



Netherlands Enterprise Agency

West Africa fruit -Scoping study

Commissioned by the ministry of Foreign Affairs

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WEST AFRICA FRUIT – SCOPING STUDY

Joep van den Broek, Nerissa Apenteng-Sackey, Michiel Arnoldus, Salif Keita, Roland Waardenburg



May, 2016

Colophon

This study was commissioned by the Netherlands Enterprise Agency (RVO) in collaboration with the Embassy of the Kingdom of the Netherlands (EKN) in Accra and Abidjan. The report comprises an internal document that serves to inform RVO and EKN on the current state and potential of the West African fruit sector. The responsibility for the information and views set out in this report lies entirely with the authors. Three companies collaborated to implement this study: Resilience, SENSE and the Rock Group. Brief company profiles are provided below.



Resilience

Resilience is a consultancy specialized in water and agribusiness solutions. Established in 2004 in the Netherlands, Resilience has implemented a wide range of studies and projects in Africa, Asia, Europe and Latin America. While analysing the bigger picture, we assist companies, farmers and governments in developing innovative solutions in often challenging environments. We work from a strong evidence base in economics, and agronomy; and provide research and project management services. We have offices in Addis Ababa Ethiopia, Bandung Indonesia and Chimoio Mozambique, where we work with local staff and a strong network of researchers, companies and farmer organizations.



SENSE

Sense is a consultancy firm specialised in Economic Development for developing countries. We use our decades of experience to help our clients to develop and execute development programs that make Sense. We specialise in value chain analyses & development, formulation of new development programs, business plan development, access to finance and agro-processing technology for Africa. Our work is based on thorough market research and economic analyses of farming, processing and trading activities. Our clients include the World Bank, GIZ, Dutch Embassies, USAID, the African Development Bank, and Impact Investment Funds.



The Rock Group

The Rock Group aspires to accelerate the transition towards a sustainable economy and society. In an advisor, entrepreneur or interim role, we support organizations to get prepared to play an economically sound role in a sustainable future. Our expertise lies in developing & mainstreaming sustainability within organizations, supporting sustainable innovations in their commercialization process, scaling up impact, and facilitating solutions for complex societal issues. We have wide experience and a broad network within universities, multinationals, start-ups, SMEs, NGOs, and governments.



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1. Introduction to the Study: Background and Rationale

The Embassy of the Kingdom of the Netherlands in Accra has prioritized commercial agriculture in its 4-years Multi-Annual Strategic Plan (MASP 2014-2017). The MASP follows the recent policy dynamics of The Hague, focusing more profoundly on (local) economic development and the contribution of Dutch private sector and expertise. Also, as a transition country, Ghana will in the near future move in the direction of a 'regular' trade partner rather than a development cooperation partner. In addition, the Embassy has a regional focus, which includes a mandate for the countries: Ivory Coast, Sierra Leone and Liberia.

In the above line, the Embassy is interested in 'Trade & Aid' opportunities of the fruit sector of West Africa; and in particular, the high-end, export sector targeting the EU market (both fresh and processed). The tropical fruit sectors of Ghana, Ivory Coast, Burkina Faso and Mali together represent an export value of close to US\$ 400 million (2015) of which around 8% is destined for the Dutch market. For Ghana alone, the horticulture export sector provides more than 70.000 (direct and indirect) jobs. Hence, the fruit sector fits well within the overall Trade and Aid policy of the Netherlands.

So far, the Netherlands have been engaged in a number of horticultural activities in West Africa, and especially Ghana. Either through central (CBI, FDOV, IDH, PSD Apps, PSI) or delegated funds (GhanaVeg), Ghanaian and foreign commercial fruit and vegetable companies receive support. In the vegetable sector, through the involvement of GhanaVeg, a comprehensive approach has been developed, including sector-wide activities that aim at improving the enabling environment, in terms of: air and sea-freight, phytosanitary and food safety issues, and land acquisition. In addition, GhanaVeg provides catalytic funding to frontrunner companies that target investments in: improved chain integration, innovative technology and certification.

The Netherlands Embassies in Abidjan and Accra want to explore opportunities for support activities to the Export Fruit Sector of West Africa. Given the substantial interest from Dutch wholesalers and retailers, the envisaged program fits well within the Dutch Trade and Aid agenda, as well as the Embassy's transition agenda in Ghana ('Netherlands and Ghana Growing Together').

This study provides more information on the main trends in the tropical fruit landscape of West Africa. The analyses take into account the western market (demand side), the opportunities and challenges in the West African countries themselves (the supply side), the international competitiveness (benchmarking) as well as the activities of other development partners and projects. The scoping study particularly focused on Ghana and Ivory Coast but included important developments from Burkina Faso and Mali as well (especially for the mango sector).

2. Objectives and methodology

Objectives

In summary, the objectives of the study were fourfold: (1) assess the competitiveness of the West African Fruit Sector (supply side); (2) explore interest of Dutch companies (demand side); (3) take stock of initiatives already undertaken (lessons learned); and (4) provide conclusions and recommendations on market and business opportunities.

Competitiveness Assessment

The first objective of the study is to assess the competitiveness of the West-African (and in particular Ghana's and Ivory Coast's) fruit sector. The analysis is put in the perspective of the global arena of fruit trade, mainly focusing on the EU wholesale and retail market. The competitiveness and comparative advantage includes aspects of: (1) agricultural production: productivity, volume availability, seasonality, quality assurance/certification, and postharvest management; skills and technical knowledge; (2) logistics: inland transport, sea freight and the cool chain; and (3) the enabling environment: rules and regulations, taxation, land and other transaction costs.

In addition, the competitiveness analyses include a rough cost price calculation, comparing Ghana and Ivory Coast to key export countries in Central America, especially Costa Rica. The main analyses are made for the following four crops: (1) pineapple, (2) mango, (3) banana and (4) coco nuts.

The analyses conclude with a SWOT analysis. The findings of these analyses are provided in the 'crop chapters' 3, 4, 5 and 6, looking at banana, pineapple, mango and coconut respectively. While chapter 7 looks at the relative success story of Costa Rica and what West Africa can learn from this.

Interest of Dutch Companies

The second objective of the study is to explore the interest and the perceptions of Dutch companies with respect to trading with and investing in the fruit sector of Ghana and Ivory Coast (the demand side). The consultants investigated the current and potential links between on the hand Western European importers (wholesale/retail) and investors (farming/input supply), and on the other hand West African suppliers (farms/export). In the report we provide an overview of the perceptions of key EU importers and potential investors, on the challenges and opportunities they see for Ghana and Ivory Coast's fruit sector. A summary of these perceptions is provided in Chapter 8.

Stocktaking of other activities

Thirdly, the study takes stock of initiatives already undertaken and still taking place; looking at both lessons learned as well as at the room for possible additional Dutch activities (complementarity). From the outset we knew that many development initiatives had been implemented in the fruit sector, in the last decade; with mixed results. In addition to this, a number of Dutch supported activities are currently being implemented, e.g. through IDH, CBI and FDOV. Therefore, we have taken stock of all these activities and we have indicated where we see room for a Dutch 'niche' for additional, targeted ad complementary activities. A summary of past and ongoing Dutch and other fruit projects is provided in Chapter 9.

Conclusions and recommendations for market and business opportunities

Lastly, on the basis of the preceding supply, demand and complementarity analyses, the study provides recommendations on potential market and business opportunities in the West Africa fruit sector (Chapter 12).

Methodology

The methodology consisted of:

- A literature review of the studies already undertaken (EU, IFPRI, WB). The literature review also included major trends in the West African Fruit Sector including the countries Burkina Faso and Mali.
- Interviews with key fruit producers, processors and exporters, as well as logistics service providers, input suppliers and government officials. On the basis of their feedback we also made a SWOT analysis of each of the country's four crop perspectives.
- Interviews and a literature review of the cost price and overall competitiveness of fruit exporters from Costa Rica (including the logistics and enabling environment). This will be done through literature review and a number of interviews.
- Interviews with at least ten West European companies on their perceptions and trend predictions with respect to West Africa's fruit sector.
- Interviews were undertaken with at least five past and ongoing initiatives in West Africa's fruit sector. These included: GIZ-MOAP, MIDA, EMQAP, TIPCEE and EDAIF from Ghana's side and IDH, CBI, Flying Swans and CABI from the Dutch side.
- After the main analyses were undertaken, the team had a joint 2-day meeting in Accra, in which the main conclusions were drawn (overall SWOT) and recommendations for market and business opportunities were listed.

3. The Banana Sector: Ivory Coast & Ghana

The Banana Sector in Ivory Coast: An Overview

Context: short overview of the banana sector in Ivory Coast

Bananas is by far the largest fruit export crop of Ivory Coast, with an estimated export of 326,000 tons per year to the EU, and several thousands of tons of second grade to neighbouring countries. Export bananas are farmed in plantations ranging from 20 to 200 hectares, mostly in the coastal zones. The export has stagnated over the past 10 years, and is still at the same level as 1999. Companies and the government are now looking into opening new areas further North in order to expand to 500,000 tons over the next years. However, whether this will materialize remains to be seen.

Up until 2009, Ivory Coast benefited from preferential trade agreements between the EU and African, Caribbean and Pacific (ACP) producer countries. In 1991, the *Organisation Centrale des Producteurs Exportateurs d'Ananas et de Bananes* (OCMB) was created largely to protect the interests of small-scale producers in developing countries. OCMB gave selected countries quotas totalling 858.000 tons of tariff free banana exports to the EU (Ivory Coast's quota was 155.000 tons), in exchange for guarantees to abide by trade agreements and EU standards. This allowed small-scale ACP farmers to sell their bananas (of varying quality) in the EU for roughly double the price of Latin American (dollar) bananas, produced by 3 US multinationals Chiquita, Dole and Del Monte. The cost of production of the 'dollar bananas' was between US\$150 and US\$200 per ton due to economies of scale, intensive production practices and cheaper labour, while ACP bananas cost between US\$400 and US\$700.

In 1993, Chiquita, backed by the US Trade Organization took the EU to the WTO court, pleading that the OCMB agreement was in violation of the WTO free trade laws. The WTO ruled in favour of the US and a 15-year Banana War ensued with the US and several Latin American countries imposing sanctions on the EU. By 2009, the EU was finally forced to scrap the preferential trade agreements, leading to the collapse of OCMB and the overnight disappearance of small-scale banana plantations in ACP countries including Ivory Coast.

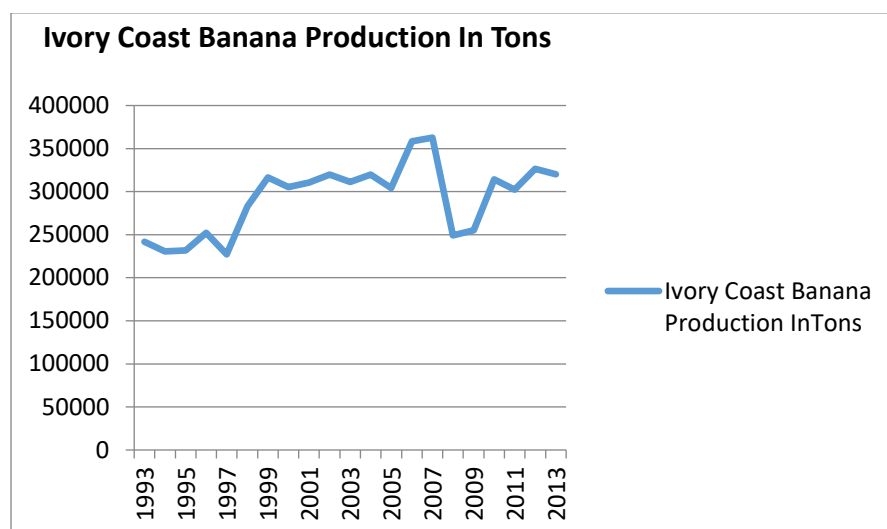


Figure 1: Ivory Coast's production of bananas (in tons) (source: combined FaoStat and ITC Trademap data)

In Ivory Coast banana exports dropped by more than 100,000 tons within one year. The organization of Banana and Pineapple Exporters and Producers (OCAB) tried to continue the export of bananas for small independent producers. However, the small producers were unable to compete on quality and price with dollar bananas, and invest in upgrading and certification of their plantations. They stopped export production and most sold their plantations to SCB (Dole), SCAB (Canavese) and Banador (Chiquita). Ivory Coast has thus adopted the same vertically integrated model as the Latin American countries.

In 2014, Chiquita and Dole sold their shares in Banador and SCB. Banador sold its plantations to SCB and SCAB. These two companies now entirely dominate the banana export market in Ivory Coast. Both are local subsidiaries of French companies, respectively Compagnie Fruitière and the Canavese Group.

Compagnie Fruitière is a completely vertically integrated company that owns plantations in Cameroon, Senegal, Ivory Coast and Ghana for mostly bananas and pineapples. They own transport companies, fruit terminals and import and distribution companies in the EU. In Ivory Coast they possess 4,000 hectares of banana and pineapple plantations, producing around 240,000 tons of fruit, most of which is banana. They also own a local transport company, AEOLIS that organizes door-to-door transport. Lastly, they also buy mangoes from local farmers and export these to the EU market. Until 2014 Dole had a minority share in SCB.

Canavese is a French importer-distributor owning 1,900 ha of banana plantations in Ivory Coast, exporting around 60,000 tons per year. In addition, they export modest quantities of Smooth Cayenne pineapple by air. Canavese also owns 650 ha of citrus plantations in Morocco.

Following organizational problems in OCAB, SCB initiated the formation of a new producer and exporters organization for fruits, OBAMCI. Most OCAB board members just transferred to OBAMCI. SCAB remained loyal to OCAB, and as a result there are now two rival organizations, each one completely dominated by one multinational.

Production

The SCB and SCAB plantations are mostly located in Sud-Comoé on the border with Ghana, la région des Lagunes west of Abidjan and l'Agnéby north of Abidjan. They vary in size from 20 ha to 200 ha, though smaller plantations are often grouped together and managed from a central office and may use the same pack house.

Plantations are normally established in the flat and fertile valleys or flood plains, where the soil is fertile and contains a lot of organic matter. This also means that a network of drainage canals and pumps is needed to prevent flooding and waterlogging, in addition to irrigation systems.

The Cavendish Grand Naine (also called Chiquita) is the dominant variety, accounting for virtually 100% of exports. There are various sub-varieties (e.g. Ranegalle, Gaffa, Champion, Gobo), and the soil conditions determine which sub-variety is planted. The plants originate from in vitro-plantlets, imported by the large companies, and are cloned locally. The planting density is around 1.800 plants per ha in alternating rows.

Daily irrigation is essential for quality and productivity. Each plantation tends to measure rainfall and evaporation, and based on the net rainfall calculates if and how much irrigation is needed that day. Natural streams and rivers are used for the water supply, and a combination of different types of sprinklers is used. The trend is to use more water efficient systems such as microjet and drip irrigation that provides water directly to the roots of the plants. However, many plantations have been established decades ago and still use inefficient and older equipment.

The typical fertilizer used is NPK, dissolved in the irrigation water. There are at least two large distributors of inputs for the sector: Louis Dreyfuss and society Yara. It takes about 12 months for the first harvest, and each plant will usually produce between three to four crops every nine months before replacement. In less fertile soils, the productivity of the plants decrease more rapidly, and therefore the plant needs to be replaced earlier. Up to seven crops from one plant is possible in exceptional circumstances, again depending on the fertility of the soil.

Bananas are harvest by hand (machete). The transport of bananas in the plantations is done either by tractor-trailer or by cableway. Transport by cableway is more efficient, because it requires less labour and fuel, and leaves more space for banana farming because fewer access roads are needed. However, it requires a substantial investment and plantations that are too hilly are not suitable for cable ways.

The plantations are managed on two clear criteria: yield per hectare, and the percentage of 'extra' grade bananas: the top grade for the largest bananas. Yields per hectare range from 40 to 60 tons, depending on soil fertility and management practices, of which between 2%-5% is rejected for export to the EU and sold to national traders and regional exporters. Between 55% and 80% of the production is extra grade, though the average for areas with good soil fertility is 70%-75%. A typical plantation of 150-200 ha employs around 180 people, who work both in the pack house on the farm and in the fields.

The main challenges for producers are, in order of importance:

- Flooding of plantations after heavy rains; due to climate change rainfall seems to decrease and become more erratic, also leading to increased flooding. Once plants have been under water for several days, they die and need to be replaced.
- The two main pests and diseases: Nematodes and *Cercospora* (also known as Sigatoka disease or leaf spot) a fungus transported by air.
- Availability of labour: it is becoming increasingly difficult to find good motivated workers in rural areas because young people migrate to the cities. More automation is probably required in the future to reduce the amount of workers needed.
- High investment cost for plantations: irrigation, drainage, land, pack house, tractors and trailers and certification all require substantial investment capital.

Grading, packaging, processing and export

The packing stations are located on the plantations, and are fairly basic technology. They consist of various baths for sorting and washing, simple transport belts and spraying equipment for the chemicals that prevent early ripening. The most critical activity is the sorting, grading and cutting of the various bunches. Bananas with visible defects such as spots are put aside, and bananas are sorted according to length and diameter. Packing is all done manually in standard size boxes on pallets, that are either transported by refrigerated truck to the port (SCB) to be packed in specialized refrigerated Banana ships, or directly in refrigerated containers (SCAB).

Smaller producers used to use centralized facilities owned by a cooperative, and load directly into containers. Bananas are normally packed in cartons of 18,5 kg. They are exported in 40 foot refrigerated containers. Each container typically contains 20 pallets of 54 cartons, or 1080 cartons containing nearly 20 tons.

A typical packing station has about 30-40 employees and can pack 10-15 pallets (10-15 tons) of bananas per day. Because containers are not packed every day, the labour also works elsewhere on the farm.

The EU is the only market for Ivory Coast bananas, because of its close proximity, large demand and good prices. In addition, the two large producers, responsible for 99% of export, are in fact owned by 2 French importers. The 2%-5% rejects are sold on the local market, and exported to Mali, Burkina Faso, Niger, Senegal and other countries in West Africa. This is mostly done by cross-border traders specialized in this market. Local companies in these countries buy the bananas to ripen them before selling them on the local market. No major processing of bananas takes place in Ivory Coast.

Logistics

SCB plantations tend to load pallets in refrigerated vans to the port, where they are stored in cold storage until they are packed on the boat. It is likely that they also use containers from time to time. SCB owns their own transport company, AEOLIS, which is responsible for most of their transport overland to port, as well as the shipment.

In SCAB plantations, the bananas are directly loaded in containers on the truck, and driven to port, where they are stored until the ship leaves. There are two ships per week, one to Duinkerken and one to Antwerp that can be used. AEOLIS normally does not work for competing fruit exporters, and certainly not SCAB.

Cost Price Analyses

We were not able to collect sufficient data to perform the cost price analyses, due to the closed nature of the industry. For the 1999-2006 period, Ivory Coast's cost of production and transport rose 37% more than that of Latin American producers over the same time period, decreasing the overall competitiveness.

Trends

The past decade has seen the virtual disappearance of the small producer, and given the investment cost for new plantations and the dominance of the two large players a reversal in this trend is not likely. Total production is expected to continue to grow, and new production areas for bananas further north are likely to be opened. It is possible that a new international player or local player with access to money may also establish plantations. Rainfall has become erratic during the past decades with periods of drought and extreme rainfall reported, leading to a higher dependency on irrigation and more flooding.

SWOT

Strengths

- Production in Ivory Coast varies between 40 and 65 tons/ha, averaging 45tons/ha, and is second only to Mali in terms of productivity in the West African region.
- The proximity to the EU market is 2.000 km as opposed to Latin American bananas, which have to travel 5000 km.
- Vertical integration of the sector by SCB and SCAB has improved the competitiveness of the industry in terms of economies of scale, collective buying of inputs such as fungicides and fertilizers.

Weaknesses

- From 1999-2006 the Ivory Coast cost of production and transport rose 37% more than that of Latin American Producers over the same time period.
- Less fertile soils and erratic rainfall in Ivory Coast mean that replanting is necessary every four to nine years, while Ecuador and Costa Rica only need to replant every 25 years.
- Bureaucratic problems at the port can delay phytosanitary inspection by up to 72 hours beyond the stipulated 24 hours.
- While the consumption of banana powder and banana chips has increased in the main markets, the EU and US, by around 40% between 2000 and 2008, there is no processing as of yet.
- Due to the monopolization of Ivory Coast's production by Compagnie Fruitière and Canavese, Ivory Coast mostly exports to France, while exports to the two largest banana importers in the EU, Germany and Belgium have dropped by as much as 66%.

- Political instability has hampered Ivory Coast between 2002 and 2007, and 2011 when civil war disrupted the economy, investment and marketing of bananas.
- Shortages of Ivorian capital and the unavailability of foreign funds hamper the development of the industry.

Opportunities

- There are several new export markets that could be accessed:
 1. Russia and the Ukraine are both growing markets with both proximity and tariff advantages for Ivorian bananas (Russia 6,3% tariff, Ukraine 0%).
 2. Algeria poses another attractive market, but with crippling import duties of 30%.
 3. Trade within the *Union Economique et Monitaire Ouest Africaine* (UEMOA) is tariff free. Within this area, Ivorian bananas may be preferred due to better conditioning in the pack house, resulting in less waste. Ivory Coast is also a year round producer, whereas traditional banana production takes place in the rainy season
- Plantains represent the majority of banana production in West Africa but are massively under-represented in exports. While the consumption of plantain chips and banana powder remains negligible in the west, it has grown in recent years.
- Since the end of the preferential trade agreements with the EU in 2009, the Dominican Republic's small-scale banana industry has managed to survive and grow as their farming practices complied to Fairtrade requirements, providing a premium in a market unavailable to the corporations that currently dominate world banana trade. This market could be accessible to independent producers in Ivory Coast.

Threats

- Climatic change has led to periods of drought and flooding in the banana growing regions.
- An increasing disparity in the cost of production between Ivory Coast and the leading exporters, Ecuador, Costa Rica and Columbia may in time force Ivory Coast out of the EU market entirely.
- The arrival of new pathogens to the region (East African *bacteriosis*).

The Banana Sector in Mali and Burkina Faso: Brief Summary

Banana production mainly takes place in the same areas as mango: the south of Mali and the south-west of Burkina Faso. Banana production is increasing, and the bananas are fully destined for the local and regional market. Production is entirely done by small- and medium-scale farmers who farm the low-lying valleys, and rely on rivers, streams and small dams to do simple irrigation by hand. As a result, production is seasonal, but many regions have slightly different months of harvest. Production is shipped to the main cities in Mali and Burkina Faso, and sometimes small amounts to countries further north. Bananas, including those from Ivory Coast, are ripened by independent entrepreneurs, often in containers.

In the months outside of the main season when local production is lower, the export rejects from Ivory Coast fill the gap between supply and demand. Importers are forced to sell produce at prices competitive

with local supply (between 100 and 200 CFA per kg or \$170 to \$340 per ton) while carrying the additional costs of transport.

There seems to be space for local producers in Mali and Burkina Faso to grow production for the local market, as well as neighbouring countries such as Niger, Senegal and Mauritania. This is particularly true outside of the main seasons by using irrigation.

The Banana Sector in Ghana: An Overview

Context: Short Overview of the Banana Sector in Ghana

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 losing substantial market shares against Costa Rican suppliers. Pineapples, mangoes, bananas and papayas lead the fruit exports. These “non-traditional” agriculture exports make a notable contribution to the economy in terms of employment, fiscal revenues and foreign exchange.

In 1998 the World Bank and the Ministry of Food and Agriculture (MOFA), commissioned a study of the sector in order to assess the opportunities, identify constraints and suggest strategies and infrastructural 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 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. 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 States 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 were championed by actors such as the Ghana Export Promotion Authority (GEPA) with the view of moving away from Ghana’s traditional market, which is the European market. Whereas EU imports 230,000 tons of mangoes, the entire West Africa exports are about 20,000 tons (Zakari, 2012). There are no significant exports of coconut from Ghana.

Banana exports from Ghana have shown tremendous growth in the early stages of the sectors development. The export grew from 3,500 tons in 2001 to 64,000 tons in 2011 (Golden Exotics, 2012). Major investments of two companies have been mainly responsible for this growth: Golden Exotics

(owned by Dole/Compagnie Fruitière) and Volta River Estates Limited (VREL). They developed commercial plantations and pack houses and account for the vast majority in export of the fruit. The removal of the quota system in the 1990s by the EU and the subsequent removal of the levy paid by Ghana on exports to the EU, provided the incentives for private sector to deepen their investment in the sector.

Ghana's export banana sector is a well-structured industry consisting of these 2 main producers. There are however numerous smallholders' farmers scattered all over the country, producing at small-scale level and selling to the local and regional markets. The figure below is a bar graph representing banana exports from the country by the largest exporter Golden Exotics, between 2008 and 2014. It can be observed that, though exports increased sharply in the 2000s, they stabilized around 50.000 tons in the 2010s.

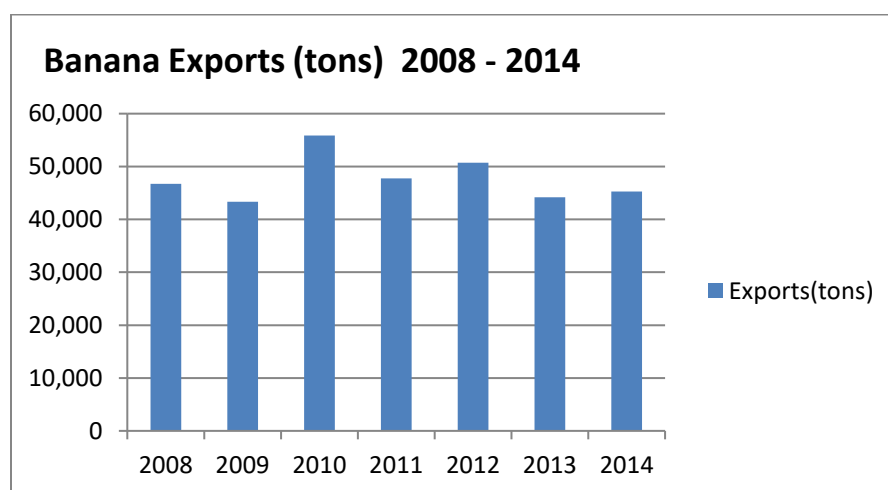


Figure 2: Banana exports from Ghana between 2008-2014 by Golden Exotics (in tons)

There are two main producers in the banana value chain in Ghana and they are Golden Exotics Limited and Volta River Estate Limited. Golden Exotics is a multinational company with an acreage of 3.500 ha and an employee base of 2.300. They produce the banana and process it for export. Created in 2003, the company Golden Exotics Limited (GEL) is the leading main plantation of bananas and pineapples in Ghana. GEL runs two plantations. One of them is devoted to pineapples and harvests around 10.000 tons per year. The other, more to the North, concentrates on bananas and produces around 50,000 tons. GEL is certified by Global GAP, and Fairtrade - Max Havelaar. In 2012, GEL also obtained the Fairtrade - Max Havelaar certification for its banana plantations. The Max Havelaar label certifies that the bananas are grown socially responsible and that some of the financial returns are shared with the employees.

Volta River Estate Limited (VREL) was established 1988 with an acreage of 300 ha, an export volume of 6.000 – 7.000 tons per annum and an employee base of 700. VREL is certified GlobalGAP, and Fairtrade - Max Havelaar.

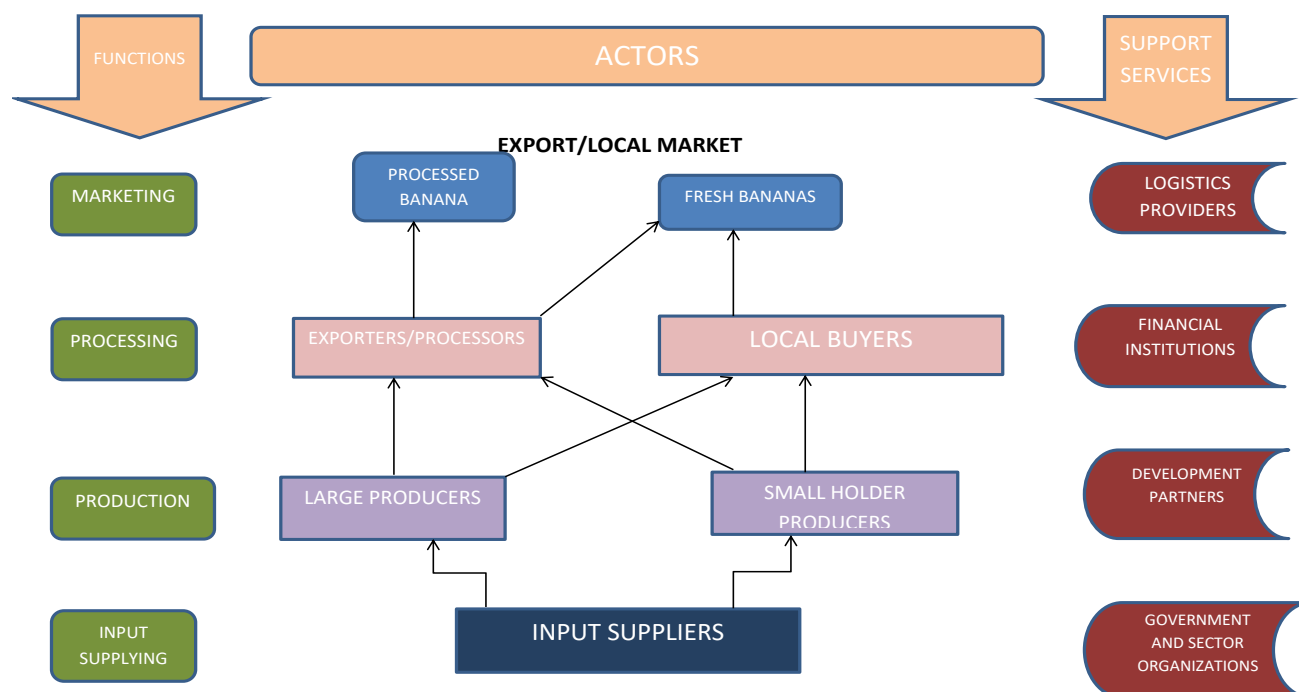


Figure 3: The banana value-chain

Actors involved in the banana value chain include producers, input suppliers, exporters, logistical service providers and other key stakeholders involved in the distribution of the product to final consumers. The above figure shows a relatively short, well-integrated export chain with very few actors involved. The local market is also rather straightforward with mainly local buyers and local markets involved. Banana, as opposed to e.g. mango, is a crop that is not much used for processing, neither for drying, juicing or cutting. This mainly has to do with the fact that banana easily colours and can be eaten relatively easily directly from the peel.

Production

In terms of production, the two companies indicate that the major challenges have to do with the water situation. Bananas react quickly to drought and the changes in the weather patterns have affected the productivity. So, bananas require a reliable source of water for irrigation and a consistent electricity supply for pumping the water. Especially the latter has caused increased costs for the companies, relying heavily on generators for pumping the water. In general, some state that the Eastern parts of Ghana are not the most ideal places for banana cultivation due to lower rainfall and poorer soil quality. They state that the Western Region (and Ivory Coast for that matter) is more ideal from an agricultural point of view.

The banana crop is susceptible for the Panama disease (fusarium wilt) which has become a large problem in Central America. Luckily in Ghana no major outbreaks of this has emerged in Ghana yet. The second disease problem is Black Sigatoka, which is a fungal disease. The disease wiped out the entire production at VREL in 1990 but is now under control through the use of fungicides and the use of more resistant cultivars.

Golden Exotics obtains its planting material from its parent company's laboratory in Ivory Coast. All the other inputs and packaging materials are imported. VREL obtains seedlings from France, South Africa and Israel and also imports most of its production and packaging inputs.

Grading, Packaging, Processing and Exports

Grading and packaging takes place at the companies' premises. As mentioned before the carton boxes are imported, because the quality of the locally produced boxes is not good enough. The rejects of the bananas are sold on the local market.

For Golden Exotics, the exports go directly to the mother company, Compagnie Fruitière, based in France. Volta River Estate Limited exports 85% of its fruits to Oké and Eko-Oké. VREL sells its bananas mostly through Agrofair, a fair-trade licensed importer based in the Netherlands. Most of the bananas are sold to the Netherlands, Belgium and Switzerland.

Logistics

The main logistics service providers are the Fruit Terminal Company Limited that manages the 'Shed 9' Fruit Terminal. Located in the Tema Port, Shed 9 became operational in 2009 to serve as the main transit point for shipment of fresh horticultural produce. 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 provides Ghana's exporters with the capacity to move more than 375,000 pallets annually, in addition to reefer container capacity, and temperature-controlled conditions. This has been complemented by individual exporters' investments in private cooling facilities, which provides the Ghanaian exporters with a continuous cold chain. The fruits are stored at the fruit terminal until the reefer vessels arrive. In addition, a new terminal will be built at the Port of Tema by Maersk / APM Terminals in the coming years, creating sufficient capacity for imports and exports. According to Maersk Groups CEO Nils Andersen this will probably ensure that Tema will have "the largest and most modern terminal in sub Saharan Africa"¹.

Overall, the logistics system of Ghana is seen as one of the strongest points of the sector with good quality facilities and infrastructure. At the same time, VREL indicated that the availability of vessels is limited and dominated by one company (Compagnie Fruitière). In addition, the companies complain about constant changes in the port's regulations with respect to security and handling arrangements.

Cost Price Analysis

Because of the closed nature of the banana industry, having only two major players, it was not possible to collect any detailed cost price data. More from a qualitative point of view the companies indicated that the cost of electricity (especially for pumping water) and the bad road infrastructure is decreasing the overall competitiveness of banana production and marketing in Ghana.

¹ <http://www.freshplaza.com/article/155008/Maersk-investing-in-Ghana>

SWOT

Strengths

- Compared to other countries, pest and disease pressure in Ghana is not a major problem.
- The companies benefit from Free Zones benefits with tax exemption incentives.
- The producers and exporters of banana are GlobalGAP and Fairtrade certified.
- The presence of a state of the art facility at the port for storage and forwarding.

Weaknesses

- The road infrastructure from plantation to the ports is poor.
- Unreliable supply and high price of electricity (especially for pumping water).
- Constant changes in the port's environment with respect to security and handling arrangements.
- Inconsistent production due to changing weather conditions.

Opportunities

- EU importers very much interested to buy from West Africa, to diversify from Latin American sources.
- The government is going to implement a system of Banana Accompanying Measures (BAM) to reduce tariffs in order to increase competitiveness with Latin American Countries.
- Continuous improvements in the Port of Tema (e.g. APM Terminals/Maersk building new facilities).

Threats

- Increasing costs for all inputs, electricity and labour
- Further aggravation of climatic change

4. The Pineapple Sector: Ivory Coast and Ghana

The Pineapple Sector in Ivory Coast: An Overview

Context: short overview of the pineapple sector in Ivory Coast

After reaching a high of 200.000 tons in 2000, pineapple exports declined rapidly to a low of 26.000 tons in 2013, before recovering to 40.000 tons in 2014 (ITC Trademap). Allegedly, two decades ago there were at least 1.500 pineapple farmers, with a combined area of around 5.000 ha. Today, the total number of pineapple farmers is only estimated at around 100, with a total area of 1.200 ha of which 600-700 ha are devoted to exports. Most small farmers have disappeared from the sector, but now that new planting material is available they are slowly starting to come back. SCB (Compagnie Fruitière) is by far the largest pineapple producer and exporter. SCAB only produces modest amounts of Smooth Cayenne pineapples for transport by air to France.

Arguably the biggest reason for the decline of the Ivoirian pineapple sector is the introduction of the new MD2 extra sweet variety by Latin American countries, their subsequent domination of the European market, and the failure of Ivory Coast to switch rapidly to this new variety. From the mid-1990s to the early 2000s the European market switched completely from Smooth Cayenne to MD2. This change was driven by countries such as Costa Rica with high rainfall and fertile soils, who are able to produce large quantities of high quality pineapples.

In Ivory Coast, SCB finally managed to get hold of good quality MD2 material in the mid-2000s. It refused to share this with other farmers. It allegedly even burned all suckers and rejects to avoid other farmers getting their hands on the material. By the time the company agreed to share planting material, most farmers had abandoned pineapple farming, or seriously reduced the area devoted to pineapple. Many farmers have converted their land to rubber or oil palm plantations.

The political instability and civil wars during the last decades have also severely hampered exports and investments in the sector. Transport costs increased, and planting material and infrastructure was destroyed. There was no credit for investment nor short-term loans to finance inputs. Finally, according to various farmers and exporters, the Sector Organization OCAB, which was traditionally the entity responsible for pineapple export, had mismanaged the export. It has been said they negotiated badly in terms of prices with importers, and deducted a lot of fees. The net price paid to farmers was deemed as being very low and unattractive.

Despite all these challenges, the pineapple sector now seems to have stabilized and there are signs that it is about to grow again. The remaining producers have all switched successfully to the MD2 variety, after SCB stopped destroying the planting material. Farmers indicate that planting material is easier to access and the MD2 variety provides better yields and is easier to farm than Smooth Cayenne. In addition to SCB, there are several national exporters who export containers regularly to the EU. Our calculations indicate that pineapple farming and export is a profitable activity. The biggest challenge however is that volumes are still small which increases transport and packaging costs, and much land in the traditional production zones is no longer available for pineapple production.

Production

Local stakeholders estimate that the sector currently has about 70 farms of less than 5 ha, 15 farms of between 5 and 20 ha, and 5 farms of between 20 and 50 ha, all owned by Ivoirians. About 10 farms, owned by foreigners have a size of 50 to 200 ha. According to FaoStat (2016) the 2014 production was 72.000 ton, of which about 40.000 tons was exported. With an average yield of 60 tons per ha (FaoStat, confirmed by local respondents) this means that in 2014 about 1.200 ha was devoted to pineapple production.

The dominant variety for both export production and local market production is now clearly MD2 with an estimated market share of 95%. About 5% of export is Smooth Cayenne. It took a long time for local farmers to get hold of good MD2 planting material, but now that it is available MD2 seems to be preferred by farmers. They indicate that this variety lends itself to more types of soil, yields are higher, and it is more resistant to drought and direct sunlight. It also requires less maintenance. Exporters also indicate that MD2 is more resistant to shocks during transport, and therefore the percentage of second grade is lower. Finally, and most importantly, the international market wants only MD2 if transported by sea. While larger farmers import their planting material as in vitro plants, smaller farmers tend to use rejected pineapples (that were too small or large for export) or shoots from old plants.

The yields per ha range from 40-75 tons of export grade. The yields depend on the soil fertility, amount of water supplied, planting density and amount of fertilizer used. However, good quality planting material and following recommended practices is crucial. Diseases do not seem to be a large problem at this stage. Finally, the yield in terms of exportable product also depends on the amount of second grade, which is usually between 5%-10% of production. This brings the combined yield for first and second grade to about 44 to 82 tons/ha. According to FaoStat the average yield is 60 tons/ha. Many pineapples that are second grade have not been rejected because of defects, but because they are either too small or too large according to the client specifications. These pineapples are sold on the local market.

The current sales prices are 125 to 130 CFA per kg for export grade, and 100 CFA per kg for the national/regional market. These are attractive prices, which allows farmers to make a serious profit of 50% to 60%, depending on their yields and input usage.

Larger producers tend to have irrigation systems, while smaller producers often order water tankers once or twice a week, or fetch barrels of water and irrigate by hand. Urea, NPK and DAP are used as fertilizers, and Ampa-Special30 is a common herbicide. In addition, Ethypon is used to create the induction for the flowering of the pineapple and it creates the yellow colour so much preferred by importers. GlobalGAP is a common minimum certification, and organic is increasingly in demand by importers.

Grading, packaging, processing and export

Large farms tend to have their own pack house on the farm and export themselves. Smaller farmers tend to rely on small exporters, who rely on *pisteurs* to source the pineapple and organize labour for the harvest, and the sorting and packing. They also organize transport to the pack house. A special box on the role of the *pisteur*, a typical value-chain actor in Francophone Africa, is provided below (box 1).

Box 1: The Role of the Pisteur in Ivory Coast's Fruit Sector

A pisteur is basically a well-trained harvester-trader who links farmers with exporters, processors or local traders by finding producers on their behalf, harvesting, sorting and selecting the fruit according to the specifications of the client (Cahier de charges) and transporting it to the client. The actual role of the pisteur and the remuneration can differ from product to product, and country to country, and even within one country and value-chain there can be different models. For example, in Mali a mango pisteur will typically take all the product in an orchard for a fixed fee, determined by his estimation of yield and quality. He then sorts and sells the various grades to his clients. In Ivory Coast, however, the pisteur only takes what he thinks is export grade and leaves the rest for the farmer to sell. In most cases the pisteur takes ownership of the fruit, and sells this fruit to his client. He is thus a trader that takes a trade risk. However, there are also pisteurs who get paid a fixed amount per kg delivered and accepted in exchange for organizing labour and transport. In these cases, they are thus a service provider, and the exporter pays the farmer directly.

The role of the pisteur is often controversial, and many businesses and development organisations have tried to get rid of them in the hope to improve the livelihood of the farmer, reducing the steps in the value-chain and improving product quality. The logic applied is that by taking part of the profit and taking over the grading of the products, he takes away the economic incentives for the farmer to invest in the orchard. This is particularly the case where a fixed fee is paid to the owner. In addition, there is no direct contact between client and producer about quality and price. However, most of the attempts to cut out the pisteur have led to a dramatic drop in the quality of the mango supplied to exporters and processors, and did not lead to owners investing more in their orchards. There have been many initiatives to train small producers to improve maintenance of the orchards and in harvesting and grading, but these have had little to no result. Yet, there is a growing trend for exporters in Ivory Coast to deal directly with the larger more professional farmers.

It seems that the pisteur is an essential part of the value-chain in cases where many small producers are poorly trained and not willing to invest much in their orchards. The pisteur saves exporters and processors the hassle of dealing with many small producers that do not sort and grade their mango properly. Their role is basically to go out into the chaotic world of small orchards with highly variable quality and try to find as many exportable mangoes as possible. In addition, it is much easier for an exporter to explain their quality criteria to 3 pisteurs than 1.000 farmers. However, more professional farmers with larger orchards who are willing to learn and invest in their farms are better of dealing directly with exporters. The largest commercial orchards often sell directly to their clients. In Ivory Coast there is also a growing trend to work directly with farmers.

In conclusion, the level of professionalism of the farmer determines whether a pisteur is needed or not. The more professional the farmer, the smaller the need for a classical pisteur. Still, there is a case to be made for having a pisteur as a service provider that comes with his truck and trained labour and harvests and sorts the mango at a fixed fee per kg. The harvest is the only time in the year when an orchard needs a large amount of labour, and it is surely much more efficient to have a well-trained harvester servicing multiple orchards, than every orchard having to find and train their own labour year in year out.

The pack house is generally rented from a cooperative at a fee of 30 to 50 CFA per kg of export quality packed. Most cooperatives are no longer functioning, because most of their members have stopped farming pineapples. The few farmers that are left rent out their pack houses to get the income needed for the maintenance and operations. Most pineapple pack houses do not have cold storage, which complicates logistics, because harvesting can only start once there is a refrigerated container available to pack. The pisteurs sell the export grade pineapple to the exporters and the rejects to cross-border traders and traders in the national market. The profit margin for pisteurs is estimated at around 20%.

The small independent exporters often have limited cash flow and ask the client for an advance to afford the packaging boxes. Clients also tend to pay for transport, sometimes from all the way from the pack house to Europe, sometimes on an FOB basis. Not every importer is prepared or able to make an advance payment, and this limits the sales of small exporters. The exporters organize the transport with a transporting company, that brings the refrigerated container to the pack house for loading. Packaging material is normally bought from one of the two local companies, Embacie or Sonaco.

Pineapple is normally packed in 12kg boxes, with 80 boxes per pallet and 20 pallets per 40-foot refrigerated container. The pallets used for pineapple are bigger than the euro-pallets used for mango because of the larger boxes. This is the reason that only 20 pallets instead of 22 fit in one container.

The exporters make a margin of 15% to 30%, depending on the market price. Many pineapple exporters are also mango and coconut exporters. The advantage of pineapple is that it is a year round activity. The biggest challenges for exporters are logistics, cash flow and the availability of sufficient quantities of pineapple.

There is hardly any pineapple processing. There is no pineapple drying, and only one juice factory is operational: Ivorio. This brand can be found all over West Africa, and since the factory was taken over by a Malian industrial family, packaging has been modernized. However, the shortage of pineapple makes it difficult to produce in volumes. Sometimes the factory is forced to buy first grade pineapple at export prices for juicing. Comfruit is a new processor in the pineapple sector that recently bought a factory that went bankrupt eight years ago. But this factory has not yet reopened.

Logistics

The biggest advantage of the pineapple sector is that the production areas are relatively close to port, and therefore transport to the port can easily be arranged by truck and is not too expensive. Another advantage is that there is no real peak-season that requires a large amount of containers in a small timeframe (due to the steady year-round production).

However, because pineapple exports are very small compared to the other fruit sectors, they are not that important for transporters, and therefore not prioritized like the bananas. Another challenge is that during the mango season refrigerated containers can become difficult to get hold of. In addition, lack of competition still makes transport relatively expensive, while road transport takes time and the risk of product loss through crashes is high. Boloré is the only independent transport company offering door-to-door transport, because competitor Aeolis is aligned to SCB and does not often work for other exporters.

The biggest difficulty is that there is in effect only one boat per week, which goes to Antwerp. A second boat going to France is not an option because of the strict French phytosanitary inspections. Because the pack houses that are used by small producers and exporters do not have cold storage, the harvest needs to be scheduled around the arrival of the containers and the departure of the boat. There is limited flexibility in the system, and non-delivery of containers has a severe impact on exports.

Transport by air is very limited because of the exorbitant cost charged by the airport in Abidjan for cargo handling and other services. According to SN Brussels, the Abidjan airport taxes are among the highest in the world. Landing and loading a cargo plane costs US\$ 12.000 and is therefore not feasible. SN Brussels is currently the only airline taking fruit as cargo into the EU. The capacity is limited to 8-15 tons, depending on the amount of passengers on the flight. The Brussels airport is able to clear the fruit within an hour of landing, and from Brussels it is often taken by truck to Paris. Air France used to take cargo, but has stopped this due to the strict phytosanitary inspections.

Cost Price analyses

The below table shows the cost price and profit margins for a small-scale pineapple producer in Ivory Coast.

Table 1: Production costs and profits for pineapple in Ivory Coast

PRODUCTION COSTS	Quantity/ha	Unit price	Cost/ha
Fertilizer			€ 610
Plants	60000	25	€ 2,287
Pesticides			€ 381
Water (barrels)	60	1000	€ 91
Labour			€ 610
Rent for land			€ 76
Total Cost			€ 4,055
SALES	Quantity	Price/kg	Revenues
1st grade (85%)	40000	125	€ 7,622
2nd grade (15%)	7000	100	€ 1,067
3d grade	0	0	€ 0
Total Sales	47000	-	€ 8,689
PROFIT ANALYSIS	Ha		
Revenues	€ 8,689		
Cost	€ 4,055		
Profit	€ 4,634		
Profit Margin (Ex Farm)	53%		

The table indicates that the biggest costs for a small-scale farmer are by far the MD2 plantlets that need to be obtained from a professional tissue-culture laboratory or research institute. The table also shows that the yields are relatively high, whereas second grade is quite substantial at 15% compared to the larger scale farmers (around 8%). Overall, profitability is high at more than €4.500 per hectare. Picturing a typical Ivorian small-scale pineapple farmer has 3 hectares of land; he/she would have an income of €14.000 per year, well above the per capita average of €1.000.

For the farmer we have taken examples from two different small-scale producers. We have not shown the second example here, which is a more intensively managed farm, with higher input costs. Profits there

were even higher than the above example. Our analysis shows that investing more in inputs leads to significantly higher yields and profits.

Also the work of the pisteur is highly profitable, see the table below:

Table 2: Cost-Benefit Analysis for the pisteur (harvesting/packaging)

HARVESTING-PACKAGING (PISTEUR) (per 1 container - 40 ft. export)			
	Quantity	Cost/kg	Cost
Packhouse rent	19200	20	€ 585
Labour for harvesting and packhouse	19200	10	€ 293
Transport field to packhouse	19200	10	€ 293
Total Cost		40	€ 1,171
PROFIT ANALYSIS (PISTEUR)			
	Quantity	par kg	Total
Revenues	19200	200	€ 5,854
Purchase cost	19200	125	€ 3,659
Packing cost	19200	40	€ 1,171
Profit		40	€ 1,024
Profit margin (Ex pack house)			18%

Though the overall profit margin is lower here than at producer level, overall quantities (volume) of pineapples is much higher here. At the same time, risks are also higher as the fruits can go bad or market prices can fluctuate. The analysis shows that the pisteur, in normal conditions, makes a healthy profit of more than €1.000 per container.

Moving to the exporting business, also here a healthy profit is made by the exporter on a container of pineapples. Important costs are the boxes and transport to the ship, even though the boxes are made locally. The overall selling price ends up at around €0.75 per pineapple, wholesale level. At retail level the pineapple often goes for between €1.50 and €2.00 per kg.

Table 3: Ivory Coast's pineapple packaging and export costs and profits

EXPORT BY SHIP (40ft container/20 pallets/80 boxes@12kg)			
COSTS	Quantity	Cost/unt	Costs
Boxes	1600	€ 1.14	€ 1,829
Pallet	20	€ 8.38	€ 168
Corners	80	€ 1.07	€ 85
Plastic tape	0.25	€ 77	€ 19
Transport to port	1	€ 610	€ 610
Transport by boat to Antwerp	1	€ 2,439	€ 2,439
Total Cost (per container)			€ 5,150
REVENUES	Price/box	Price/kg	Total
Revenues sale FOB	7.64	€ 0.64	€ 12,218
Reimbursement for transport from client		€ 0.13	€ 2,439
Purchase of pineapple		€ 0.30	€ 5,854
Packing and transport to boat		€ 0.27	€ 5,150
Profit	7.64	€ 0.19	€ 3,653
Profit Margin (%)			29.9%

Trends

Since the successful introduction of the MD2 variety clients have become more interested in pineapples from Ivory Coast. Small farmers and exporters are slowly starting to come back to the industry. The pineapple export sector is growing again now, while production for the local and regional market has remained stable over the past decade. However, growth is limited by the amount of land available in the traditional farming sector.

Where previously, cooperatives and the producer-exporter organization OCAB were important in the industry, there are now private exporters doing business directly with farmers (with the help of pisteurs). There seems to be a clear interest from European importers in organic pineapple, and several exporters are currently looking into the certification process with locally represented certification bodies, such as Control Union.

Finally, the last 5 years have seen a decrease in rainfall and increase in sunny, hot days which impacts negatively on pineapple production. Irrigation has become more important than ever, while the MD2 variety seems more resistant to drought and direct sunlight.

SWOT

Strengths

- Profitable activity for all actors in the chain
- Producers have adopted the MD2 variety and associated production practices
- Even small farmers have high yields and a low percentage of rejects
- Year round production
- Close to market
- Proximity to port limits transport cost
- No major diseases and product is less susceptible to heat than mango
- Attractive prices on national market for export rejects
- MD2 variety seems more resistant to climate change

Weaknesses

- Expensive and unreliable logistics: long transit time, one ship per week and shortage of containers during the mango season
- Almost no processing, hence limited value addition
- Limited land available in traditional zones; many plantations were converted to rubber and oil palm during the pineapple crisis
- Most small producers have been driven out of the sector
- Still limited availability of planting material
- Working capital for smaller exporters is a challenge
- Many smaller, less professional exporters
- High cost of airport limits the size of air-freight market
- Poor infrastructure for irrigation at the small farms
- No cold storage in packing stations

Opportunities

- With MD2 the European market offers good possibilities for growth
- Very profitable crop that can easily be promoted amongst emerging commercial farmers
- Processing for off grades: dried pineapple, juice, frozen, cut.
- Organic pineapple

Threats

- Climate change
- Competitive land uses, such as rubber and oil palm
- International competition

The Pineapple Sector in Ghana: An Overview

Context: short overview of the pineapple sector in Ghana

The pineapple sector is probably the sector within Ghana's horticultural industry that the government and development partners have invested in most. It was the entry point for most of the major public investments in the horticulture sector in Ghana. The following projects, Farm-A-Pine, TIPCEE, EMQAP, MOAP and MiDA, together invested hundreds of millions of dollars into the pineapple sector. Exports increased by 56% between 2001 and 2004 but the gains were easily eroded between 2004 and 2009, as illustrated by the graph below. Exports declined by negative 39% due to the introduction of MD2 onto the international market which outcompeted Ghana's smooth cayenne, internationally known as the 'Golden Pineapple' (Korboe, 2010). Costa Rica became the main exporter of pineapple and still is at this moment.

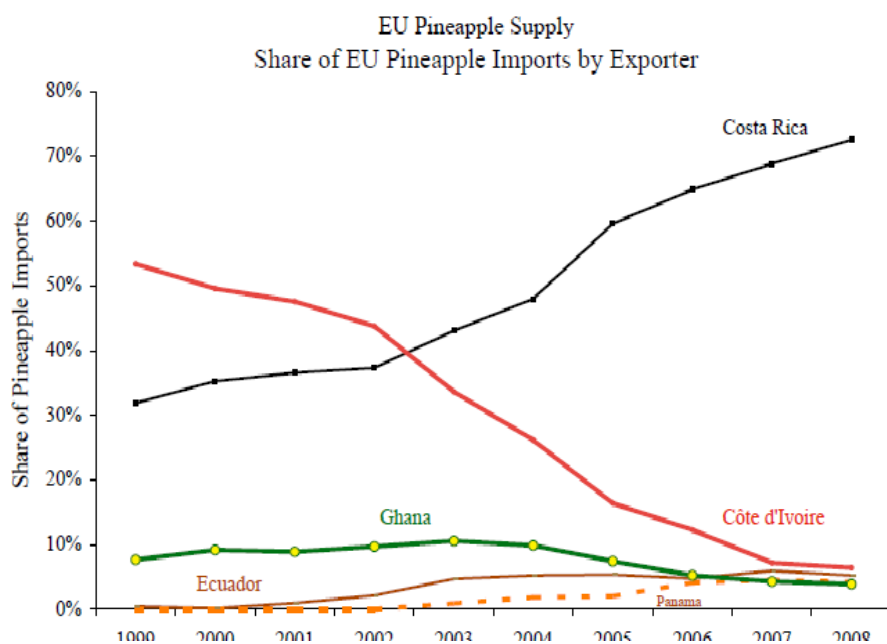


Figure 4: Worldwide exports of pineapple to the EU between 1999-2008 (DevelopEconomics, 2011)

The main varieties of pineapples now cultivated in Ghana are the Smooth Cayenne, MD2, Sugarloaf and Queen Victoria. The commercial cultivation of pineapples in Ghana is mostly located at the west and northwest of Accra, within 75 kilometres of the capital. Production is much concentrated in Nsawam-Aburi-Suhum in the Eastern region, Amasaman area in the Greater Accra region and Kasoa-Bawjiase-Winneba, Agona Swedru and Mankesim in the Central region.

Pineapples are harvested throughout the year, but the mid-year rainy season is a poor time for fruit quality. Hence, the production is usually lower at this time of the year with a resulting lower export volume from June to September. The major peak season for the export of pineapples from Ghana is from October till December and the minor peak season is from February to April.

The pineapple value-chain based on production data for 2011 and 2012 has a large number of commercial farmers producing about 90% of pineapple in the country. MD2 constitutes about 90% of total production in Ghana, with smallholders accounting for about 2% of production volumes. About 50% to 60% of produce is exported by sea with the rest sold to Blue Skies (6.000 tons), the domestic market (fresh), processing firms and niche air shipments to the EU (Sugarloaf). Not more than 10% of pineapple production as indicated above is targeted at Smooth Cayenne production, which is limited to a few commercial farms and mostly grown by smallholders.

The exports of fresh pineapples from Ghana is undertaken by a few companies, most of them located in the Awutu Senya District of the Central Region and Akuapim South District in the Eastern Region. For fresh cut fruits, Blue Skies based in Nsawam has been the leader (95%). All their products are air-freighted using commercial passenger airlines such as British Airways and KLM with the bulk of Blue Skies products destined to British supermarkets.

All consignments of fresh pineapples shipped by sea are exported to Europe with five companies accounting for 41% of all exports. About 20% of all the pineapple is shipped to Britain, mostly directly to the supermarkets, with the rest shipped to Switzerland and other EU countries. The exporters that transport their produce abroad through sea-freight are part of an association known as Sea-freight Pineapple Exporters of Ghana (SPEG). There are currently 23 members of this association with just about 10 members being actively involved in the exports. According to SPEG, the export of pineapple by its members dropped from 45.000 metric tons in 2014 to 20.000 metric tons in 2015. This, according to SPEG, is mainly due to the high cost of producing the MD2 variety and the lack of credit for smallholder farmers to support their farms operations.

The figure below represents exports of pineapple between 2004 and 2013 and it can be observed that exports have declined steadily from the good years of 2004-2006 to 2008-2013. The year 2011 was a positive exception; quantities were not much higher but prices were.

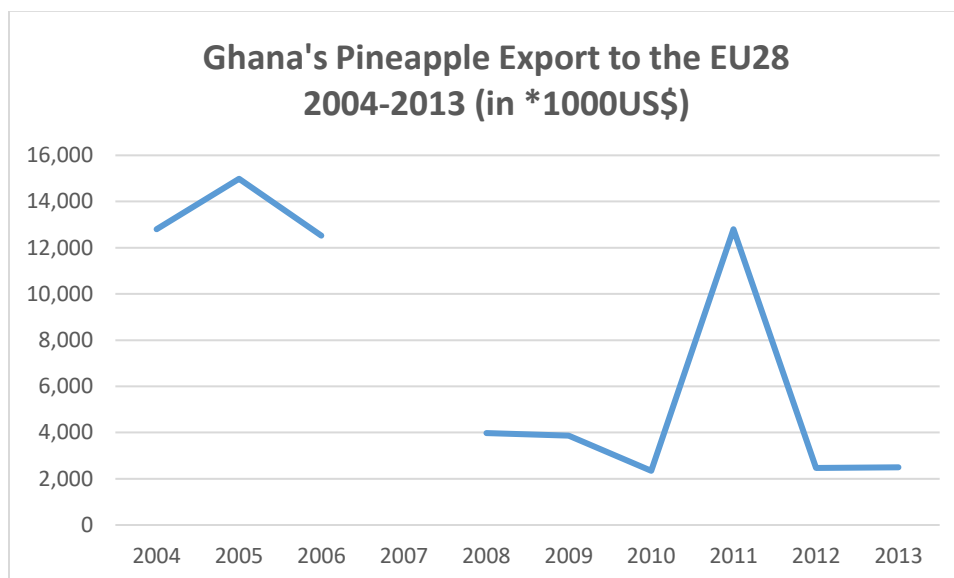


Figure 5: Pineapple exports from Ghana to the EU (2004-2013) in 1.000 USD (UN Comtrade)

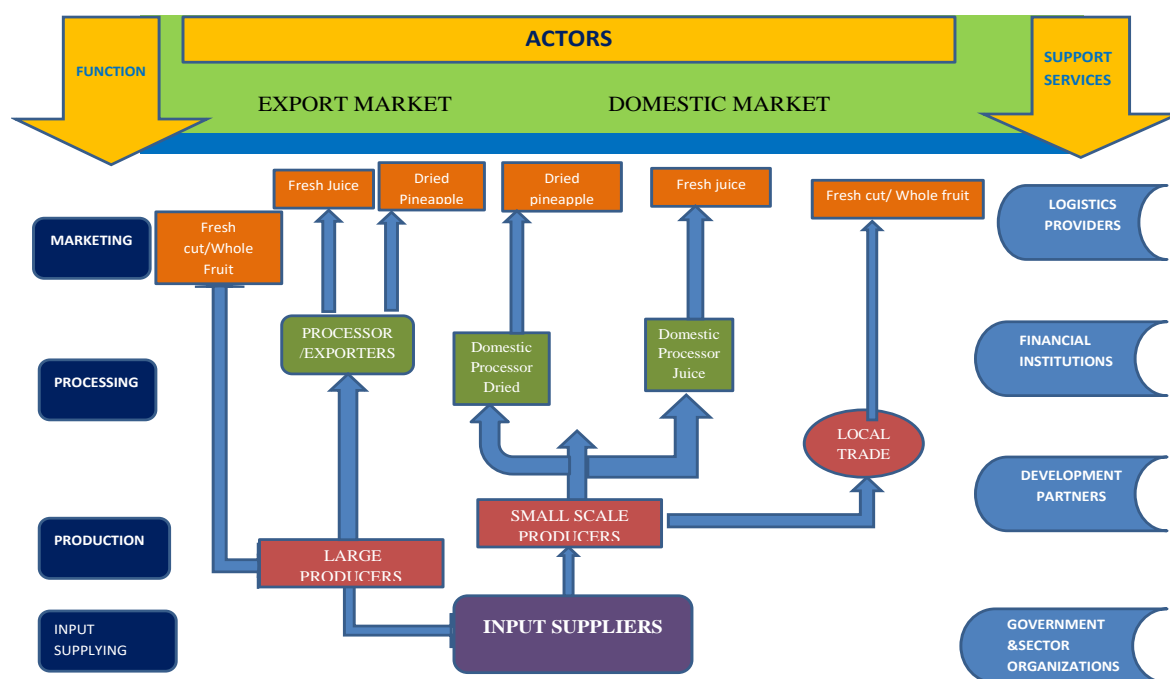


Figure 6: Ghana's pineapple value-chain

Producers involved in the pineapple value-chain include larger producer exporters, small-scale producers operating as individuals and outgrowers to larger producer exporters. Especially the diversity in output markets is interesting in this respect (also compared to neighbouring countries like Ivory Coast), as there is much attention for adding value through juicing, drying and cutting the pineapple. Important companies in this respect are: HPW, Blue Skies, Pinora and Peelco. Especially for cut, dried and juice the Smooth Cayenne is still the preferred variety, which grows well in Ghana and farmers have good experience with.

Production

The group of smallholder producers typically grow pineapples on 0,25 to 1,5 hectares and also supply fresh pineapples for export through links to the members of the Sea-freight Pineapple Exporters of Ghana (SPEG). The smallholder pineapple producers have formed associations which assist their members to adopt better practices and accessing high-end markets (processors) such as Blue Skies, HPW and Pinora.

Contradicting our findings from Ivory Coast, Ghanaian farmers and exporters indicate that MD2 is a difficult pineapple to grow. According to them it requires a more intensive input regime, with higher levels of fertilizer and pesticide use. They mention that the MD2 is more susceptible to pest and diseases than the Smooth Cayenne and is less resilient to brief water shortages. The diseases mentioned most are: mealybugs, nematodes, ants and fungal diseases. Farmers also complain about the fact that the agrochemicals available can be counterfeited and their efficacy is not constant.

Pineapple production requires good (drip) irrigation facilities. The current systems used require much electricity for pumping and distribution, which – like in the banana sector – is relatively expensive and unreliable in Ghana. Overall, the cost of production is mentioned to have increased substantially over the last five year, mainly because of higher input, electricity and labour prices.

Grading, packaging, processing and export

The large producer/exporters are organized in SPEG, which is a group of 23 pineapple producers and exporters who currently together export 20.000 tons of fresh pineapple per year in reefer vessels and by air. The association assists its members in maintaining common quality standards, attaining certification (GlobalGAP) and providing shipment arrangements. SPEG members also co-operate in marketing of their produce in the European Union and the Middle East.

Table 4: List of major fresh pineapple exporters in 2013

Export Companies	% Share of the market
Golden Exotics	26
Jei River Farms	12
George Fields Farms	5
Gold Coast Fruits	8
Bomart Farms	15
Prudent Farms	6
Koranco Farms	7
Milani Ltd	14

Source: FAO, 2013(<http://www.fao.org/3/a-ar708e.pdf>)

The logistics providers for the sea-freighted pineapple exports is Fruit Terminal Company (FTC) limited located at the Tema port. Fruits bound for France are transported by Golden Exotics, which has its corporate offices in Marseille, France. Currently, vessels operated by the African Express Lines (AEL), a

subsidiary of Compagnie Fruitière, move most of the fruit shipped by sea. AEL has dedicated fruit vessels with two scheduled port calls per week, making them more attractive than other.

There are two main logistics service providers at the airport, AGPC and Aviance. The Air Ghana Perishable Cargo Centre is located at Kotoka International Airport with proximity to the cargo planes that carry the fruits. They have a state of the art cooling facility and provide handling service for all fresh cargo. All government checks are integrated in the facility, ranging from phytosanitary inspections (PPRSD) to narcotics (CEPS). AGPC works directly and exclusively with carriers like: Cargolux, Delta Air, Lufthansa and Turkish Airlines.

Aviance Ghana was established in 1994 and is the largest cargo handler in Ghana with approximately 80% of all the airport cargo being processed by their experienced staff. The cargo warehouse is able to accommodate up to 2.200 pallets of cargo. Some of the company's key clients include: British Airways, South African Airways, Ethiopian Airlines, Alitalia and KLM.

Cost Price Analysis

For the full cost benefit analysis of pineapple we have included: the cost of production, pack house handling, packaging, and storage; exporting costs (sea/air-freight, handling); as well as the sales price of the fruits. These are estimations based on data provided by a limited number of exporting companies.

Table 5: Production costs pineapple – large MD2 plantation

Production	
MD2 / Plantation	Cost per Ha
Land Preparation	€ 425
Plastic mulch laying	€ 1,137
Sucker treatment	€ 84
Labour	€ 1,766
Fertilizer application	€ 2,204
Pesticides	€ 674
Forcing	€ 50
TOTAL COST PER HA	€ 6,340
COST PER TON	€ 0.08

In terms of production costs Ghana scores significantly higher than Ivory Coast. In the above case of a very large pineapple plantation of more than 1.000 hectares, especially the soil preparation and fertilization costs are much higher than in Ivory Coast. Where is in Ivory Coast the largest cost component were the plantlets, in Ghana own developed suckers are used and most resources are spent on land preparation, plastic mulch and fertilizer. This relates to the fact that both the fertilizer amounts required as well as the prices of fertilizer are high.

Table 6: Pineapple yields and grading Ghana

Production	%	Tons
1st Grade	90%	67,500
2nd Grade	10%	7,500
TOTAL Production		75,000

The production is slightly lower than the big farm in Ivory Coast, which produced 87 tons. The amount of 1st and 2nd grade is more or less the same.

Table 7: Pack house costs Ghana

Packhouse	Costs
Packaging (sorting/packing/loading)+ transport	€ 6,273.00
Fungicide Application	€ 244.69
TOTAL COST	€ 6,517.69

Total costs for sorting, packing and grading are also higher in Ghana than Ivory Coast (CIV was € 5150).

Overall, profitability in Ghana for pineapple is lower than Ivory Coast; especially due to better productivity and lower production costs. In addition, the logistical chain seems to be organized more efficiently.

SWOT

Strengths

- Pineapple is the most developed non-traditional horticultural export product from Ghana
- Most of the producers are certified (Global GAP and/or Fair Trade)
- Farmers are well-trained with good basic knowledge of pineapple cultivation
- Presence of well-equipped pack houses in all pineapple growing areas
- Very good logistics facilities both the Tema port and KIA

Weaknesses

- The cost of production is high for the MD2 variety (inputs, irrigation, labour)
- Limited availability of credit for investment and working capital and high interest rates
- High susceptibility of pineapple to pests and diseases (especially MD2)
- Declining soil fertility
- Limited irrigation facilities
- Problems with counterfeit chemicals on the market

Opportunities

- There is a growing demand for fresh cut and processed pineapples in the European market
- The provision of investment and working capital loans through the envisaged Ghana EXIM Bank

Threats

- Increase in production by Latin American countries and other countries in the sub region such as Ivory Coast
- Ever increasing production costs due to increased costs for electricity (fuel), agrochemicals and labour.

5. The Mango Sector: Ivory Coast & Ghana

The Mango Sector in Ivory Coast: An Overview

Context: an overview of the Mango sector in Ivory Coast, Mali and Burkina Faso

The main production zone for mango in the region stretches from the North of Ivory Coast (Korhogo, Ferkessedougou) towards Orodara, Banfora and Bobo-Dioulasso in Burkina Faso, and Sikasso and Bougouni in Mali. Around the Malian Capital of Bamako is a second mango production zone. Though each of the three countries has their specifics, they have much more in common when it comes to the mango sector, and cross-border transport and commerce is common in the region.

Originally mango was planted widely for local consumption, and the variety Amélie, and to a lesser extent Brooks, were the dominant varieties. However, these varieties are not well suited for export due to a lack of red coloration, sensitivity to shocks and limited shelf-life. After the 1980s Kent and Keith (also called Keitt) were introduced for export.

The potential for mango farming and export in the region is large. The climate is well suited to mango farming, and the area produces perhaps the tastiest mangoes in the world. Because the region is in the northern hemisphere, the season differs from many of the other large exporters in Latin America such as Brazil and Peru, and therefore competition is limited. In addition, the region is much closer to the EU market and if logistics are well organized, should have much shorter travel times. This also allows mangoes to be harvested at a more advanced stage of ripening, and therefore with a better flavour than competitors. The close proximity to the EU, also makes airfreight more affordable.

However, export is currently limited due to expensive, slow and sometimes unreliable transport, as well as the poorer quality of the mango. Availability of containers is often an issue, and the whole region needs to export large volumes through one congested port, Abidjan. The sector is still dominated by small producers that invest little in the maintenance of their orchards, and even larger farmers are not really professional. As a result, the percentage of exportable mango is low, and quality problems are common. A particularly large issue is the fruit fly, that attacks the fruit as soon as the rains begin, effectively reducing the season by about 4-6 weeks. Anthracnose, or black spot, is another large issue because the disease only manifests itself once the mango arrives in the EU.

There is a lot of cross-border trade in mango; Mali and Burkina Faso export to Europe via Ivory Coast, even from Bamako. The mango drying factories and the juice factory in Burkina Faso are importing mango from Mali, and sometimes Ivory Coast. Mango from Ivory Coast is also exported from Ouagadougou airport, and Burkina Faso and Mali export mango to processors in Ghana.

Analysing trade statistics is not easy. Firstly, because in recent years exports from Burkina Faso and Mali have not been recorded. Secondly, because the mango yield can vary greatly from one year to the next,

and thirdly, because the conflicts in Ivory Coast and Mali have led to border and port closures that impacted heavily on trade volumes. Finally, the cross-border trade can easily skew statistics.

The export statistics paint a picture of a sector with potential to grow that has stagnated nevertheless. Burkina Faso export shows limited growth during the past decade, with around 7.500 tons, of which about 5.000 tons is exported to Europe and about 2.500 tons to Niger, Ghana and Morocco. Mali's exports have moved up and down quite erratically, but in 2012 they were 7.500 tons to the EU and about 14.500 tons to the region, including Senegal, Morocco, Mauritania, Ghana, Burkina Faso and Ivory Coast. Alternative data suggest that exports to the EU average around 6.000 tons over the 2013-2015 period. Finally, the export volume of Ivory Coast seems to be increasing over the past decade and is now at 25.000 tons according to ITC Trademap. However, this seems very high given their short season and it is well possible that this includes the exports from Mali and Burkina Faso as well. Local organizations estimate the 2015 export at 20.000 tons.

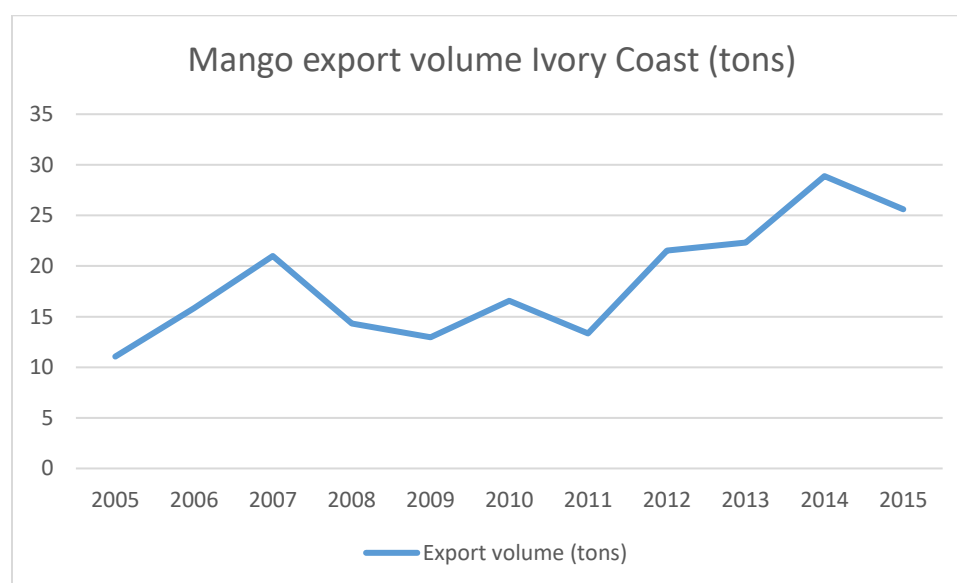


Figure 7: Export volume from Ivory Coast (2005-2015) (Source: TradeMap ITC)

Production

In Ivory Coast about 15% of plantations are smaller than 5 ha, and these are usually not able to export, while 80% of orchards are between 5-20 ha, and 5% are 20-70 ha. There is one orchard of 150 ha with its own pack house. In Mali and Burkina Faso over the past decades, emerging commercial farmers have established orchards of 5, 10 or sometimes even 30 ha, but the sector is still dominated by small producers, many of which own orchards smaller than 5 ha. These producers are often organized into cooperatives.

Most orchards, including the larger commercial ones, have large trees that receive little management. The owner may do some pruning from time to time, remove some weeds, spray a little pesticide and plough

the ground in-between trees to loosen the soil and allow more rainwater to sink into the ground. Less than 1% of farmers use irrigation, usually drip irrigation. Spacing between trees is wide (traditionally 10x10m, changed more recently to 10x6m and 5x5m). The trees are often allowed to grow very tall and wide, which makes harvesting difficult.

The harvesting and sales are traditionally done by pisteurs, who have a team of pickers and sell to independent exporters and processors. In Mali and Burkina Faso they pay a fixed fee to the owner after making a crop estimate, and take all the mangoes they think they can sell. In Ivory Coast, they agree on a price per kg for exportable quality, and leave the rest either on the tree or in the orchard for the owner to sell. The pisteur then transports the mangoes to the export pack house or the processors.

In Ivory Coast farmers are increasingly organizing their own picking teams and are selling directly to the exporters. The exporters encourage this practice because they hope it makes it more attractive for the farmers to invest in the orchards and that they take more responsibility for the quality.

Because of the lack of maintenance and investment, yields are low. The majority of orchards only produce about 10 tons/ha. In some cases, where more is invested, yields can increase to 15 tons, and in more modern plantations with a 5x5m density and more maintenance, yields range from 15 to 20 tons. Where there is irrigation, yields are closer to 20 tons.

Poor quality is another issue. Only about one third of mangoes in an export orchard are actually suitable for export. Most are rejected because of external blemishes, size (too small or too big), lack of coloration and ripeness (unripe or too ripe). Particularly in Mali and Burkina where pruning is even less practiced, coloration is an issue. More recently, shrivelling due to a lack of water has become a problem in Burkina Faso. Declining rainfall and the often long distances between orchard and pack house lead to moisture reduction in the mangoes. Finally, because flowering is not induced, the mangoes ripen at different times, and even on one tree one can find mangoes in five different stages of ripeness. This needs to be reduced to at most 3 stages at the pack house, and even then it makes the mango unsuitable for the growing ready-to-eat market where importers ripen mangoes before they are delivered to retailers.

Another problem is the quality of trees. Traditionally, specialized nurseries graft the desired variety onto a local rootstock, but when the tree is sold to the orchard the taproot can be damaged, which reduces the ability of the tree to take-up nutrients and can delay fruiting by several years. Trees should be planted and grafted directly on the farm or nurseries need to improve their level of professionalism and ensure the taproot remains intact.

The biggest challenge at farm level, however, is diseases. Fruit fly and anthracnose (blackspot) are the most serious diseases, which seriously cut short the season. By late May exporters are forced to stop exporting, though mangoes are available until late July/early August. The risk of a container being rejected is however too high; as one rejected container can easily wipe out the profits of a whole season for an exporter. Though there are various national and regional initiatives in the fight against fruit fly, results have been limited. There are simply too many poorly maintained orchards that do not treat against fruit fly and leave unsold mangoes on the ground and in the trees.

Kent is the main variety for fresh mango exports, followed by Keith (Keitt) that is more fragile and largely coincides with the arrival of the rains and fruit fly, and therefore only a small part can be exported. An early variety for the fresh export is not available. Small quantities of Amélie are exported, many as organic, but only because there is limited supply from competing countries on the market at that stage. The below figure shows the different windows of the varieties.

	APRIL		MAY		JUNE		JULY	
Amélie								
Kent								
Keith								

Figure 8: Mango export calendar from Ivory Coast

The calendar indicates that for the most important variety (Kent) the main season is only 6 weeks. For importers April and May are very difficult months. Amélie is not a very popular variety for importers, due its low shelf-life, but importers are buying them because there is a general shortage in April. The second part of June has been shaded light grey for Keith. Though mangoes are available in this period they are often affected by Anthracnose and fruit fly (due to the start of the rains).

In Ivory Coast, about 80% of mango is said to be Kent, followed by 7% Keith, 3% Amélie and 10% other varieties. In Mali and Burkina Faso, Brooks and Amélie are still the most popular, because they provide a long season and are suitable for the local and regional fresh market, as well as mango drying and mango juice. Kent and Keith have been planted for fresh export and are highly valued for drying, which takes up a lot of the rejects. Lippens has become very popular for the local and regional fresh market but is not suitable for drying. Valencia, Palmer and Zille have been planted but are not popular. There are currently no internationally accepted, early season varieties in production. However, it could be possible to introduce, for example, the early season Tommy Atkins variety produced in South Africa.

Grading, packaging and exports (Fresh)

Exporters buy the mango from pisteurs, but only pay for exportable mangoes. The rejects are sold by the pisteurs on the local market. Though larger exporters tend to own their own pack houses, the majority of exporters rent a pack house including staff, from a cooperative or private service provider for CFA 30/kg for non-refrigerated, and CFA 50/kg for refrigerated facilities. Pack houses tend to have simple, automatic washing and sorting lines, where mangoes are sorted according to size. The sorting takes place according to: colour, blemishes and other visible defects and is done by hand. Before packing mangoes, the ripeness is checked by measuring the sugar content (brix) using a simple measuring tool.

In Burkina Faso and Mali, most pack houses have cold stores and pre-cooling facilities, where the temperature in the fruit is rapidly decreased from 40 degrees to 8 degrees. In Ivory Coast, 80% of pack houses do not have cold storage and pre-cooling facilities. Because they have a shorter transport time they can get away with this, and it saves electricity cost (CFA 15/kg) and investments. However, it does

decrease the flexibility in the chain; the pisteur can only harvest when there is a refrigerated container available. In addition, a cooling facility would allow harvesting at higher ripeness, which would improve the flavour.

The management of pack houses used by various companies is not easy. In PLAZA, the packing house constructed with Dutch development aid in Bamako, conflicts between traders over space are common, while the packing house itself often operates at a loss. A publicly funded packing house in Bobo-Dioulasso in Burkina Faso struggles to attract users.

Most exporters in the region are local businesses. Small exporters tend to ship ten containers per season, medium sized exporters about 30 and a few large exporters, mainly in Ivory Coast, manage to do 100 containers or more. SCB in Ivory Coast has also started to export mango, but they simply buy ready packed mango from exporters/pisteurs at the pack house. While exporters in Mali and Burkina focus on mango only, many exporters in Ivory Coast are also involved in pineapple and coconut, partly because the Ivory Coast season is so short.

Though the focus of the sector is on the EU market, the West and North African market presents great opportunities, and are in terms of volumes more important for Mali and Burkina Faso than the EU market. Simple non-refrigerated trucks transport large quantities of local varieties and export rejects to Niger, Senegal, Mauritania and Morocco, as well as Ghana.

Challenges for mango exporters are comparable to those in the pineapple sector; notably, a lack of working capital to buy boxes and expensive and often unreliable logistics. In addition, the short season is a challenge. Finally, the language barrier makes it difficult to communicate with importers, which is made worse by the large cultural gap.

It is interesting to see that there is a manufacturer of good quality mango packing lines in Ivory Coast. The cartons for packaging are also produced locally in Abidjan by two factories.

The dominant certification is GlobalGAP, which is really a required minimum. In addition, many orchards in Burkina Faso and Mali are organically certified. This is easy, because most orchards are organic by default. However, the market for organic mango is not large enough to sell everything as organic. Some orchards are also Fair Trade certified, but the market for Fair Trade mango is small, and the certification costs are high.

Processing

Mango processing is most advanced in Burkina Faso, where a large mango drying sector developed in the late 1990s. In the mid-2000s a record export of 500 tons of organic dried mango to the EU snack market was reached, before the sector collapsed due to bad product quality. Production in Mali, exported via Burkina Faso had also begun. With the support of the World Bank, the Royal Tropical Institute reformed the industry by introducing South African drying technology in cooperation with a large South African producer. Production was reoriented towards the conventional snack market in EU supermarkets. The sector is now growing steadily and is exporting at higher levels than before the crisis; about 700 tons per annum (for which more than 11.000 tons of fresh mango is used). Mali currently has one modern factory

exporting about 45 tons per year. As a result of the World Bank project, IMAGRI in Mali is now manufacturing good quality mango dryers.

Burkina Faso is also home to DAFANI, a modern plant producing mango pulp for the EU market and juice for the local and regional market. Due to poor marketing, lack of market research, poor financial, production and supply management the factory has gone bankrupt more than once. At present it is unclear whether they are exporting mango pulp to the EU, but juice is still produced for the regional market and is well-appreciated by consumers. Mali also has a new mango juice/ pulp factory, but it is unclear whether they are actually producing or profitable.

There is no real mango processing taking place in Ivory Coast. There are three mango drying factories that were each donated a South African tunnel dryer, but they do not have the skills or knowledge to operate efficiently. Another mango drying company is in production using the old wooden ovens made in Burkina Faso, and sells to Gebana, an exporter in Burkina Faso.

The dried mango market presents a great opportunity for the region. The market is growing fast and producers are failing to keep up with demand. West Africa is able to produce the best quality dried mango on the market, and production is highly profitable. Because the value of the product is high and it is not highly perishable, export is not limited by the unreliability and high cost of logistics.

In Burkina Faso and Mali, the size of the processing industry provides an attractive market for farmers and pisteurs. Quality criteria for processing mangoes are much lower than for fresh export. In addition, local varieties not suitable for export can be used. In Burkina Faso and Mali processors are now worried about the availability of mango, and have started to invest together with the World Bank in the development of modern commercial orchards with irrigation. Local demand for mango juice is high, and artisanal juice factories are common in Mali, but fail to reach the scale of production required because of a lack of modern packaging equipment. There are opportunities on the EU market for mango pulp, but only for high quality products.

The lack of processing in Ivory Coast means that the market for second grade mango is limited. Prices in Ivory Coast for non-export grade fruit are only half to one third of those in Mali and Burkina Faso. For processors, HACCP certification is essential. There is generally a 2-year period in which it is sufficient to show you are applying most principles and that you are in the process of certification.

Logistics

Logistics is the biggest barrier to the growth of the mango export industry in Mali and Burkina Faso; and to a lesser extent in Ivory Coast as well. Poor roads and railroads and lack of competition make the overland travel to the Abidjan port long, risky and expensive. For example, shipping a refrigerated container from Bobo-Dioulasso by rail to Abidjan and Antwerp costs about €5.700. The train takes more than two days to travel the 1.000 km to the port. Most exporters from Ivory Coast use trucks to drive the 700 km to the port, because it is quicker and more flexible than the railways. It is also 50% cheaper. However, trucks can take five hours from arriving at the port to reach the actual fruit terminal due to traffic congestion in between. The railway to Dakar from Bamako is not functional, so even mango from

Bamako needs to be transported by road to Abidjan. The expensive overland transport not only increases the cost of fruit transport, but also the cost of packaging, because pallets and boxes need to be brought in from Abidjan.

The main causes of high transport prices for mango are: the lack of competition in the transport sector; poor road and rail infrastructure; and the short season of 1,5 to 3 months. The latter means that companies like Bolloré need to cover the fixed cost of dedicated infrastructure for only a short period of the year. Bolloré is the only independent company offering integrated door-to-door transport, while AEOLIS is linked to SCB. Lengthening the mango season by e.g. introducing an early season variety is crucial to reducing the investment and overhead costs of both transport and pack houses.

Another critical issue is the shortage of refrigerated containers. Particularly in the high season when Ivory Coast has a large mango volume, exporters in Mali and Burkina Faso, and even in Ivory Coast, struggle to obtain containers. Though the situation has improved somewhat over the past years due to transporters like Bolloré, building up stock of refrigerated containers ahead of the season, it is still possible to have a pack house full of packed mango waiting for export, while no containers are available. At this stage the only thing an exporter can do is to re-sort, try to ship the best mangoes by plane, and then sell the rest as second grade at a huge loss.

Lastly, there is currently only one ship a week that can be used to transport mangoes to the EU, which goes to Antwerp. The other ship that sails to Duinkerken is not suitable, because most mango is rejected in that port due to strict French phytosanitary inspections. Similarly, mango can be flown into Brussels from where it is taken to Paris, but not directly to Paris. Rotterdam is also said to have phytosanitary inspections that prohibit the import of mangoes. Because mango is only a seasonal product, shipping lines are not likely to adapt their schedule and add more boats or routes. Due to the high tariffs at Abidjan airport and the lack of dedicated freight planes, most exporters use the Ouagadougou airport for exports by air.

Trends

There is a growing interest in mango exports and mango processing in the region that does not always translate into growing volumes due to transport difficulties. There is also a movement towards more professional orchards with small, well maintained trees under drip irrigation, but this is largely driven by donor programs and a few wealthy individuals. Access to finance for modern orchards is still very limited. The fruit fly problem seems to be getting worse, despite investments from the various states and donors in trying to control their populations. There is a movement towards cutting out the pisteur, thereby forcing the farmer to invest more in the orchards. Finally, climate change will increase the need for irrigated orchards, particularly in Mali and Burkina Faso.

SWOT

Strengths

- The three countries, Burkina Faso, Ivory Coast and Mali have an ideal climate for growing mango
- There is a very high production capacity of existing trees and larger farms

- Farmers respond well to market demands for new varieties
- Proximity to EU market
- Strong mango drying sector in Burkina Faso
- Mango dryers and fresh mango sorting lines manufactured in the region
- Two factories available in Ivory Coast that produce packaging material locally

Weaknesses

- Expensive and unreliable logistics, particularly for Mali and Burkina Faso
- Lack of working capital and affordable loans for producers, and hence, low investments in orchards, resulting in low yields and variable quality
- No processing in Ivory Coast
- Lack of cold storage in Ivory Coast
- Difficult to combat fruit fly and other diseases with many unprofessional farmers that invest little in their orchards
- Very short mango season due to lack of an early season variety and fruit fly and anthracnose cutting the season short

Opportunities

- The EU market continues to grow, and is close by
- Emerging local and regional markets (Sahel and North Africa)
- Dried mango demand in EU is growing, and production is lucrative
- Using growth hormones or the introduction of an early mango variety such as Tommy Atkins can increase the season by 1,5 months

Threats

- Further spread of fruit fly and other diseases, and related interceptions in the EU because of this. Only one port (Antwerp) currently accepts mangoes from West Africa, due to more lenient phytosanitary inspections
- Climate change, especially affecting Burkina Faso and Mali (dry spells / droughts)

The Mango Sector in Ghana: An Overview

Context: an overview of the Mango sector in Ghana

Mangoes are so far the fastest growing fruit crop in Ghana. Consumers and market operators alike estimate that growth has increased by over 100% in the last four years with a national production that is estimated at 70.000 tons per year. Mango is the fourth most consumed fruit in cosmopolitan areas. Ghana imports mangoes from Togo, Benin and Burkina Faso; which is mostly done by the processing companies.

Over the last ten years, there have been several private and public sector investments in mango production and processing. The sector has been boosted by the further public investment in pack houses under the MiDA and EMQAP projects. Pack houses have been constructed at Vakpo in the Volta region and Akorley in the Greater Accra region.

Though the mango exports declined by about 230% between 2005 and 2010 as a result of an import ban by South Africa (due to high incidence of Stone Weevil and Anthracnose diseases), domestic demand continues to grow ahead of supply. Mango fruit juice is becoming popular and it is the third most consumed fresh juice after pineapple and oranges.

Dried mango processing is becoming popular with good export opportunities. In the future, mango butter, a derivative of butter from the mango seed could be explored to provide additional value to the mango sector. The figure below shows the sharp growth in the mango exports 2011 and 2015. Ghana is now exporting more than US\$25 million of mangoes, mainly to the UK, Switzerland and the Netherlands (both fresh and dried).

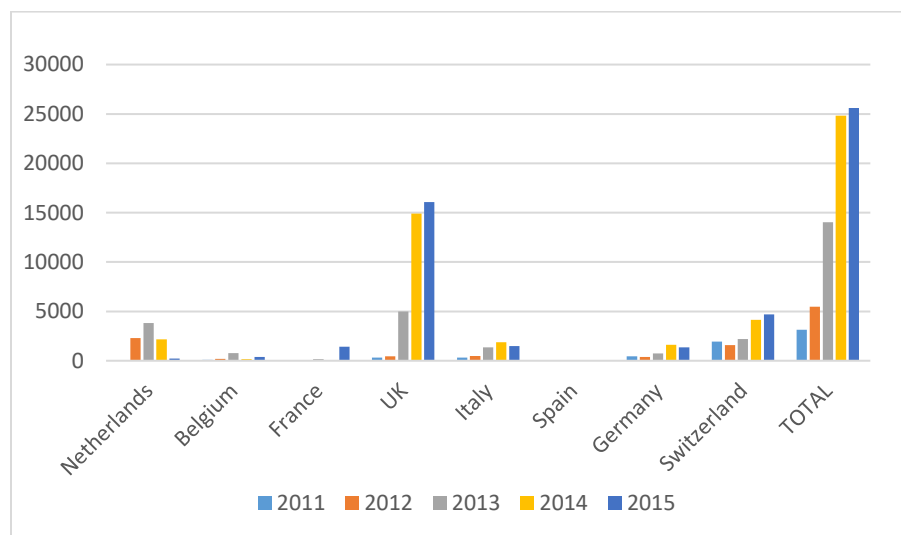


Figure 9: Mango exports from Ghana to the EU, 2011-2015 (in 1.000 US\$) (Source: ITC Trademap, 2016)

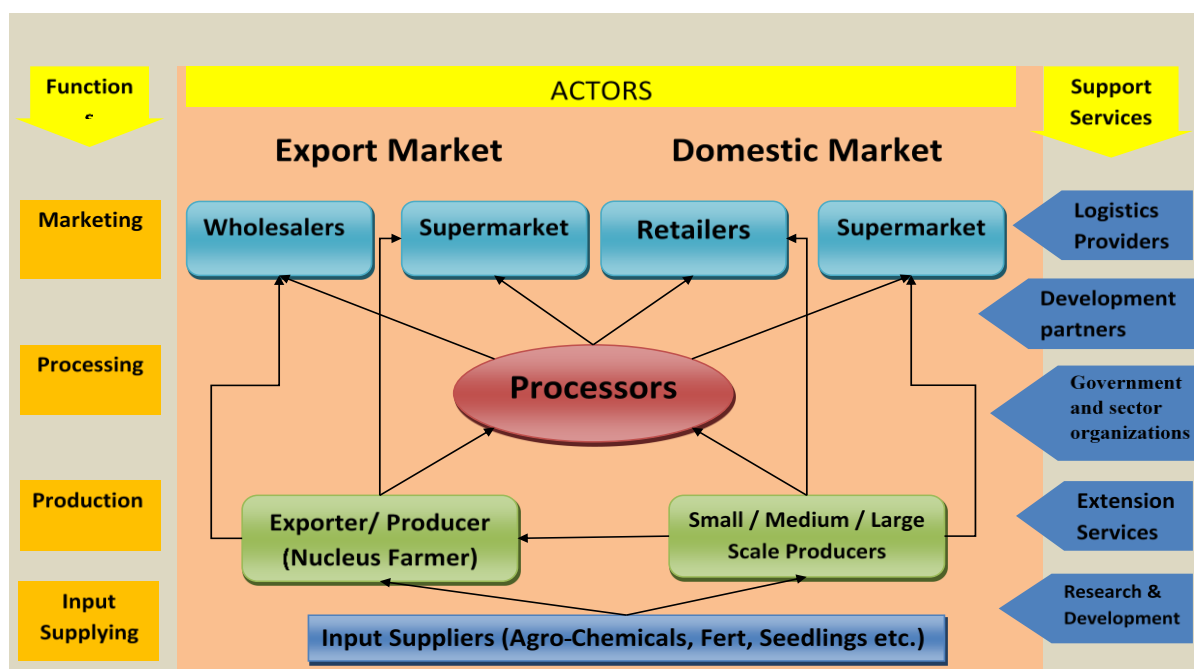


Figure 10: Value-chain Map of Ghana's mango sector

The value-chain map illustrated above is a representation of activities in the mango sector, exporters of fresh fruits and the predominance of processing factories; for juice, dried and for fresh cut fruit salads. There are quite well established contracting arrangements between the producers and the exporters/processors. These arrangements are essential because of the stringent requirements of the international market which requires international and globally accepted certifications to attest to good agriculture production standards and food safety.

There is a large and growing number of mango farmers across the country and many have formed associations. One of these associations is Yilo Krobo Mango Farmers Association, which was established in 2005 with about 125 members of which 63 are GlobalGAP certified. There is also the Many Krobo Mango Farmers Association which was registered in 2007 and has a membership of 89 of which 19 are GlobalGAP certified. They are currently collaborating with various institutions to introduce additional varieties to meet the demand that is been created. Dangme West Mango Farmers Association is comprised of more than 100 members with sizes of 3 to 90 acres. The Association assists members in the proper production of mangoes by establishing and enforcing appropriate standards.

Production

Like in Ivory Coast there are many problems with respect to mango cultivation. The most important production issues are the fruit fly problem and the Anthracnose disease. In addition, climatic change is causing more erratic rainfall, and consequent larger production fluctuations.

The varieties currently being produced in Ghana are also Kent and (Togo) Keith as well as Palmer, Brooks and Hayden (the latter two originated from Southern Florida originally). In addition, a bit of Tommy Atkins

is produced. Blue Skies (cut fruit salads) prefers Kent and Keith, while HPW (drying) takes all varieties. Especially Palmer is not good for fresh cut. For export Tommy Atkins is not preferred as the flesh gets soft very fast and the fruits tend to be smaller.

The current production window, like in Ivory Coast is rather narrow; basically running from Late May to early July. The earlier varieties are Palmer, Tommy Atkins and Togo Keith; which can already be harvested and sold in April. There is still a need for earlier maturing varieties. The production could be expanded during the minor season in December to February when some varieties can be induced to produce fruits. This is also a good window for exports.

Experiments are currently undertaken with growth hormones (like *paclobutrazole*). When applied properly it can better time the harvest, eight months after application. In this way it was possible to prolong the season to April-July for Kent and Keith.

Major issues in Ghana's mango sector also have to do with management and production knowledge. Many people who started plantations in the last 10-20 years didn't have a background in agriculture. If you want to get high yields and low pest populations the orchards need careful management, in terms of pruning, soil fertility management, watering and pest management. On the latter quite a lot of experience has been gained in the last years, by using protein baits (which are now easily available) and traps. So far, the baits have been more effective than the traps. According to experts the most promising area for mango production is the middle belt, especially the Brong Ahafo Region.

Grading, packaging, processing and exports

There are several producers and exporters of mango in the country, one of the main exporters of fresh cut and processed mango is Blue Skies Ghana Limited. Fresh exporters include: Bomart Farms, Green Village and Bassam. HPW is known for dried fruit, while Pinora is setting up a mango line as well, for puree and juice. In general, Ghana has a relatively large sector for processed fruits, also including companies like Peelco, Sunripe and Biotropical. For the domestic market many more companies exist, most of them (36) are represent in the Fruit Processors & Marketers Association of Ghana (FPMAG).

Currently, local suppliers are unable to meet international standards for packaging material. The current products are 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. For mango it was estimated that 21% of the cost of exports was in packaging material.

Blue Skies prepares, packs and exports pineapples for the UK and Dutch and Swiss markets. All fresh-cut mangoes are air-freighted. 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 GlobalGAP standards as well as the individual labels of the different retailers. Other market destinations for its fresh-cut exports include Italy and France. Blue Skies expanded its facilities by a state-of-the-art juice production factory in 2015. The factory that got support from the Dutch PSI Scheme introduced four new juice products to the country: Still Lemonade, Sugarcane, Ginger and Lime and Tropicoco; a blend of coconut water, mango and passion fruit. Blue Skies is the biggest employer in the fruit processing sector with an estimated 3.000 employees.

Another large producer and processor of mangoes is the Integrated Tamale Fruit Company (ITFC), which started in 1999. ITFC is 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 is owned by other Dutch companies. The establishment has a total workforce of about 410.

ITFC cultivates certified organic mangoes of which it exports between 80-90%. The company currently produces Kent, Keith, Amélie and Zill varieties from its production base in the Northern Region and from its nucleus farm of about 200 hectares, having about 1.200 outgrowers. The nucleus plantation is fully irrigated and certified organic by the Soil Association of the UK and certified GlobalGAP. In 2011 the company exported about 240 tons of fresh mangoes and five 40 ft. containers of dried mangoes.

Logistics

Fresh mango is mainly exported by sea-freight. The practices here are similar to those of pineapple, which have been described in the earlier chapter. Specifically, for mango, a number of pack houses has been built in the north and middle belt of the country (MiDA funded). Though it is not clear how efficiently these are being managed at the moment. For the processed (especially cut) exports companies are rather positive about the facilities at the airport and on-factory inspections of PPRSD and CEPS, enabling fast movement of sealed trolleys directly from the factory to the airplane.

Cost-Price Analysis: Ghana and Ivory Coast Comparison

The cost price analysis of the mango value chain indicates that investments in mango production are relatively low. For Ivory Coast two examples are provided both of relatively traditional farmers; for Ghana a larger plantation was selected (Cotton Weblink Farms, 500 ha). Because for both the investments in trees and land clearing are only done once and many orchards are at least 10 years old they are not included in the cost price.

The limited investments result in low yields of exportable fruit. Both in Ghana and Ivory Coast the first grade sales were estimated at around 50%. Clearly mango producers operate on a high margin - low volume business model typical for West Africa. Pack house costs comprise a serious part of the overall cost figure, which are almost as high as the price paid for the mangoes. These costs include packaging material, labour, electricity, and transport to the harbour. In general, Ghana has much lower inland transport costs than Ivory Coast. This is mainly because of the vicinity of the important mango producing areas of Eastern Region to the port, and the overall better state of the road infrastructure. On the other hand, Ivory Coast has slightly lower sea-freight costs to Antwerp and lower production costs. For both countries the margins for the actors in the chain are profitable. In both countries the exporters make around 20% profit on a successful shipment.

Major improvements can be made in:

- Increasing productivity of the plantations
- Reducing percentage of rejects (currently at 50%)
- Reducing pack house costs and inland transport

Table 8: Cost-price analysis of Ghana and Ivory Coast Export Mango (Sea-freight)

PRODUCTION COSTS PER HA		GH	CIV1	CIV2
Land Preparation		€ 114	€ 38	€ 46
Plants		€ 0	€ 0	€ 0
Fertilizer		€ 0	€ 0	€ 0
Crop Protection		€ 17	€ 15	€ 152
Labour (including harvesting)		€ 115	€ 114	€ 61
TOTAL		€ 246	€ 168	€ 259
REVENUE (EX-FARM)				
Yield		10000	6000	10000
Price per kg *		€ 0.10	€ 0.10	€ 0.10
Revenue		€ 1,000	€ 576	€ 960
PROFIT FARM LEVEL PER HA		€ 754	€ 408	€ 701
HARVEST & PACKAGING (PER CONTAINER)				
Transport to Packhouse		€ 182	€ 429	
Labour Harvest + Packhouse (Pisteur)			€ 429	
Packhouse	Utilities + Rent + Labour	€ 1,545	€ 746	
	All Packaging Materials	€ 2,124	€ 2,704	
	Transport to Port	€ 273	€ 1,524	
Port Costs	Handling, cold storage, packing	€ 492	€ 183	
COSTS PACKAGING & INLAND TRANSPORT		€ 4,434	€ 6,015	
COSTS PRODUCE (21120 KG / CONTAINER)		€ 6,758	€ 5,634	
TOTAL COSTS		€ 11,192	€ 11,649	
FOB TEMA / ABIDJAN (PER CONTAINER)				
		€ 13,939	€ 14,784	
PROFIT FOR EXPORTER				
		€ 2,747	€ 3,135	
SEAFREIGHT TO ANTWERP PER CONTAINER				
		€ 3,156	€ 3,029	

SWOT

Strengths

- There are a number of small-scale and large scale mango producers in Ghana. Mango production has been stimulated a lot, and many new orchards have started in recent years.
- Many packing houses have been built in mango growing areas, which provides improved storage capacity (though the pack houses are often not refrigerated).
- Facilities at the airport and seaport are in a good state and expanding.

Weaknesses

- Mango production continues to be affected by pest and diseases such as fruit flies and anthracnose.
- There is a decrease in yield due to reduced rainfall as a result of climate change.
- Inability of producers to meet export qualities and quantities.
- Lack of loans available for both short-term and longer-term loans, with high interest rates

Opportunities

- There is a growing export market of mango into Europe, both for fresh and processed
- There is relatively good research going on in terms of varieties, growth hormones and reducing fruit fly populations

Threats

- Climate change
- Increasing production costs and red tape for exporters

6. The Coconut Sector: Ivory Coast & Ghana

The Coconut Sector in Ivory Coast: An Overview

Context: Coconut in Ivory Coast

During the 1920 and 1930s coconut was planted along the coast of Ivory Coast. In the 1960s and 1970s factories for flaked coconut and coconut oil were set-up along with new industrial plantations belonging to the factories, and village plantations. However, a combination of mismanagement of the factories, declining markets, competition from Asia and lack of investments in the plantations and factories have led to the demise of most of the industry.

Today, the total area planted with coconut, as estimated by the Ministry of Agriculture, is 37.500 ha, of which roughly half is industrial plantations, and the other half so called village plantations. They are mostly planted in the coastal strip and islands where the poor soils and salinity make it difficult to grow other crops.

Over the past years the demand for coconuts, particularly for export to the EU and for the local and regional fresh market has been growing. Especially, Nigeria, Libya and Morocco are large buyers. Niger, Ghana, Mali and Burkina Faso also consume coconut. Coconut oil production for the regional market has been growing steadily. The supply on the other hand seems to be decreasing, due to lack of investment in new plantations, diseases and a decrease of the area covered by plantations due to urbanization. Decreasing rainfall, the aging trees and diseases have been the main causes for the decreasing yields.

The main industrial use for coconut is the production of coconut oil which is used in foods and in cosmetics. Dried coconut destined for oil production is called copra. The international demand for coconut oil and copra has not seen any significant growth over the past decades, and is completely dominated by Asian countries such as the Philippines, Indonesia and Thailand. It will be difficult to compete with these nations as they have large, high-yielding plantations with large factories that can produce various types of oils in high volumes. However, there is a large and growing demand for coconut oil as a hair cosmetic in Nigeria, Ghana and other West African countries, and local coconut oil industries in Ivory Coast and Ghana are the main market for copra produced in Ivory Coast.

Despite the high demand for coconut and coconut oil, there is little investment in the sector, neither by government, nor farmers and processors. The coconut value-chain is poorly organized and needs to be restructured in order to take advantages of the market opportunities, as well as new varieties that can boost yields, and are less disease prone.

Producers

About 45% of plantations is smaller than 15 ha, 45% is between 15 and 50 ha, and 10% is between 50 ha and 150 ha. The ownership of the plantations is not always clear; formally about half of the plantations are supposed to belong to industries, but many of these went bankrupt. Most plantations are actually exploited by the pisteurs (harvester-traders), who pay a small price to the owner: CFA 25 (or €0,04) per nut. Meeting actual plantation owners is difficult because they are never on site, but the pisteur is.

The fact that owners are mostly not involved in the day-to-day running of the plantation is one of the main reasons there is no investment in the form of new trees, fertilization, irrigation or treatment of sick trees. They receive a fixed fee from the pisteur, who himself has no incentive to invest because he does not own the plantation. Old and sick trees are generally not replaced, the only new trees come from the germination of fallen coconuts that were not collected.

A second reason for low investment is the history of frequent expropriation of plantations of private owners when factories were started. After bankruptcy these plantations were never given back to the original owners.

Though the plantations are profitable because the cost of growing coconuts is virtually zero, the revenues per ha are very low. Currently 6 ha are needed to fill one 40-foot container for export. This means that farmers prefer to invest in the establishment of rubber and oil palm plantations in other areas, instead of renewing existing coconut plantations or starting new ones. Even at the current record low prices for rubber, revenues per ha are at least 3-4 times as high as from an existing coconut plantation.

With new varieties the revenues could easily double. Nevertheless, there may be more lucrative land uses in areas with good soils. Still, renewal of existing plantations in areas where there are few alternative land uses seems a good investment.

Finally, the urbanization of the coastal zone and islands has also decreased the space for coconut plantations.

There are currently two main coconut varieties in Ivory Coast:

- Grand Ouest Africain (GOA) is a very old variety, that gives 3.000-4.000 coconuts per year per ha. They take 10-12 years to bare fruit. The nuts are usually too small for export, but do have a high oil content. They are therefore mostly used for copra.
- Old hybrid varieties, such as NGM. They produce 8.000 to 10.000 nuts per ha/ per year, of a larger size. Trees fruit after about seven years. 80% of coconut exports come from hybrid plantations, which also account for 70-80% of plantations. Over the past decades only hybrids have been planted.

Over the past years CENERA, the national research institute, has tested various new varieties. Recently, they released a new variety called PB121 that allegedly fruits after four years and has a yield of 22.000 nuts per ha/ per year.

The effect of aging plantations and decreasing rainfall is the clearest on the number of harvests; GOA trees now give fruit only twice a year instead of three times, and the hybrid trees three times instead of four.

Grading, export and processing

Fresh exports to the EU seem to be growing again, and the number of exporters seems to be growing as well. Where some exporters used to do three containers per week, they now struggle to get hold of enough coconuts for one container. The exporters tend to be small independent businessmen, who are often also involved in mango and pineapple.

Exporters buy the coconuts from the pisteurs. The pisteur buys all the coconuts in the plantation, because generally the real quality and size can only be assessed once the hairy outer layer is removed. Once that layer is removed, the nuts are separated in first grade and second grade. The grading criteria are size, but also whether the nut is intact with the water still inside; or whether it is damaged or even already germinated. About 60%-65% of a hybrid variety is normally first grade and suitable for export. This part is sold to exporters, local wholesalers or cross border traders.

The second grade is normally processed into copra by the pisteurs. First the coconut is split and the white flesh is separated from the hard outer layer. This work is normally done for free by women, who receive the shells in return for their labour. The women use the shells for charcoal production. The flesh is then dried in the sun, or in case of heavy rains in a simple oven. In turn, the flesh is packed in jute bags and sold to local coconut oil factories, or exported to the factories in Ghana. One second grade nut gives on average 0,13 kg of copra.

Exporters simply double check the nuts, to make sure they are all export grade, and if necessary cut some of the fibre of the outside. A small amount of fibre is left on the nuts to absorb shocks during transport. The fibre also makes the nuts stick together in the bag, which reduces movement and shocks. Nuts are normally packaged with 40-50 nuts in a jute bag, and loaded in a 40-foot refrigerated container. One container normally fits almost 1.100 bags of 40 nuts, or a total of 43.750 nuts of around 500 grams. To obtain this amount of export nuts 70.000 nuts need to be gathered. The second grade nuts normally deliver about 3.400kg of copra.

In addition to copra, coconuts are also processed into coconut shavings as a snack. Sometimes the shavings are boiled in a solution of sugar and milk before drying, or caramelized in sugar. This is a popular snack in Ivory Coast, but also in Mali and Burkina Faso. It was successfully introduced in German supermarkets, but the dried mango producers in Mali and Burkina Faso that produced the product in the off-season could not meet the demand and required price, because of the transport cost from Ivory Coast to the factories in Mali and Burkina Faso was too high.

Currently, there is no factory producing large amounts of dehydrated/dried coconut shavings, powder or other products for exports. Copra is also not exported to the EU. It is therefore unclear why trade statistics show a large and increasing export of dehydrated coconut to the EU, larger even than the regional exports.

Logistics

Though some exporters still use non-refrigerated containers, the majority uses refrigeration to avoid germination of the nuts. Availability of refrigerated containers can be a problem, because coconut export is not a priority for shipment companies due to the small volumes. Particularly during the mango season the refrigerated containers are in short supply.

Coconuts are also high in demand in neighbouring countries such as Mali, Burkina Faso and Ghana. However, most nuts are transported as secondary load on other trucks, buses and oil tankers. Dedicated transport is deemed too expensive, partly also because customs officials at borders often demand import duties to be paid or are looking for bribes.

Cost price

Table xx contains the cost price calculations for coconuts at production level. This is the level at the owner of the plantation.

Table 9: Costs & Revenue for coconut production level, hybrid tree plantation (excl. pisteur)

Herbicides-Pesticides	€ 30
Labour	€ 107
Total Cost	€ 137
Yield per hectare, 3 collections (nuts)	12,000
Sales price per nut	€ 0.04
Revenues	€ 457
Profit	€ 320
Profit margin	70%

The owner of the trees or the farmer invests very little and therefore makes a relatively high profit. However, because the yield is low, revenues per hectare are also low. About 62,5% ends up as 1st grade for direct export of the nut, while 37,5% ends up as copra. In our calculations we used a 5.8 ha farm that produces the typical amount to fill 1 container with 1st grade coconuts (43.750 coconuts) and leaves 26.250 coconuts for copra production. The cost benefit analysis for both for these combined two processes are provided below:

Table 10: Harvesting, grading and processing of coconuts

Harvest, cleaning & packing	<i>1 ft. foot container carries 43.750 nuts</i>		
	Quantity (nuts)	Unit cost	Cost/container
Harvesting labour	43,750	€ 0.0084	€ 367
Removal of outer layer	43,750	€ 0.0229	€ 1,000
Sorting, weighing and cleaning	43,750	€ 0.0004	€ 17
Total Cost			€ 1,384

Copra production	<i>Based on 26250 coconuts (2nd grade)</i>		
	Amount	Unit Cost	Total Cost
Harvest	26,250	€ 0.0084	€ 220
Removal of outer layer	26,250	€ 0.0229	€ 600
Splitting and removal of flesh	26,250	€ 0.0000	€ 0
Drying	26,250	€ 0.0015	€ 40
Bags	1,313	€ 0.3049	€ 400
Total Cost			€ 1,260

SALES	Amount	Unit Cost	Revenues
Nuts (in nuts)	43750	€ 0.11	€ 5,002
Copra (in kg)*	3412	€ 0.34	€ 1,170
TOTAL			€ 6,172

*13% copra per nut

PROFITABILITY	Total
Sales revenues	€ 6,172
Purchase Cost of Nuts	€ 2,668
Harvesting, grading, cleaning & processing	€ 2,188
Profit	€ 1,317
Profit margin	21%

The pisteur has a healthy profit. Selling nuts on the fresh market is more lucrative than copra production, and therefore only second grade nuts and the small traditional variety nuts are used for copra. With respect to the exports of nuts the below table provides the cost-revenue picture for the exporter:

Table 11: Bagging and exporting fresh coconuts (sea-freight, 1 container) from Ivory Coast

Export by Sea	40ft reefer container, 43750 nuts		
	Quantity	unit cost	Cost
Transport to Port (per container)	1	€ 457	€ 457
Bags (40 nuts/bag)	1094	€ 0.38	€ 417
Sea Freight (per container)	1	€ 2,591	€ 2,591
TOTAL			€ 3,466

Cost Benefit Analysis (Exporter)	40ft reefer container, 43750 nuts		
Sales revenues	€ 0.23	43,750	€ 10,271
Purchase of nuts	€ 0.11	43,750	€ 5,002
Transport, Bagging & Sea Freight	€ 0.08	43,750	€ 3,466
Profit			€ 1,803
Profit margin (%)			18%

Again, the exporter makes a healthy profit, though it must be noted that certain transaction and insurance costs have not been included. Also, the exporter runs a certain risk if the coconuts go bad during transport.

Trends

Demand for coconuts is growing, especially in the West African Region, while supply is decreasing due to climate change, urbanization, diseases, lack of regeneration and maintenance and diseases.

SWOT

Strengths

- Strong regional market for coconuts, including the strong local demand for coconut oil, which provides market for 2nd grade/ export rejects
- Proximity to the market is good

- Year round production
- The crop can be grown on poor soils with limited alternative land uses

Weaknesses

- Old and sick plantations with decreasing yields
- Area under cultivation is decreasing due to urbanization
- Low yields and low earnings per hectare
- Poorly organized sector
- Uncertain ownership of plantations
- Farmers do not invest in plantations

Opportunities

- EU, local and regional fresh markets
- Growing regional market for coconut oil as cosmetic for hair, particularly Nigeria
- European snack market for dried coconut
- New high yielding varieties (PB121) that produce after only a few years

Threats

- Urbanization
- Climate change

The Coconut Sector in Ghana: A Brief Summary

The importance of the coconut palm in the economy of Ghana was well established till the late 1990s. The land area under coconut cultivation was estimated at about 43.000 ha most of this by small-scale farmers with average holdings of 0,5 to 1,5 ha. About 80% of coconut production is found in the south western coastal belt of Ghana.

Coconut is one of the key fruits where demand exceeds supply. Presently, the fresh coconut market has become a mainstay in urban and peri-urban areas as people turn to consumption of natural drinks and its associated health benefits. It is a common practice to see vendors selling fresh coconut in wheelbarrows and carts at vantage locations in cosmopolitan areas. Some companies have started bottling coconut juice putting more pressure on the existing demand.

There are very few farmers in the coconut industry, this is mainly due to the Cape St. Paul wilt disease that affected the industry and so efforts are being made to revamp the coconut production sector. The Ministry of Food and Agriculture (MoFA) together with the Oil Palm Research Institute (OPRI) located in Kade developed varieties that are resistant to the Cape St. Paul wilt disease and these varieties are being

given to farmers to cultivate. However, only a few larger farms produce coconut as part of their crops. One of such a farms is Exonas Ltd who has 80-100 coconut trees which are about 80 years old.

A number of processing companies use coconuts for their processing activities: e.g. Blue Skies for juice, HPW for dried coconut, and Peelco similarly for drying. Though for all of them it is not a major product, and they complain about the little and expensive supply.

Ghana does not export coconut to the foreign markets except for some Nigerians who come straight to the coconut farms to buy dry coconut for processing into cosmetic products. The main buyers of the coconut are the vendors who sell on trucks directly or sell to small-scale processors.

Preliminary findings and Conclusions

- The coconut sector has been severely affected by the Cape St. Paul Wilt Disease destroying many coconut farms and plantations. The situation seems to be worse than in neighbouring Ivory Coast.
- The Ministry of Food and Agriculture and the Oil Palm Research Institute developed new varieties that are resistant to the disease to revamp the sector.
- There is an increasing market for the dried coconut (copra) especially within West Africa.

SWOT

Strengths

- Many of the Coastal areas of Ghana are well suited for coco palm
- There is a ready market both domestically (processed) and to Nigeria (both fresh and copra)

Weaknesses

- Drastic reduction in the production due to the Cape St. Paul Wilt disease
- Lack of hybridization facilities and inputs for field maintenance
- Farmers have shifted away from coco palm production and moved to other crops like oil palm

Opportunities

- The regional market for cosmetics and health products is increasing rapidly
- New resistant varieties have been developed by research and a substantial number will start bearing fruit in the next couple of years
- Coconut trees can grow under very marginal conditions (salty and dry)

Threats

- Competitors from South East Asia supplying end products to West African countries (especially cosmetics)
- Though new varieties are available, the production of sufficient seedlings (and a sustainable business model for producing them) is lacking

7. Enabling Environment

The Enabling environment in Ivory Coast

Macro economics and politics

Ivory Coast was together with Senegal the most developed country in West Africa during the colonial times. Still, at this point it is one of the most industrialized countries in the region, with the best developed infrastructure. It has always been the largest exporter of agricultural commodities in West Africa, particularly due to the cocoa sector. Ivory Coast is the largest cocoa producer and exporter in the world. Rubber and cashew are other important commodities.

However, over the past 20 years' development has been severely hindered due to political instability. A series of coups and civil wars has scared away foreign investors, damaged infrastructure and even led to port and border closures for several months at a time.

Since 2014 the country has been politically stable, which is illustrated by the return of the African Development Bank after a prolonged stay in Tunis. Given the climate, size, infrastructure, industrial base and geographic location, the country has a large growth potential. In addition, it is the port to the world for landlocked Francophone countries such as Mali, Burkina Faso and Niger.

Currently, the biggest barrier to growth is the state of the infrastructure. Though recently some investments have been made in road, rail and port infrastructure, the vast majority is old, unreliable, slow and unable to cope with the transport volumes. For example, the train from the north takes two days to cover 900 km, while trucks take up to five hours to reach the docks from the start of the port. In addition, ships cannot dock to load and unload containers due to the port congestion. A lack of competition in the transport sector means that rates are high and service often poor.

Language is another major barrier to growth. Few people in the international business world speak French these days, while few Ivoirians speak any English. This means that, like the rest of Francophone Africa, the country is often bypassed by investors, importers and exporters as well as NGOs and donors. Furthermore, local businessmen are often limited in the marketing of their products, to French speaking countries and businesses. Lastly, client service is often an issue, because even if purchase managers speak French, the logistics or quality control coordinators often do not.

For Mali and Burkina Faso the infrastructure, political instability, a narrow industrial base and language are the main issues. Very little gets manufactured in these countries, so any business involved in some sort of processing needs to import pretty much everything. What is manufactured locally is often of poor quality and very expensive. Excessive import duties (e.g. 35% in Burkina) and non-cooperative customs officials frequently block cross-border movement (particularly in Burkina Faso). Again, the language barrier (no English is spoken) makes importing equipment very challenging. Being landlocked with poor rail and road connections makes importing and exporting even more expensive and time consuming. Finally, both have had political unrest over the past years that have led to the suspension of development programs, trade and investments.

A particular challenge when it comes to export of fresh and processed goods is the lack of internationally accredited laboratories, and the lack of faith of European clients in the local laboratories, some of which (i.e. in Bobo Dioulasso, Burkina Faso) can be professional. This means that export companies are often forced to send samples by couriers to labs in the EU for analyses, which is very costly.

Sanitary and Phytosanitary Issues

With respect to the phytosanitary situation, mango is the number one crop from Ivory Coast that causes interceptions into the EU. E.g. in 2011 fruit fly on mango caused 94% of all interceptions of all Ivorian products exported to the EU. The following table shows the trends over the last five years:

Table 12: Number of interceptions of harmful organisms into the EU

CIV	Number of interception in the EU				
	2015	2014	2013	2012	2011
Mango	12	62	23	32	47

These interceptions were mainly because of fruit fly. As indicated in the mango chapter, Ivory Coast's exporters are very much aware of this situation and tend to export to more lenient ports like Antwerp in order to prevent strict phytosanitary inspections. The phytosanitary inspections in Abidjan are currently not well capacitated to intercept the fruit flies at the port of exit.

The Enabling Environment in Ghana

Macro-Economic Policy and Incentive Packages

Ghana's economy has been in heavy weather over the last two years. Poor macro-economic discipline resulted in much higher government spending, relative to revenues. This was aggravated by the lower than expected oil revenues (both because of lower volumes and prices for oil). The challenging macro-economic situation further resulted in high inflation rates and a devaluation of the Ghana Cedi (GHS). The domestic inflation (as measured by the consumer price index) went up from below 10% in 2011-2012 to more than 15% in 2014 and close to 20% in 2015 (WB Data, 2015). The devaluation of the GHS has been even more sharp, reaching 100% in a period of two years. Mid-2013 the Cedi was still valued at GHS 2 for US\$ 1; while by mid-2015 the Cedi had fallen to GHS 4 to the dollar. At the moment of writing (April 2016) the Cedi stabilized at GHS 3.8 against the dollar. The stabilization has been a result of an IMF bail-out package and related strict macro-economic conditions, which were agreed upon late 2014.

In turn, the difficult macro-economic situation has led to high interest rates on loans from banks, making it difficult for farmers to access loans (short-term but especially investment loans). The Export Development Agricultural Investment Fund (EDAIF), however, has provided interest free loans to a number of companies.

In addition, the companies that are operating in so-called Free Zones Areas, enjoy tax exemptions on imports and this helps them to reduce the cost of production. Overall, as also exemplified by the cost price

calculations, the cost of inputs such as machinery, agrochemicals and planting materials are still very high. The electricity situation does not help either, with erratic power supply in the main industrial areas necessitating companies to rely on expensive fuel-based generators. The last challenges is the land availability. The difficult land tenure system in Ghana makes purchasing (leasing) land in Ghana cumbersome and expensive.

At the same time, Ghana still has a number of advantages compared to its neighbours: it is politically stable, has relatively good infrastructure and the main language is English which enables easy communication in trade relations.

Sanitary and Phytosanitary Situation

Most producers and exporters of fruits are GlobalGAP certified enabling them to meet the minimum requirements of the EU export markets. In addition, a number of companies have Fair Trade and HACCP certification for processing.

The Plant Protection and Regulatory Service Department (PPRSD) of the Ministry of Food and Agriculture undertakes the inspection of harmful organisms at the exit points and provides the phytosanitary certificates. Especially for mango the fruit fly problems remain ever present. Compared to the other horticultural export crops (especially vegetables) the number of interceptions in the EU are relatively modest. Only 2012 had high numbers of fruit fly interceptions. The low number of interceptions is probably related to the low total volume of fresh exports, the more professional plantations in Ghana (than Ivory Coast) and the high general awareness on the fruit fly issue (many projects have focused on the issue).

Table 13: Number of interceptions of harmful organisms into the EU

GHANA	Number of interception in the EU				
	2015	2014	2013	2012	2011
Mango	1	2	5	25	5

In the coconut sector, the Ministry of Food and Agriculture and the Oil Palm Research Institute developed varieties that are resistant to the Cape St. Paul Wilt diseases and these varieties were given to farmers whose farms were affected by the disease.

Port Management

Logistics have improved with the operations of the Fruit Terminal Company at the port. However, there are limited vessels available for fresh fruits and there is also a cumbersome custom regime for fresh fruit export at the port. The roads that link the farms to the ports are in a bad shape and hence the smooth transportation of the fruits is a challenge. Currently, the low quantities of exports, both for air and sea-freight are driving up the prices of the transport. In general, sea-freight prices from Ghana are higher than neighbouring Ivory Coast, though the facilities at the port are better.

8. Perceptions from EU Importers

Introduction

In general, many importers are very interested to increase their activities in and import from West Africa. They see an increasing importance in working with additional producers and exporters from West Africa. This is especially due to climate change and a shifting interest of Central and Latin American producers to North America. The climatological conditions in West Africa offer perfect conditions to increase the production, according to the importers, although one of them also has serious doubts about the usability of the soil in Ghana for e.g. cultivating MD2 pineapple.

At the same time, they describe that experience in the (recent) past hasn't proved to be very successful in many cases. Importers mention delays in logistics, insufficient cooling & packing conditions, long transport times and a lack of improvements and innovations. An important reason for these problems seems to be the fragmentation of the local production market.

For some importers, the negative reputation of Africa, and the proven successful relations with Central and Latin American producers are enough to not source more from West Africa at this moment. Importers tell that importing from, or producing in West Africa demands a lot of (European) manpower on sites, they say that it will take a long time before production in West-Africa is at the same level of professionalism compared to Central and Latin America. Importers seem to make an exception for Senegal: "...is more experienced, you find more foreign companies, international players in Senegal. This makes the production base there more reliable."

Timeliness

Even though West Africa is relatively close to Europe, importers often experience delays when importing from West Africa. "Fragmentation of the producers is a problem. Producers are also not well organized" one importer mentioned. The consequences are that producers often don't work with unified quality, standards and cooling and packing conditions.

Contract conformance

The experiences of importers with countries are very diverse. In some countries (like Ivory Coast) the contract compliance can be very good. In other countries, like Ghana, there are big challenges. Sometimes the middleman and informal structures make contract compliance more difficult. It is important is to have intense contact with people in the countries. That is also why importers indicate that on-the-ground presence is a must to create compliance.

One of the importers had to laugh when we talked about contract compliance, indicating that there was lots of room for improvement compared to Central America. Often the focus of West Africa is short term, producers aim for quick money. And that has a negative effect on consistent volume deliveries. Which is also influenced by the size of the exporting companies. Because they are a lot smaller in West Africa than in Latin America, their volumes are also more at risk when difficulties arise.

Sourcing Mix

Quality & Certification

In general products from West Africa could have a similar quality compared to Central America, but due to a lower level of professional cultivation, logistics and in general a more fragmented production base the products lack the quality expected in the European market.

Specifically, for pineapple from Ghana a long time importer indicated: “MD2 from Costa Rica is definitely better. MD2 from Ghana is missing out on quality; they don’t know how to cultivate it. MD2 is not made for Africa. You need a constant water supply, which is not available in Ghana. And you need more fertilizer, more pesticides. Smooth Cayenne is of less quality, also in terms of shelf-life. Getting brown fast, with the MD2 remaining yellow. Producers need support daily in cultivating pineapples. Experienced people need to travel around all the time to coach and control. There is limited knowledge in the field. They need to know when and how to use water, fertilizers and pesticides. And you need an up-to-date lab to check.”

As to certification in Europe, trends in the consumption of fresh fruit are developing towards more sustainable approaches to production and processing. Top-of-the-bill is still food safety, and then comes sustainability. For food safety certifications that are required could be GlobalGAP and BRC. For sustainability that could be BSCI, Fairtrade, Rain Forest Alliance and SMETA.

Certification wise there is no difference between Central and Latin America and West Africa. Both production regions can deliver on those. Consistent quality is still the main competitive advantage for the Americas. Importers indicate that there is sometimes also a lack of capability and also willingness to work on improvements in West Africa. This is especially valid for Ghana, which is also seen as a donor darling, which leads to less entrepreneurship from the farmers because of the relatively ‘easy money’.

Pricing

Generally West Africa is cheaper than Latin America due to lower labour costs and logistics. On average this could be 20% cheaper. But because of many risks in the production and in the transportation to Europe, the integral price is often much higher (for example due to fragmentation, failed transports, delays, phytosanitary issues, no cooling). So, the basis for a competitive price is there, but that comparative advantage is lost along the way. From Compagnie Fruitière we can learn that is possible to offer a competitive product. This company is a professionally led company with a huge production acreage.

Logistics

Sea and airfreight logistics are reasonably well organized. Improvements can be made in terms of food safety and quality control, but in general, the sea and air freight logistics are seen as up to standard. At least the importers do not see logistics as a major barrier for higher imports from West-Africa.

Conclusions

Main conclusions after interviewing several importers:

- Business operation in West Africa less professional compared to Latin and Central America.
- Business in West Africa is more fragmented.
- Knowledge of cultivation and certainly the application of knowledge is definitely weaker in West Africa.
- There seems to be a lack of interest for young people to start working in farming in West Africa.
- Intervention opportunities

Many respondents mention the fragmentation of the West-African producers as one of the largest causes why West-Africa falls behind. Development projects that help to centralize or cluster the production and/or marketing would be of great help to the importers. Collaboration between producers and the development of cooperatives (not just small farmer cooperatives) could help to make the production more centralized and more stable. Invest in good infrastructure (roads, electricity in rural areas). Higher stable quality volumes should be the outcome.

Definitely cultivation has to be professionalized. If production is not handled in a structured way, then there is no opportunity for West Africa to become a viable alternative for Latin and Central America. With the exception of bigger companies that are already active, most other producers could gain a lot by applying rigorous cultivation and handling techniques.

One of the importers: “West Africa needs more investments in infrastructure, management, and corruption reduction. For that it needs help from EU governments and companies. Our strategy is to increase the focus on Africa. We see that for importers there is a need to look for other suppliers than only Latin and Central America. Southern and Central America are focusing more and more on North America and Canada. We increase our interest in Africa, for example through a project in Senegal.”

Right now working in agriculture is not appealing for young people anymore. Young people leave to find better paid jobs, often in cities. Rural communities are lacking skilled agricultural workers. Make agriculture attractive for young people, for example through accessible agriculture funds

9. The International Benchmark for Banana & Pineapple: Costa Rica

General information

Grupo Acon is the biggest independent producer of the country. It does not belong to any multinational. They produce and package for the clients. They sell to Dole, Chiquita, Del Monte and also various non-USA clients like Tesco, Pfeifer, Simba and Promoplom (Italy, Portugal). The company sells directly at the gate of their farms, and hence doesn't face difficulties in logistics.

Banana

Costa Rica exports between 110 and 150 million boxes (18,14 kg/each) of bananas annually. This combined is close to two million metric tons of fruit, making it the third largest exporter in the world behind Ecuador and Vietnam. The production area for banana is close to 45.000 hectares, which less than 1% of the country's territory and with a productivity of 46,6 tons per hectare Costa Rica has one of the highest productivity rates in the world. Most of the bananas are exported to the European Union (48%) and the United States (41%) with the remainder to countries such as Turkey and Norway (11%). The principal European export destinations are the United Kingdom (12%), Italy (8%), Belgium (7%), Greece (5%), Germany (5%), Sweden (2%) and Norway (5%). The only banana variety grown for export is Cavendish.

Pineapple

Costa Rica is the largest pineapple exporter in the world. The production area is close to 41.000 hectares, less than 1% of the country's territory, with one of the highest productivity rates in the world. Most of the pineapple is exported to the United States (53%) and the European Union (44%); with the remainder exported to countries such as Russia and Norway (2%). The principal European export destinations are United Kingdom, Germany and the Netherlands.

As the market growth has slowed for the largest variety (MD2), competition has intensified. Costa Rica still supplies 84% of the EU fresh pineapple imports and the market is led by the five agro-multinationals (Dole, Del Monte, Fyffes, Banacol and Chiquita). Following the success of the MD2 variety, new companies from Costa Rica and other developing countries entered the market. West Africa's comparative advantage is bigger in niches (fair trade or organic) than for MD2; also other varieties can be promoted provided they can overcome the reputation of inconsistent quality and comply with the buyer requirements.

Costa Rica has 1.200 pineapple plantations of which 40 are large (more than 500 hectares). The growers are united in an Association called CANAPEP, that brings together 42 companies. Together they represent 87% of the 41.000 ha at national level.

The production of pineapples is the most regulated agricultural activity in Costa Rica. The control on the production can make the production more difficult, but on the other hand it strengthens the sector compared to others, especially on economic, social, environmental topics. The share of MD2 in the total pineapple production is 92%. The production of the remaining 8% pineapple varieties is destined for the local market.

Mango

Mango producers are price takers. Mango prices in Costa Rica are based on the international baseline price, provided by the importers and the bottom price they receive in the local market. This price mechanism is especially valid for the period between January and May, when the mango window is open for Costa Rica. Mango prices are dependent on other fruit categories, since (local) consumers are willing to use different and other tropical fruits depending on seasonal availability.

Trade Statistics

Costa Rica's overall production levels have especially increased for pineapple over the last ten years, which is visualized by figure xx. With respect to banana especially 2009 was a bad year due to severe storms which caused major flooding. In addition, due to the worldwide economic crisis demand in the EU and the US was reduced. The overall production of banana gradually increased again in 2010-2013. The production of pineapple shows a continuous growth, with a year on year average increase of 10-15%. Since the inception of the MD2 variety in 2004 Costa Rica has progressively become the world market leader for this variety.

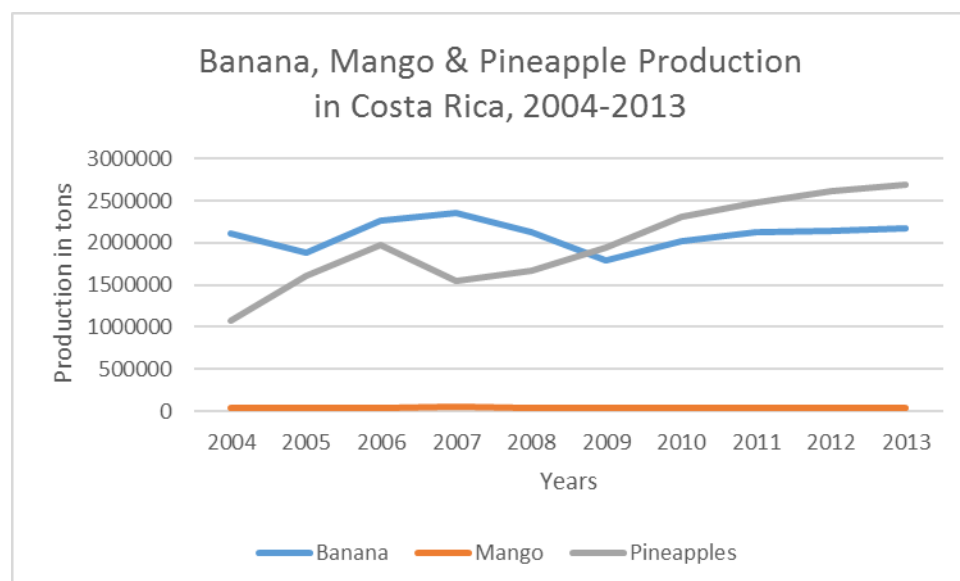


Figure 11: Production of banana, mango and pineapple in Costa Rica, 2004-2013 (FAOSTAT, 2016)

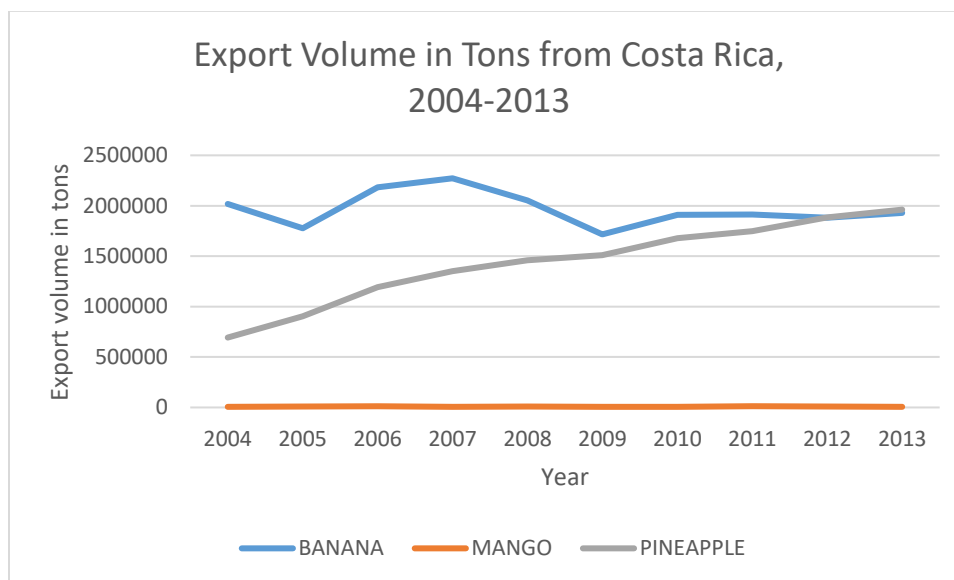


Figure 12: Export volumes of banana, mango and pineapple from Costa Rica 2004-2013

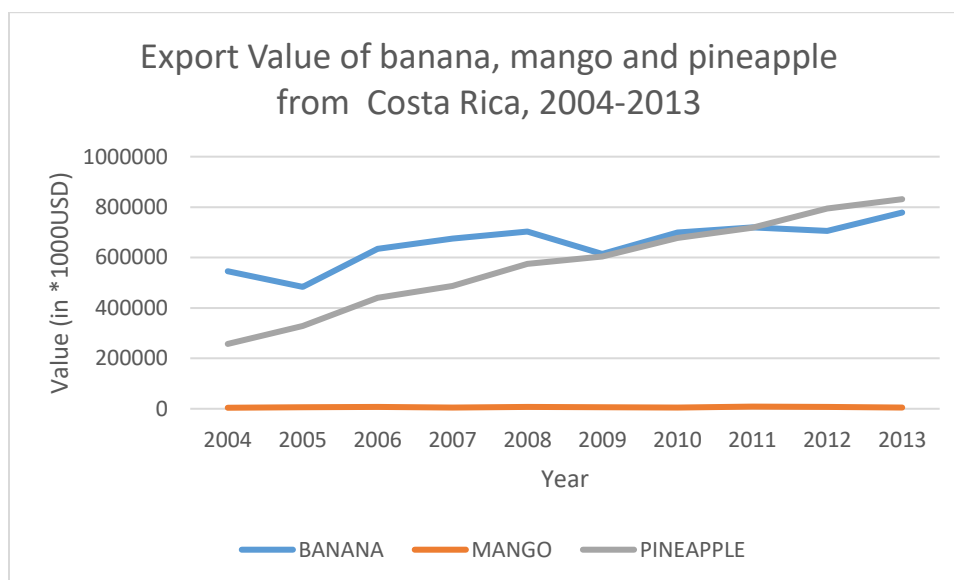


Figure 13: Export value of banana, mango and pineapple from Costa Rica 2004-2013

Since 2012 pineapple has overtaken the export of bananas in terms of value. Both contribute about US\$ 800 million each to the overall export of the country. Though not directly visible in the graph the export value of pineapple decreased quite substantially since 2002 (the introduction of MD2) and now the price more than halved, from US\$2 per kg in 2002 to less than US\$0.7 per kg in 2011. The Costa Rican pineapple sector is seen as highly competitive with many producers and exporters.

Though mango looks very small in the graphs, Costa Rica still exports about 20.000 tons of mango on a yearly basis (about the same as Ivory Coast).

Production issues

Land Preparation

They have good, quite up to date technology. Good agricultural equipment. (ACON)

Soil fertility

The soil fertility situation in Costa Rica is better than in other countries. The step towards organic production can be made but is not always profitable. The soil in Costa Rica is very good for pineapples, very fertile. That's the reason why many start producing pineapple, especially in the north and Atlantic coast.

Climate

Climate Change is seen as the biggest problem for fruit production in Costa Rica. Sometimes it rains too much which causes flooding, sometimes too little. There are no clearly defined seasons anymore. Before, between February and September was the dry season in Limón, while the rest of the year it rained regularly. Now it is all mixed up. 2015 was a very bad year because of this. In 2009 and 2015 the exports went down as rains destroyed the roads and the production. Allegedly, 500 small-scale producers quit producing because of these climate issues and the growing cost of production.

Pest & diseases

As of late Costa Rica's products encounter phytosanitary issues when entering the US ports. Some batches have been rejected.

Post-harvest issues

There are not many issues with respect to the transport of fruits. In general, the cooling is well done and there are not many accidents. But it can happen that the refrigerator is not cooling at the right temperature (with loss of stock as result). There are sometimes problems with packaging as not all the companies do the packaging themselves. Local transport goes often via subcontractors and this is seen as expensive. The road network is improving.

Certification

In terms of certification, most companies comply with GlobalGAP, Rainforest Alliance. They fulfil international and national legislations and norms. CANAPEP represents the pineapple companies that work according to the national social and environmental guidelines. All processors, exporters and producers are GlobalGAP certified.

Additional services

Costa Rica has a highly qualified labour force (educational levels are high in the country). With little training the employees already know what the clients want. They protect the product, have high hygienic standards and the clients value that the products are safe and healthy.

Harvests and seasons

Harvests are continuous, whole year round, every day (pineapples and bananas). Pineapples are a whole year product. There are peaks in production, but during the whole year there is a harvest. Companies are used to having contracts for long term and they have the security that they can sell what they produce.

Trends

Due to climate change the exports fell in 2015. In 2016 it is improving and by 2017 they hope to have it back at the same level as 2014. Costa Rica is seen as very innovative. They try to apply modern methods for harvesting, and preparation of the terrain. In the coming years Costa Rica aims to broaden its export base by including East Asian countries as well, in particular China.

Cost Price Analysis

Production costs

Salary costs in Costa Rica are high, especially because of high social security support costs that have to be paid by law (CANAPEP). Within the overall cost-price labour is by far the most expensive budget item (46%). In contrast water and electricity are relatively cheap in Costa Rica. For social and environmental issues companies in Costa Rica have to budget about 10% of their cost price. These costs are enforced by the government's strict social and environmental 'guidelines'. Another big cost item are the cardboard boxes; even though they are manufactured locally they still cost U\$1,25 per piece for bananas. The phytosanitary service of Costa Rica is a service offered by the State which is compulsory and for which the companies have to pay.

Processing & export costs

Export to the European Union is expensive and takes many days, therefore other conditions apply to the products and other safety measurements need to be used. Import tax is seen as very high in Costa Rica. Transport costs comprise an important factor for pineapple pricing in Europe. They account for up to 50 percent of the price for both sea and air transport (€ 0.38 and € 0.83 per kg). On average the prices are between 6 and 6.50 dollars in 2016 for a box of pineapples.

Logistics

Everything by sea. Air is very expensive. A new port terminal is being constructed in Limón.

Conclusions

Costa Rica is the largest exporter of pineapple and the third largest exporter of bananas in the world. The combined export value was estimated at close to US\$ 2 billion in 2014, of which about 50% ends up at the US market and 40% in the EU (and the remainder is exported to Russia, Turkey and Norway). Both in the US and the EU Costa Rica has an 85% market share for pineapple. The success of Costa Rica's export industry coincided with the sharp reduction of trade barriers to the EU market at the end of the 1990s and the introduction of the MD2 pineapple variety by Del Monte in 2002. The very suitable agro-ecological conditions in Costa Rica (good rainfall and fertile soils) further contributed to the rise of the export fruit

sector. Next to the good growing conditions, the stable year round production, good quality and high productivity; Costa Rica's comparative advantage mainly lies in the economies of scale and well-developed logistical chain (road infrastructure, cooling and port facilities). The main threat for the competitiveness of Costa Rica are the rising labour costs and climatic change. Partly due to high social welfare taxes, salaries have increased by 40% between 2010 and 2015; making up an increasingly high part of the overall cost price. In addition, El Niño associated floods and storms are increasingly reaping havoc in banana and pineapple production areas.

10. Development Projects in Ivory Coast and Ghana

Development Projects and Organizations in Ivory Coast

Because of the political instability over the past decades, there have been very few development projects from the various donors and NGOs in Ivory Coast. This should make it much easier for a new project to work there, because opportunistic behavior is less developed. Most sector development has been driven by national institutions, most notably FIRCA, CENERA and ANADER.

CENERA is the Centre National de Recherche Agronomique, and responsible for most applied/ practical agronomic research in Ivory Coast. The organization seems to work on very relevant issues, like the coco palm varieties and mango fruit fly issues, and has shown concrete results.

The Agence National d'Appui en Developpement Rural (ANADER) is responsible for communicating the results of the agricultural research of the CENERA to farmers, processors and exporters. In addition, they are often involved in the organization of producers, trader, exporters and processors in cooperatives and industry organizations.

The Fond Interprofessionnel pour la Recherche et Conseille Agricole (FIRCA) is responsible for financing the activities of the CENERA and ANADER. The latter two organizations are managed like service providers and contracted for specific activities. However, some activities can also be outsourced to other organisations than CENERA and ANADER; for example, for processing studies and market research. FIRCA's funding comes from the contributions it collects from the actors in the various value-chains it supports (like the former Dutch Product Boards). These contributions are augmented with government and sometimes donor funding.

In Mali, l'Intitute Economie Rurale (IER) is traditionally responsible for applied agricultural research, and also the execution of rural projects. However, their organizational capacity is very weak, and most of their knowledge and working procedures are outdated. They currently do not have the capacity to carry out simple, modern applied research. Burkina Faso has several organisations responsible for rural and agricultural research and development and the organizational capacity tends to be stronger than in Mali.

Development Projects and Organizations in Ghana

For the last one-and half decade Ghana has had a multitude of development projects focusing on the fruit sector. Most of them worked in a public-private setting with a strong role for the Ministry of Food and Agriculture in the design and implementation of the activities (AfDB, WB, GIZ, MiDA). The following list, adapted after Zakari (2012), provides the largest initiatives that have been undertaken in the 2004-2016 period. In addition, more localized initiatives were present as well, e.g. from ADRA, SNV, MASHAV and Solidaridad. The most important fruit crops being: pineapple, mango, citrus and processed fruits (various).

Table 14: Past interventions in the fruit sector

PROJECT NAME & DONOR	DESCRIPTION	PERIOD	BUDGET IN USD
TIPCEE (USAID)	Increase exports of agricultural (and horticultural) produce: production of mango & pineapple	2004 -2009	US\$30 million
HEII (World Bank)	Promote the diversification and innovation in the horticultural industry, strengthen its competitiveness and maintain market shares	2004 – 2007	US\$9.8 million
EMQAP (AfDB)	Increase the incomes of horticultural crop farmers and exporters incomes and of cassava producers	2007 – 2013	US\$28.5 million
MOAP (GIZ)	Improve the competitiveness of agricultural producers, processors and traders on regional, national and international markets	2004-present	US\$23+ million
MiDA (MCC)	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	2007 – 2013	US\$547 million

Trade and Investment Program for a Competitive Export Economy (TIPCEE)

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. The 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. At the same time, the new mango farmers faced difficulties as well in marketing their products, with a limited domestic market and strict export market. To that end TIPCEE focused both on popularizing mango for local consumers, e.g. by organizing the Ghana Mango Week, as well assisting FBOs in GlobalGAP certification and linking them to buyers. In general, TIPCEE was seen as a success because it boosted both pineapple and mango exports (fresh and processed) and had a good capacity, on the ground, to work on production issues.

The Adventist Development and Relief Agency (ADRA) was one of the implementers of the TIPCEE project, especially where it concerned the community based mango activities. Some advice from ADRA on potential new fruit activities are:

- The majority of the people involved in the mango (and to a lesser extent pineapple) industry are not agricultural people: so it is important to make knowledge and skills available to them.
- To have the right knowledge available still research-industry linkages at sector-level are important. This especially concerns solutions for pest and diseases and testing new agro-inputs (e.g. growth hormones for mango; IPM and chemicals).
- The processors are the key change agents in the mango sector; they are now the main buyers, and because they process you have less problems with phytosanitary issues. Also, the larger processors do their own research and work directly with small-scale farmers.

Millennium Development Authority (MiDA)

MiDA implemented the five-year (2007-2013), US\$ 547 million Millennium Challenge Compact (MCC), 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 focused on increasing the production and productivity of high-value cash and staple food crops in specific areas of Ghana, and was charged with enhancing the competitiveness of Ghana's export base in traditional agricultural crops.

MiDA took the initiative to build pack houses to shore up and strengthen the supply chain of horticultural products. As a result, MiDA built pack houses around horticultural zones to ensure that post-harvest losses are minimized. The pack houses serve as transit zones for the products before they are finally processed for exports. Management and ownership of the pack houses has been an issue since the closure of the MiDA project, with complex organizational models with a combination of farmer representation and private management.

MiDA also financed the Shed Nine, a multipurpose fruit terminal fitted with a modern cooling system to temporarily house fruits prior to shipment. The facility 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 built a pack house at Akorley to serve the mango producer associations of Yilo Krobo, Manya Krobo, Damgbe

East. In addition, MiDA also engaged in farmer and enterprise training in commercial agriculture including the training of mango farmers, especially on productivity, quality and FBO formation.

Export Quality and Awareness Project (EMQAP)

The African Development Bank (AfDB) provided support to the Ministry of Food and Agriculture to further develop the horticultural sector of Ghana. They were instrumental in discussing the ownership and management models of the various pack houses that were developed under the MiDA and TIPCEE projects. Rearranging the ownership structure (to single entity ownership) and/or supporting management contracts through tendering. In addition, MOAP worked on supporting FBOs in production, quality and certification, as well as public support through the extension system and plant protection and regulatory services department (PPRSD).

Market Oriented Agriculture Programme (MOAP)

The German Agency for International Development Cooperation (GIZ) started the €8.4 million Market Oriented Agriculture Programme (MOAP) in 2004 and the project has afterwards been extended for a second and third phase till 2015. Currently, the project is exploring a fourth phase. MOAP mainly focused on the fruits: pineapple, mango and citrus. Some of the main activities of the currently ending project include:

- Market facilitation through support to key actors to visit fruit and horticultural fairs
- Development of fruit export directories to guide market players
- Ensuring product quality assurance through product certification such as GlobalGAP, organic, Fairtrade.
- In cases of export bans on fruits and vegetables MOAP facilitates processes to ensure compliance with sanitary and phytosanitary regulations.
- MOAP supports private processing companies to achieve export quality and international certification.
- MOAP has developed detailed and extensive fruit and vegetable production and processing manuals.
- MOAP organizes a lot of trainings for fruit and vegetable farmers and farmer groups (FBOs), including support for GlobalGAP certification.
- The project also supported the establishment of local certification companies.

The main advice of the project for new activities in the fruit sector is to:

- Reduce the scope of the interventions and maintain focus.
- Promote the use of success stories as models to motivate other actors to adopt new approaches.

In terms of the focus they recommend the following issues to receive sufficient attention:

- In general focus on agricultural insurance and financing, as these are major obstacles for farmers and small- and medium enterprises
- With respect to mango production remains a major issue, especially pest and disease management

- Private sector actors are the key actors in fruit export sector. Supporting, capacitating them to adequately invest in fruit export will help in building the industry.

Lessons Learned from Projects

The following observations and lessons can be learned from the various projects and interviews held with project managers:

- The Ghana Fruit Sector has been relatively spoiled by projects and donor funding. Nevertheless, the exported amounts are still modest and major systemic issues (e.g. on phytosanitary issues) have not been solved.
- Many investments have been made in Farmer Based Organizations; their production, organization and certification. Some form of project dependency has emerged here. The projects were not clear whether the FBO-model really works in Ghana. In general, the success rate in more pragmatically organized outgrower models (smaller groups) directly linked to companies has been higher.
- Gradually, projects started focusing more on downstream value-chain activities, marketing and market promotion. Though it sounds old fashioned, attention for the basic production practices (increasing productivity, and proper pest and disease management) is still required.
- There is a lot of knowledge and information available in the sector, e.g. in terms of production and processing manuals (GIZ), and available trainers for technical support.
- A number of the very large USAID and Bank funded projects (AfDB and WB) tended to have a rather compartmentalized approach, with different work packages and separate components. This limited real integration on the ground between the activities and hence limited the overall impact of the activities.
- Most projects have ended now (EMQAP and USAID for sure), and only MOAP is considering a next phase, while some form of support is envisaged under the Government of Ghana's EDAIF scheme. This leaves room for the Netherlands to coordinate specific Trade & Aid activities in the fruit sector.

11. Dutch Projects in West Africa's Fruit Sector

There are four Dutch initiatives that are already supporting the fruit sector in West Africa: IDH (Initiative for Sustainable Trade), CBI (Centre for Promotion of Exports from Developing Countries), Flying Swans and the CABI-FDOV project. The Netherlands also still supports Blue Skies through a PSI subsidy (for juice and ice), this initiative has been presented in the chapter on Ghana's mango sector and will not be further highlighted in this chapter. For each of the four other initiatives a small description is provided with some of the lessons learned by the implementing organizations.

IDH – the Sustainable Trade Initiative

The Sustainable Trade Initiative is a relatively large co-financing scheme that invests in greater vertical integration of leading companies in the agro-food sector. The initiative supports projects that link smallholder farmers to high-value markets, focusing on increased income and environmental sustainability; mostly through certification. The scheme provides up to 30% of the resources, where companies are providing the other 70%. Funding can be utilized for hardware investments, training and organization of farmers, and certification. The main entry point is the EU importing company (wholesale or retail), mostly the larger multinational companies (e.g. Ahold, Unilever, Nestlé and Dole). They focus on key international commodities like: coffee and tea, cocoa and cotton; as well as fruit and vegetables. IDH has a budget of € 20 million per year which it invests mainly in Africa, Asia and Latin America.

In West-Africa IDH is currently active in five projects:

- With FairFruit and Colruyt, IDH invests in the fresh mango value-chain of Ivory Coast, Burkina and Mali. The project trains farmers on new varieties, quality management, product handling and post-harvest management. They use the farmer field school model that has been developed in Guatemala for FairFruit's fine beans and mangetout (snow pea) supply chain.
- In Ghana IDH works with HPW on pineapple and Mango. The project works with 500 small- and medium sized farmers, promoting cluster farming, and introducing new varieties and improved agricultural practices. At the HPW processing facility the storage is being improved and pasteurization equipment is introduced to increase the shelf-life of the mangoes. All in all, the project aims to increase the production and processing capacity to achieve 60 tons of dried fruit per week.
- Ghana is also part of a pilot under the AgriPlace project of IDH. Within this project a system is built that can bring together and streamline the different certification standards. The final AgriPlace Portal aims to facilitate faster and easier compliance to the standards for companies and small-scale farmers.
- Further, in the wider West-African region IDH is active in Benin on small-scale pineapple production and Nigeria's dried fruit sector.

Main lessons learned from IDH in West Africa and advice for new fruit activities are:

- West Africa is a preferred region for most of the EU wholesalers and retailers due its proximity and related product quality (potential)
- The headache is in dealing with West African exporters; which relates to having a continuous supply of good quality products

- The main issues at country level have to do with the poor state of the logistics and legal issues (e.g. introducing new varieties).
- The main issues at company level are: the detailed know-how of the production process; access to finance and real entrepreneurship.
- The main advice is: Don't start with everybody, but start with a few reliable companies that are scalable.
- Another advice is to not only focus on the EU market but also on the regional trade and local markets; there is an increased local purchasing power throughout West-Africa.

CBI – Centre for the Promotion of Imports from Developing Countries

CBI aims to promote exports from developing countries to the Netherlands and the EU at large. The Organization does this through providing information (e.g. sector studies) and direct trainings of SME level companies in developing countries. In Ghana CBI promotes a project that provides training to fifteen companies involved in the export of yam, Asian vegetables, papaya, mango and pineapples. Examples are Sam Valley, Univeg, Albe Fruits and KK Fruits. These companies receive a number of group trainings and individual coaching sessions, and together a marketing and business plan is developed. After that the companies can participate in a number of Trade Fairs to promote their projects and to broker trade deals. The project runs from 2013 till 2017.

So far, the results have been slightly disappointing. Out of the fifteen companies only seven participated in the latest FruitLogistica in Germany. In addition, only a few trade deals emerged as a result of the participation. The main lessons learned from CBI implementing partner are:

- Smaller Ghanaian fruit exporting companies are not really entrepreneurs. There is very little integration and communication in the chain, with many promises but little follow-up, “they either don't have the product or they don't have the money”.
- Also, often the communication with the importers is poor. These two things combined make the companies rather unreliable towards the EU importers.
- The main issues for the companies are: a lack of finance (and very high interest rates) and a lack of chain integration.
- Another advice is to focus on finance, at the moment interest rates are too high and too limited in their scope (3-6 months).

Flying Swans

Flying Swans is a Dutch Topsector initiative focusing on the sectors: logistics, agro&food and horticulture. Pre-competitive sector approach – part of topsectors: logistics, agrofood and horticulture. They are currently designing integrated logistical chains from Africa to the Netherlands, with an initial focus on Ethiopia and South Africa. The consortium consists of Boskalis (Port Development), Frugiventia (Fruit & Vegetable Wholesalers Association), FMO (finance) and the Port Authority of Rotterdam (Havenbedrijf Rotterdam). The project runs from 2013 to 2017. In principle they would be interested to do something in West Africa, though they first have to show results to their members in the ongoing projects, before starting new initiatives.

The coordinator of the initiative was recently also in Ghana for a F&V Trade Mission and his lessons learned and advice is:

- FrugiVenta members are interested in West Africa. The companies that are currently importing from Central America increasingly face competition from North American importers.
- The challenges in West Africa mainly have to do with the relatively small size of the companies and continuity in supply.
- At the Dutch side the trend is that there is a rapid consolidation of the wholesale companies. These are becoming very big and it is expected that in ten years' time there will only be five to ten left.
- The sector advice of Frugiventa for West Africa is to focus on logistics. The EU needs integrated chains, with tracking and tracing, conditioning and – smaller aggregation centers where necessary.
- In the end, production and product quality drives the chain; if you have good quality products in sufficient quantities you will be able to find a buyer. The demand in the EU for tropical fruit (products) is growing faster than the supply.
- For a possible project there are a number of member companies that are interested to collaborate.

FDOV-CABI: Facility for Sustainable Entrepreneurship and Food Security

CABI, the Centre for Agriculture and Bioscience International, has recently won a project under the FDOV tender scheme of RVO. The Plant Health Project focuses on Ghana's export fruit and vegetable sector, with a focus on phytosanitary and food safety issues. In the project they will work together with Ghana's vegetable exporters association (GAVEX), individual fruit and vegetable companies and the plant protection and regulatory services department (PPRSD). The project will run from 2015 to 2020 and has a budget of € 2,5 million, excluding the co-financing contribution of the partners.

The planned activities of the project are:

- To provide training in all phytosanitary issues of inspectors and other phytosanitary staff of PPRSD.
- To develop and maintain a data management system that is supported and aligned with the electronic export certification system (CLIENT).
- To train 1.500 farmers in thirteen areas to facilitate Good Agricultural Practices adoption and phytosanitary procedures.
- To support the building and upgrading of fifteen basic sorting, inspection and packing facilities in thirteen vegetable growing areas.
- Train GAVEX members, Sunshine Organic Farms and technical staff in organic production standards.

Lessons Learned from the Dutch Projects

Two lessons learned from the international projects active in Ghana can be reiterated based on the interviews with the Dutch supported projects in West Africa: the importance of finance, and to be very selective in choosing who to work with. In addition to these two recommendations, the projects mention:

- The development of integrated, fresh logistical chains will be crucial, linking quality produce with good infrastructure and tracking and tracing systems.
- Worldwide there is a trend towards consolidation in the F&V sector; at the West African side this also requires an increase in the scale of operations, both at the production and exporter level.
- The regional market of West Africa is developing fast and there are increased business opportunities in fresh and especially processed fruit products for this market. Having a strong regional market can form an important stepping stone to the EU market (as well as good outlet for 2nd grade products).
- For Ghana, there will be a continuation of projects that will support the government's phytosanitary and food safety services (through MOAP and CABI). Hence, collaboration can be sought with these activities, but no additional stand-alone activities are required in this field.

12. Main Findings and Conclusions

Introduction

This chapter provides the main findings of the sector studies, the Costa Rica benchmark, EU importers perceptions and the lessons learned from other projects and interventions in West Africa's fruit sector.

The West Africa Fruit Sector: Sizable and Growing

The overall West African fruit sector comprises an annual export value of more than US\$ 400 million per year and grows at about 5% per year. The growth is not even for all the countries and all the crops. On average, we see that Ivory Coast is growing faster than Ghana and we see that mango exports are doing better than pineapple. The following two graphs illustrate this.

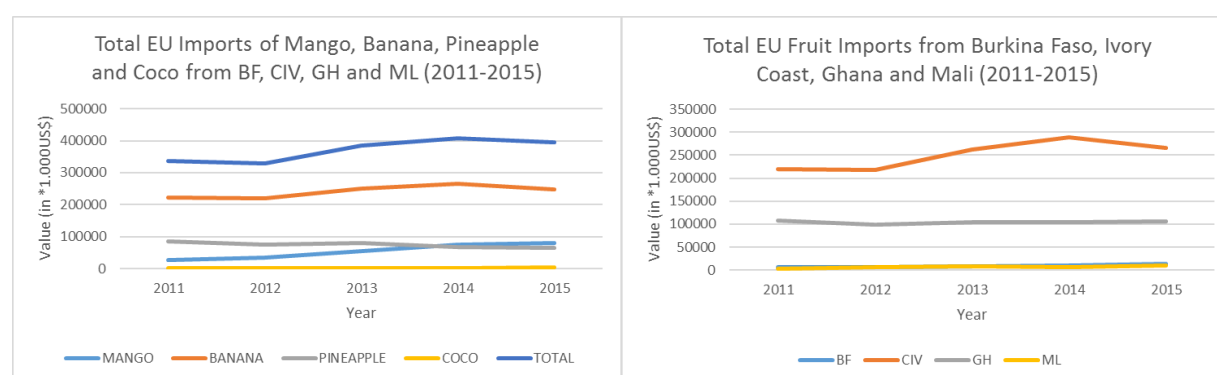


Figure 1-2: Total fruit imports into the EU from West Africa per crop & country in value (2011-2015)

Banana is by far the biggest export commodity with an export value of around US\$ 250 million; second and third are mango and pineapple, both with a value of around US\$ 75 million in 2015. Interestingly, mango has now taken over pineapple as the biggest non-banana export crop. Compared to Costa Rica, the sector is still of a modest size (Costa Rica exports almost US\$ 2 billion per year), but compared to other export sectors in the countries themselves it is a very important sector. The fruit sector ranks fourth in importance for Ghana, after cocoa, gold and petroleum; and sixth for Ivory Coast, after cocoa, ships, petroleum, rubber and gold. And compared to other export sectors it has the highest potential for contributing to food and nutrition security for a large number of people (both directly and indirectly)².

The Enabling Environment: Macro-economics, Logistics, Credit, SPS & Applied Research

The overall macro-economic situation of Ghana has been deteriorating rapidly over the last years. An IMF bailout package was necessary to stabilize the economy after record high budget deficits and sky rocketing inflation took place in 2014. Overall, the cost of production has increased in Ghana, both for labour, electricity and inputs, and this has decreased the overall competitiveness of the economy. In addition, reduced cargo volumes (of especially pineapple) and close to monopoly for Compagnie Fruitière's vessels have driven up the cargo prices which are also significantly higher than in Ivory Coast.

The economy of Ivory Coast has been growing rapidly in the last four years and currently averages around 8,5% growth per year (2015 and 2016 projections, WB). Ivory Coast, having the benefit of being linked to the Euro, faces different constraints than those related to the devaluation of the currency and they mainly have to do with the logistical chain. The port in Abidjan is heavily congested and the inland infrastructure is of poor quality leading to long (and expensive) travel times. Once at the port paperwork can still delay shipments for 48-72 hours. Overall, the exporting conglomerates of banana and pineapple face less difficulties in accessing vehicles and reefer containers, than the smaller and medium-sized exporting companies involved in pineapple and mango. Mango, being a more seasonal crop, has serious difficulties in accessing the available pack house capacity and refrigerated containers.

Producers and exporters in both countries suffer from limited access to credit; this concerns both working capital (for inputs and products) as well as investment capital. Especially the latter restricts the company's capacity to increase the productivity and quality of the farms and pack houses (e.g. by investing in drip irrigation, new planting material or cold storage). In Ghana interest rates are now higher than 30% in Ghana Cedi (GHS) terms, while in Ivory Coast they are more than 10%, while agricultural financing is often not a priority of the Banks.

Both countries have recently suffered from voluntary and compulsory phytosanitary bans for the exports of mangoes; mainly due to a specific fruit fly (*Ceratitits cosyra*). As a result of the high level of incidences in 2014 (62 for mango alone), Ivory Coast started a large campaign in 2015 to support farmers in reducing pest levels at the farm and more rigorous inspections in pack houses. In addition, a specific export window has been put in place, after and before which no mangoes can be exported. In Ghana the fruit fly is less of an issue (yet) which could be a result of the fact that the farms are bigger and younger, and that the management is better. For banana and pineapple less problems occur in both countries.

Overall, Ivory Coast ranks well in terms of its applied research capacity, through the system of FIRCA, the public-private, applied research fund, and CENERA, the applied agricultural research institute. In Ghana, the knowledge on fruits seems more fragmented with a number of research institutes and universities involved. Also, the linkage between the academia and researchers on the one hand, and the companies on the other seems weaker than in Ivory Coast.

Interest from the EU Market: Getting the Basics Right?

Interviews with key importers of fresh fruits in the EU market revealed that West Africa is on many's radar as an interesting supplier. Most importers of banana and pineapple indicate that North America is increasingly competing for the Latin American market, and they are looking to diversify their supply. Figure 3 on the next page shows the main importers in the EU of West African products: Belgium, France and the UK. The dominance of Belgium and France is mainly influenced by the historical and Francophone ties with Ivory Coast; especially for banana and pineapple this connection runs through some of the bigger fruit multinationals (SCB and SCAB). For the UK a similar phenomenon can be observed through the connections with major production and processing companies in Ghana. The Netherlands is by far the largest importer of fresh and dried mangoes. These imports cut across the four countries with a preference for Ivoirian and Malian mangoes (more than US\$ 25 million out of the total US\$ 31 million come from these two countries). According to the importers, West Africa should be able to compete well with Latin America due to cheaper labour costs and logistics.

At the same time, the EU importers complain about the difficulties in doing business with the smaller and medium-sized exporters from Ghana and Ivory Coast. They have quite a number of exporters that are not performing on their contracts, both in terms of quality and quantity.

The importing companies are more enthusiastic about the West African mango than the pineapple. For pineapple Costa Rica performs best in terms of brix and physical quality, as well as consistency year round. With respect to certification, they see that some companies start off bright by delivering good quality certified products, but then later fall back into 'old habits'. In general, the companies feel that competition in Latin America is healthier; with less power blocks and fragmentation in the chain. Nevertheless, a large number of Dutch companies mention they are interested in collaborating on a potential project in West Africa, e.g. setting up sustainable supply chains.

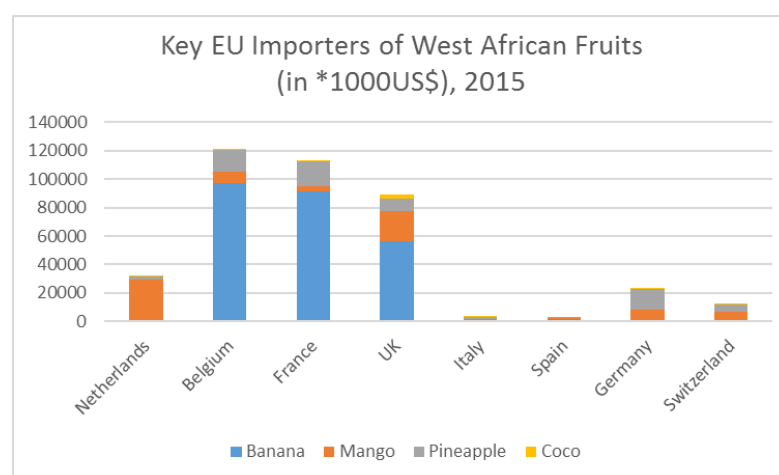


Figure 3: Key EU Importers of West African fruits, 2015 (ITC TradeMap)

The Rapidly Emerging Sector of Processed Fruits

A major observation was that the export market for processed fruits is booming. Both from the West African companies' side and EU importers side there is a shortage in dried, juiced or cut fruit products. The profit margins, especially for dried fruits, are mentioned to be very healthy. In addition, the products increasingly also find a local and regional market. Nigeria is coming up as a big importer of processed fruits while also the populations of Ivory Coast and Ghana themselves have increased purchasing power to afford locally produced fruit juices and fruit snacks, for coconut it is especially the desiccated coco (or copra) that is in high demand for cosmetics products, throughout West Africa.

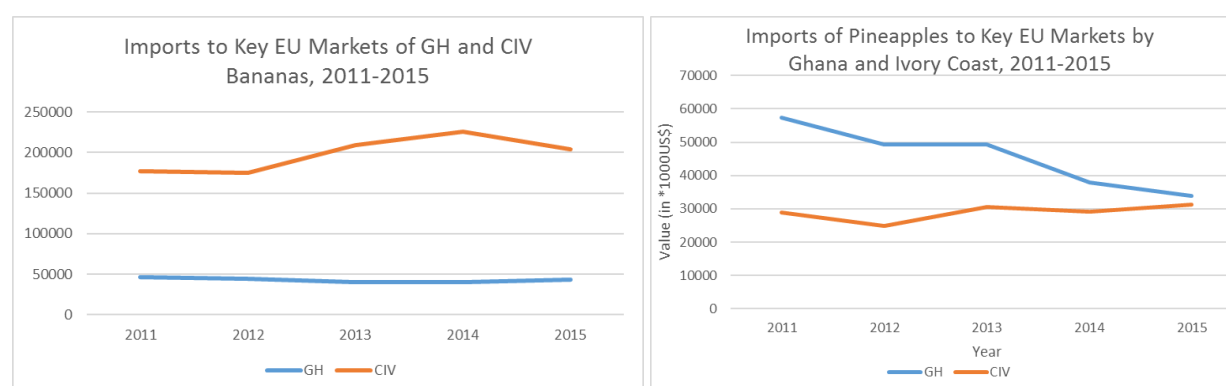
At the same time, only a few companies at the moment have the required level of professionalism to export to the EU markets (e.g. Blue Skies, HPW, Peelco). The EU Markets require at least GlobalGAP and HACCP certification and a consistent quality and reliable flow of products. Many smaller and medium-sized factories have difficulties meeting these conditions. In addition, given the seasonal nature of the mango harvest (contrary to e.g. pineapple), companies require large storage facilities with some form of conditioning, in order to produce year round.

Regional Linkages: Francophone West Africa and Nigeria

Especially for mango, being a more Savannah type of crop, the linkages between the four countries are well established. There is a lot of cross-border trade in fresh mango: Mali and Burkina Faso export to Europe via Ivory Coast, and even from Bamako directly by air. The mango drying factories and the juice factory in Burkina Faso are all importing mango from Mali and sometimes from Ivory Coast. Mango from Ivory Coast is also exported from Ouagadougou airport, and Burkina Faso and Mali export mango to processors in Ghana. Processed products travel throughout the region with Ivorio, Dafani and Pinora all being important regional brands for fruit juice. Lastly, the market for processed products (dried, snacks and cosmetics) in Nigeria is pulling significant supply from Ivory Coast and Ghana. Especially for copra (the white desiccated coco 'flesh') there is a large market.

Trends in Pineapple & Banana: Scale and Niche

Focusing in on the banana and pineapple sector, one key observation is that the level of consolidation is increasing. For banana this has been the case since the onset of the gradual lifting of the quota system at the end of the 1990s. For pineapple this has been the case since 2002, when the new MD2 variety was introduced and later when Costa Rica seriously expanded its scale of production, productivity and logistical efficiency. All in all, there are now two companies left in both Ghana and Ivory Coast respectively that export close to 100% of all the banana (Golden Exotics and VREL; and SCB and SCAB). The growth in this sector is driven by the investments that these companies make, which is currently more geared at Ivory Coast than Ghana.



Figures 4-5: Imports of bananas and pineapples to key EU markets between 2011-2015 (in *1.000US\$)

Also for pineapple these players play a key role, though less dominant with a greater role for local medium-sized producers and exporters. E.g. in Ghana the four biggest exporters together have around 70% of the export market (Golden Exotics, Bomarts, Milani and Jei River). In Ghana, pineapple has suffered from two bad years. Producers complain that the MD2 variety requires much more care than the other varieties (Smooth Cayenne and Sugar Loaf) and input costs are higher. In addition, Ivory Coast seems to have a natural advantage through its more fertile soils and higher rainfall. As a result, production figures in Ivory Coast are picking up while those in Ghana are rapidly decreasing (at 15-20% per year). Our cost price analyses indicate that especially Ivory Coast's labour, agrochemicals and sea-freight costs are lower than those in Ghana.

The overall trend for both countries is that the consolidation of production and exporting companies will continue, with increased vertical integration, by including cooling and shipping facilities like Compagnie Fruitière. In order to continue competing with Central and Southern American countries, both the cost of production and transport costs need to be brought under control. The main recommendation of exporters and importers alike is that the government can facilitate the bigger companies, only to a certain extent, by increasing their competitiveness, through less red tape (especially in Ghana), better infrastructure and sound macro-economic policy.

Another trend, especially in the banana and pineapple industry, is that towards nice products. In order to compete with the big five (Dole, Delmonte, Chiquita/Fyffes, Compagnie Fruitière and Canavese) the smaller and medium-sized exporters are increasingly focusing on special products (e.g. air freighted Sugarloaf pineapple), quality and/or processed (dried, cut, concentrate). The advantage of processed fruits is that the variety choice is much larger than with fresh (basically only MD2 pineapple and Cavendish banana) and more adapted varieties like Smooth Cayenne (for pineapple) and Palmer and Brooks (for mango) can be well used.

The New Kid on the Block: Mango - Great Potential if Quality can be Controlled

The biggest growth in the West African fruit industry has been observed in the mango sector. Since 2011 the export of both fresh and dried mango has almost tripled (from US\$ 27 million in 2011 to US\$ 79 million in 2015). Growth cuts across the board for Burkina, Ghana, Ivory Coast and Mali, though it has been especially large for Ghana (figure 6 illustrates this). The mangoes of West Africa are very much appreciated for its taste (according to some importers “the best of the world”) and the fact that they can fill a specific window in the year (April-June). In addition, it seems that earlier investments in the sector (in pack houses, seedlings and trainings), in particular Ghana, are starting to pay off.

Accelerated growth of the sector can be achieved if the following issues are being addressed:

- The West African mango season is short. In Ivory Coast it currently runs (by decree) from 8 April to 5 June (for the Kent variety). Earlier, the fruits are still immature (though some Amélie can be exported) while later the crop suffers from fruit flies and anthracnose, as a result of the start of the rainy season. Three solutions have been suggested to extend the season: better fruit fly control, inducing earlier flowering of trees through growth hormones, and the introduction of new varieties (especially the early maturing Tommy Atkins variety).
- Because the best mango production areas are far away from the ports, the logistical chain is very important for the product quality. There are major issues at the moment with respect to the transport of fresh mangoes from Burkina and Mali to Abidjan. These problems are even so big that some prefer trucking the mangoes through the Sahara to Tangier (Morocco) into the Spanish mainland. Investments in all elements of the logistical chain are required; from road infrastructure to collection points; and from cold storage facilities to reefer containers.
- In most of the countries a strong mango processing industry is emerging (both for dried, cut and juice). This provides a very good 2nd grade market for the mangoes. In mango, in general, the amount of 2nd grade product (too large, too small, slightly blemished) is rather large which necessitates a ready alternative outlet. The amount of 2nd grade in Ivory Coast, both at harvesting and packaging point, was estimated at more than 60%. If done professionally, there is still much room to expand the processed fruit industry in all the four countries.

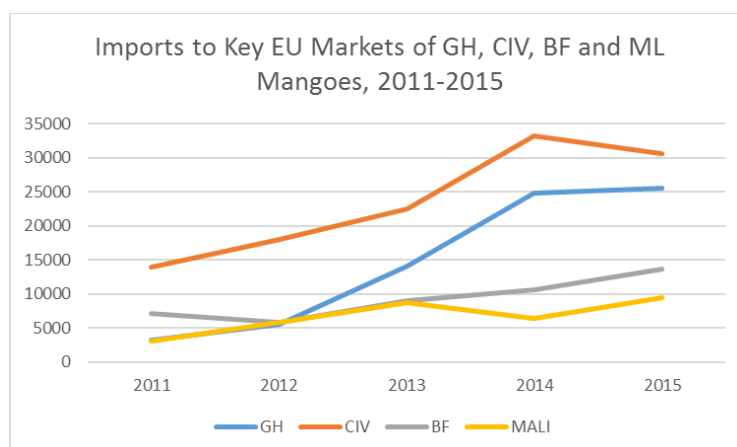


Figure 6: Imports to key EU markets of mangoes from West Africa, 2011-2015

Coconut: A Long-Term Promise & Especially Interesting for the Regional Market

Though our data analysis found signs of a re-emerging export market for coconuts in Ghana, our interviews with key fruit exporters told another story. In general, the sector in both Ghana and Ivory Coast has been dwindling. Ever since the emergence of the Cape St Paul wilt disease in the Volta Region in Ghana in the 1990s, the production and productivity of the trees has gone down. In Ivory Coast the decline was also influenced by the introduction of oil palm and rubber which proved much more profitable than the low yielding coconut varieties available.

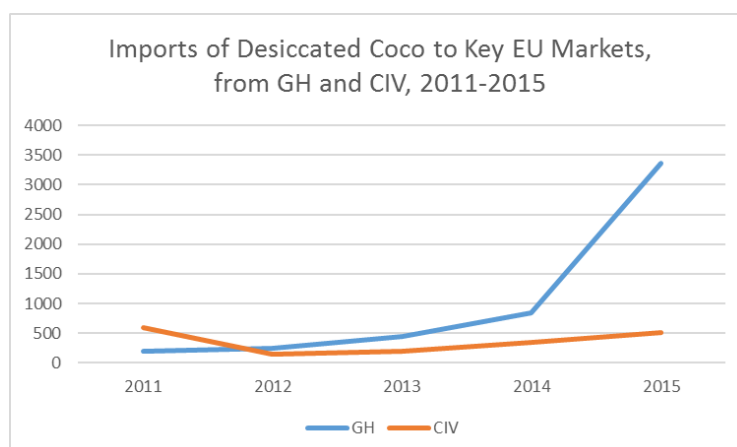


Figure 7: Imports from Ghana and Ivory Coast by EU countries of desiccated coco, between 2011-2015

The sector shows some potential as the crop can be grown under the most marginal conditions (poor salty soils with low rainfall). In addition, new hybrid varieties have been developed that can withstand the wilt disease while being much more high yielding. Good quality coco oil and copra finds a ready market in the West African cosmetics industry. Our cost-benefit analyses showed that within a low input – low output business model the coconut can fetch healthy profits at each point of the chain. Large-scale plantations are probably required to bring this sector to the next level.

For the moment we didn't see major investments in the sector. Therefore, Ghana's spike in exports (to more than US\$ 3 million) was hard to explain. The only companies in Ghana currently doing some exports are the processing companies of dried fruits and juice (Blue Skies, Ebenut, HPW and Peelco). For now,

creating interest in the sector by rapidly scaling up the availability of disease resistant, high yielding varieties and developing a clear business case for investors, might be the first step.

Benchmark Costa Rica

Costa Rica is the largest exporter of pineapple and the third largest exporter of bananas in the world. The combined export value was estimated at close to US\$ 2 billion in 2014, of which about 50% ends up at the US market and 40% in the EU (and the remainder is exported to Russia, Turkey and Norway). Both in the US and the EU Costa Rica has an 85% market share for pineapple. The success of Costa Rica's export industry coincided with the sharp reduction of trade barriers to the EU market at the end of the 1990s and the introduction of the MD2 pineapple variety by Del Monte in 2002. The very suitable agro-ecological conditions in Costa Rica (good rainfall and fertile soils) further contributed to the rise of the export fruit sector. Figure 8 shows the gradual increase of Costa Rica's exports between 2000 and 2015 for banana, pineapple and mango.

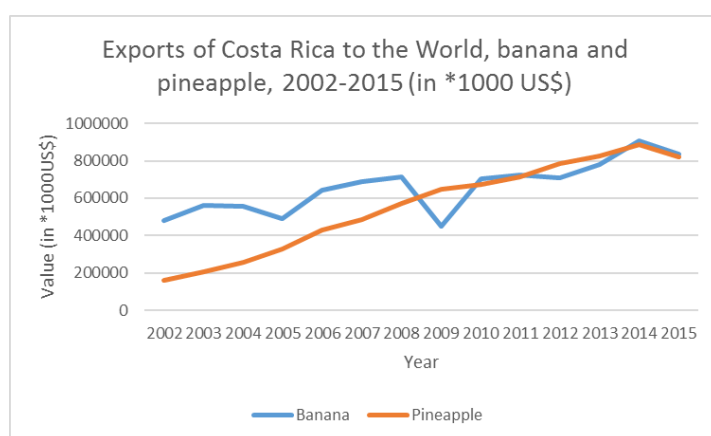


Figure 8: Exports of Costa Rica to the world for banana and pineapple, 2002-2015 (in *1.000US\$)

The graphs show two dips, in 2009 for banana and 2015 for both pineapple and banana. Both had to do with adverse weather conditions; storms and floods hit the country, destroying 1.000s of hectares of production. As Costa Rica is the biggest exporter of pineapple it also to a large extent determines the price on the market. Nowadays, there is very little difference between Costa Rica and West Africa's import price anymore. While in 2002 prices hiked at more than €1,1 per kg they settled around €0,60 per kg between 2008-2012. Due to the strengthening of the US Dollar and the mentioned production issues, prices later increased to €0,70-0,80 for 2014 and 2015.

Next to the good growing conditions, the stable year round production, good quality and high productivity; Costa Rica's comparative advantage mainly lies in the economies of scale and well-developed logistical chain (road infrastructure, cooling and port facilities). The main threat for the competitiveness of Costa Rica are the rising labour costs and climatic change. Partly due to high social welfare taxes, salaries have increased by 40% between 2010 and 2015; making up an increasingly high part of the overall cost price. In addition, El Niño associated floods and storms are increasingly reaping havoc in banana and pineapple production areas.

Lessons Learned from Other Projects: Business Driven & Company-Led Chain Integration

Especially in Ghana a large number of development projects have been implemented in the fruit sector over the past decade. Though difficult to aggregate, the total project intervention budget is estimated at around US\$ 100 million for fruits alone. These projects included the GIZ-MOAP, MiDA, EMQAP, USAID-TIPCEE and WB HEII projects. The following observations and lessons can be learned from them:

- Many investments have been made in Farmer Based Organizations (FBOs); their production, organization and certification. Some form of ‘project dependency’ has emerged here. From an outsider’s perspective it is not clear whether the FBO-model really works in Ghana. In general, the feeling is that the success rate in more pragmatically organized outgrower models (smaller groups) directly linked to processing and exporting companies has been higher.
- Related to the ‘project dependency’ is the strong advice of both the international and Dutch projects to have a clear financial commitment from the organizations targeted (co-financing). Both the ADRA (TIPCEE/EDAIF) and IDH projects show that creating very clear expectations from the onset and accountability (from both sides) during the implementation is extremely important.
- Gradually, in time, projects started focusing more on downstream value-chain activities, like processing and market promotion. Though it may sound old-fashioned, attention for the basic agricultural production practices and technical processing skills are still heavily needed.
- A number of the very large USAID and Bank funded projects (AfDB and WB) had a rather compartmentalized approach, with different ‘work packages’ and ‘components’; each with their own implementation teams and deliverables. On the ground this reduced the integration of the activities, and hence, limited the overall impact of the activities.
- For Ghana, there will be a continuation of projects that will support the government’s phytosanitary and food safety services (through GIZ-MOAP and CABI). Hence, collaboration can be sought with these activities, but no additional stand-alone activities are required in this field.

From the ongoing Dutch projects in West Africa we learned that the two key limiting factors for further growth of the companies are: finance, capacity and entrepreneurship. All in all, the main lesson learned is that any new project needs to be very critical in the selection of which companies and farmers to work with. The advice is to focus on the genuinely motivated and relatively well-capacitated companies; starting from the entry point of a clear business case. The business case should have a very strong economic underpinning and the envisaged partners should contribute a substantial amount of co-financing. Related to this, the selected companies should have a certain scale and track record in order to be able to expand rapidly and achieve impact. In the envisaged project, additional intensive technical support (both for production and processing) is probably needed, while due attention needs to be paid to the design and implementation of possible outgrower models – as often here things go wrong.

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This is a publication of:
Netherlands Enterprise Agency
Prinses Beatrixlaan 2
PO Box 93144 | 2509 AC The Hague
T +31 (0) 88 042 42 42
E klantcontact@rvo.nl
www.rvo.nl

This publication was commissioned by the ministry of Foreign Affairs.
© Netherlands Enterprise Agency | Januari 2017

Publication number: RVO-007-1701/RP-INT

NL Enterprise Agency is a department of the Dutch ministry of Economic Affairs that implements government policy for agricultural, sustainability, innovation, and international business and cooperation. NL Enterprise Agency is the contact point for businesses, educational institutions and government bodies for information and advice, financing, networking and regulatory matters.

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