANA

1 THE FRESH MANGO VALUE CHAIN

Compared to other West African origins, the presence of fresh mangoes from Ghana on international markets is relatively modest, amounting to less than 3% of EU imports in terms of volumes supplied from ECOWAS countries. However, fresh-cut mangoes from Ghana have made important inroads in the last 10 years, adding value to the product and directly impacting the national economy in terms of income generation and employment creation.

Over the last years, investments made by private enterprises such as Blue Skies, Bomarts and the Integrated Tamale Fruit Company (ITFC) and capacity building of farmers supported by USAID/TIPCEE (now replaced by ADVANCE), and MoFA’s district extension, have led to an export grade production base, including Global GAP certification of the smallholder farmer base who are an important part of the supply chain.

For this study, the fresh mango value chain will comprise mangoes that are exported both internationally and regionally, in its unprocessed form or packed in cut slices.

1.1. Actors and stakeholders of the fresh mango value chain in Ghana

Actors involved in the fresh mango value chain include producers, input suppliers, exporters, logistical service providers and other key stakeholders involved in the distribution of the product to final consumers. It must be emphasized that although mention has been made of certain actors in the horticulture industry in general, their bearing on mango is not yet ascertained. They have however been identified in this study because it is anticipated that they could have a role in the general development of the mango sector, especially within the ECOWAS Trade and Enterprises Network. Actors have been grouped into specific categories, and the followings albeit not exhaustive are the major contributors to the sector:

1.1.1 Producers and exporters of mangoes

Farm Management Services Limited

FMSL was established about a decade and half ago and is based in Somanya in the Eastern Region. FMSL is a member of the Yilo Krobo Mango Farmers Association and Ghana Shippers Council. Since its inception, FMSL has been involved in its mango plantation sharing scheme, an initiative that enables investors to own a well-managed mango farm without the hassle of day to day plantation management operations. Managing a farm requires a significant commitment of one's time and often involves processes, which may seem quite complicated.
to an investor new to this kind of agricultural enterprise. The scheme is attractive because it offers
the opportunity for anyone to get involved in an apparently profitable industry, without having to give
up existing work and/or business commitments in order to manage a plantation farm.

FMSL has six clients signed to the scheme who have established their farms and four more waiting
to participate in the next planting season. Present members include Cotton Web Link Farms, Premier Exotic, UAM, SMI, Beulah and Kwesnah. FMSL operates about 1,130 hectares of mango of
which Cotton Web Link Farms owns about 500 hectares. In 2011, the company produced 8,700 tons
of mangoes, down from a peak of 14,000 tons reached in 2008. The CEO of FMSL intimates that of
the total mango produced by their group annually, between 20-25% is lost to post-harvest losses,
whilst export grade mangoes is estimated about 15% of output. Processors, supermarkets and
market women take up the rest of the output to be retailed. No specific data on how much mango
has been commercialized was provided. FMSL specializes in three mango varieties, namely Keitt,
Kent and Palmer types which are normally destined for the Netherlands. It was revealed during the
interactions that Britain prefers the Palmer and the Tommy Atkins varieties, whilst the rest of Europe
prefers Keitt and Kent varieties which are even more commercially viable for producers and
exporters in respect of the European market.

Grading and Control section

Reefer heading for Tema

Yilo Krobo Mango Farmers Association

This farmer association is one of the largest mango producing entity in the country, however no
numbers where provided. The farms are scattered around Dodowa, Somanya and the surrounding
districts. It comprises many smallholder farmers whose mission is to provide support services to
members and other mango farmers with the view to contributing substantially to growth and
development of the mango industry in Ghana. The association’s functions include promoting the
production and marketing of fresh mangoes, working with relevant stakeholders in the area of
capacity building on good and improved production practices, current industry trends and other
internationally acceptable requirements. The association principally produces Keitt and Kent, but no
information regarding for what markets and commercialized volumes were provided. Some of the
notable members of Association include Akudey’s Farm, Angmor Farms, Dansak Farm, Koldams
Enterprise, Mission Farm, Pentacon and Seth Farm.
Papaya and Mango Producers and Exporters Association of Ghana

PAMPEAG is an association of privately owned companies specializing in the production of premium fresh papaya and mangoes which are grown in orchards of the members. The goal of the association is to establish a brand that is recognized by its high quality and taste. The Association facilitates the training of members in GAP and also consolidates fruits from the orchards of members for group export. Some of the members of the Association who are into mango production are AC Farms, Divinefields Venture and Botim farms. No numbers related to mango production and commercialization were provided.

Blue Skies Limited-fresh cut

Blue Skies was founded in 1998 with a factory just outside Nsawam in the southern part of Ghana. The company was established to prepare, pack and export pineapples for the UK market. In the course of its operations, the company incorporated mangoes into its portfolio of services. While Ghana remains the flagship project, Blue Skies has developed further facilities in Egypt, South Africa, Brazil, Senegal and the Gambia in order to provide a portfolio of products throughout the year including the exportation of mangoes to destination markets. The Ghanaian operation also supplies papaya and coconut.

All fresh-cut mangoes are air-freighted. In the absence of appropriate cold store facilities at the airport, the company uses two refrigerated shipping containers on the apron. Most of its exports are sold through UK retailers (about 45%) and is certified to meet both the general Global GAP standards as well as the individual labels of the different retailers, such as Waitrose or Leaf. The company is also LEAF (Linking Environment and Farming), BSCI (Business, Social Compliance Initiative), Organic, Fair Trade as well as Field to Fork certified. Other market destinations for its fresh-cut exports include the Netherlands, Switzerland, Italy and France. The company is also making efforts to penetrate the United States market.

One of the core operations of Blue Skies is the bottling of juices of the various fruits under its operations. Under its juices portfolio, the company has fresh pineapple juice, pineapple ginger, and then there is a blend of mango, passion fruit and pineapple. According to company officials, juice demand in the local market outstrips supply; hence the company has no intention of exploring the sub-regional market, at least for now. Per the company’s estimates, 120 tons of mangoes are processed weekly. This figure encapsulates the quantity for export as well as the volume processed as juice for the local market.

In spite of the gains made in the exports of fresh horticultural products including mangoes, the company still faces certain nagging challenges; such as fruit quality, seasonal variations, difficulty in having fruits, cost of importing mangoes from other countries, limited capacity for mango juice and a host of other factors preclude the company from operating optimally. Although the company sometimes faces fresh mango supply challenges, it has no immediate intention of integrating backwards.

Integrated Tamale Fruit Company

Incorporated in 1999, ITFC is a company located in Gushie, within the Savelugu Nanton District of the Northern Region, with operations in four districts. (Savelugu Nanton, Tolon Kunbungu, Karaga and West Mamprusi). 70% of the company’s shares are held by Ghanaians of which Wienco owns
50%, and the rest by Dutch interests. The establishment has a total workforce of about 410, comprising 195 women (of which 160 are at the pack house) and the rest being men.

ITFC cultivates certified organic mangoes for the local market (10-20%), and exports between 80-90% of its production to the international market. The company currently produces Kent, Keitt, Amelie and Zill varieties from its production base in the Northern Region and operates a nucleus farm of about 200 hectares with about 1,200 outgrowers. The nucleus plantation is fully irrigated and certified organic by the Soil Association of the UK and certified Global GAP. So far in 2011, the company has exported about 240 tons of fresh mangoes and five 40’ containers of dried mangoes. The company expects 6,000 metric tons of organic mangos per year from 2015, which could yield an export value of approximately US $3,300,000 per year. According to MiDA¹, in spite of making significant inroads in the mango sector, ITFC still faces some substantial challenges:

- Poor roads to outgrowers’ farms lead to about 75% loss of annual export volumes to road condition bruises
- Diesel and other ancillary cost of operating three generators at the pack house, office and staff bungalows
- Operates only 1 oven to process 180 tons per season

To ameliorate some of the challenges faced by the company, MiDA intervened to offer assistance in the following:

- Construction of 9 feeder roads along outgrowers’ farms
- Construction of 25km high voltage transmission lines
- Provision and installation of 315 KVA Transformer
- Operating 2 ovens to meet increased demand for dried fruits from both local and international markets
- Extended product line and operations to include mango puree, okra and tomatoes drying

Volta Mango Growers Association

VOMAGA was formed at the end of 2005 upon the initiative of Mr Tackie of Tacks Farms, located in the same area. Both the membership and the executive committee changed often during the first year, but the association consolidated with around 60 member farmers concentrated in the area around Fojuku and Juapong. VOMAGA is located in the Volta Region, around Juapong and Fojuku, south of the Volta Lake. No exact production figures were provided. The first orchards were established in the period 1997-1999 with seedlings from a USAID funded nursery project executed by ADRA (Adventist Development and Relief Agency). Through these first farmers, other farmers obtained mango seedlings and mango cultivation continued to spread in the region.

VOMAGA is being viewed as a relevant mango actor because it has the capacity to improve the supply side deficiencies that are associated with most horticultural products. As an association that engages in export, it will not be far-fetched if any major intervention by ECOWAS TEN takes cognizance of the members with the view to creating the necessary synergies required in the mango sector. Until 2006, VOMAGA farmers sold part of their mango production individually to exporters, but the quantities sold are unknown. In 2008, a total of 12 tons of mangoes were sold: 5 tons to WAD (Switzerland) and 7 tons to Nature’s Best. VOMAGA was certified organic in 2009 under WAD but with independent internal control systems.

1.1.2 Trade Promotion Organisations

Ghana Export Promotion Authority

Established in 1969, the Ghana Export Promotion Authority (GEPA) is the national export trade support institution that facilitates the development and promotion of exports. GEPA’s intervention in the mango sector over the years has been significant, cutting across the area of nursery development and trade promotion activities. For instance, in 2002 GEPA with the support of the UNDP developed a project known as “Specialised Support to Supply Base Expansion of Mangoes” in which 13,000 mango seedlings were produced and distributed to 90 farmers in the Dangme West District. Before that project, MOFA had established three mango nurseries in Dodowa, Kintampo and Ejura, while the University Farms at Kade also developed mango seedlings for the industry. Aside these interventions by GEPA, the organisation is involved in the promotion of mango products in the international market place, such as during the Fruit Logistica event in Germany, and other fairs in the Maghreb.

Export Development and Investment Fund

Established in 2000, EDIF provides financial resources for the development and promotion of Ghanaian exports². In 2009, EDIF embarked on a “National Mango Plantation Development Project” aiming at developing 20,000 acres of mango plantation by 2013 in the Savannah and transitional Zones of the Country i.e Brong Ahafo, Northern, Upper East, Upper West Ashanti and Volta Regions. In line with this vision, in 2009, the board of directors supported eight farmer based organisations / associations in the Northern and Upper West regions to cultivate 1,440 acres of mangoes. In 2010 25 farmer based organisations where supported to cultivate 5,000 acres in 25 districts of the five selected regions. In the first two years of the project (2009 – 2010), the project was implemented using the nucleus out-grower scheme. However, following the lack of interest in the project by some of the out-growers, EDIF decided to support exporters and commercial farmers with the required know-how in farming and land management to undertake the project. The decision to shift to commercial farmers and exporters was also informed by observations made by the team made up of, board members, EDIF staff and farmers sponsored by the Fund to visit mango plantations in Brazil at the invitation of Minor Wier & Willis (MWW), EDIF marketing partners for the mangoes. With this new focus, the management of EDIF in January 2011 invited farmers for an interactive meeting through which close to 40, most of them already in mango farming were selected for the project. The EDIF Mango Project has the following objectives:

² See Annex 1
• To turn the three Northern Regions, the transitional zones and part of the Volta Region into mango hubs;
• To contribute to the diversification of the country’s non-traditional export products;
• To increase the country’s foreign exchange earnings;
• To alleviate poverty through inter cropping with short gestation crops like sunflower, soy bean to generate income to support their immediate needs.
• To generate employment focusing on the youth
• To combat desertification in the three northern regions

Table 2: Summary of EDIF Mango Project (2009 - 2011)

<table>
<thead>
<tr>
<th>Year</th>
<th>Acreage</th>
<th>Number of beneficiaries</th>
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<tr>
<td>009</td>
<td>1,440</td>
<td>Associations supported with a total membership of 432 farmers</td>
</tr>
<tr>
<td>2010</td>
<td>5,000</td>
<td>25 Associations supported with a total membership of (1,900 farmers)</td>
</tr>
<tr>
<td>2011</td>
<td>5,000</td>
<td>38 Merchant farmers directly benefited and more than 1,000 people are benefiting indirectly through temporary employment offered by the Merchant farmers</td>
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<tr>
<td>Total</td>
<td>11,440</td>
<td>This is the position of the acreage supported by the Fund. However, due to bush fires and high drought and threat of stray animals to the plantations, the figure has dropped to about. Again, the 2011 projects are on-going and hopefully by the close of the year, all the fields will be planted</td>
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EDIF has had an important array of challenges, such as the unavailability of water in the 2010 plantation. In view of this, approval has been given for the drilling of additional boreholes in each of the 25 farms, since the existing one borehole per 200 acre is inadequate. At the same time, the sudden high temperature witnessed in the Northern sector in the last quarter of 2010 led to the wilting of some seedlings. To make matter worst, the entire 5,000 acres could not be planted due to the difficulty in completing land preparation (constant break-down of bulldozers at the site, heavy rains, etc.).

National Horticultural Task Force

A broad-based private sector-led group with representations from produce and marketing organisations, public sector institutions and the donor community. Since its inception in 2003, the NHTF has been instrumental in initiating discussions on a “National Quality Assurance Scheme” for horticultural products, including mangoes. This activity had led to the initiation of the GhanaGAP program to address issues on quality, safety and traceability. The task force is equally a forum for dialogue, sharing of challenges such as the fruit fly menace in the southern belt, and the taking of joint actions to address these challenges. In addition the NHTF acts as a lobbying force for the sector and identifies needs for capacity building.

The Federation of Association of Ghanaian Exporters

Founded in 1992 FAGE’s mandate is to support the growth of the private sector in non-traditional exports through four areas: advocacy, market and trade information, training and integrated export
development programmes. FAGE’s portfolio of products and services aims principally at increasing
the competitiveness of exports in the international market place. No clear information was provided
on the type of interventions FAGE has been conducting on mangoes, however the organization has
been collaborating with the GIZ on implementing the Market Oriented Agricultural Programme
(MOAP), where issues related to the horticultural competitiveness have been addressed.

_Horticulturists’ Association of Ghana_
This association promotes the production and export of horticultural products; provides training and
guidance to members on current trends in EU Food Safety Regulations; provides effective
representation at both domestic and international levels on a range of issues on horticulture. It has a
mission to enhance development within the horticultural industry in Ghana and offer support in
product export by providing air freight, agrochemicals and other services for members. Despite their
apparent key role in Ghana’s horticulture sector, no specific intervention has been capitalized related
to mangoes; however their role in the country shall be emphasized in upcoming interventions in the
sector.

1.1.3 Input suppliers

Further field work is necessary in order to complete this section, which focuses on agri-chemical
providers.

_Cardboard_
Mangoes for exports are packed in corrugated boxes. According to a study conducted by ITC³, local
suppliers are unable to meet international standards and offer products of low quality, as very little
investment is made in products that can be weather resistant, waxed or laminated. Most of
corrugated cartons used in fresh mango exports are imported from South Africa and France.

_Dizengoff Ghana Limited_
With a presence of over 40 years in Ghana, the agricultural division of Dizengoff sells various types
of fertilizers and agrochemicals to farming communities all over the country. In addition it provides
irrigation systems, which it can also install, commission, maintain and offer seeds as well as
technical advice, to farmers on diverse cultivation methods and techniques. The company’s
contribution cuts across a multiplicity of crops including the horticultural industry. The company is
hence being considered as an actor because of its role in the supply of agriculture inputs to farmers
including those of mango.

_YARA Ghana Limited_
YARA supplies fertilizers to various farmer groups and farmer associations based on specific crop
and soil requirements. According to the managing director of YARA, Mr. Mendi Saint Andrea, Yara’s
fertilizer sales are done in various packaging forms, ranging from bulk cargo, sack sizes, smaller
weight categories among other specifications. He intimated that fertilizers are supplied to farmer
groups in the mango producing areas based on their specific needs.

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³ Current situation and perspectives of agro food packaging for export in Ghana (2006), [http://tinyurl.com/76qnh6l](http://tinyurl.com/76qnh6l)
**Sidalco Ghana Limited**

Sidalco Limited is a distributor of all agricultural products in Ghana. Sidalco’s product range includes Sidalco 10:10:10 and a range of Kwazar sprayers and applicators including the Kwazar Neptune 15 Knapsack Sprayer. Sidalco Limited is also a grower and exporter of Pawpaws and Pineapples. Sidalco is regarded as an actor because it is a known brand in the country and the company is known by farmers and groups. In this vein, mango farmer groups could liaise with the company to supply them with the requisite agricultural inputs. (corroborated during interviews)

**Wienco Ghana Limited**

Established in 1979 Wienco imports and distributes agriculture inputs such as fertilizers and agrochemicals to farmers, and is also dealing with cocoa, cotton and warehousing activities. Through its subsidiary Volta River Estates Ltd, the Ghanaian-Dutch joint venture has been involved in the banana sector that are certified Fair Trade. In the mango sector, Wienco’s subsidiary company ITFC has developed an organic production in the Northern Region.

### 1.2. Mapping and description of the fresh mango value chain

The fresh mango value chain is a complex linkage of various production and operational role-players. Key stakeholders are producer organizations, exporters and traders.

**Figure 1: Fresh mango supply chain in Ghana**

![Source: Consultant](source.png)
As indicated above, the supply chain of mango has different facets depending upon the stage that the fruit reaches the final consumer. The chain is simpler and less exposed to stringent healthy inspection if the fruit sold fresh in the local market. However if it is to be exported, one should expect stringent sanitary and phytosanitary inspections.

Mango as depicted by the diagram above is either processed or packed fresh (fresh cut) either for the local or the international market place. If the fruit is to be exported as fresh, it has to go through several steps to ensure that it meets international market standards and access requirements. The chain begins from research institutions and then to the nurseries and then planted. Workers then undertake the necessary farming activities including spraying, flower induction, pruning etc. and then harvesting by the harvesting gang. Harvested fruits are transported to bulking point and then to pack houses where the fruits are washed, disinfected, waxed, graded, boxed, palletized and then pre-cooled from a temperature of about 32 degrees Celsius to about 9 degrees Celsius. The fruits are then packed in reefer containers at the same temperature of 9 degrees Celsius to the Tema harbor. The containers are plugged on the vessel carrying the products to the destination market.

It should also be noted that production of mangoes for export to the European market, should strictly be under Global GAP certification. The Global GAP standard is primarily designed to reassure European consumers about how food is produced on the farm by minimizing detrimental environmental impacts of farming operations, reducing the use of chemical inputs and ensuring a responsible approach to worker health and safety. Traceability is also a key component in Global GAP certification (the National Traceability Program will be touched on later).

If the fruits are to be air freighted, mangoes are harvested at a later period, when the fruits are ready to be consumed within the next few days using a more costly air logistic to cater foreign markets. Although air freighted mangoes are more expensive to ship and represent a relatively small niche market for mango connoisseur in Europe or other developed countries, profits can be higher than sea freighted products. In terms of quality, the product has to be perfect in every sense, and delivered to the client (in 6kg crates as compared to 4kg for boat shipments) without absolutely no default.

It is widely believed that producers in developing countries face numerable problems in their efforts to transact with the global retail chains and food processors due fundamentally to proper representation in the destination market and lack of market information (Interviewees identified market representation as a major problem).

Problems abound at every stage of the mango value chain including production, harvesting, post-harvest handling, distribution and logistics and quality management. Consumers, especially in Europe and North America are becoming more concerned about the safety of the food that they consume and the very manner in which this food has been produced.

However, in most developing countries concern for the environment and sustainable methods of production are often neglected because of farmers need to maximize income to meet household demands. Issues such as occupational health and safety, particularly towards the application of chemicals, potentially endanger not only the operator but also the environment.
Various efforts to introduce quality management systems have often met resistance, not because of lack of knowledge or institutional support, but mainly to the substantial costs associated with maintaining such system. At the micro-level, while many projects have attempted to improve the efficiency of the supply chain by an examination of the transactional costs involved, there is a growing recognition of the importance of interpersonal relationships and social capital.

1.2.1 Bottlenecks hindering the competitiveness of the fresh mango value chain

Challenges in distribution / commercialization

The ultimate objective of every fresh mango producer and/or exporter is to create a strategic market niche where mangoes produced can continuously be sold. The European market is divided into various market segments with different price and quality ratios. However, the Ghanaian growers do not have a strategy that is adapted to suit these markets in terms of diversification or individual cultivation decisions, and in terms of variety selection to be cultivated.

Some of the challenges faced by exporters are in the area of marketing are:

- Stringent sanitary and phytosanitary requirements in the market destinations
- Change in taste and preferences of the import market
- Lack of trust between importers and exporters
- No reliable and powerful institution or entity to represent the interest of exporters in the destination market.
- One market destination, thus Europe limits diversification
- Lack of market information systems
- Lack of management capacity. Only practical management available
- No unity. Great competition between growers producing for the same customers
- Limited knowledge of the segmented nature of the European market, particularly the organic mango market.
- The local market is small. Poorly developed local market, particularly with respect to cushioning the effects of overproduction or lack of exports
- Major cultural differences between Ghana and Europe

Problem areas in logistics

In recent years, there has been a lot of investment to improve the state of Ghanaian infrastructures such as feeder roads connecting production areas to markets, improving access and reliability of electricity and others. However, challenges in the area of logistics still remain for mango exporters:

- Poor infrastructure, especially bad nature of the road network, still impacts negatively on the quality of mangoes,
- Unadapted trucks used in carting mangoes from farms to pack houses,
- Lack of refrigeration facilities, resulting in losses and inferior product quality,
- High freight charges due to low export volumes.
It has also been established that low quality of fruits from farms adversely impacts on volumes meant for export which in turn leads to high cost of freight in Ghana. The link between cost of freight, quality and quantity is demonstrated below

**Figure 2: The mutual dependency flow of the three critical factors affecting mango**

![Diagram showing mutual dependency of product quality, product volumes, and freight costs]

**Source:** Sustainable Horticultural Export Chain

**Problem areas in production and post-harvest operations**

Correct production techniques and post-harvest operations are very important. In Ghana, it has been estimated that the average loss following harvesting is between 20 and 50 per cent. Improvements following harvesting can therefore lead to a substantial reduction in loss. The main reason for losses with regards to Ghanaian mango has been attributed to the fruit fly presence and a host of diseases as well as the lack of cold chain facilities, and long transit time. Since air transportation is an expensive alternative, the greatest profit can be made through the refrigeration of the mango directly after harvesting. Some of the challenges in the area of cultivation and post-harvest losses are given below:

- Cost and availability of inputs including fertilizers
- Knowledge and timely intervention by extension officers to guide farmers on relevant issues with respect to production through to post-harvest issues.
- Cost of seedlings
- Farmers rely on natural rainfall due to lack of irrigation equipment
- Damages due to road conditions, inadequate transportation material, poor packing into crates, product mishandling during loading and unloading operations.
- Cold-chain management does not start immediately after fruit picking
- Most of the mangoes are transported within Ghana in non-refrigerated conditions. They are sometimes kept in high temperature conditions for 12 to 72 hours
- Harvesting methods of small-scale farmers vary greatly

**Problem areas relating to packaging**

Adequate packaging is essential for exports as its first use is to prevent damage during transportation. The requirements set for packaging are that they are strong while also allowing air to
pass through and being sufficiently resistant to moisture. In addition, they must also meet the European and United States’ norms and dimensions. There are three local packaging companies in Ghana, namely Poly Kraft, Ghana Carton and Packrite. However, the large-scale growers do not make use of these companies, as the packaging is of an inferior quality compared with the packaging that they import from South Africa (Mondipak), France (Smurfit-Socar) and the Netherlands (Kappa). This imported packaging is heat-glued whereas locally produced packaging has hand-folded corners. The imported packaging is much stronger and more resistant to moisture and rain. Among other things:

- Cost of boxes imported is high and therefore has impact on margins
- Imported boxes are more reliable and less problematic than locally manufactured ones.
- Ghanaian packaging companies use hand-folded corners instead of the heat-glued corners. Hand-folded corners are not as strong. The reasons for this are the current problems in Ghana with electricity and the insufficient capital for investment in machinery
- Insufficient checks and tests are carried out in the Ghanaian packaging industry.
- The transit time for the delivery of cardboard is approximately (4 to 5 months).
- The large-scale growers obtain their packaging from Europe.

1.2.2 Past and ongoing interventions to improve the fresh mango value chain

Ghana has no specific policy interventions geared towards mango alone. There is however broader intervention towards the horticultural sector. It must however be emphasized that the mango in recent times is receiving enormous attention from both the private and the public sectors. EDIF’s intervention for instance is an indication of strong involvement by a governmental agency.

<table>
<thead>
<tr>
<th>Project name and donor</th>
<th>Description</th>
<th>Period</th>
<th>Amount (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIPCEE (USAID)</td>
<td>Increase exports of agricultural (and horticultural)</td>
<td>2004-2009</td>
<td>$30 million</td>
</tr>
<tr>
<td>HEII (World Bank)</td>
<td>Promote diversification and innovation in horticultural industry, strengthen its competitiveness and maintain market shares</td>
<td>2004-2007</td>
<td>$9.85 million</td>
</tr>
<tr>
<td>EMQAP (AIDB)</td>
<td>Increase the incomes of horticultural crop farmers and exporters incomes and of cassava producers</td>
<td>2007-2011</td>
<td>$28.5 million</td>
</tr>
<tr>
<td>GHPPP (USAID)</td>
<td>Link Ghanaian with distribution networks worldwide by assisting producing in meeting safety, quality and other market standards</td>
<td>2002-2005</td>
<td></td>
</tr>
<tr>
<td>MOAP (GIZ)</td>
<td>Improve the competitiveness of agricultural producers, processors and traders on regional, national and international markets</td>
<td>2004-2011</td>
<td>$22.6 million</td>
</tr>
<tr>
<td>MiDA (MCC)</td>
<td>Increase production and productivity of high value cash and food crops in three zones of Ghana, and enhance the competitiveness of high value cash and food crops in local and international markets</td>
<td>2007-2013</td>
<td>$547 million</td>
</tr>
<tr>
<td>ADVANCE (USAID)</td>
<td>Replaced TIPCEE, no specific information provided</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Ghana Export Horticulture Cluster Strategic Profile Study, 2008
There are on-going attempts to shift Ghana’s agricultural economy’s dependency on few traditional export crops. The shift is towards high value horticultural crops among which the mango export sub-sector is being propped to succeed. A number of initiatives are being carried out by development partners for safe-guarding the horticultural export market.

**Horticulture Exports Industry Initiative**

Ghana Government, through AgSSIP, supported by the World Bank, implemented HEII, which aimed at supporting the growth and development of Ghana’s horticulture Industry. This project has made substantial investments in key areas to address factors influencing the development of Ghanaian horticulture. The main objectives of AgSSIP–HEII were:

- To create a GIS-based DBMS for specific production areas;
- To establish produce pack houses based on mapping analysis of grower distribution in relation to other location infrastructures;
- To survey locations, acreages and plant population of fruit trees (mangoes, citrus, papaya);
- To conduct surveys and map pests and diseases affecting mangoes and other horticultural products.

Despite the obvious impacts and implications on ECOWAS TEN interventions based upon HEII's outputs, no such results have been compiled in this study. Further field work will be required to obtain such capital information.

**Trade and Investment Program for a Competitive Export Economy**

Launched in 2004, USAID/TIPCEE was set to promote economic growth by enhancing productivity and sales of non-traditional agricultural exports and improving the enabling environment for private sector growth. In 2006, TIPCEE focused on improving domestic food crop production and linking it to markets. Regarding mangoes, TIPCEE played a key role on putting Ghana on the map of potentially important suppliers. That project met its initial objective, and mangoes became a novelty on Ghana’s urban markets, and reached the 1,000 ton mark on the EU market for the first time in Ghana’s history. However, farmer incomes plummeted because of low yields. Farmers sold their fruit to local markets, as export markets could not be tapped because of low quality, lack of cold chain facilities, poor managerial skills, inadequate market information and high levels of pest infestations among a host of challenges. Solving the problem was urgent, as the popularity of the crop had induced many smallholders to plant orchards and this production was due to hit the market over the coming years with no export outlet.

TIPCEE laid the groundwork to ensure an upcoming surge in production would find a commercial outlet in urban and export markets (training of farmers on integrated pest management, good agricultural / harvest / post-harvest practices, certification, geolocalization of mango orchards, etc.). Regarding geographical information systems, the technology gave farmers greater visibility to input suppliers, access to credit, the ability to track pest infestation, attracting infrastructure development (bulking points and feeder roads). Among other realizations:

- Facilitated the Global GAP certification of more than 170 mango farmers across six associations, and in partnership with GIZ, expanded certification to the Brong Ahafo Region;
- Assisted ITFC in establishing and disseminating good production practices to farmer organizations, and promoting the adoption of GIS technology to monitoring and trace its production base;
- In partnership with ITFC and the Ghana Standards Board, improved standards of Ghanaian mangoes by sponsoring the creation of “Norms and Standards” posters distributed to mango operators;
- Pioneered shipments to Europe by boat in order to save costs;
- Organized the Ghana Mango Week in 2006 to promote the importance of the product for the Ghanaian economy.

Due to the critical importance of TIPCEE’s intervention on the mango sector, further field work is necessary in order to capitalize on the numerous outputs this USAID funded project has on Ghana’s horticultural industry.

Millennium Development Authority
MiDA is implementing the five-year (2008-2012), $547 million MCC Compact, also known as the Ghana Compact, with the goal of reducing poverty by raising farmer incomes through private sector-led agribusiness development. To this end, the program focuses on increasing the production and productivity of high-value cash and staple food crops in certain areas of Ghana, and is charged with enhancing the competitiveness of Ghana’s export base in traditional agricultural crops. MiDA has taken the initiative to build pack-houses to shore up and strengthen the supply chain of the notable horticultural products. In this direction, MiDA has built pack houses around horticultural zones to ensure that post-harvest losses are minimized – however no exact figures or location indications have been made available in this study. The pack houses serve as transit zones for the products before they are finally processed for exports. Currently, Shed Nine (a multipurpose fruit terminal fitted with a modern cooling system to temporarily house fruits prior to shipment) became operational in October 2009. The facility has the capacity to handle about 2,500 pallets of fresh produce at a time. More recently, MiDA has started building a pack house at Akorley to serve mango producer associations from Yilo Krobo, Manya Krobo, Dangbe East (source: field survey 2011). Aside these positive interventions, MiDA is also engaging in farmer and enterprise training in commercial agriculture including the training of mango farmers, to achieve the following:

- To accelerate the development of commercial skills and capacities among FBOs and their business partners, including entities adding value to the agricultural sector such as processors and marketers.
- To encourage irrigation development with the view to increasing yield
- To improve access to and use of irrigation facilities by FBOs and FBO in order to enhance agricultural production.
- To improve post-harvest handling and value chain services by building pack houses to improve and strengthen the chain of horticultural;
- To build public sector capacity to introduce and monitor compliance with international plant protection standards;
- To augment the supply of, and access to, credit provided by financial institutions operating in the intervention zones. To increase access of seasonal credit to FBOs through commercial and rural banks as well as through non-traditional channels such as input suppliers. To increase
access to medium-term bank credit in order to finance capital goods such as irrigation systems, post-harvest processing equipment and storage facilities.

**The Shed Nine Fruit Terminal**

Located in Tema Harbor and managed by FAGE and Golden Exotics, Shed Nine has become operational in 2009 to serve as a transit point prior to the shipment of fresh horticultural produce to destination market. The facility covers a floor space of 440m², as well as housing a dedicated container-handling and plug-in platform. Altogether, the facility can hold a total of 2,500 pallets at a time. It will provide Ghana’s exporters with the capacity to move more than 375,000 pallets annually, in addition to reefer container capacity, and in temperature-controlled conditions. This is being complemented by individual exporters’ investments in private cooling facilities, which will enable Ghanaian exporters to benefit from a continuous cold chain. Another fruit terminal being considered near Shed Nine, has been sighted in a publication below.

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**Fruit Terminal for Tema**

The port of Tema would soon get a major cold store devoted to the export of fruit. This was disclosed to The Accra Mail in an exclusive interview by Mr. Rien van Beek, General Manager for Special Projects of International Expeditiebedrijf Ebrex B.V. He said Ghana is on the list of countries which the Dutch government would like to help to increase the export of its fruit. The Tema Port has “everything” but lacks the infrastructure for fruit export. A consortium of four companies, including local partners is being put together to get the project going.

The Port Authority of Rotterdam, one of the largest in the world, has expressed an interest in the project. A cold store, Mr. Beek said, “takes the pressure away” because the harvesting of fruit need not be rushed and can be done on a daily basis to await the arrival of vessels. Explaining further, he said, “we cannot do this alone, it is a governmental thing.”

The cold storage for meat, fish and other animal products cannot be used for fruit, so though the Tema Harbour has many cold stores, none of them would be suitable for the growing Ghanaian fruit export. Mr. Beek’s visit was to avail him the opportunity of talking to all the players in the industry and so he met with a lot of the Ghanaian fruit exporters “who see the advantage of this project”. He disclosed further that officials of the Dutch government have already been in touch with their Ghanaian counterparts and both the ministries of agriculture and trade are “aware of what we are doing and they have embraced it.”

The project has left the drawing board stage and at the moment, they are already talking of the acquisition of land near Shed 9 at the harbour to begin construction. The Dutch government will pay 1.5 million guilders (US$700,000) towards the realisation of the Project, EBREX will contribute US$250,000. Other partners will contribute a total of US$550,000.

Mr. Beek is so confident about the viability of the project that he told The Accra Mail, “We think, we will be breaking even in 3 years.” He regards the availability of such a cold store as very essential “when you like to meet European standards, because a cold store will prolong your shelf life.”

Source: FAGE (Oct. 29, 2011)

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**1.3. Evaluation of the mango demand**

Despite the increasing popularity of mangoes in various parts of the world, the most immediate opportunities for Ghanaian exporters of fresh mangoes remain within the European Union and ECOWAS countries. As one can guess, historical ties and trade patterns with Europe, the existence of direct logistical access and a strong Ghanaian community in the UK and other parts of the continent, all play a significant role in connecting Ghana’s products to the EU. At the same time, information related to the EU market is more easily available than data for West African countries. Therefore, the information presented below on Europe’s mango demand shall not overshadow the market potentialities offered to Ghanaian operators within West Africa. Overall, Ghanaian mango exports are relatively minor in terms of volumes when compared to other West African suppliers.
However, when one takes into account the added value by processors such as Blue Skies the picture can be quite different, as Ghana is the main if not the only supplier of pre-packaged ready-to-eat mango slices – an important source of value addition on a rapidly increasing EU market.

1.3.1 Mango market size and market share

Global mango demand: World imports of mangoes stood at 1,37 million tonnes in 2010, increasing by more than 50% between 2006 and 2010. The USA has been the most important mango importer worldwide, followed by China (including Hong Kong) and the Netherlands. It is important to note that close to 90% of Dutch imports are re-exported to Northern European destinations (Germany being the most notable market). The table below shows the trend in the global demand for mangoes.

World mango imports (in tons)

<table>
<thead>
<tr>
<th>Partners</th>
<th>2006</th>
<th>2007</th>
<th>Period 2008</th>
<th>2009</th>
<th>2010</th>
<th>Growth Annual</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>298,088</td>
<td>303,568</td>
<td>172,843</td>
<td>295,653</td>
<td>332,108</td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>42,422</td>
<td>66,217</td>
<td>62,417</td>
<td>126,350</td>
<td>124,205</td>
<td>31%</td>
<td>193%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>92,817</td>
<td>92,760</td>
<td>109,555</td>
<td>65,491</td>
<td>120,310</td>
<td>7%</td>
<td>30%</td>
</tr>
<tr>
<td>China</td>
<td>23,763</td>
<td>42,293</td>
<td>61,969</td>
<td>124,997</td>
<td>115,136</td>
<td>48%</td>
<td>385%</td>
</tr>
<tr>
<td>United Arab Emirate</td>
<td>n/d</td>
<td>66,255</td>
<td>56,150</td>
<td>69,389</td>
<td>75,330</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>48,330</td>
<td>45,660</td>
<td>35,643</td>
<td>38,583</td>
<td>58,250</td>
<td>5%</td>
<td>21%</td>
</tr>
<tr>
<td>Germany</td>
<td>38,709</td>
<td>46,761</td>
<td>51,866</td>
<td>40,660</td>
<td>48,451</td>
<td>6%</td>
<td>25%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>54,676</td>
<td>57,307</td>
<td>55,730</td>
<td>48,111</td>
<td>47,578</td>
<td>-3%</td>
<td>-13%</td>
</tr>
<tr>
<td>Canada</td>
<td>42,192</td>
<td>46,736</td>
<td>42,459</td>
<td>41,544</td>
<td>46,648</td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>23,521</td>
<td>23,433</td>
<td>29,767</td>
<td>40,676</td>
<td>42,015</td>
<td>16%</td>
<td>79%</td>
</tr>
<tr>
<td>Others</td>
<td>233,402</td>
<td>250,605</td>
<td>296,415</td>
<td>304,631</td>
<td>360,823</td>
<td>12%</td>
<td>55%</td>
</tr>
<tr>
<td>Total</td>
<td>897,920</td>
<td>1,041,595</td>
<td>974,814</td>
<td>1,196,085</td>
<td>1,370,854</td>
<td>11%</td>
<td>53%</td>
</tr>
</tbody>
</table>

More than 75% of mango shipments to the USA are provided by Mexico, its southern neighbour, and exports from African countries are non-existent due to obvious logistical challenges related to distances but also phytosanitary issues (hot water treatment is required to repel fruit flies). Even if the Chinese market for imported mangoes has been growing quite rapidly (especially in Hong Kong), Ghana and other West African mango exporters should be aware that accessing such remote market can prove very difficult, besides the fact that most of Asian demand is supplied by the Philippines, Mexico and an increased Peruvian presence.

Although the figures provided by the ITC differ from those obtained with Eurostat, the Netherlands is the main gateway in terms of accessing the EU market, with the port of Rotterdam playing a crucial role in unloading mango shipments and re-exporting them to northern European destinations such as Germany and France. As regards to mango demand in the United Arab Emirates, South Asian suppliers (Pakistan and India) are the traditional mango caterers for Dubai and the Persian Gulf region due to their proximity and historical links. Air links between major West African cities and Dubai offer a niche market for ECOWAS mango suppliers; however it should be well understood that only top quality competitive mangoes could eventually fetch some market shares.

Source: ITC TradeMap, processed by Consultant
Global mango supply situation:
Mexico and India were the leading exporters of fresh mangoes on a global scale, the first origin being located just next to the United States while the South Asian supplier exports 50 to 60% of its products to the Persian Gulf countries. The numbers provided by ITC and extracted from the UN Comtrade database should only be used as a general indication.
Compared to world figures, ECOWAS mango exports represented less than 3% of global supplies in 2010. According to 2010 figures, Ghana ranked 91 in terms of mango shipments. However, as mentioned earlier, the figures taken from ITC Comtrade should be taken as a general indication, and more precise figures can be obtained from Eurostat or Ghanaian customs export statistics. More representative statistics on actual exports from Ghana can be found the sections below.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Partners</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Growth</th>
<th>Annual</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mexico</td>
<td>232,376</td>
<td>235,995</td>
<td>226,083</td>
<td>232,643</td>
<td>275,366</td>
<td>4%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>253,151</td>
<td>239,751</td>
<td>281,669</td>
<td>267,617</td>
<td>182,974</td>
<td>-8%</td>
<td>-28%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Thailand</td>
<td>29,777</td>
<td>61,026</td>
<td>61,608</td>
<td>144,079</td>
<td>144,566</td>
<td>48%</td>
<td>385%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>115,724</td>
<td>116,271</td>
<td>133,944</td>
<td>110,355</td>
<td>124,380</td>
<td>2%</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hong Kong</td>
<td>19,988</td>
<td>41,589</td>
<td>42,853</td>
<td>104,441</td>
<td>99,386</td>
<td>49%</td>
<td>397%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Peru</td>
<td>82,685</td>
<td>82,675</td>
<td>82,696</td>
<td>69,191</td>
<td>96,942</td>
<td>4%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Mali</td>
<td>8,554</td>
<td>6,586</td>
<td>8,056</td>
<td>n/d</td>
<td>13,908</td>
<td>13%</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Côte d'Ivoire</td>
<td>15,374</td>
<td>16,877</td>
<td>12,949</td>
<td>13,763</td>
<td>12,975</td>
<td>-4%</td>
<td>-16%</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Burkina Faso</td>
<td>n/d</td>
<td>8,101</td>
<td>6,458</td>
<td>5,355</td>
<td>6,915</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Senegal</td>
<td>7,051</td>
<td>8,865</td>
<td>7,164</td>
<td>6,650</td>
<td>4,165</td>
<td>-12%</td>
<td>-41%</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>Ghana</td>
<td>156</td>
<td>711</td>
<td>779</td>
<td>332</td>
<td>8</td>
<td>-52%</td>
<td>-95%</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Others</strong></td>
<td>375,744</td>
<td>440,710</td>
<td>441,405</td>
<td>490,058</td>
<td>488,356</td>
<td>7%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>1,140,580</td>
<td>1,259,157</td>
<td>1,305,664</td>
<td>1,444,484</td>
<td>1,449,941</td>
<td>6%</td>
<td>27%</td>
<td></td>
</tr>
</tbody>
</table>

Source: ITC TradeMap, processed by Consultant

EU-27 mango demand: Between 2001 and 2011, Europe imports have grown from 136,000 to more than 225,000 tons, representing a 65% leap that denotes a continuous growing popularity of the product.

Source: Eurostat, processed by Consultant
Globally, EU mangoes imports continue to be dominated by Brazil and Peru, accounting together close to 70% of total shipments. Peru has significantly increased its presence over the last few years, and 2011 represented a record-high for the origin – although it is predicted that 2012 will see less arrivals from this origin due to production issues. In terms of supplier importance, Ghanaian mangoes were ranked 25th in 2011 in terms of volumes, far behind Cote d'Ivoire (5th position) and Senegal (9th).

### EU-27 mango imports between 2006 and 2011 (in tonnes)

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Partners</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Annual</th>
<th>Total</th>
<th>Jan to Nov 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brazil</td>
<td>85,117</td>
<td>83,025</td>
<td>96,870</td>
<td>80,821</td>
<td>92,256</td>
<td>2%</td>
<td>8%</td>
<td>73,709</td>
</tr>
<tr>
<td>2</td>
<td>Peru</td>
<td>41,040</td>
<td>36,854</td>
<td>50,756</td>
<td>36,270</td>
<td>60,386</td>
<td>10%</td>
<td>47%</td>
<td>68,232</td>
</tr>
<tr>
<td>3</td>
<td>Israel</td>
<td>11,353</td>
<td>15,018</td>
<td>12,743</td>
<td>12,998</td>
<td>10,700</td>
<td>-1%</td>
<td>-6%</td>
<td>13,997</td>
</tr>
<tr>
<td>4</td>
<td>Pakistan</td>
<td>10,120</td>
<td>13,225</td>
<td>12,942</td>
<td>12,916</td>
<td>10,596</td>
<td>1%</td>
<td>5%</td>
<td>11,738</td>
</tr>
<tr>
<td>5</td>
<td>Cote d'Ivoire</td>
<td>14,433</td>
<td>14,706</td>
<td>11,249</td>
<td>11,701</td>
<td>11,323</td>
<td>-6%</td>
<td>-22%</td>
<td>9,768</td>
</tr>
<tr>
<td>6</td>
<td>USA</td>
<td>5,971</td>
<td>7,404</td>
<td>7,516</td>
<td>5,353</td>
<td>4,744</td>
<td>-6%</td>
<td>-21%</td>
<td>8,475</td>
</tr>
<tr>
<td>7</td>
<td>Costa Rica</td>
<td>7,549</td>
<td>4,664</td>
<td>5,360</td>
<td>5,685</td>
<td>3,429</td>
<td>-18%</td>
<td>-55%</td>
<td>6,873</td>
</tr>
<tr>
<td>8</td>
<td>Dominican Rep.</td>
<td>1,618</td>
<td>2,767</td>
<td>4,307</td>
<td>4,186</td>
<td>4,303</td>
<td>28%</td>
<td>166%</td>
<td>6,345</td>
</tr>
<tr>
<td>9</td>
<td>Senegal</td>
<td>6,194</td>
<td>4,702</td>
<td>6,034</td>
<td>6,240</td>
<td>2,758</td>
<td>-18%</td>
<td>-55%</td>
<td>5,338</td>
</tr>
<tr>
<td>10</td>
<td>Mexico</td>
<td>1,765</td>
<td>2,680</td>
<td>1,674</td>
<td>1,596</td>
<td>4,938</td>
<td>29%</td>
<td>180%</td>
<td>5,254</td>
</tr>
<tr>
<td>12</td>
<td>Burkina Faso</td>
<td>2,153</td>
<td>3,191</td>
<td>2,406</td>
<td>1,988</td>
<td>3,302</td>
<td>11%</td>
<td>53%</td>
<td>2,081</td>
</tr>
<tr>
<td>13</td>
<td>Mali</td>
<td>3,477</td>
<td>4,317</td>
<td>4,902</td>
<td>3,480</td>
<td>3,672</td>
<td>1%</td>
<td>6%</td>
<td>1,781</td>
</tr>
<tr>
<td>14</td>
<td>Gambia</td>
<td>785</td>
<td>857</td>
<td>696</td>
<td>1,246</td>
<td>776</td>
<td>0%</td>
<td>-1%</td>
<td>1,503</td>
</tr>
<tr>
<td>25</td>
<td>Ghana</td>
<td>295</td>
<td>983</td>
<td>1,097</td>
<td>880</td>
<td>428</td>
<td>10%</td>
<td>45%</td>
<td>197</td>
</tr>
<tr>
<td>31</td>
<td>Guinea</td>
<td>346</td>
<td>469</td>
<td>544</td>
<td>388</td>
<td>842</td>
<td>25%</td>
<td>144%</td>
<td>93</td>
</tr>
<tr>
<td>Others</td>
<td>19,149</td>
<td>16,539</td>
<td>11,888</td>
<td>12,788</td>
<td>10,539</td>
<td>10,513</td>
<td>-14%</td>
<td>-45%</td>
<td>10,513</td>
</tr>
<tr>
<td>Total</td>
<td>211,365</td>
<td>211,401</td>
<td>230,982</td>
<td>198,717</td>
<td>224,991</td>
<td>2%</td>
<td>6%</td>
<td>225,896</td>
<td></td>
</tr>
</tbody>
</table>

Source: Eurostat, processed by Consultant

The EU-27 demand for mangoes has grown by 2% per year between 2006 and 2010, imports fluctuating between 200 000 and 230 000 tonnes. Shipments for the January-November period in 2011 amounted to more than 225,000 tons, and soon-to-be available figures for December should show an all time record for mango imports in the European Union. Brazil and Peru are the main mango suppliers, accounting for more than 65% of imported volumes in 2010.

Swiss mango imports: In 2010, Switzerland imported close to 9,500 tons of fresh mangoes, shipments growing by 14% annually and being catered by importers located in Netherlands, Germany and France. The European re-exporters and operators represent more than 50% of all products being imported in the country, however it can be assumed that between 60 and 70% of the transited mangoes are coming from Brazil and Peru.

---

4 Switzerland is not a member state of the European Union and administers its own customs. However, Eurostat provides trade data for the country.
Ghana's direct shipments to Switzerland amounted to 96 tons in 2010, and reached almost 200 tons for the first eleven months of 2011. Côte d'Ivoire and Senegal are the two other suppliers of the Swiss market. HPW AG, a Swiss company marketing Fair Trade and organic mangoes that has a partnership with Bomarts Farms, is responsible for most of the sales.

**Lebanon mango imports**

<table>
<thead>
<tr>
<th>Origins</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Annual</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>0</td>
<td>181</td>
<td>199</td>
<td>285</td>
<td>222</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ghana</td>
<td>140</td>
<td>158</td>
<td>128</td>
<td>144</td>
<td>185</td>
<td>7%</td>
<td>32%</td>
</tr>
<tr>
<td>Brazil</td>
<td>85</td>
<td>66</td>
<td>77</td>
<td>6</td>
<td>111</td>
<td>7%</td>
<td>31%</td>
</tr>
<tr>
<td>Spain</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>84</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Yemen</td>
<td>0</td>
<td>0</td>
<td>144</td>
<td>170</td>
<td>74</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>158</td>
<td>152</td>
<td>167</td>
<td>237</td>
<td>142</td>
<td>-3%</td>
<td>-10%</td>
</tr>
<tr>
<td>Total</td>
<td>383</td>
<td>558</td>
<td>722</td>
<td>842</td>
<td>818</td>
<td>21%</td>
<td>114%</td>
</tr>
</tbody>
</table>

Lebanon is a relatively important destination for Ghanaian mangoes, shipments growing by 7% annually and presenting 820 tons in 2010. Industry sources mention that the majority of mangoes are sent by a single operator within Ghana, and that the product is being processed in Lebanon. However, no clear assessment has been conducted in order to understand the Lebanese consumers’ tastes and preferences on that specific product. Further field work is required in order to better understand how can Ghana increase its presence in that market, and explore opportunities to use Lebanon as a market diversification platform (Jordan for instance).
### 1.3.2 Traded mango volumes from Ghana for the last 5 years

As illustrated in the graphic below, EU-27 imports (excluding Switzerland) of Ghanaian mangoes are on a steep decline: after passing the 1,000 ton mark in 2008, shipments have fallen to 200 tons for the first eleven month of 2011. Climatic and production factors in Ghana seem to be behind the drop in shipments. However other factors such as aging orchards and fruit fly issues seem to be hindering the origin’s competitiveness against other world suppliers.

![EU-27 imports from Ghana since 2001](image)

*Source: Eurostat, processed by Consultant*

Another important hypothesis is the possible disorganization of producer organizations, since the TIPCEE project ended in 2009. It can be assumed that year, shipments of uncut mangoes have come to slowly disappear, and be replaced by precut and mango juice products supplied by Blue Skies.

### EU-27 mango imports from Ghana (in tons)

<table>
<thead>
<tr>
<th>Reporter</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011*</th>
<th>Annual</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>145</td>
<td>387</td>
<td>169</td>
<td>107</td>
<td>82</td>
<td>-13%</td>
<td>-44%</td>
</tr>
<tr>
<td>Germany</td>
<td>26</td>
<td>25</td>
<td>44</td>
<td>29</td>
<td>45</td>
<td>15%</td>
<td>73%</td>
</tr>
<tr>
<td>Italy</td>
<td>9</td>
<td>61</td>
<td>3</td>
<td>16</td>
<td>31</td>
<td>38%</td>
<td>260%</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>61</td>
<td>48</td>
<td>45</td>
<td>17</td>
<td>23</td>
<td>-22%</td>
<td>-62%</td>
</tr>
<tr>
<td>Belgium</td>
<td>324</td>
<td>119</td>
<td>161</td>
<td>6</td>
<td>13</td>
<td>-55%</td>
<td>-96%</td>
</tr>
<tr>
<td>France</td>
<td>68</td>
<td>117</td>
<td>20</td>
<td>5</td>
<td>2</td>
<td>-59%</td>
<td>-97%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>348</td>
<td>339</td>
<td>437</td>
<td>247</td>
<td>0</td>
<td>-100%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>-100%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>983</strong></td>
<td><strong>1097</strong></td>
<td><strong>880</strong></td>
<td><strong>428</strong></td>
<td><strong>196</strong></td>
<td><strong>-33%</strong></td>
<td><strong>-80%</strong></td>
</tr>
</tbody>
</table>

*Source: Eurostat, processed by Consultant*

In terms of quantities, European imports of Ghanaian mangoes have fallen by more than 80% between 2007 and 2011, from 983 to less than 200 tons (see figure below). Most significantly, Eurostat data show that Dutch imports from Ghana have completely stopped in 2011, which used to
average 350 tons before that year. The UK remained Ghana's most significant partners, although quantities are insignificant when compared to other world and regional suppliers.

1.3.3 Mango pricing

**Prices in Europe:** When considering prices, it is not only crucial to understand what affects the value paid by clients for an average mango produced in Ghana (degree of market saturation, perceived quality, level of trust between actors, etc.), but also how profitable the export operation is for the Ghanaian supplier. The majority of mangoes in Europe are bought in supermarkets, and the very large quantities necessary to offer low prices to European consumers put tremendous pressure on mango suppliers worldwide. This downward pressure set by retailers is especially strong on the relatively modest suppliers in Ghana. In general, prices will generally increase before and around Easter and Christmas / New Year periods, and become less attractive when European summer fruits are made available.

According to the CBI, average mango import prices in Europe have increased on average by 1.2% per year between 2005 and 2010 to reach €1.19 / kg (freight on truck Holland). One Ghanaian exporter mentioned that his mangoes shipped by boat could fetch between €3 and €5.2 per 4kg crate at the wholesale level in 2011, count, weight, size, attractiveness and quality being critical factors influencing the final value.

On a different scale, Fairtrade certification provides minimum prices and premiums for mangoes that respect a set of criteria aiming at promoting « sustainable development and to reduce poverty through fairer trade » in developing and emerging countries. Although the goal and objectives of Fairtrade are for the best interest of small producers and actors involved in harvesting operations, the European market is still a niche one representing less than 1% of total demand according to some importers. The table below shows the minimum prices and premiums offered to certified suppliers in Ghana and the rest of West Africa (note that prices are higher for Ghanaian mangoes than the other regional origins).

<table>
<thead>
<tr>
<th>Origin</th>
<th>Mango type</th>
<th>Min. price</th>
<th>Premium</th>
<th>Price level*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana</td>
<td>Organic</td>
<td>0.56</td>
<td>0.08</td>
<td>FOB</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>0.56</td>
<td>0.08</td>
<td>FOB</td>
</tr>
<tr>
<td></td>
<td>Organic</td>
<td>0.27</td>
<td>0.08</td>
<td>EXW</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>0.25</td>
<td>0.08</td>
<td>EXW</td>
</tr>
<tr>
<td>West Africa</td>
<td>Organic</td>
<td>0.19</td>
<td>0.08</td>
<td>EXW</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>0.17</td>
<td>0.08</td>
<td>EXW</td>
</tr>
</tbody>
</table>

* FOB : Free on Board; EXW : Ex Works

**Source:** Fairtrade International, processed by the Consultant

* Mango prices in Ghana: In the local market however, one kilogramme of mangoes goes for between GHC 0.50 to GHC 1.0 depending on the outlet. According to the CEO of FMSL, mangoes meant for the largest supermarket in Ghana (Shoprite) are priced between GHC 0.80 to GHC 1.50 (about US$1 based on current exchange rate).

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5 Fairtrade International, [www.fairtrade.net](http://www.fairtrade.net)
1.3.4 Local and regional markets for fresh mangoes

Supplying distant export markets can prove very challenging for Ghanaian exporters of fresh produce. The difficulty associated with accessing those markets brings to the fore the role of local and regional markets serving as alternative strategic market niches for mango, and access requirements are relatively less stringent at the national level. Supplying fresh mangoes require operators to identify specific windows of opportunities in West Africa in order to fulfill demand where Ghana has a comparative (and competitive) advantage. This would translate into shipping mangoes at times of the year when no other origin is present, or when Ghana would have a price / quality advantage compared to foreign / local competitors. Also, it is important to remember that Category I mangoes destined for consumption automatically fetches higher prices than the ones destined for processing.

In this context, it is noteworthy to look at mango import figures for Ghana. In 2010, Ghana has imported more than 3,000 tons of fresh mangoes, and one third was being supplied by Brazil. The main reason associated with such numbers lies behind the fact that juice processors in Ghana, such as Blue Skies, need to have a constant supply of fresh products (including mangoes) in order to meet their year-round demand. At present, mango production in Ghana is limited to certain months of the year, and unless the production window is increased, supplying national processors will continue to prove challenging. No figures have been made available on mango volumes from Ghana being effectively used by juice processors.

<table>
<thead>
<tr>
<th>Origines</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Annual</th>
<th>Total</th>
<th>2011*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkina Faso</td>
<td>-</td>
<td>34</td>
<td>-</td>
<td>24</td>
<td>421</td>
<td>-</td>
<td>-</td>
<td>955</td>
</tr>
<tr>
<td>Brazil</td>
<td>693</td>
<td>331</td>
<td>148</td>
<td>8</td>
<td>1,094</td>
<td>12%</td>
<td>58%</td>
<td>770</td>
</tr>
<tr>
<td>Senegal</td>
<td>465</td>
<td>2,746</td>
<td>356</td>
<td>88</td>
<td>701</td>
<td>11%</td>
<td>51%</td>
<td>459</td>
</tr>
<tr>
<td>South Africa</td>
<td>187</td>
<td>800</td>
<td>592</td>
<td>327</td>
<td>219</td>
<td>4%</td>
<td>17%</td>
<td>280</td>
</tr>
<tr>
<td>Côte d'Ivoire</td>
<td>658</td>
<td>441</td>
<td>311</td>
<td>400</td>
<td>545</td>
<td>-5%</td>
<td>-17%</td>
<td>n/d</td>
</tr>
<tr>
<td>Others</td>
<td>207</td>
<td>43</td>
<td>-</td>
<td>11</td>
<td>50</td>
<td>-30%</td>
<td>-76%</td>
<td>n/d</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,210</td>
<td>4,395</td>
<td>1,407</td>
<td>858</td>
<td>3,030</td>
<td>8%</td>
<td>37%</td>
<td>2,464</td>
</tr>
</tbody>
</table>

* Partial figures

Source: ITC TradeMap, processed by Consultant

At $80 million, the value of the local market for fruits and vegetables compares quite favorably with earnings from exports which stood at €80 million in 2008. However, prices in the local market tend to be lower than in export markets. When so-called market ladies buy “residual fruit” from farmers on the spot, the offer price is often fairly low. With mangoes, for example, a kilo sold by a farmer for export is priced around 30 pesewas, whereas the “residual fruit” sold to the local market might fetch 10 pesewas. Anecdotal evidence suggests, however, that but for these markets many smallholder farmers and small-scale exporters would perhaps have dropped out completely of the fresh produce industry in Ghana.
1.3.4 Market access requirements

The various EU member states follow the legislation set by Brussels in terms of mango marketing. Each European country is committed to the Codex Alimentarius, more specifically to the Mango Standards that define a set of provisions in terms of quality, sizing, tolerances, presentation, marking or labeling, contaminants and hygiene. Ghanaian mango suppliers are obliged to meet those minimum requirements, Class I products being destined for direct consumption while Class II mangoes are used for processing.

At the same time, Global GAP, a private standard set by major European retail chains, is nowadays a minimum for mango exporters when supplying large retail chains in Europe. Certification of producers/exporters (Option 1) or grouping of small producers (Option 2) have made significant inroads in Ghana, however the main challenge lies within the sustainability of such important investments committed by private operators.

The fruits should be devoid of chemical traits, should be firm with bright colours. Mangoes as part of the edible fruits family undergo strict sanitary inspection prior to shipment to maintain credibility in the European Market. PPRSD, Food and Drugs Board as well as the Ghana Standards Authority ensure that mango exports meet the required quality standards before they are exported. To avoid environmental degradation, the Soil Research Institute and MoFA as well as GEPA collaborate with farmers to adhere to best environmental practices. There are equally strict regulations regarding type of chemical application on the farm. The EPA, with the mandate to protect both flora and fauna in the ecosystem, ensures that farmers adhere to best environmental practices.

1.3.5 Market promotion activity, participation in trade fairs

Participation in major international trade fairs such as Fruit Logistica in Germany, SIAL in France, Anuga in Germany is strongly encouraged and supported by GEPA and other national institutional and private partners such as FAGE and SPEG. An example of support provided by GEPA is the Export School, its flagship program tutoring on export market fundamentals and requirements for specific market destinations. Another important feature of GEPA’s market promotion activity is the payment of freight charges of exporters’ exhibits, and the procurement of exhibit stands. At the moment, no activity is completely dedicated to mango promotion.
1.4. Supply potential assessment of the value chain to meet demand

Until mango cultivation became a commercial venture, mangoes produced in the country were largely consumed locally. The introduction of export grade mangoes raised the level of awareness with respect to the economic viability and positive health implications of mangoes. It is estimated that of the total mangoes produced in the country, export grade constitutes about 10%, whilst 25% is lost due to post-harvest methods. A smaller proportion is dried whilst the rest goes into mango juice processing and for the local fresh market.

Mango in Ghana has some unique comparative advantages over cocoa, palm oil and citrus production. Statistics show that citrus has a break-even point of 7 years, cocoa 8 and palm oil 10, while mango has a break-even point of 5 years. Acknowledging that surfaces and production figures involved can greatly vary, in terms of export earnings, currently yield per acre for cocoa stood more than 1,000 Ghana Cedis; citrus, 1,500 to 2,500 Ghana Cedis but mango ranges between 2,500 and 4,000 Cedis.

1.4.1 Production volumes and availability

According to data compiled by TIPCEE and GIZ in 2009, mango production is estimated to be at 40,000 tonnes per annum and spread over 17,000 hectares\(^6\), although mango trees can be found all over Ghana, commercial production is mainly found in two distinctive agro-ecological zones: Northern Ghana around Tamale and Southern Ghana (Greater Accra, Eastern and Volta Regions). Half of the production (close to 20,000 tonnes) is located within the Eastern Region on more than 5,200 hectares, while Brong-Ahafo and Greater Accra produces respectively 18% and 16% of national mango outputs. Production conditions in Northern Ghana are similar to those in the major mango production zone of Sikasso in Mali, Korhogo in Cote d'Ivoire and Bobo Dioulasso in Burkina Faso, with a harvest season running from March (for early varieties) to June (late varieties). Production in Ghana used to lag far behind that of neighbouring countries, but in 2000 the ITFC installed a nucleus plantation and started an outgrower scheme. Despite the fact that ITFC is certified organic and has made some debut in the UK and South African markets, some production difficulties are hindering its export activities.

Ghana’s unique climate provides two seasons, a short one December to February-complement the traditional April to July production period. Furthermore, Ghana grows a number of mango varieties, however the vast majority is made of Keitt (approx. 80% or 24,000 t.), Kent (10% or about 3,000 t.), the other fourteen varieties (Palmer, Tommy Atkins, Zill, etc.) amount to very low quantities. Region wise, Greater Accra, Volta, Eastern, Brong Ahafo and the Northern regions of Ghana are noted for mango production as depicted by the following map. The map also gives specific mango growing areas and the tonnage produced in 2010.

\(^6\) See Annex 2
There are also seasonal variations in the supply of mango. Whilst volumes peak between June and July, lean periods hover from the end of April / beginning of May and then August and early September. The following diagram depicts the production calendar in Ghana.

No data regarding the availability Global GAP certified production areas have been identified. Further field work is needed, as substantial efforts were made by the TIPCEE project to certify producers under Options 1 and 2.
### 1.5. SWOT analysis of the fresh mango value chain in Ghana

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Seasonal advantages for mango cultivation especially in the upper middle belt and the northern regions of Ghana</td>
<td>• Farmer organizations seem to have been disorganized since the closure of TIPCEE with regards to mango production / post-harvest technical assistance</td>
</tr>
<tr>
<td>• DIF to cultivate about 8,000 hectares of mango in the northern part of the country will eventually increase mango availability</td>
<td>• Actors have partial knowledge of production potential, available varieties, post-harvest practices</td>
</tr>
<tr>
<td>• Past and present involvement of external partners such as the USAID/TIPCEE project (now ADVANCE), GIZ, ADRA, among other technical and financial partners have improved significantly the quality of mango production, harvesting, processing</td>
<td>• Actors have partial knowledge of market access requirements, demand trends and international competition</td>
</tr>
<tr>
<td>• Existence of a National Fruit Fly Committee that will address the <em>bactrocera invadens</em> invasion issue</td>
<td>• Poor post-harvest practices in the area of fruit handling, transportation, among others lower the quality of fruits produced as well as contributing to post harvest loses</td>
</tr>
<tr>
<td>• The shipping route from Ghana to Europe is shorter than it is from South America to Europe translating into lower cost of exports</td>
<td>• Difficulty of operators to maintain GLOBALGAP certification due to the associated costs</td>
</tr>
<tr>
<td>• Important investments have been made in the development of mango plantings</td>
<td>• Challenges in supplying excess production to mango processors</td>
</tr>
<tr>
<td>• Cold stores and pack houses have been built over the years to support the pineapple export industry, benefiting the mango value chain</td>
<td>• Mango exporters have difficulties obtaining resources to finance export seasons due to the absence of collaterals and others reasons</td>
</tr>
<tr>
<td>• Measures against anthracnose and stone weevil are showing signs of success (to be verified)</td>
<td>• Pesticide treatments and application methods are not made adequately – still a long way for effective integrated plant protection approach</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• EU mango imports are still growing, however supplies are dominated by Brazil and Peru – and West Africa as a whole exports on average 30,000 tons per year. Opportunities for organic mangoes should benefit operators like ITC near Tamale</td>
<td>• Farmer organizations seem to be struggling in supplying quality and quantity to market intermediaries which is penalizing the country’s capacity to cater foreign markets</td>
</tr>
<tr>
<td>• Mango and fruit processors in Ghana (Sunripe, Ebenut and Blueskies) are always on the lookout of mangoes for processing purposes</td>
<td>• Various diseases (anthracnose, powdery mildew, alternaria, stem-end rot) and pests (fruit fly, mealybug, termites, mango bugs, etc.) are major concerns and have a direct economic impact on the various operators, despite some success in controlling diseases</td>
</tr>
<tr>
<td>• Urban consumers in West Africa are becoming richer and more conscious of healthy living : Accra represent an immediate opportunity compared to foreign markets.</td>
<td>• Power: distribution network is clearly improving but on-farm power supplies are still reported to be difficult and expensive.</td>
</tr>
<tr>
<td>• Despite the Middle East being a new opportunity due to an important mango market (UAE and Saudi Arabia represent together about 130 000 – 150 000 MT), most of the product is supplied by Pakistan and India, leaving little room for Ghana due mainly to geographical distance. However, the direct flight between Accra and Dubai can possibly offer a niche market for superior air freighted mangoes.</td>
<td></td>
</tr>
</tbody>
</table>
1.6. Conclusion and recommendations

Despite various initiatives encouraging the commercial production of mangoes in Ghana and their compliance with market requirements in Europe, mango shipments have significantly gone down since 2008. On the other side, fresh cut mangoes seems to have a brighter future, as illustrated by the performance of some Ghanaian players like Bomarts and Blue Skies on the Swiss and UK market. Exporting whole mangoes in 4kg or 6kg crates and shipping pre-cut fruits are two distinct things, each product having its own benefits and challenges in terms of production capacity, technology and financial requirements.

The outgrower scheme embarked upon by entities such as the ITFC and EDIF, which remains one of the promising programmes in the Ghanaian mango industry despite its challenges, should be strengthened and encouraged by all stakeholders, including ECOWA TEN. One of the possible roles ECOWAS TEN could play is the capitalization of technical and commercial information related to mango production and proposing mango industry wide technical tools in order to assist operators in Ghana become more competitive.

One of the major issues faced by the mango industry in Ghana or in West Africa is the fruit fly, that can be only tackled at the regional level. ECOWAS TEN should collaborate with ongoing efforts made by the ECOWAS Commission and other key regional / international actors involved on that problematic (EU funded EDES initiative lead by COLEACP\(^7\)). Another challenge faced by the mango industry in ECOWAS is related to financial resource mobilization and the high capital cost. A regional approach to lessening this approach should be embarked upon by the ECOWAS Commission. The ECOWAS-TEN, in this direction can link up with regional banks such as the AFREXIM Bank and ECOBANK, to facilitate credit delivery to producers and exporters. Such producers and exporters can be contacted through the private sector mapping being undertaken by the TEN.

1. Encouraging innovation amongst the actors involved in supplying export markets will prove a crucial element for the industry wide solutions to remove bottlenecks affecting the Ghanaian mango competitiveness should identified. A possible ECOWAS TEN intervention could be the creation of a Mango Competitiveness Fund, which would be regional in scope but that will take into account national specificities of the mango industries.

2. Recent government efforts to revamp the sector should be supported by ECOWAS-TEN, who could offer training in the area of marketing and management to outgrowers. It is believed that when the projects come into fruition, the outgrower scheme will be revitalized for employment creation and will also go a long way to address the supply side constraints affecting the sector.

3. Having identified both the Maghreb Region and the Middle East as potential market niches, ECOWAS TEN could play a key role in sharing missing market data and access information through a dedicated mailing list amongst interested regional suppliers.

4. The National Traceability System which is sponsored by UNIDO, hosted by GEPA and implemented by various agencies should be supported by the ECOWAS Commission in the area of finance and technical support so as to improve quality and quantity of exports.

\(^7\) Website of EDES: [http://edes.coleACP.org/en](http://edes.coleACP.org/en)
5. Encourage activities revolving around mangoes, such as the Mango Week Ghana that had been organized by TIPCEE in 2006\(^8\), and that could be coordinated by ECOWAS-TEN.

6. ECOWAS-TEN, strong of its collaboration with EMBRAPA (Brazilian Agricultural Research Institute), should encourage technical support between that organization and Ghanaian mango stakeholders (research, mango development and promotion, packaging, etc.). EMBRAPA's African office is located in Accra.

\(^8\)“Ghana to host first Mango Week” (March 2006), [http://allafrica.com/stories/200603090517.html](http://allafrica.com/stories/200603090517.html)
2 THE VALUE CHAIN OF PROCESSED MANGO PRODUCTS

The main considered product in this section will be mango juice. Factors such as sanitary and phytosanitary requirements, packaging challenges, investment requirements involved in setting up processing plants or erroneous market information, have largely contributed to the low level of operators in the processing segment of the value chain in Ghana. The processing segment of the chain largely depends upon a mango sector that should meet its requirements in terms of organoleptic quality, quantity and availability (to avoid processing interruptions). For instance, Blue Skies processes substantial amounts of Kent mangoes coming all the way from Senegal (and even Brazil), even though the main reason is due to origin’s late start (June - September) that allows the company a steady supply.

2.1 Actors involved in juice processing

Mango juice processing is not a strong feature of the fruit processing establishments in Ghana. Pineapple, the leading horticultural product in terms of both production and exports has been at the forefront in terms of juice production. More so, most of the important operators produce juice varieties with the view to diversifying their operations. There are a number of actors along the chain of mango juice processing, including juice processors, mango suppliers (producers/farmers/traders), input suppliers (packaging makers, logistical service providers) and other public and private support structures (Association of Ghana Industries, Food and Drugs Board, Ghana Standards Board, Environmental protection Agency). Due to time constraints, only a few of the various actors could be assessed.

2.1.1 Mango producers

For a mango juice processing company to be a going-concern, it is imperative that a strong supply base is continuously guaranteed. It is against this backdrop that processors have strong linkages with mango producers and exporters. Based on the interviews conducted, most of the mangoes are bought from producers at a predetermined price of about GHc 770 per ton in the year 2011. In other words, contractual agreements are sometimes signed with mango farmers. The two major juice processing concerns under consideration are Sunripe and Blue Skies Ghana Limited. It is imperative to notice that negotiated prices for mangoes destined for consumption are much more interesting than for the ones linked to processing.

2.1.2 Juice processing companies

A well-structured juice processing sector can act as a catalyzer for the development of the mango value chain. This assertion is predicated on the fact that a greater part of mangoes (about 80%) produced does not get exported. This work therefore takes a look at two major processing companies in Ghana - Sunripe and Blueskies.
Sunripe Co. Ltd

Currently, Sunripe is one of the largest fruit processing entities in Ghana, processing freshly harvested local fruits into juice, pulp, puree, smoothies and pineapple cylinders for the local market. With aseptic technology, the company is able preserve fruit product without preservatives or additives which are shelf stable for up to 2 years.

Farm inspection: To ensure compliance with international standards, Sunripe inspects the farms and check on fruit quality and properties (agricultural practices, brix, sizes, etc.); that negotiate quantities and prices with producers.

Quality assurance laboratory: Sunripe is equipped with laboratory that analyzes the products before and after processing. Sunripe is certified by local and international bodies (Ghana Standards Board, Ghana Food & Drugs Board and ECOCERT) on its food safety standards.

Multifruit processing line: The company can process pineapple, mango, watermelon, pawpaw and passion fruits, with a processing capacity of 20 tons of juice per day.

Bottling line: Sunripe’s bottling line cleans, fills and caps the fruit juice in sizes ranging from 330ml to 1.5 litres. The filled bottles continue along automated sections (sterilization, temperature control, sleeve application, thermal sleeve shrinking & coding) to bulk packaging and then packaged.

Warehouse & storage: Sunripe has storage facilities including cold ones for both finished and unfinished product. The finished product is placed under quarantine for 5 days during which stage the quality assurance team monitors and analyzes the product- making sure the product meets the specified standards and is fit for consumption.

Aseptic bag in drum: In order to have an all year round supply of fruits (especially the seasonal ones e.g. Mango, orange and water melon), the company stores the juice in 200lt aseptic bags in drums when they are in season and they can be kept without refrigeration for up to 2 years.

In-house packaging development: As part of efforts to ensure the production of a hygienic product, the company has PET blowing machines in-house. The bottles are blown directly onto the production line thus minimizing cost and contamination.

Blue Skies

A subsidiary of Blue Skies Holdings Limited based in the United Kingdom, Blue Skies started its operations in Ghana in 1998 by setting up factory in the southern part of Ghana
that focused on preparing, packing and exporting pineapples to the UK. In the course of its operations, the company incorporated mangoes into its portfolio of services. Apart from the Ghana factory that employs 1,500 people – making it the biggest of its operations, Blue Skies runs processing factories in Egypt, South Africa and Brazil.

The company's presence in Ghana has provided a market place for growers of pineapple, papaya and coconut. It has pioneered the growth of mango farming in the Eastern Region of Ghana and is responsible for 25 percent of Ghana's pineapple exports. It currently supplies 100 percent of its fruit products to some of the biggest supermarket chains in Europe and South Africa.

The company supplies various types of juice products: fresh pineapple juice, pineapple ginger juice, mango, passion fruit and pineapple blend juice. According to company officials, local demand for juices is on the ascendancy and therefore exports have not been considered. Mango for processing is purchased from the local market after inspection by the company's agronomist. Mango is also purchased from the international market. Mango is often obtained from Dodowa, Somanya and parts of the Volta region. Blue Skies however imports mangoes from various countries including Brazil, Burkina Faso, South Africa and Senegal in leaner times.

2.1.3 Packaging companies

The two major mango juice producers have their plants that manufacture PET bottles for the packaging of the juice. The preforms are imported from Belgium, Dubai and other countries, and then transformed into plastic PET bottles for packaging. However, corrugated carton boxes that contain the plastic bottles are normally manufactured in Ghana by PackRite, PolyKraft among others. Although Ghana has some companies manufacturing and blowing preforms per specification, Sunripe for instance imports performs from Belgium and then blow them according to sizes in Ghana. The preforms imported from Belgium cost about 90 Euros per a thousand count. According to the CEO of Sunripe, the local ones have quality issues compared to the imported ones.

2.1.4 Other actors

Environmental Protection Agency

Since processed mango leaves in its trail residues and discardable sections, the EPA regularly undertakes visitations to enterprises in the mango processing enclave as well as other business concerns in other sectors to check on the effect of their operations on the environment. Corrective measures are taken if discoveries in the area of chemical residues detrimental to the soil are observed. The EPA is the leading public body for protecting and improving the environment in Ghana. It ensures that flora and fauna are protected. It has more than 30 years of rich history. This outfit ensures that the right chemical is applied on the soil so as to prevent environmental degradation. Farm input sellers therefore need certification from EPA before they can start operation.
2.2 Mapping and description of the value chain and the challenges inherent

Selling mango juice usually starts with fresh mango purchases from production areas (directly or through intermediaries) or from mango that has been imported. As intimated earlier, juice processing entities usually have teams of agronomists who undertake pre-harvest inspections to ascertain fruit quality to be used for juicing. The schematic view of the chain is given below.

Figure 3: Mango juice supply chain in Ghana

Processors buy mangoes from reliable and reputable farmers or farmer groups, especially those that are Global GAP certified. The price per ton of mangoes from certified sources such as Cotton Web Link farms is about GHc 770. The pre-inspection of the mango orchards by agronomists of the various juice processing entities is meant to ensure that the mangoes to be harvested are disease / pest-free and they are of good quality. After the product has been harvested, it is conveyed to the factory for sorting and subsequent processing. The major problem encountered by juice processors at the input level has to do with first and foremost, inadequate supply of mangoes as well as quality and reliability of supply of fresh mangoes. Another problem at this stage is the high cost of transporting the fruits to the manufacturing concern and the cost of the fruits itself, especially during the lean season. The most important bottleneck in the processed mango value chain is the cost of energy and more specifically, be it the use of generators (fuel price) and issues related to power fluctuation. Other costs encompass the cost and availability of preforms and other packaging materials.

The next phase of the chain has to do with product distribution to various outlets, including supermarkets, kiosks, shops, bars and restaurants. The bottleneck here is the cost and the
availability of the means of transportation, especially if the factory is situated farther away from major markets such as Kumasi and Sunyani.

Beyond the national mango juice market, Sunripe is making efforts to access the sub-regional market with particular interest in opportunities in Nigeria. In the same direction, the company has initiated steps to obtain the ECOWAS Trade Liberalisation Scheme certification with the view to penetrating the West African market allowing it to export its products without the payment of import duties or equivalent taxes. Blue Skies intimates that it has no immediate plans of exporting to West Africa, as the company by virtue of its status as a Freezone entity is disqualified from accessing the ETLS (Article 7 of protocol A/P1/1/03 of the act establishing the scheme).

Although ITFC has started producing mango puree for both local and international markets, it is yet to get approval and certification from the Food and Drugs Board before it can start exporting, according to the operations manager.

2.3 Evaluation of demand

Despite the fact that local and international markets for mango juice are growing, the lack of economies of scale and other market access requirements have confined the operators to the national market. It has also been established by both Blue Skies and Sunripe that the local mango juice market is growing. According to the chief agronomist at Blue Skies, demand for their products, outstrips supply due to the fact that their production line is currently operating at full capacity.

Sunripe intimates that their plant is capable of churning out about 20,000 tons of fruit juice annually but that constraints related to the availability and quality of mangoes sub regional market restrictions in the area of tariffs and prohibition lists in Nigeria, among others inhibits the entity from operating efficiently, as it operates around 30% capacity. The Managing Director believes the West African market holds good prospects for them to explore given the level of awareness of regional urban consumers with respect to healthy lifestyle and the importance of fruit consumption. For the meantime, the company is seeking strategic alliances with entities in Nigeria, and then get National Agency for Food and Drug Administration and Control (NAFDAC), certification for its juice before venturing into the Nigerian market.

Table 11: World demand for other fruit juice including (mango, guava, tamarind etc, in tons)

<table>
<thead>
<tr>
<th>Destinations</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>1,437,885</td>
<td>1,680,698</td>
<td>1,365,518</td>
<td>1,325,988</td>
<td>1,346,869</td>
</tr>
<tr>
<td>United States of America</td>
<td>413,534</td>
<td>459,130</td>
<td>184,015</td>
<td>321,340</td>
<td>340,850</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>75,300</td>
<td>80,607</td>
<td>50,553</td>
<td>58,342</td>
<td>75,667</td>
</tr>
<tr>
<td>Germany</td>
<td>89,467</td>
<td>93,180</td>
<td>76,085</td>
<td>65,842</td>
<td>69,065</td>
</tr>
<tr>
<td>Netherlands</td>
<td>43,895</td>
<td>47,071</td>
<td>74,805</td>
<td>87,925</td>
<td>63,788</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>84,397</td>
<td>47,768</td>
<td>47,444</td>
<td>44,539</td>
<td>43,587</td>
</tr>
<tr>
<td>France</td>
<td>41,760</td>
<td>40,370</td>
<td>42,160</td>
<td>40,301</td>
<td>42,114</td>
</tr>
<tr>
<td>Japan</td>
<td>60,195</td>
<td>69,937</td>
<td>64,731</td>
<td>50,505</td>
<td>41,972</td>
</tr>
</tbody>
</table>
Above table indicates that global demand for other fruit juices including mango is growing although there has been decline since 2008. In 2010, global demand for other juices including mango stood about 1.2 million tons. The USA leads in the importation of these products with 25.3% of global demand in 2010.

### 2.4 Market access requirements

In order to supply the local market, juice producing enterprises must obtain certifications from both the Food and Drugs Board as well as from the Ghana Standards Board. These certifying bodies pay regular visits to monitor the operations of the entities.

In the EU market for instance, the entity will need to ensure that mangoes are obtained from Global GAP certified source, and then meet the requisite sanitary and phytosanitary requirements of the market. It is equally required that there must be traceability data to enable proper verification on the finished product.

For an entity to be competitive in the sub-regional market however, it makes business sense for it to apply and obtain ETLS, albeit it is not mandatory. This scheme substantially reduces the cost of exporting to the sub-regional market, as import duties or equivalent taxes are waived. Additional NAFDAC certification is however required for mango juice to access the Nigerian market, which holds the biggest opportunities for juice processors.

### 2.5 Mango juice pricing

With its focus on the national market, Sunripe sells a bottle of 330ml mango juice for GHC 1.20 at the factory (i.e., to distributors), whilst in the open market, the same quantity goes for between GHC 1.5 and 2.5 or even GHC 3 depending upon the sales outlet. Blue skies’ 500ml bottle of mango and Passion fruit blend costs around GHC 1.55 at the factory, whilst the price ranges between GHC 2 and GHC 4 in the retail segment of the market. Similarly, the CEO of FMSL also indicated that his establishment sells mango pulp to restaurants, hotels, bars for about GHC 5 (about US$ 3.3) per litre, although pulp production is very insignificant and is only carried out during gluts, the core activity has always been the exportation of fresh mangoes.

### 2.6 Supply potential assessment of the mango juice sector

As intimated, the demand for juice in the local, sub-regional as well as the international market is high. They are however supply side deficiencies with respect to quality and the variety of mangoes produced. Although, Sunripe has the capacity to produce about 20,000 tons of fruit juice annually it is still operating below capacity due to constraints related to financial and operational challenges and the problems with the availability of mangoes. According to trade figures from the ITC TradeMap, Ghana is still a minor player on international markets, exporting only less than 30 tons of juice in 2005.
2.7 SWOT analysis for the mango juice value chain

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Compared to other ECOWAS countries, Ghana has an interesting number of processors that use mangoes in their operations</td>
<td>• Processing capacities not fully utilized</td>
</tr>
<tr>
<td>• PET bottles are manufactured by some of the companies</td>
<td>• Irregular supply of mangoes</td>
</tr>
<tr>
<td>• Managerial competence</td>
<td>• Reliability and cost of energy</td>
</tr>
<tr>
<td>• Relatively important warehousing capacities</td>
<td>• High maintenance costs associated with companies with excess capacities</td>
</tr>
<tr>
<td>• Easy access to markets and production bases</td>
<td>• Accessing other parts of the local market is a challenge due to poor road infrastructure and high transportation costs</td>
</tr>
<tr>
<td></td>
<td>• Financial resource mobilization challenges including high cost of finance</td>
</tr>
<tr>
<td></td>
<td>• Expensive preforms are imported from outside the sub-region</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increasing demand in local and sub-regional markets</td>
<td>• Strict requirements and certification costs from the EU is likely to exclude unprepared operators.</td>
</tr>
<tr>
<td>• Duty free access to the sub-regional market if ETLS is obtained</td>
<td>• Stiff competition from countries like the Netherlands, USA, Germany and Thailand that are leaders and have competitive advantage because of economies of scale has eroded Ghana’s position in the global market.</td>
</tr>
<tr>
<td>• New and improved mango orchards coming up to somewhat palliate the supply base challenges</td>
<td></td>
</tr>
<tr>
<td>• Growing incomes and middle class in Ghana.</td>
<td></td>
</tr>
</tbody>
</table>

2.8 Conclusions and recommendations

The mango juice sector remains modest in Ghana when compared to other African countries such as Nigeria, South Africa or Egypt, despite the presence of two important processors that have reached substantial processing capacities and actively engaged in commercialization efforts for the last few years. It is estimated that the processing capacity is possibly in the order of 20,000 to 30,000 t. of finished product, and that increased market demand will lead to further expansion of the fruit juice industry in Ghana. ECOWAS TEN could play a key role in three key areas related to processed mangoes, namely opportunity identification & follow-up, productivity enhancement and mango producer upgrading.

Donor support from USAID, ADRA and GIZ has been important for the development of some commercial export horticultural investments. The Italian Government has provided fruit processing equipment for a number of farms, e.g. KPF, Jei River and 2K Farms as reported above. Some development banks, e.g. DEG, also provide technical assistance to help businesses they financed to address any problems they encounter. ECOWAS TEN need to collaborate with those organizations in order to address the constraints affecting the mango processing sector.
Opportunity identification and follow-up:

ECOWAS TEN could play a lead role in providing value chain actors involved in mango processing key strategic and commercial information related to processed mangoes: a) capitalization of “good mango processing practices” (GMPP) in West Africa (with case-studies on the experiences in Burkina Faso and Nigeria) and the dissemination of such information to the relevant private and public actors; b) identification and dissemination of technical specifications required by potential partners (regionally and/or outside West Africa); c) develop tools in partnership with local authorities to attract foreign investments and develop strategic partnerships with foreign firms (Nigeria, South Africa, etc.). The output of such activity would be an increased market and technical knowledge of the mango supply dynamics involved in West Africa and abroad.

Increasing productivity of processing units:

ECOWAS TEN could assist processors in obtaining the necessary technical and financial capacity to increase their production levels: a) inputs and good practices: capitalization / review of available technologies (improved technologies already in use in West Africa) able to increase productivity; encourage the preparation of technical material related to good processing and preservation practices; encourage the technical training of actors involved in mango processing; b) inputs and production equipment supply management: support suppliers of mango product processors understand the needs of the industry and adapt their supply of product / services; c) innovation / diversification: a cost-shared support program can be proposed for the acquisition or improvement of extraction and processing equipment, and support for the setting up of processing units. The outputs would be a set of technical specifications and visual tools on good processing practices being developed for mango juice extraction and mango processing; good practices capitalized and disseminated; choice, availability and quality of material by local suppliers improved and reflecting the needs of the processing industry; increased use and adoption of efficient and adapted processing technologies.

Improving processors capacities to meet specifications of potential markets:

ECOWAS TEN should play a key identification role between what the final client need and present technical capacities:

a) Provide opportunities to processors in conducting product testing with well defined value chain actors on national / regional / international markets: acquisition of adapted packaging, technical support, market follow-up, focused technical visits, etc.

b) Marketing / branding build-up activities, etc.
3. THE DRIED MANGO VALUE CHAIN

The dried mango segment of the mango value chain in Ghana is not yet popular in terms of both consumption and exportation. Most Ghanaians are used to fresh mangoes and mango juice rather than dried mangoes. The target market has traditionally been the international market with two notable enterprises in this sector being Ebenut and Integrated Tamale Food Processing Company, which are major players in the dried mango industry. As the awareness for dried mangoes is created locally, it can be expected that demand will eventually grow and attract more operators in the sector. For now, the sector is still underdeveloped and interventions have mostly come from donors and non-governmental organisations such as the USAID’s West African Trade Hub (WATH).

Dried mangoes in Ghana are usually obtained through the use of ovens. In the process, thinly sliced choice mangoes are prepared by using a low-temperature drying process with clean air which retains all the flavor, color and nutrition without the use of any additives. The finished products are normally made from full sized fruits which are not bruised. Dried fruit is used in consumer or food service packing, mainly consumed as a snack and as an ingredient for breakfast cereals, healthy ready-to-eat snacks and desserts. Bakeries and breakfast cereal mixes are one of the largest end users of dried fruit.

Many experts believe that a well-diversified and developed value chain will insure more to the benefit of the mango farmer, exporter or processor as well as some of the major actors in the industry. In this vein therefore, the development of the dried mango segment of the value chain is relevant to the strengthening the mango value chain in Ghana.

In addition to fresh-cut and juicing operations, there is some interest in producing dried fruit, but this is a small market opportunity. WATH is trying to help small businesses sell into the American market and HPW is investigating opportunities in Switzerland and Southern Europe.

Exports opportunities of dried tropical fruit in Europe are small compared with fresh-cut and juices. WATH is trying to help market dried fruit in the USA but reports tend to indicate that the Ghanaian product is not competitive. This would need to be confirmed by further research. Ghana might have some competitive advantage in the niche organic and fair trade markets, but apart from this, it is difficult to see where Ghanaian exporters might be able to derive competitive advantage.

3.1 Actors along value chain of dried mango

The actors in the dried mango sector are similar to those ones in the juice sector, apart from the main actors in the business, thus the processors themselves:

- Ghana Standards Board
- Food and Drugs Board
- GEPA
- Environmental Protection Agency
- Mango producers
- Transporters and dryers
The major actors in the industry and the ones this survey contacted are the ITFC and Ebenut Company Limited.

**Integrated Tamale Fruit Processing Company**
- Cultivates certified organic mangoes for local (10-20%) and export (80-90%) markets.
- Operates a nucleus farm – 600 acres which represents 44% of acquired lands under cultivation.
- Cultivates about 60,000 mango trees (i.e. 100 trees/acre).
- Deals with 1,200 small-scale outgrowers against a 2007 target of 2,000 (60%).
- Outgrowers cultivate about 120,000 mango trees (i.e. 100 trees/acre/outgrower).
- Goal of Outgrower Program: To alleviate poverty in Northern Sector.

As intimated above, ITFC’s major lines are fresh cut, and dried mangoes. The company operates two ovens to meet demand for dried fruits from both local and international markets; albeit the demand locally is very insignificant. Its main market destinations are the Netherlands and Italy. The general manager also indicated that mangoes for drying are obtained from various locations including Kintampo, Wenchi, Burkina Faso, and Somanya etc. Like the processed companies for juice, the growers of the mangoes must be Global GAP certified. As of September 2011, the company had exported about 11 forty feet containers of dried mangoes mostly to Switzerland.

**Ebenut Company Limited**
An organic and Fairtrade certified food processing company that dries tropical fruits and vegetables like pineapple, mango, papaya, coconut and banana, tomatoes, okro, kontomire (local green leaves), aubergine leaves and preserves them so they are available even when out of season. The fruits and vegetables are bought directly from certified Fair trade farmers. The dried end-products are sold locally and internationally. It employs about 17 permanent and 15 casual workers for its operations.

Since its establishment, the company has carved a reputation for its range of products, and has therefore been one of the main clienteles of GEPA. The company is known locally for its range of dried fruits and vegetables, notably dried mangoes, pineapple, citrus, coconut and a blend of mango and coconut or a mixture of mango, pineapple and coconut. Having operated in the local market for while, the company is making efforts to expand its exports into the ECOWAS region, although it exported once to Senegal but was not sustainable due to prohibitive road transportation cost. To reduce costs, the company is in the process of obtaining an ECOWAS Trade Liberation Scheme (ETLS) certification, evidenced by the submission of ETLS application form to GEPA. The company believes that the products submitted will receive approval under the scheme by the end of 2011. According to the CEO of Ebenut, Mrs. Paulina Appea-Kubi, the company exports the dried mangoes, originating from Dodowa, Akosombo (Akonadi), to Switzerland and Germany, and usually exports about 10 tons per season; thus 20 tons per year. In the local market, the company’s clients are Koala supermarkets, Shoprite and Maxmart.
However, in 2010, Ebenut produced a quantity of about 10 tons of dried mango for both the local and international markets. It is believed that if the ETLS is approved, the company’s exports towards West Africa will increase.

3.2 Mapping and Description of the value chain and the associated bottlenecks

As in the mango juice value chain, inputs are obtained from producers, after export grade mangoes have been selected, and then transported to the processing enclave where mangoes are sliced and dried using ovens. In the case of ITFC, mangoes are supplied directly from its own orchards and the fruits that do not meet standards in terms of sizes and shapes are transferred to the drying section of their operations. Diagrammatically, the chain will appear as the following:

Figure 6: Mango supply value chain (Dried)
Along the dried mango value chain, the main obstacles are usually encountered at the input, processing and the commercialization segments, according to the CEO of Ebenut. During discussions, it was revealed that sometimes when they place order for fresh mangoes, they are often delivered below specifications. To avert this phenomenon, like juice processors, they undertake pre-harvest inspection, after signing contract with the producers. The harvested fruits are then transported to the processing plant, peeled, sliced and then dried in the oven.

The major challenge dryers are facing has to do with the cost of operating the ovens. Cost of energy has been identified as the major cost centre when it comes to oven operations. For instance, Ebenut spends about Ghc 2,000 weekly for electricity tariff.

Another challenge is related to securing markets for the dried mangoes. The strategy adopted here is that they mostly operate when orders are received. In order words, exports are tailored towards specific orders. For instance, an order could come in the form of oven dried Kent mango of a specific quantity. Ebenut is also a major participant in many trade fairs that GEPA organizes; all with the view to diversifying their market destinations. Another problematic area has to do with payment. To avert the problem of payment challenges, letters of credit are employed.

### 3.3 Demand evaluation of dried mango

The companies interviewed intimated that their dried mangoes are destined for the EU market, which is the biggest trading partner for Ghanaian horticultural products. The market for dried mangoes in Europe is relatively low compared to fresh fruits. Consumption in Europe stands at about 3,000 tons according to (Strategic Policy Document of the mango value chain in the ECOWAS). This figure represents about 1% of the total demand for dried fruits in Europe.

The curb the problem of singular market destination for dried mango exports and all other horticultural products, many organisations such as the GEPA are embarking on pragmatic and proactive market diversification strategies in the Maghreb and the Middle East, where fruit consumption is high especially during the month of Ramadan. The GEPA believes that when these market diversification efforts start bearing fruits, exports of horticultural products will be significantly impacted in the positive direction.

### 3.4 Pricing and Market access requirements

The market requirements are not significantly different from all other edible products. Sanitary and phytosanitary requirements are mandatory. Similar to fresh-cut exports, dried mangoes must be from Global GAP certified sources. According to the general manager of ITFC, whilst they export the organic mangoes fresh-cut, the dried ones are not necessarily made from organic mangoes. These mangoes are sourced from across the country and sometimes from Burkina Faso. Interactions with the CEO of Ebenut company limited revealed that a carton of dried mango weighing about 5 kilograms will go for about Ghc 5 (US$ 3.2) FOB. At the largest supermarket in Ghana, Shoprite, the 100g sachet of dried mangoes is retailed at GHC 3 (about US$ 1.8; based on exchange rate of GHc 1.66 to the dollar).
3.5 Supply potential of the dried mango value chain

In terms of longevity/preservation, drying of fruits including mangoes are considered as one of the most effective techniques to prolong the product shelf life. Consequently, dried mangoes can be available throughout the year, although there are two mango production seasons, which invariably are in tandem with Ghana’s double maxima rainfall pattern. The supply is only challenged by the lack of mangoes during leaner times, transportation and logistics problematic, operational difficulties including the cost of operating ovens, among a host of other issues. It is estimated that Ghana has the capacity to produce and export more than 100 tons of dried mangoes yearly.

3.6 SWOT analysis of dried mango chain

<table>
<thead>
<tr>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Growing demand both international and local but there is room for expansion</td>
<td>• High operational costs</td>
</tr>
<tr>
<td>• Availability of certified fresh mangoes</td>
<td>• High cost of capital</td>
</tr>
<tr>
<td>• Credibility of the few actors in the industry</td>
<td>• Landed property needed as collateral to be able to secure loans for expansion in the business.</td>
</tr>
<tr>
<td>• Market diversification efforts by TPOs</td>
<td>• Identification of leads and follow-ups with potential buyers</td>
</tr>
<tr>
<td>• Interventions in the mango sector by credible and strong establishments such as EDIF</td>
<td>• Difficulties to meet market requirements</td>
</tr>
<tr>
<td></td>
<td>• Misunderstanding of end-market tastes and likes.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
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<tbody>
<tr>
<td>• Increasing demand in the global market and in the local market as well</td>
<td>• Stiff competition from other countries such as Thailand and India could pull down prices. Again given the level of development of Brazil in mangoes, they are likely to pose as serious threats anytime they make entry in the dry mango segment of the chain.</td>
</tr>
<tr>
<td>• Opportunities to export to the sub-region.</td>
<td>• Competing substitutes such as dried pineapple, banana etc.</td>
</tr>
</tbody>
</table>
4. GENERAL CONCLUSIONS AND RECOMMENDATIONS FOR ECOWAS TEN / AREAS OF INTERVENTIONS

Over the years, key interventions have been instituted to arrest some of the challenges facing the sector. Although most of the initiatives take a holistic approach to solving the problems of the horticultural sector, mango has had its share of attention. The EDIF’s mango project in the Northern region of Ghana, attests to this fact. Government therefore sees this sector as one of the means of solving the unemployment challenges.

The mango processing segment of the value chain is making significant inroads in the Ghanaian mango industry, as local consumption of mango juice has been showing an upward trend due to urbanization and gradual improvement in living standards. However, a good processing sector requires adequate primary producers who produce quality and internationally certified fruits. It has been observed that Ghana has about 60,000 metric tons of processing capacity which it is yet to concretize due to key challenges such as the lack of fresh mangoes, seasonal fluctuations, cost of fruits, and operational costs of running the processing plants.

The dynamism of the European and the Middle East markets requires that producers and exporters of mango constantly abreast themselves with changing trends in the market. At the same time, operators should not overlook opportunities at the national and regional market levels. Some of the urgent issues that need immediate assistance include the issue of pests and diseases.

**General recommendations**

- The ECOWAS Actors Platform on Mango, which seeks to bring together key stakeholders along the mango value chain must be strengthened and supported by the Commission to serve as a body that can lobby governments on issues such as the financing of the mango sector and regional market access through the implementation of ETLS.

- Solving the problem of bad roads leading to mango growing areas is relevant to maintaining quality and bringing down cost. In this direction, ECOWAS TEN should lobby governments at the highest level to construct roads leading to mango farms. Alternatively, the World Bank and other multilateral agencies could be contacted by the Commission to assist in this direction.

- The mango observatory concept being mooted by stakeholders should be taken seriously by governments as well as the ECOWAS Commission. The Center among other issues should handle issues pertaining to research on mango diseases and pests.

- ECOWAS-TEN should facilitate the adoption of an ECOWAS label for mango, that could bring credibility on foreign and regional markets. The mango label would require Ghanaian and regional suppliers to fulfill a strict set of production and harvesting criteria.

- ECOWAS TEN should encourage the creation of training tools on good harvesting / post-harvesting practices, as well as on good processing practices, by capitalizing efforts that have been undertaken in West African countries such as in Senegal or Mali.
ECOWAS TEN should closely monitor activities and eventual outputs of the Export Development and Investment Fund in Ghana, and capitalize the initiative in order to inform other ECOWAS mango producing countries.

ECOWAS-TEN should play a key role in supplying Ghanaian and other West African mango operators key market intelligence related to national, regional and global markets for fresh, processed or dried mangoes.

ECOWAS-TEN should develop a database of actors of the mango sector which can be accessed online for a fee.

It is also recommended that a database of ETLS certified companies in the mango processing enclave within the sub-region be created by the TEN. The database should also contain processing companies without ETLS which could be assisted by TEN to go through the certification process.

The African Development Bank, the AFREXIM Bank and ECOBANK and other regional financial institutions should be approached by the ECOWAS-TEN to render support to the mango sector through the provision of funds to outgrowers.
5. MAIN CONSTRAINTS AFFECTING THE MANGO SECTOR IN GHANA

Market access issues
- Meeting SPS requirements in the destination markets
- Inability of operators to identify tastes and preferences of consumers
- Management capacities (access to info, understanding and identifying opportunities)
- Ability to supply Ghanaian and regional markets (transportation, demand assessment)
- Meeting export orders (specifications, quantity, time)

Logistics and infrastructures
- Road conditions between production zones, pack houses, markets
- Cold chain facilities (storage availability, refrigerated trucks)
- Freight cost due to low volumes

Production
- Cost of inputs (fertilizers, irrigation material, packaging)
- Harvesting practices
- Land tenure (acquisition, extension)
- Pest and disease management
- Financing (collaterals, business plan, etc.)
- Packaging quality and availability

Processed mango products
- Mango supplies availability and quality
- Cost of imported packaging
- Access to regional markets (ETLS)
- NAFDAC requirements in Nigeria
- Energy supply cost and consistency
- Availability of market intelligence
- Knowledge of good processing practices
- Understanding of processors needs by mango suppliers
- Inadapted distribution network (best distribution practices ex. FANMILK Ghana)
6 PROJECT BRIEF IDEAS/PROPOSITIONS OF INTERVENTIONS FOR THE MANGO SECTOR

6.1 Interventions within the mango sector in general

6.1.1 A Mango Competitiveness Fund

ECOWAS TEN should provide mango stakeholders in Ghana and Western African countries a tool that will allow them to seize opportunities at national, regional and international levels and to sustainably position private sector operators on growing market segments by lifting constraints affecting their competitiveness. Addressing the development of business and service propositions directly linked to the competitiveness of the ECOWAS mango industry (both fresh and processed), the Fund would (partly or wholly) support initiatives that will revolve around 5 specific intervention areas:

- Intensification of fight against pests and diseases
- Expansion of commercial orchards
- Increase in agro-processing capacities
- Focus on quality, expansion of GLOBALGAP, introduction of a common ECOWAS label, and capacity strengthening
- Improvement of post-harvest treatment

These five intervention areas came forward from the regional document strategic document for the ECOWAS mango industry (Togo, August 2011)

Mitigating the risks associated with innovation and reducing the financial burden on upstream and downstream actors involved in mango-related activities will be the aim of the Mango Competitiveness Fund, in order to improve their performance and facilitate the integration of Ghanaian and ECOWAS mangoes in sustainable distribution regional and global networks. A set eligible and non eligible activities for funding will defined for each Fund component, and priority regions within ECOWAS countries will be determined. Access to funding will be governed by established eligibility criteria and a technical evaluation of the applicant.

6.1.2 Mango practices community:

Capitalizing and disseminating information related to mango sector competitiveness in West Africa

ECOWAS TEN could play a central role in West Africa by offering economic operators and stakeholders involved in the mango sector an information and best practices platform related to technical and commercial issues affecting the industry. The objective of a platform, based on the model of the World Bank funded Cop Horti (www.cop-horti.net) developed within the Rural Hub in Senegal, would be to increase the quality of decisions made by mango value chain actors (as well as support and governance structures) in order to improve the sector’s competitiveness on national,
regional and international markets. To that end, ECOWAS TEN should explore collaboration possibilities with the Rural Hub and the idea of facilitating two of the existing communities of practices, namely the Mango Trade Community and the Mango Fruit Fly Community. The platform could eventually address other key issues for the mango sector in Ghana and West Africa, such as processing good practices, conditioning, logistics and other thematic having a direct impact on operators’ competitiveness.

6.1.3 Mango Export Quality guidebook for Ghanaian and ECOWAS exporters

ECOWAS TEN should play a lead role when it comes to promoting and encouraging quality within the Ghanaian and West African fresh mango export industry, as the mango value chain analyses in Ghana, Cote d’Ivoire and Mali have put forward this important weakness that is affecting the sector’s competitiveness on international markets. To this end, one of the possibilities would be to provide a technical guidebook that would specifically address good practices at the harvesting and conditioning stages, by illustrating the various steps and elements to take into consideration in order to meet final market requirements. The guidebook will be in part based on existing tools developed in West Africa or in other exporting countries, and will take into account the specific agro-climatic and socio-economic environments composing ECOWAS countries.

6.2 Interventions within the mango juice sector

The mango juice sector remains marginal in Ghana, despite the presence of two important processors that have reached substantial processing capacities and actively engaged in commercialization efforts for the last few years. Therefore, ECOWAS TEN could play a key role in three key areas related to processed mangoes, namely opportunity identification & follow-up, productivity enhancement and mango producer upgrading.

6.2.1 Opportunity identification and follow-up

ECOWAS TEN could play a lead role in providing value chain actors involved in mango processing key strategic and commercial information related to processed mangoes.

a) Capitalization of “good mango processing practices” (GMPP) in West Africa (with case-studies on the experiences in Burkina Faso and Nigeria) and the dissemination of such information to the relevant private and public actors.

b) Identification and dissemination of technical specifications required by potential partners (regionally and/or outside West Africa).

Outputs: increased market and technical knowledge of the mango supply dynamics involved in West Africa and abroad

6.2.2 Increasing productivity of processing units

a) Inputs and good practices: capitalization / review of available technologies (improved technologies already in use in West Africa) able to increase productivity; encourage the preparation of technical
material related to good processing and preservation practices; encourage the technical training of actors involved in mango processing.

**b)** Inputs and production equipment supply management: support suppliers of mango product processors understand the needs of the industry and adapt their supply of product / services

**c)** Innovation / diversification: a cost-shared support program can be proposed for the acquisition or improvement of extraction and processing equipment, and support for the setting up of processing units.

**Outputs:** technical specifications and visual tools on good processing practices have been developed for mango juice extraction and mango processing; good practices have been capitalized and disseminated; choice, availability and quality of material by local suppliers have been improved and reflecting the needs of the processing industry; increased use and adoption of efficient and adapted processing technologies
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Annex 1 - EDIF Brokers Mango Marketing Deal

The Export Development and Investment Fund (EDIF), has reached a marketing partnership deal with British Produce Buying Company; Minor, Weirs and Willis, to purchase the produce under its mango development project. The agreement, which would ensure ready market for farmers is expected to generate a total revenue of GH ¢ 46.03 million by 2013 and grow to about GH ¢184.2 million by the close of the project in 2017. EDIF is investing GH ¢52.24 million over the next five years to boost the cultivation of 20,000 acres of mango for export in the savannah regions of the Northern, Upper East, Upper West, Volta and Brong Ahafo Regions. The venture is in line with government policy to turn the five regions into a mango production hub.

Mr. Agyabeng Antwi-Agyei, Acting Chief Executive of EDIF told journalists in Accra that the deal would help address the age-old problem of access to foreign markets by local farmers. He said under the deal the British firm, was expected to provide a large clientele ready for Ghanaian farm produce, which met the standard of the UK market. "Ghana has the potential to produce about 300 farm produce out of the 600 product lines of the company, hence the decision of EDIF to concentrate on the agriculture sector," he said. As at the end of December 2010, GH ¢8.27 million has been spent in the cultivation of 6,600 acres in 32 districts of the target regions, providing direct employment to more than 1,800 people.

Mr. Antwi-Agyei said as part of the project, key infrastructure along the mango value chain such as pack houses and processing facilities would be provided. "These would ensure international market certification requirements are met as well as reduce post-harvest losses to the barest minimum through value addition to non-exportable fruits," he said.

He said considering the long gestation period of mango, in the early stages of the plantation farmers would be supported to inter-crop their farms with groundnut, soyabean and sunflower to improve their income. Mr. Antwi-Agyei said the country had long depended on cocoa and EDIF was ready to support diversification into mango production. Apart from the mango cultivation, Mr Antwi-Agyei said the Fund and Minor, Weirs and Willis were also supporting farmers to produce butternut squash fruits, which the marketing partners had expressed interest in sourcing from Ghana. He said EDIF had imported 50 kilograms of butternut squash seeds from South Africa for pilot production in Nkoranza, Somanya and Gomoa Kakraba. A total of 60 acres have been earmarked for the pilot production.

Mr. Antwi-Agyei said the first trial shipment of fruits was expected in the second week of May 2011. To ensure successful cultivation of the fruit a team which had undertaken a week- long training in South Africa was on the field assisting farmers.

EDIF was established in October 2000 to make financial resources available for the development and promotion of Ghana’s export trade. It has to date provided GH ¢157.27 million to support 227 projects across the country.

Source: FAGE Website (FAGEplus.com)
Annex 2 – Major mango production & processing areas