CBI
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Value Chain Analysis for Processed Fruits from Burkina Faso, Mali and Ivory Coast

Commissioned by The Centre for the Promotion of Imports from developing countries (CBI)

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Executive summary

Background and scope

This value chain analysis was commissioned by CBI (Centre for the Promotion of Imports from developing countries) in order to identify the most promising product market combinations for processed fruit from Burkina Faso, Côte d'Ivoire and Mali.

Export market competitiveness

While tropical dried fruits and tropical frozen fruits are still relatively small compared to the total processed fruit market size, we see that tropical fruits are gaining market share from native European fruits. Preserved fruits (mainly canned pineapple), fruit juices, concentrates (for juices) and coconut oil are larger markets, but they are stable or in some cases declining. Purées for the baby food segment and coconut derivatives other than coconut oil are interesting growth segments when the high quality and food safety standards required are achieved.
For all processed fruits market segments, the same countries appear as trade hubs for the European market: The United Kingdom, The Netherlands, Germany, France, Belgium and Italy.

Market trends provide opportunities and threats for the development of a processed fruits segment. Consumer demands for healthy and sustainable products are increasing. The shift in consumer dietary patterns and the growing vegan population is expected to drive the growth of the processed fruit market. Traceability of the supply chain for food safety and ethical compliance is becoming more and more of a mandatory requirement for buyers, especially those in the more niche markets, and is likely to be followed in the future by import regulations. Climate change is a concern and, among other things, this changes the requirements for packaging with a tendency towards more plant-based consumption. The European economy is slowing down, which could mean a slowdown in demand for the more niche, exotic products.

Comparative position in relation to other mango origins globally is ranked in four categories of indicators: macro-economy, business environment, sustainability and CSR, and mango sector. Burkina Faso, Côte d'Ivoire and Mali are at the middle to lower end of the comparative analysis. Within the region, Ghana is the main competitor and is making positive strides.

Value chain analysis for Côte d'Ivoire

There does not seem to be a reason why Côte d'Ivoire should not have a flourishing fruit processing industry. This is especially true for mango since there is high oversupply and post-harvest losses, stricter EU phytosanitary rules for fresh products and plenty of investment capital in the country. It is also true for coconut as there is potential and a clear growth in market demand for coconut products.

However, there is currently very little fruit processing going on in Côte d'Ivoire, mainly due to the strong focus on the more profitable cocoa, coffee and cashew commodities. From the analysis, and validated in the workshop in Abidjan, it became clear that the problems and solutions with regards to processing exist across all of the value chains. A processor often processes more than one fruit; therefore, it makes sense to look at the tropical fruit processing industry as a whole, instead of just focusing on one value chain. It is therefore recommended that interventions in Côte d'Ivoire do not focus on one value chain, but instead support the enabling environment of the processing industry. This means improving their organisation and lobbying capacity, as well as access to finance and information.

If a choice is to be made on the value chain with the most potential for a successful export promotion intervention, our analysis shows that a focus on the mango sector would add the most value. Though

still very small, it is the most organised sector, and it is the right timing when also combined with Mali and Burkina Faso. Important challenges to resolve in the processed mango value chain include diversification of the products, development of favourable fiscal and tariff mechanisms, and access to finance, packaging and marketing.

Coconut and pineapple have been explored in Côte d'Ivoire. Though they provide opportunities, the sectors also deal with significant challenges, heightening the risk factor for intervention when it comes to promoting exports to Europe. Coconut, with its range of possible value-adding products, has a promising market in Europe. However, challenges need to be overcome, both in the enabling environment, processing capacity, innovation, as well as in its raw material supply. Initial interventions in coconut would need to focus on organising the sector and supporting its stakeholders in obtaining the necessary information to build a strategy upon. A possibility would be to look at joining forces with the other West-African coconut producers in order to create sufficient supply, as the taste of coconut products is often related to a specific geographical region.

Pineapple has a long history in Côte d'Ivoire and is also well-known in its processed form. It is a crop that is essentially disease-free, can be harvested throughout the year, has a growing cycle of a year and is said to be profitable for all supply chain actors involved. On the other hand, in Côte d'Ivoire, it is a sector that has known multiple crises, and many of the pineapple areas were converted to palm oil, rubber and cocoa plantations. Farmers have become discouraged. This has led to a significant supply gap, adding to the already high costs of production. This makes Côte d'Ivoire unable to adequately compete on the international markets with countries like Costa Rica. The processed pineapple products therefore mainly go towards the domestic and the regional markets, which also shows most potential for successful growth.

Value chain analysis for Burkina Faso & Mali

The dried mango sector in Burkina Faso has been supported by government and civil society for over two decades, and it currently has a 25% share in the European market. The value chain and enabling environment are reasonably well-organised. The mango sector in Burkina Faso now needs to become independent from development support by establishing direct connections to the market, professionalising processing by implementing international standards for food safety and sustainability certification, and mitigating the challenges of mango seasonality by diversification. Burkina Faso is well-positioned to capture the growth of the market and possibly increase market share by improving its competitive position compared to other origins, most notably South Africa. A risk is the growth in the number of mango processors in Burkina Faso and the region, as well as the growth in volume by individual processors. Currently, supply grows faster than demand, which may affect price and profitability.

Mali has some artisanal drying units near the border with Burkina Faso, which are directly linked to the value chain and exporters in Burkina Faso. We see limited potential for Mali to become a significant origin for dried mango, and those drying units that have potential can be considered part of the regional mango trading system. However, Mali has some traction in processing juices, concentrates and purees for export, with two factories currently operating and two exporters having expressed interest in investing in processing.

Concluding joint analyses and conclusion

Mango has been identified as the most promising product market combination. Overall, Burkina Faso has the strongest position, Côte d'Ivoire can probably kickstart a sector relatively quickly, and Mali is the weakest of the countries in scope. There is however strong competition in a market that is only limited in size and for which supply seems to grow faster than demand.

Compared to other African mango origins, the focus countries have the following strengths, which can be leveraged to maintain and expand market position. This comparison provides a starting point for a regionally coordinated diversification and strengthening of the chain.

- Burkina Faso: large existing market share with track record of inclusiveness, organic agriculture and is suitable for markets demanding organic products and storytelling. Dried mango is the most promising segment.
- Côte d'Ivoire: well-developed agricultural economy and business environment in comparison to the other countries in the region, allowing it to potentially kickstart the mango processing sector relatively quickly. Côte d'Ivoire is a transport hub for landlocked neighbouring countries.
- Mali: opportunity to tap into premium niche markets for dried mango that are interested in storytelling about inclusiveness and environmental sustainability, some traction in purees and concentrates.

While a programme on mango processing could provide opportunities for employment creation and inclusiveness, there are risks. These are mainly related to politics and security, as well as market demand and competitiveness. Political and security risks relate to uncertainty about elections coming up in Côte d'Ivoire and Burkina Faso, and to religious and tribal tensions in border areas between Burkina Faso and Mali. These need to be monitored closely by all stakeholders in order to ensure their security and maintain access to the market.

Market demand and competitiveness are risks: an increase in processing in Côte d'Ivoire and Mali may be a threat to Burkina Faso's current leading position in the market. Also, while market demand does grow for dried fruits, frozen fruits and purées, supply in the dried fruits segment is currently growing faster than demand. This can lead to competition between the focus countries, as well as with other supply countries like Ghana and South Africa. The key to mitigating these risks is diversification, coordination and market growth initiatives.

In order to increase the positive impact of the sector, key factors need to be considered for supporting companies and their enabling environment, which is true for all three countries:

1. Diversification: to address the challenges related to the seasonality of the mango sector, different types of processing, new product development, different fruits, value addition of by-products and different markets.
2. Professionalisation: packaging, quality consistency, standard setting, food safety, and sustainability certification. The latter is especially important in order to address social issues.
3. Market growth: build buyer/supplier relationships, niche (organic, "free-from"), substitute non-tropical fruits with mango and storytelling.
4. Coordination: regional interconnected mango value chains, coordinating market focus, sector support, and integration of other value chains (processing sector development).

We would advise against a full-fledged programme for either coconut or pineapple, at least within the timeframe of a CBI program. However, if interventions in these processing sectors are considered, they should be focused around organising the (processing) sector and providing support with regards to market information (supply and demand). This will both strengthen the supplier base and improve lobby and advocacy capacity towards government. While the coconut sector has the most market potential, it would also be the most difficult to realise.

Both the coconut and pineapple can be processed by the mango drying units in the mango off-season, allowing these processors to create the opportunity for year-round income. Therefore, integrating coconut and pineapple in a programme via the mango processing sector would allow the intervening actors to get to know the sectors and their potential for processing and organising themselves.

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Abbreviations

2PAI-Bélier	Projet de Pôle Agro-industriel de la Région du Bélier
AAFEX	Association Afrique Agro-Export
ADCI	Agence pour le développement et la compétitivité des industries de Côte d'Ivoire
AfCFTA	African Continental Free Trade Area
AFD	Agence Française de Développement
AfDB	African Development Bank
AGEDI	Agence de Gestion et de Développement des Infrastructures Industrielles
AGOA	African Growth and Opportunity Act
AJEM	Association des Jeunes Exportateurs
AMALEF	Association Malienne des Exportateurs de Légumes et Fruits
AMANORM	Agence Malienne de Normalisation
AMEPHCI	Association des Petites et Moyennes Entreprises Phytosanitaires de Côte d'Ivoire
ANADER	l'Agence Nationale d'Appui au Développement
ANDE	Agence Nationale de l'Environnement
ANOPA-CI	Association Nationale des Organisations Professionnelles Agricoles de Côte d'Ivoire
ANSSA	Agence Nationale de la Sécurité Sanitaire des Aliments
APCAM	Assemblée Permanente des Chambres d'Agriculture du Mali
APEX	Agence pour la promotion des Exportations
AREXMA	Association Régionale des Exportateurs de Mangues
ARMAO	Alliance Régionale Mangue pour l'Afrique de l'Ouest
AW2A	Agro West Africa Abidjan
BANACI	Banane Antille Côte d'Ivoire
BCI	Business Case Ideas
BEC	Business Export Coaching
BF	Burkina Faso
BMZ	German Federal Ministry for Economic Development and Cooperation
BNDA	Banque National de Développement Agricole
BNETD	Bureau National d'Études Techniques et de Développement
BSO	Business Support Organisation
CAIMPEX	Compagnie Agroindustrielle pour l'Importation et l'Exportation
CBI	Centre for the Promotion of Imports from developing countries
CCI-CI	Chambre de Commerce et d'Industrie en Côte d'Ivoire
CDA	Centre de Développement Agroalimentaire
CEPICI	Centre de Promotion des Investissements en Côte d'Ivoire
CFA	Compagnie Fruitière
CGECI	Confédération Générale des Entreprises de Côte d'Ivoire
CI	Côte d'Ivoire
CIAPOL	Centre Ivoirien Anti-Pollution
CILY	Côte d'Ivoire Lethal Yellowing
CIRES	Centre Ivoirien de Recherches Economiques et Sociales
CIV	Centre d'Innovations Vert pour le secteur agro-alimentaire
CNE	Conseil National des Exportations
CNPM	Conseil National du Patronat du Mali
CNRA	Centre National de Recherche Agronomique
CNS	Comité National de Surveillance des Actions de Lutte contre la Traite, l'Exploitation et le travail des Enfants
CODINORM	Côte d'Ivoire Normalisation
COLEACP	The Europe-Africa-Caribbean-Pacific Liaison Committee
COPAGRI	Compagnie des Produits Agricoles
CORAF	Conseil ouest et centre africain pour la recherche et le développement agricoles

CSO	Civil Society Organisation
DEG	The Deutsche Investitions und Entwicklungsgesellschaft
DNA	Direction Nationale de l'Agriculture
DNACPN	Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances
DNVB	Digitally Native Brand
DOL	Department of Labour
DOPA	Direction des Organisation Professionnelles Agricoles
DPVCQ	Direction de la Protection des Végétaux, du Contrôle et de la Qualité
EBA	Everything But Arms Agreement
ECOWAS	Economic Community of West African States
EEE	Export-Enabling Environment
EKN	Embassy of the Kingdom of the Netherlands
ENABLE	Empowering Novel Agri-Business-Led Employment
EU	European Union
FAFCI	Fonds d'Appui aux Femmes de Côte d'Ivoire
FAO	Food and Agricultural Organisation of the United Nations
FCIAD	Competitive Fund for Sustainable Agricultural Innovation
FCIP	Farm and Coop Investment Program
FENAMACI	Fédération Nationale des Acteurs de la Mangue de Côte d'Ivoire
FIPME	Fédération Ivoirienne de Petites et Moyennes Entreprises
FIRCA	Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles
GFSI	Global Food Safety Initiative
HS	Harmonized Commodity Description and Coding System
IER	Institut d'Economie Rurale
IFAD	International Fund for Agriculture Development
IFEF	Institut de Formation et d'Education Féminine
IITA	International Institute of Tropical Agriculture
ILO	International Labour Organization
IM	Interprofession Mangue du Mali
IMF	International Monetary Fund
IPD	Import Promotion Desk Germany
IQF	Individual Quick Frozen
ITC	International Trade Centre
LANADA	Laboratoire d'Analyse et d'Appui au Développement Agricole
LANEMA	Laboratoire National d'essais de Qualité de Métrologie et d'Analyses
MAB	Mécanisme d'Appui à la Banane
MADR	Ministère de l'Agriculture et du Développement Rural
MEDD	Ministère de l'Environnement et du Developpement Durable
MFI	Micro Finance Institutions
MINADER	Ministère De L'Agriculture et Du Développement Rural
MINAGRI	Ministère de l'Agriculture et du Développement Rural
MINEDD	Ministère de l'Environnement et de Développement Durable Côte d'Ivoire
ML	Mali
MPME	Mouvement des Petites et Moyennes Entreprises Côte d'Ivoire
MRL	Maximum Residue Level
MSFFE	Ministere de la Solidarité, de la Famille, de la Femme et de l'Enfant
MT	Metric tonne (= 1,000kg)
NFC	Not-From-Concentrate
NPD	New Product Development
o2o	Online to Offline
OBAM-CI	Organisation des producteurs-exportateurs de Bananes, d'Ananas, de Mangues et d'Autres fruits de Côte d'Ivoire

OCAB	Organisation Centrale des Producteurs Exportateurs d'Ananas et de Bananes
OCP	Office Chérifien des Phospates
OCPV	Office d'aide à la Commercialisation des Produits vivriers
OIF	Organisation internationale de la Francophonie
ONUDI	Organisation des Nations Unies pour le développement industriel
PACAM	Projet d'Appui à la Compétitivité Agro-industrielle au Mali
PADFA	Programme d'appui au développement des filières agricoles
PAPEA	Programme d'Appui à la Promotion de l'Entrepreneuriat Agricole
PARCSI	Projet d'appui au Renforcement de La Compétitivité du Secteur Industriel
PDC-ID	Projet De Développement des Chaînes de Valeur dans La Région de l'Indénié-Djuablin
PFV	Processed Fruits and Vegetables
PMC	Product Market Combination
PNCE	Plateforme Nationale de Commerce Equitable Burkina
PNDES	Programme Nationale de Développement Économique
PNSR	Plan National du Secteur Rural
PROPACOM	Projet D'appui A La Production Agricole et à La Commercialisation Extension West
RCI	République de la Côte d'Ivoire
REFSY-CI	Réseau des femmes syndicalistes de Côte d'Ivoire
RET-PACI	Réseau National des Agro-transformatrices de Côte d'Ivoire
RVO	Netherlands Enterprise Agency
SCAB	Société coopérative d'exportation d'Ananas et de Bananes
SCB	Société d'étude et de développement de la Culture Bananière
SDG	Sustainable Development Goals
SEAP-CI	Société d'Engrais d'Amendements et de Phytosanitaire de Côte d'Ivoire
SIAPA	Société Ivoiro-Antillaise de Production Agricole
SICOR	Société Ivoirienne de Coco Râpé
SME	Small Medium Sized Enterprises
SNV	Netherlands Development Organisation
SYNA-CNRA	Syndicat National des Agents du CNRA
SYNTAPAC	Syndicat National des Travailleurs Agricoles Privés et Assimilés de Côte d'Ivoire
UMOCI	Unité de Mise en Oevre du Cadre Intégré
UNFCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organisation
UPMACI	Union des Producteurs de Mangue de Côte d'Ivoire
USAID	United States Agency for International Development
UTMACI	Union des Transformateurs de Mangue de Côte d'Ivoire
VC	Value Chain
VCA	Value Chain Analysis
VCO	Virgin Coconut Oil
VCS	Value Chain Selection
VITIB	Village des Technologies de l'Information et de la Biotechnologie
WACOMP	West Africa Competitiveness Programme
WUR	Wageningen University and Research

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1 Background

1.1 Rationale

This study was commissioned by CBI (Centre for the Promotion of Imports from developing countries). CBI is part of the Netherlands Enterprise Agency (RVO) and funded by the Netherlands Ministry of Foreign Affairs. The mission of CBI is to connect small- and medium-sized enterprises (SMEs) in developing countries to the European market and thereby contribute to sustainable and inclusive economic growth. CBI does so by implementing three-to-five-year projects in a specific export value chain (VC) in a specific county, focusing on seizing opportunities for exports to Europe and tackling obstacles that hamper or hinder these exports. Many CBI projects are integrated, meaning they involve both SME exporters and the export enabling environment.

CBI develops and implements projects in several consecutive phases:

1. Value chain selection (VCS) phase: based on preliminary research, the most promising value chain in the target country is selected.
2. Business case idea (BCI) phase: an initial idea for a project is formulated, focusing on the selected value chain.
3. Value chain analysis (VCA) phase: an in-depth analysis of the VC is conducted.
4. Business case phase: a detailed business case for a project is developed.
5. Implementation and performance management phase: the project is implemented and the success of the project is monitored.
6. Audit and evaluation phase: after completion, the project is audited and evaluated.

This report falls under the value chain analysis phase. The choice for processed fruits is to make better use of second- and third-grade fruits not suitable for export when fresh to the EU. In previous research phases, dried mango and mango pulp have been identified as products with potential for export to Europe for Burkina Faso and Mali. Therefore, dried mango (conventional, organic, sweetened) and mango pulp have been pre-selected as potential a product market combination (PMC) for Burkina Faso and Mali and needs to be validated or disavowed in this VCA.

For Côte d'Ivoire, a scoping study was conducted in 2018, where banana (purée, powder, chips), pineapple (juice, dried, frozen), papaya, coconut (desiccated, snacks, water, purée, milk, oil), cola nuts, and mango (frozen, dried, sweetened) have, among others, been identified. Tamarind, passion fruit, baobab fruit and cashew apple are alternative raw materials that could be used.

1.2 Objectives

The objectives of this value chain analysis are:

- To identify and test the appetite and interest of European importers to sustainably source processed fruits from the target countries Burkina Faso, Mali and Ivory Coast;
- To determine the product market combinations that best suit importers' interests;
- To identify ongoing projects, interlinkages and synergies with project managed by CBI and other actors, including the processed cashew and Hortifresh projects in Côte d'Ivoire and third-party mango projects in Burkina Faso and Mali, which are further described in section 0; and
- To find out which business model(s) will work to realise exports of these PMCs to Europe.

1.3 Approach

The approach consisted of five phases:

Phase 1: Develop a preliminary action plan that describes the products, detailed methodology, background, timeframe and budget.
Phase 2: Conduct desk research based on documentation and research provided by CBI, documentation already available at Agri-Logic and internet research.
Phase 3: Conduct semi-structured interviews and focus group discussions to analyse the PMCs. Stakeholders in West Africa and Europe are included in the analysis.
Phase 4: Organise validation workshops and webinars with the relevant stakeholders based on the draft report. Feedback from these workshops will be included in the final report.
Phase 5: Incorporate feedback from the validation workshop in the final report, which will be available in English and French.

1.4 Scope

We have narrowed down the scope of product-market combinations (PMCs) in three stages:

A. Desk research explored all fruits grown in countries within the scope and all their potential processed forms.
B. As part of the inception report, based on desk research, we shortlisted a number of PMCs to be explored in field research.
C. Based on field research and validation, we have selected the most promising PMCs, which are fully described in this VCA report.

This report describes the most promising PMCs in detail. For those PMCs that have not been selected, we have included a motivation for rejecting them.

1.5 Structure of the VCA Report

The report starts off with an overview of the market demand in Europe in chapter 2. Separate chapters zoom in on the processed fruit value chains of Côte d'Ivoire (chapter 3) and Burkina Faso & Mali (chapter 4). They detail the production and processing in the target countries, as well as the value chains' structure, governance and sustainability, followed by an analysis that shows its opportunities and obstacles.

In chapters 5 and 6, the analysis is combined, leading to the final chapter 7, which represents the overall conclusions and recommendations of the VCA, providing a clear set of recommendations on how to continue towards the development of one or more business cases which support exports to Europe.

1.6 Limitations to the Study

A lack of a specific statistical international trade codes (HS code) of, for example, dried mango and mango purées prevents detailed monitoring statistics for the import of dried fruits into Europe. CBI has previously commissioned a study to estimate market size for dried mango in Europe, which has been used as a starting point for this analysis (Jovanovic, 2018). Volumes for other segments are estimated based on this same research and are complemented with additional data collected and stakeholder input.
FAO statistics seemed unreliable for the selected fruits combined with the target countries. Statistics were generally unavailable. Export data combined with information from key informants provided the best estimates.

2 Export Market Competitiveness

2.1 Market Definition

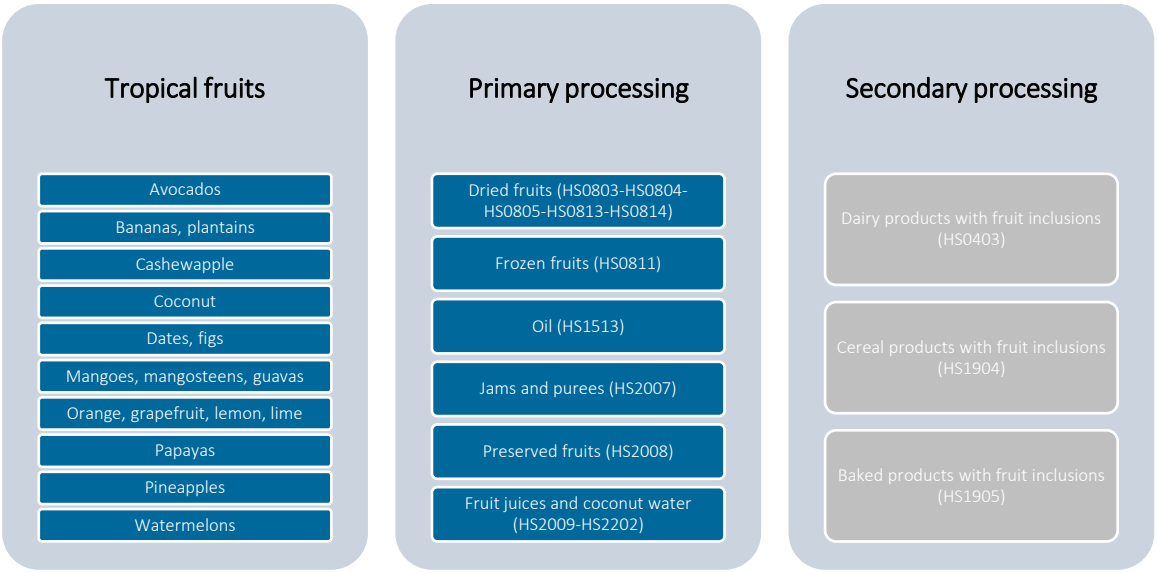
Processed tropical fruits form a very broad market. Our definition, for the purpose of this analysis, is made up of three components:

A. **Fruits:** although the focus of this value chain analysis is on fruits, we have included a selection of tree nuts in our initial market analysis, given that dried fruits often share a market with nuts and some fruits and nuts originate from the same tree.
B. **Tropical:** we define our market based on West African tropical fruits and tree nuts grown in the three countries in scope: Côte d'Ivoire, Mali and Burkina Faso.
C. **Processed:** there are several forms of primary and secondary processing. We explicitly exclude any fresh fruits and focus on primary processing. Primary processing has the largest potential for value addition in producing countries and is the scope of this value chain analysis. Primary processing generally takes place immediately after harvest and close to the growing areas. Instead of exporting fresh fruits and nuts, primary processing allows more time to reach the end consumer, while simultaneously reducing logistics costs and reducing food losses. Secondary processing companies are business-to-business markets for the exporters. These are manufacturers of packaged food preparations who use the dried or otherwise preserved processed tropical foods as part of their recipes, sometimes together with other tropical communities, including grains or cocoa products.

We have clustered the PMCs in this VCA into six primary processing categories:

1. Dried fruits
2. Frozen fruits
3. Canned and preserved fruits
4. Fruit juices
5. Jams, pulps and purées
6. Coconut products (oil, desiccated, milk, water)

The figure below summarises the scope of this analysis. We have used HS codes to identify product categories. A full list of HS codes and their corresponding EU PRODCOM codes can be found in Annex I.



Sources: (FAO, 2017) (UN COMTRADE, 2017)

Figure 1 Market definition: crops, primary and secondary processing

Based on the crops grown in the countries in scope, we have identified a longlist of 21 potential product-processing combinations.

Table 1 Longlist of potential PMCs

	Dried fruits	Frozen fruits	Fruit juices	Jams and purées	Oil	Preserved fruits
Bananas, plantains	✓			✓		
Cashew apples			✓			
Citrus			✓	✓		
Coconuts	✓		✓		✓	✓
Dates	✓					
Mangoes, guavas	✓	✓	✓	✓		
Papayas	✓					
Pineapples	✓	✓	✓	✓		✓
Watermelons			✓			

After our market analysis and value chain analysis, we have shortlisted the PMCs with most potential to be competitive in the European market. The remainder of this report focuses on those selected PMCs listed in Table 2. A motivation for excluding other crops is found in Annex VII.

Table 2 Shortlist of PMCs with the highest potential

Country	Crop	Processing
Côte d'Ivoire	Mango	Dried, concentrate, frozen, juice
	Pineapple	Dried, concentrate, frozen, juice, preserved
	Coconut	Desiccated, copra oil, coconut water, preserved, etc.
Burkina Faso & Mali	Mango	Dried, concentrate, frozen, juice

2.2 Market description and demand per product category

Fruits are processed into a multitude of food products, which can be grouped into dried fruits, frozen fruits, coconut oil, canned and preserved fruits, fruit juices and coconut water, and jams, purées and concentrate.

2.2.1 Dried tropical fruits

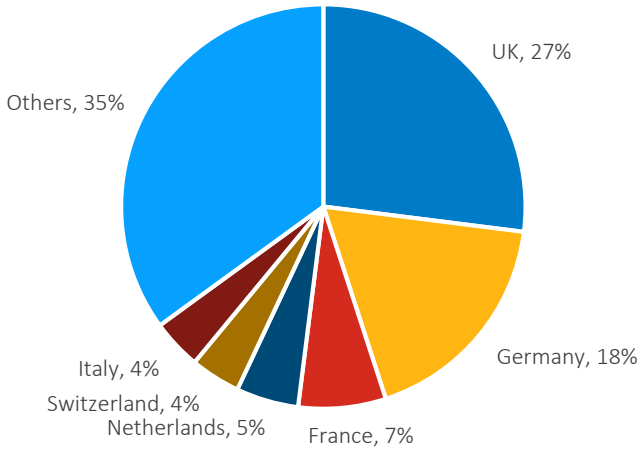
Dried tropical fruit is the product prepared from ripe fruit that is native or grown in tropical regions (climatic zone surrounding the equator), processed by drying, either by the sun or other recognised methods of dehydration, with or without added sweetening agents (such as cane sugar) and food additives. In some production methods (such as for banana chips), the product is not actually dried but fried in hot oil, similar to the production of potato chips. Another aspect of producing banana chips is that the raw material used is not ripe but green fruit. Another method is to soak the fruit in syrup before drying, creating a very sweet, shelf-stable product. This is widely done for soft fruit, such as papaya and pineapple (CBI, 2017). Although dried tree nuts are not within the scope of this VCA, we recognise the supply chains and markets are closely aligned.

The EU represents approximately 40% of the global dried fruits and nuts market (CBI, 2018). The total global market for tree nuts is estimated at 4 million tonnes (INC, 2018), while the global market for dried fruits is estimated at 2.8 million tonnes or €7.8 billion (INC, 2018; Oanda, 2019). Although several

nuts, notably cashew, are grown in tropical regions, the majority of dried fruits are dates and grapes, which grow in more moderate climates. Tropical dried fruits are estimated at 1% of the total dried fruits market in Europe (CBI, 2017; CBI, 2018). Dried fruits currently only represent a very small portion of the fresh fruits market <1% (UN COMTRADE, 2017).

Mango is the largest tropical fruit in the dried fruits segment, which otherwise consists mainly of dried grapes (raisins), dates, prunes, apricots, cranberries and figs (INC, 2018).

It is estimated that the European market for dried mango is between 5,600 and 6,200 tonnes annually, with an estimated import value of €47 million (Jovanovic, 2018), which is less than 1% of the total dried fruits market in Europe.



Source: (Jovanovic, 2018)
Figure 2 European consumption of dried mango per country (volume)

A previously commissioned study identifies six markets as most promising for West African dried mango. Trade potential does not necessarily mean that selected markets are also the largest-consuming countries, as some markets (such as the Netherlands, Italy or Switzerland) are trade hubs and re-sell most of the imported dried mango to other European markets. (Jovanovic, 2018)

Table 3 Most promising European markets for dried mango

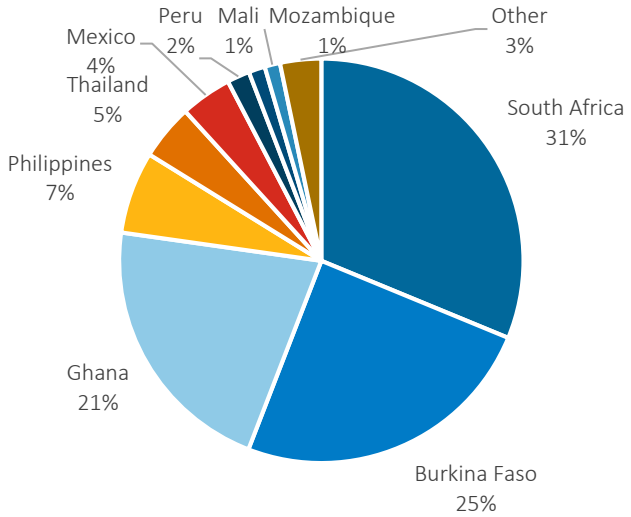
Promising market	Rationale for the selection
1. United Kingdom	The UK is the largest-consuming European market for dried mango, with a constant increase of consumption over the last five years. Also, the UK is the largest European market for dried fruit in general.
2. Germany	Germany is the second-largest European market for dried mango with a stable demand. German traders believe that demand will increase in the coming years as dried mango is a "trendy" product.
3. Switzerland	Although small in terms of its consumption, Switzerland is the home of a few very large trading and processing companies, which together sell around one-quarter of all European dried mango. Switzerland is especially attractive for the trade of organic dried mango. This makes Switzerland the third-largest import market for dried mango in Europe.

Promising market	Rationale for the selection
4. The Netherlands	The Netherlands is an important trade hub for both conventional and organic mango with several companies already present with sourcing initiatives in West Africa, including Mali and Burkina Faso. Also, Dutch dried mango importers are constantly searching for new sourcing destinations.
5. France	Compared to the first four markets, France has a much smaller growth in demand for dried mango and a smaller market. Still, French trading companies are active in introducing new processing technologies (such as rehydration). Also, leading dried mango trading companies from France are actively present in other large European markets where they supply some of the leading retail chains.
6. Italy	Italy is ranked the last among the top six due to its much smaller and slower growing market compared to the other five leading countries. However, Italy is home to some important traders of dried fruit, including dried mango, which are very active in European and international trade.

The dried mango market consists of three main segments (Jovanovic, 2018):

- Conventional dried mango (73-77%)
- Organic dried mango (17-20%)
- Sweetened dried mango (5-7%)

The majority of supply comes from South Africa, Burkina Faso and Ghana, and accounts for more than 75% of total supply of dried mango to Europe. Burkina Faso has the highest offer of organic dried mango. Mali is increasing its production and export to Europe. (Jovanovic, 2018)



Source: (Jovanovic, 2018)
Figure 3 Leading suppliers of dried mango to Europe (volume)

Research commissioned by CBI estimated that, since 2013, the dried mango market in Europe grew in quantity by an average annual rate of 13%, much higher compared to the total imports of dried fruit, which is 1% for the same period (Jovanovic, 2018). According to European traders, the growth of the dried fruit market will continue in the next five years but at a lower rate. In 2019, selling dried mango

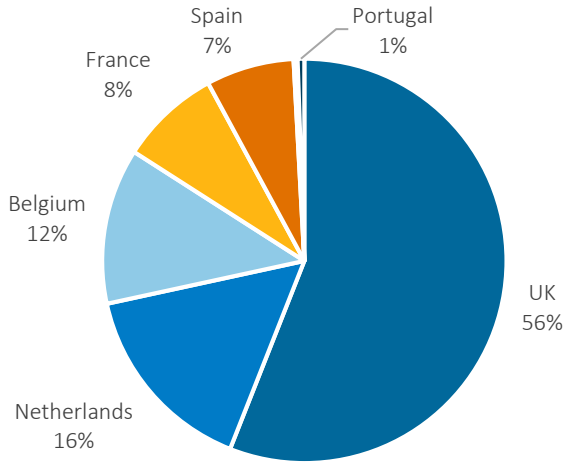
from Burkina Faso could be more difficult because of overproduction and a heterogeneous quality (frequent cases of dried mango that do not meet food safety requirements) (Jovanovic, 2018).

Based on the current installed drying capacity in South Africa, Burkina Faso and Ghana, it appears that although the dried fruits market shows some growth, it is also largely saturated.

2.2.2 Frozen tropical fruits

Frozen (or IQF) tropical fruit can be in a diced or a purée form. It can be sold directly to consumers or used as a base for secondary processing. Immediate processing and a temperature-controlled supply chain are critical, but the market size is significant.

The total European market for frozen fruits is valued at €434 million (UN COMTRADE, 2017; Oanda, 2019). Tropical frozen fruits are, however, a smaller segment, valued at €64 million (Jovanovic, 2018).



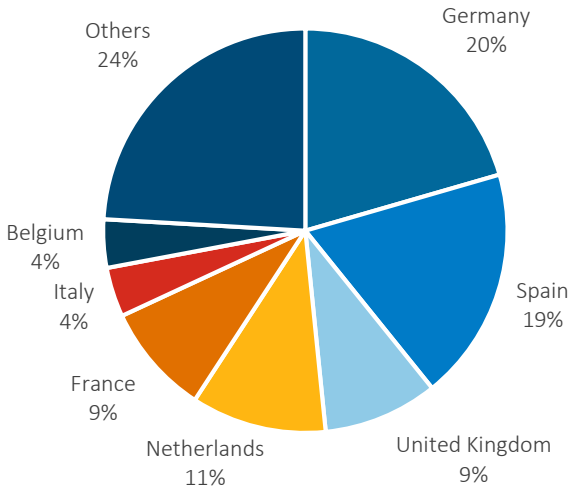
Source: (COMEXT, 2017)
Figure 4 European imports of frozen tropical fruits per country (value)

Frozen fruits is a large market in the EU (UN COMTRADE, 2017), and the market share of tropical fruits is growing quickly (CBI, 2018). Côte d'Ivoire is currently the only country out of those in scope that exports frozen fruits to Europe, coming from only one supplier.

2.2.3 Preserved tropical fruits

Preserved fruits are those fruits that are preserved in other ways than mentioned above. Preservation is often achieved by canning. Canned pineapple has become a staple in European kitchens, and the market size is around €350 million (UN COMTRADE, 2017; Oanda, 2019). The market for other preserved fruits is estimated around €9 million in Europe (European Commission Market Access Database, 2018).

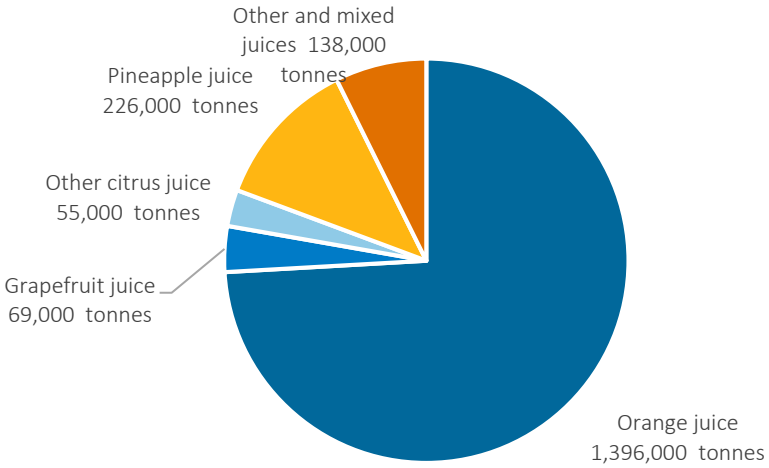
Market size is declining. This is not seen as interesting market as it is a low-value product, thus allowing for little differentiation.



Source: (UN COMTRADE, 2017)
Figure 5 European imports of canned pineapple per country (value)

2.2.4 Fruit juices

Fruit juices form a major trade flow worldwide, including tropical fruits such as orange, pineapple, grapefruit and other citrus fruits. These goods can be traded in liquid, frozen or concentrate form. A specific addition to this category is coconut water, which is not technically fruit juice but shares a market. Note that the fruit juice category includes all citrus juices, which can indeed be imported from tropical countries but grow in a wide range of climates, with several developed and developing countries supplying and competing in this segment.



Source: (UN COMTRADE, 2017)
Figure 6 European imports of fruit juices per segment (volume)

By far, the largest category in the market is orange juice. Although oranges grow in tropical regions, the majority of supply to the EU is internal and from developed countries.

The total European juice market is estimated at 25% of the global market and valued at €21 billion (AIJN, 2018). The European market of (tropical) fruit juices is estimated at €350 million (AIJN, 2018; Jovanovic, 2018).

European and global fruit juice consumption has been declining since 2006, following campaigns calling attention to the natural sugar content in juice, so further decline in consumption is expected (AIJN, 2018).

2.2.5 Jams, pulps and purées

Tropical fruit purée is a product obtained by sieving, grinding and milling of fruit native to or grown in tropical regions, without removing the juice. The terms pulp and purée are sometimes used interchangeably. If fruit purées are made without the extraction of water, they are frequently called single-strength purées by the industry players. However, tropical and other fruit purées can be also be made by the physical removal of part of its water content. Those purées are called concentrated fruit purées and they are also included in this analysis (CBI, 2017).

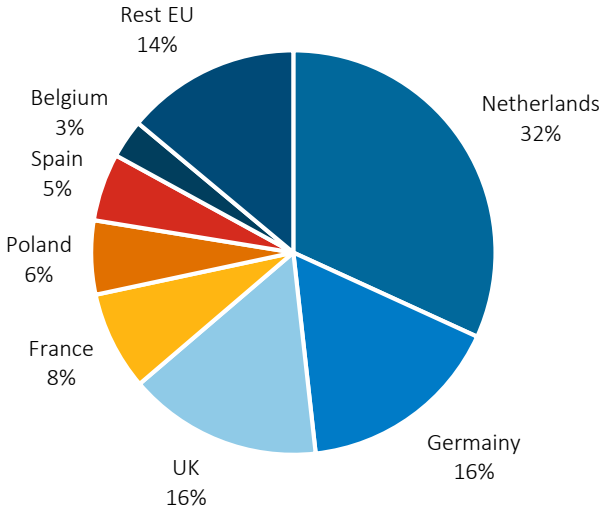
The European market value for tropical purées is estimated at €500 million (Jovanovic, 2018; UN COMTRADE, 2017).

The tropical fruit used is mainly banana, but mango and pineapple as well. This is a growing market with a forecasted CAGR of 4.4% until 2023, with growth expected especially in baby food (Market Research Future, 2019).

2.2.6 Coconut products

2.2.6.1 Desiccated Coconut

Desiccated coconut is coconut meat which has been shredded or flaked and then dried to remove as much moisture as possible. It can be produced without oil extraction or with partial oil extraction by the appropriate physical means (CBI, 2019). The market size in Europe was about €186 million in 2018. Côte d'Ivoire represents about 0.7% of the total imports of desiccated coconut into Europe. The compound annual growth rate since 2008 is +11%. The main suppliers to Europe are the Philippines, Indonesia and Sri Lanka. Ghana, directly competing with Côte d'Ivoire as main supplier from the African continent, has shown an average year-on-year growth in import volumes of 80% over the last five years, compared to Côte d'Ivoire which has only shown an average growth of 13% (Eurostat).



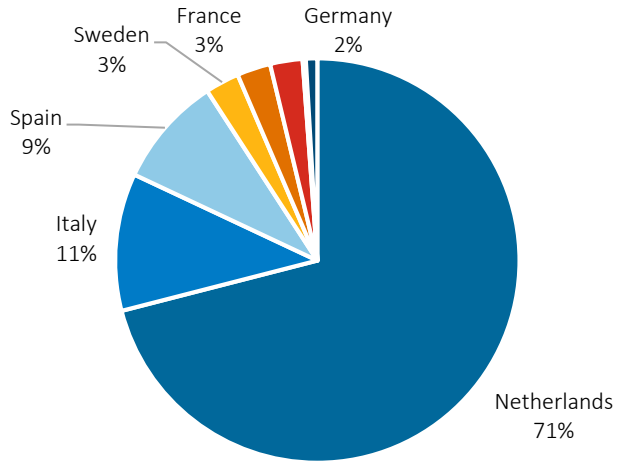
Source: (Eurostat, 2018)
Figure 7 European Imports of desiccated coconut per country (volume)

2.2.6.2 Crude coconut oil

Coconut oil is derived from the kernel (meat) of the coconut. Coconut oil is used in the food industry, on which this report is focused, but it is also used for cosmetics and various industrial uses. The oil is

produced from the dried kernel (copra oil/conventional coconut oil). The main quality problem associated with coconut oil is contamination. This makes it crucial that special care is taken in all steps of the production process, from harvest to distribution. Coconut oil is one of the vegetable oils most resistant to rancidity (CBI, 2016).

Extraction of the crude oil from it usually takes place in the coconut-growing regions. Market size to Europe was €493 million in 2018. This includes oil used for cosmetics but excludes oils for industrial usage. The supply of coconut oil to the EU is dominated by the Philippines (94%). From the African continent, Côte d'Ivoire is the main supplier of coconut oil, representing 0.04% of total import volumes in 2018. It is followed by Ghana, which only represents 0.006%. The main importers of coconut oil are the Netherlands, Italy and Spain.



Source: (Eurostat, 2018)
Figure 8 European imports of crude coconut oil[1] per country (volume)

2.2.6.3 Other coconut products

In addition to coconut oil and desiccated coconut, there are other coconut food products used for consumption, such as coconut butter, coconut milk, coconut water, coconut flour, coconut cream, coconut sugar, coconut vinegar and coconut nectar. There is limited trade data available on these products.

For coconut water, there is some information available from a CBI report (CBI, 2018). The United Kingdom is the largest importer, far ahead of the Netherlands, France and Germany. One of the fastest-growing markets regarding the consumption of coconut water is France. Coconut water, according to public information provided by Technavio, will see a compound annual growth rate of 26% globally between 2018-2022 (Technavio, 2018). The main competitors for coconut water are the Philippines, Indonesia and Thailand, but also Mexico and Brazil. Mexico and India are investing in the coconut water sector, which means strong competition for Côte d'Ivoire.

According to an article from Market Research Future® and Technavio (Market Research Future, 2019; Technavio, 2017), coconut milk and flour are popular amongst the consumers with lactose intolerance. It is also rich in vitamins and minerals, and it contains lauric acid, which boosts energy. Europe, according to Market Research Future, has a 21.7% global market share. Technavio and Market Research

[1] Based on HS 15131199 Crude Coconut Oil, in immediate packings of >1 KG or put up otherwise (excl. for technical or industrial usage); HS 15131191 Crude Coconut Oil, in immediate packings of <=1 KG (excl. for technical or industrial usage) and HS15131999 Refined coconut oil for human consumption, in immediate packaging of a net content exceeding 1 kg

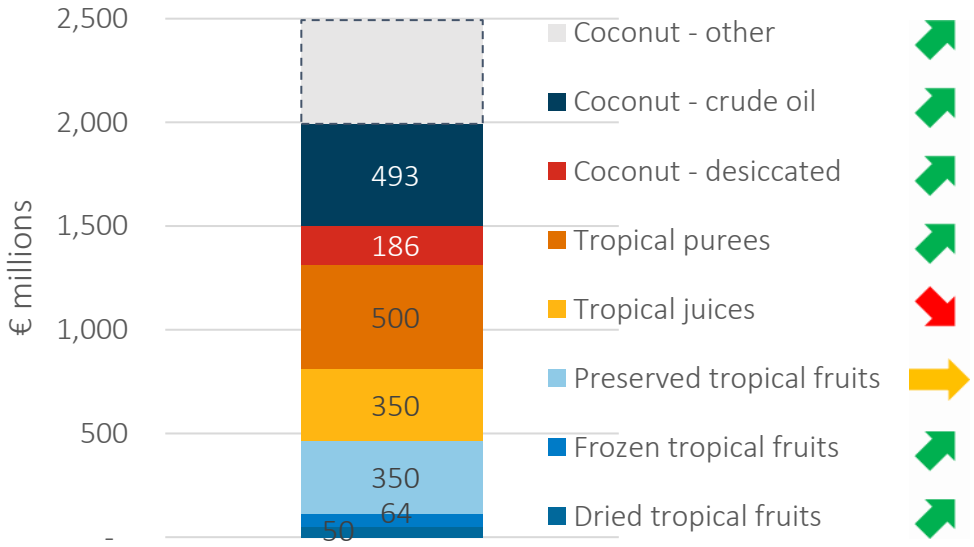
Future estimate a compound annual growth rate of coconut milk of, respectively, 8% and 14% between 2018-2022/23.

Publicly available statistics on these products are lacking and are non-existent if focusing on Europe alone. These are definitely markets that merit additional investigation.

2.2.7 Most Promising Market Segments and Countries

While tropical dried fruits and tropical frozen fruits are still relatively small markets compared to the total processed fruit market size, we can see that tropical fruits are gaining market share from native European fruits, and most growth is seen in these segments.

Preserved fruits (mainly canned pineapple), fruit juices and coconut derivatives are larger markets, but they are stable or in some cases declining. Purées and concentrates are an interesting growth segment if quality can be achieved, largely for baby food.



Sources: (Jovanovic, 2018; COMEXT, 2017; UN COMTRADE, 2017)
Figure 9 European market size and trend per processed tropical fruit segment by value in 2018

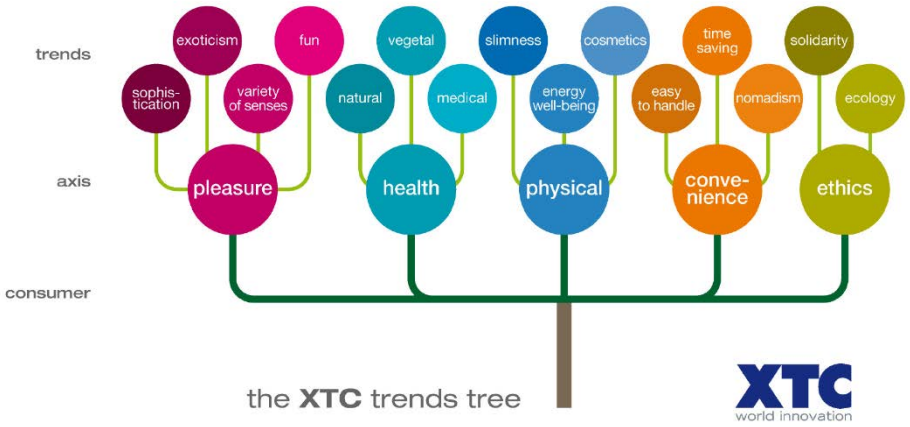
For all processed fruits market segments, the same countries appear as trade hubs for the European market:

- The United Kingdom: largest EU market for dried fruits
- Germany: second-largest EU market for dried mango and largest consumer market for juice
- Switzerland: large trading and processing companies, trade of organic processed fruits
- The Netherlands: trade of conventional and organic dried fruits and juices
- France: processing technologies, leading mango trading companies, leading consumer market
- Italy: important traders of dried fruits, several juice companies

2.3 Trends on the European Market

2.3.1 Social & Consumer Trends

Important for the trends relevant to processed fruits is an understanding of global food trends, which can be clustered along the axes of pleasure, health, physical, convenience and ethics. The XTC trends tree, first presented at SIAL, is often used for segmenting today's global food trends.



Source: (XTC, 2016)
Figure 10 Trends in global food

Examined below are two main trends, *health* and *convenience,* which are the most relevant to the demand for processed fruits.

2.3.1.1 Health

The increased health awareness of the European consumer provides opportunities for the processed fruit product categories. Even though high in natural sugars (excl. coconut), both dried and fresh fruits are a rich source of antioxidants and fibres and they fit within the vegan lifestyle. Retail, according to CBI sector consultations, and confirmed by the ITC report (ITC, 2019), is increasingly looking for other or additional requirements in meeting customers' needs. Below, some of the trends are highlighted.

Organic and vegan
Organic is highlighted as it is seen as a potential niche market for the tropical fruit products; vegan[2] is highlighted as it is trending towards more plant-based consumption, including that of processed fruits.

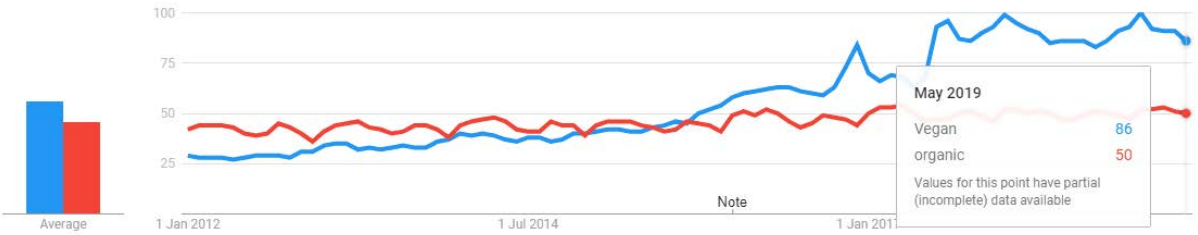
Organic has seen a continuous growth over recent years, globally as well as in Europe. The US is the largest single market with 47%. It is closely followed by Europe with 41% (FiBL & IFOAM Organics, 2019). Total organic sales in 2017 in Europe was €37.4 billion (FiBL & IFOAM Organics, 2019), which represents about 3.4% of total food & beverage sales in the EU (FoodDrink Europe, 2018). France, Spain and Denmark all registered double-digit growth in organic sales from 2016-2017.

[2] *Veganism is the practice of abstaining from the use of animal products, particularly in diet, and an associated philosophy that rejects the commodity status of animals. A follower of the diet or the philosophy is known as a "vegan". Dietary vegans (also known as "strict vegetarians") refrain from consuming animal products, not only meat but also eggs, dairy products and other animal-derived substances. The term "ethical vegan" is often applied to those who not only follow a vegan diet but extend the philosophy into other areas of their lives and oppose the use of animals for any purpose. Another term is "environmental veganism", which refers to the avoidance of animal products on the premise that the industrial farming of animals is environmentally damaging and unsustainable.*

This growth is very much due to the trend of healthy living and the increasing desire for natural and healthy products. Germany and France together represent almost 50% of the European market (FiBL & IFOAM, 2018). Overall, the largest expenditure per capita of organic products (incl. packaged foods) is Switzerland with €274, followed by Denmark and Sweden (FiBL & IFOAM, 2018).

The health trend does not only translate to organic, but also to a growing trend for vegan (plant-based) products. In the UK, it is an important market for processed fruits as only 9% of new food products were vegan in 2017, but by April 2019, this had increased to 18% (The Grocer, 2019). The UK also saw the number of vegans increase by 350% over the last decade, influenced by social media and driven by consumer groups between ages of 15-34 (Rise of the vegan, 2018).

A *Google Trends* search for 'Vegan' and 'Organic Food' confirms this trend (Google, 2019), with an overall increase in searches and these terms are trending throughout the EU.



Source: (Google, 2019)
Figure 11 Google Trends 'vegan' and 'organic' worldwide 2012 - 2019

Table 4 Top 10 European countries where 'vegan' and 'organic' are trending in Google search

	Vegan*	Organic Food
1	Austria	Poland
2	Germany	Spain
3	Czechia	Denmark
4	Switzerland	Romania
5	Italy	Greece
6	Sweden	Ireland
8	France	Hungary
9	Portugal	Finland
10	Netherlands	UK

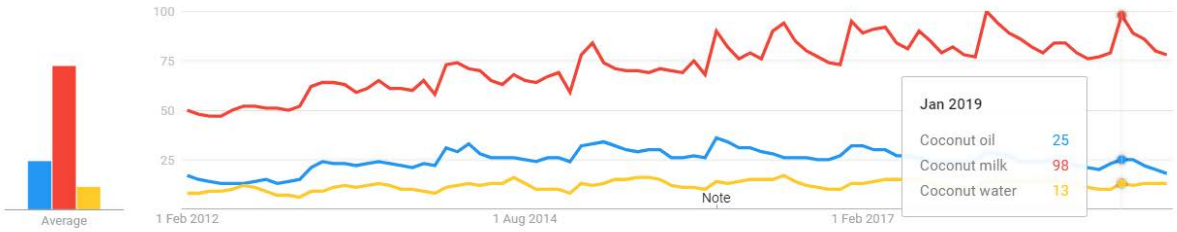
** Also Top 10 worldwide*
Source: (Google, 2019)

The vegan trend is especially popular in Europe, while organic seems to be mostly trending in Asian countries. This is because the European markets have matured and availability of organic products has become more common. This does mean a downward pressure on prices for organic products, which was also confirmed by the buyers interviewed. To be able to compete on the European markets, the target countries would need support converting to organic if this niche market is targeted.

Coconut

The consumption of coconut products is trending, which is also mostly related to the *health* trend. Coconut flour, which is made from defatted coconut meat, is a common gluten-free alternative to flour. Coconut water is an alternative to the sweetened sports drinks. According to internal consultations of CBI held with the sector, the consumption of coconut milk, cream, flour, desiccated coconut, coconut sugar and especially coconut water continues to increase. It is especially marketed towards younger consumer groups via popular online media channels. Coconut oil is the only product that goes against the trend, as it was criticised by Harvard professor Karin Michels, whose critique then went viral.

A Google Trends search also further strengthens these observations (Google, 2019).



Source: (Google, 2019)

Figure 12 Google Trends 'coconut oil, milk and water' worldwide 2012 - 2019

Table 5 Interest in European countries for 'coconut oil, milk and water'

'Coconut Milk' (food)	**Value***	**'Coconut Water'** (coconut)	**Value**	**'Coconut Oil'** (topic)	**Value**	**Coconut** (fruit)	**Value**
Sweden	61	UK	12	Ireland	36	Portugal	46
Norway	53	Ireland	10	UK	33	UK	20
Denmark	46	Netherlands	7	Norway	8	Croatia	27
France	42	Spain	6	Sweden	5	Ireland	25
Switzerland	31	Sweden	6	Denmark	4	Slovakia	25
Poland	28	Czechia	6	Netherlands	4	Slovenia	25
Belgium	28	Switzerland	6	Switzerland	3	Romania	23
Austria	26	Finland	5	Germany	1	Italy	23
Ireland	26	Poland	5	Spain	1	France	19
Germany	25	Austria	5	France	1	Switzerland	17

** Values are calculated on a scale from 0 to 100, where 100 is the location with the most popularity as a fraction of total searches in that location, a value of 50 indicates a location which is half as popular. A value of 0 indicates a location where there was not enough data for this term.* ***Note****: A higher value means a higher proportion of all queries, not a higher absolute query count. So, a tiny country where 80% of the queries are for 'bananas' will get twice the score of a giant country where only 40% of the queries are for 'bananas'.*

Source: Google Trends 1 February 2012 – 15 June 2019

2.3.1.2 Convenience

Convenience means targeting meal-time with time-saving solutions (Mintel, 2019; Namén, 2017; Witham, 2017). This trend has a potentially positive influence on (natural) fruit snacks. The snacking culture is clearly growing among consumers, translating into (healthy) small-portion meals. Google Trends shows the same when searching *'snacks'*. The trend value for snacks is highest for the Netherlands, Belgium and Germany, which all show up in the top ten worldwide. When refining the search to 'fruit snack', Slovakia, Belgium and the UK all come up in the top ten.

In an interview held with Euromonitor analyst Jared Koerten for Confectionary News, it was said that there is a rise in real fruit snacks, whether freeze dried, dehydrated fruit, fruit clusters, or fruit-nut clusters. According to Koerten, consumers are trying to get more fruits (and vegetables) into their diet and are looking to get back to basics, back to fruits, so they are turning to these simple-ingredient snacks (Sherred, 2019). Processed fruits are easier to store, carry and easier to consume as a snack than fresh fruits.

2.3.1.3 Implications of social & consumer trends

The table below attempts to provide a summary of how different processed fruit products could potentially fit into the general food trends in Europe.

Table 6 Food trends and their implications for processed fruits

Trend	Fruit products
Pleasure	Natural processed fruit ingredients can help create a chewy, crispy or crunchy texture to products in order to surprise or elate consumers. Tropical fruits contribute to the exoticism and the variety of products. According to Innova Market Insight, global product launches incorporating mango flavours have increased by 240% over the last ten years (CBI, 2018). The most desired attributes of dried mango are a sweet taste, a strong flavour similar to fresh mangoes and a pale orange colour (CBI, 2018). For coconut products, opportunities can be found in specific products, such as coconut water with an increased amount of pulp and not made from coconut water concentrate or new flavour mixes (CBI, 2018). Technavio indicates a trend towards sparkling coconut water.
Health	In processed fruits, the nutrients are preserved, it is healthy source of calories, and depending on the type processing, it can be good source of anti-oxidants (phenols), vitamins (B Vitamin folate), minerals and fibre. Frozen mango cubes are increasingly consumed in Europe due to the popularity of smoothies. The same is true for frozen pineapple. Coconut products are low in sugar compared to other fruit products and are a good source of fibre, fitting well into a vegan diet. Coconut water is low in calories, fat-free, low in sugar and high in potassium. Banana and coconut flour, but also mango (peel, kernel) flour, are alternatives to wheat flour for those with gluten allergies. Products that are organic and are labelled *'free-from'* would also fall under this category.

Trend	Fruit products
Physical	If it has no added sugar, they are a good source of energy, especially papaya, pineapple and bananas, which are all high in simple carbs (easy to digest). Coconut water is seen as a good alternative to sports drinks because of certain characteristics (such as electrolytes).
Convenience	Dried fruits (incl. coconuts) are a perfectly suitable snack solution. This also goes for the juices and coconut waters when put in smaller packaging. Purées and frozen cubes can be used for breakfast smoothies as a faster-to-prepare breakfast alternative.
Ethics	By targeting West African countries, the processed fruit products have a high potential to be marketed as ethical, on both the social and environmental side (tree crops, value addition to waste). This would translate to certifications such as organic and Rainforest Alliance.

The prioritisation of these trends on the product will depend on the market that is targeted. As explained earlier, different markets prioritise different trends and require a different marketing approach.

2.3.2 Technological Trends

As is certainly visible in the more industrialised fruit processing value chains, the future is digital. Just think of names like Food Tech, o2o (online-to-offline) food industry or digital food (SIAL Network, 2018).

BlockChain, in the context of the target countries, is the most relevant aspect to highlight. Distributed ledger technology (DLT) or blockchain technology in combination with smart contracts allows users to codify significant parts of the workflow processes, agreements or tasks (Weston & Nolet, 2016) and is another technological development relevant for the supply chains discussed. It is very much related to the trust crisis experienced by consumers in the food industry—just think of the 2013 horse meat scandals and the more recent Fipronil egg contamination, both of which have resulted in a cry for more transparency and traceability. Every year, one in ten people around the world become ill due to foodborne diseases, and approximately 420,000 of them die (Radocchia, 2018). A reason for these high figures for foodborne diseases is that it takes time to isolate products for recall or contamination issues in the supply chain.

Blockchain is seen as an important tool to ensure food integrity because it promises traceability, risk reduction, accountability, audibility, sustainability, performance improvements and all-round business efficiency for all participants in a given chain (PWC, 2018). However, being a young technology, it still has to prove itself. There are still many regulatory uncertainties, it is a complex technology, there are collaboration challenges, and the output still depends on the quality of the data input. In Côte d'Ivoire, ModulTrade, in 2018, signed an agreement with ANOPACI (Association Nationale des Organisations Professionnelles Agricoles de Côte d'Ivoire), which is a leading agro association using a blockchain-based smart contract platform (MarketWatch, 2018). SIM (Supply Chain Information Management) has been actively monitoring supply chains for retail, and retailer Albert Heijn is using it for its orange juices. The SIM Powerchain enables near-real-time data to be proactively logged and checked along the entire product journey. From the primary producer through all the steps of the supply chain, every actor can immutably log their data in a safe, encrypted and distributed environment (SIM website).

Other traceability system that exist are Farmerline, ChainPoint, GeoTraceability, Sourcemap, Farmer Field Book, and Green Fingers Mobile. It is unclear if and at what scale they are used for mango, pineapple and coconut products.

2.3.3 Environmental Trends

Just like the more social trends, environmental trends impact consumer habits. What should be retained from this trend is the relevance of storytelling (communication), certification and choosing the production method, packaging material and transport means for the products you wish to put on the market. Lastly, it is important to realise that it impacts policy, notably import regulations.

In Europe, climate change is high on the agenda. The Accord of Paris, which is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), deals with greenhouse-gas-emissions mitigation, adaptation, and finance, starting in the year 2020. Its long-term goal is to keep the increase in the global average temperature to well below 2°C above pre-industrial levels, and to limit the increase to 1.5 °C, since this would substantially reduce the risks and effects of climate change (Wikipedia, n.d.).

Consumers are increasingly aware of and willing to contribute to combatting climate change. This is especially driven by millennials, though not always acted upon. Though there is limited research on European millennials and their environmental actions, a recent study by Naderi & Van Steenburg (2018) conducted among US millennials shows that almost three-out-of-four millennial respondents were willing to pay more for brands committed to a positive social and environmental impact, compared to only 51% of baby boomers (aged 50-64) who were willing to pay extra. Millennials are also supportive of stricter environmental laws, more likely to attribute global warming to human activity, and likely to favour environmentally friendly policies, such as green energy development and economic incentives for sustainability (Naderi, I. & Van Steenburg, E., 2018).

Reducing meat consumption can create substantial benefits for global land use, play an important role in future climate change mitigation policies (Stehfest, E. et al., 2009), and be a driver for some consumers in their vegan lifestyle. Though veganism is mostly associated with health, consumers do also associate it with animal welfare and, to a much lesser extent, to the environment (Crawford, 2015; Meager, 2016; Swerdloff, 2016; De Witt, 2016). The vegan lifestyle also opens up doors for fruit waste processing. Fruit waste can, for example, be turned into alternative products to leather. An example is the brand Piñatex, which makes wearable products out of pineapple leaf fibres (Hickey, 2014), or Alberto Volcan and Henry Hong who turn apple peels into leather (Mirror.co.uk, 2016; Egerton-Read, 2016). Similar work is being done by a group of students from Rotterdam who use leftover fruits for the production of a leather alternative (Luleva, 2015).

The increased interest in the environment could be both a threat and an opportunity for the target countries. It is an opportunity for fruits that, by definition, have a lower environmental impact, or a threat for those that do not. An example is issues related to the expansion of the Costa Rican pineapple crop, which had major environmental impacts on deforestation and soil erosion to agrochemical contamination of local rivers and wetlands.

According to the Environmental Leader, the environmental trends are the mainstreaming of organic foods, which relates to soil health, and reduced CO_2 impact because of use of organic fertilisers, which are also under private label; the growing prominence of plant-based foods in order to reduce environmental impact; reducing packaging impact related to consumer concern with regards to plastic; and more emphasis on sustainability schemes, labels and ethical retail initiatives (Hermes, 2019).
This trend was further confirmed during sector meetings held within CBI. Sustainability and clean production are becoming more important. This translates into company activities that aim at reducing

the carbon footprint and promoting the use of alternative energy sources. Additionally, packaging is becoming more and more recyclable. Tetra Pak, the world's leading food packaging company, is promoting recyclable packaging, but also post-consumption recycling through different projects around the world.

2.3.4 Economic Trends

The food and drinks industry is the biggest manufacturing sector of Europe in terms of jobs and added value. In the last 10 years, European food and drink exports have doubled, reaching over €90 billion and contributing to a positive balance of almost €30 billion (European Commission , n.d.). The EU's growth ambition in the food and drinks industry is 2.5%-3.5% per year by 2025 (FoodDrink Europe, 2019).

Though the retail market is growing, economic slowdown is affecting consumption due to low consumer confidence. Volume dropped by 0.4% in Europe (the worst performance in two years), while prices went up by 2.7%. Spain achieved the highest growth (2.2%) of the bigger Western European markets, followed by Italy and the UK (1.4% and 0.8%, respectively). Germany had zero growth (Retail Detail, 2019). Though it does not say much for the longer term, on the short term, one could say that certain markets have become less attractive to enter. Especially when local and regional markets show fast growth in demand.

2.3.5 Political Trends

2.3.5.1 EPA

The target countries are part of the regional Economic Partnership Agreement (EPA). EPAs are meant to provide trade reciprocity, promote sustainable development, and further regional integration by encouraging African, Caribbean and Pacific (ACP) countries to enter the negotiations with the EU in regional groupings (ICTSD, 2014). Under the EPAs, EU markets are immediately and fully opened, while the ACPs have 15 years to open to EU imports (with protection for sensitive imports) and even up to 25 years in exceptional cases.
Until the adoption of the full regional EPA with West Africa, 'stepping stone' Economic Partnership Agreements with Côte d'Ivoire and Ghana entered into provisional application on the 3rd of September 2016 and 15th of December 2016, respectively. The agreements provide legal certainty for investors and are expected to boost trade relations between the two parties, as well as economic growth. Mali and Burkina Faso also have a concluded EPA as part of the regional EPA with West Africa, but adoption is ongoing. Until Burkina Faso and Mali adopt a *stepping stone EPA*, they are part of the EU 'EBA' 'Everything But Arms' agreement.

2.3.5.2 Brexit

Given the highly integrated complex supply chains in the food and drink sector between EU countries, Brexit is currently the main political trend with potentially the highest impact on the European food industry. Trade in food and drink products between the EU27 and the UK amounts to €46 billion (FoodDrinkEurope, 2019). With a no-deal Brexit, EU27-UK trade will revert to the World Trade Organisation's (WTO) 'Most Favoured Nation' status, which will lead to high import tariffs on agri-food products, increased transport costs and burdensome procedures.

For exporters in the target countries, the impact of Brexit is a worry. This is mostly related to the uncertainty around the trade agreements, with the UK being an important market for the processed fruit products from West Africa (see previous section), and its market demand might reduce at least in the short term.

Furthermore, there is uncertainty around exchange rate volatility, which may affect prices for food commodities and could potentially affect competitiveness. It is expected by most that the British pound will lose some value compared to both EUR and USD, but the effects on the value of EUR and USD are uncertain. Predictions and expectations vary largely (Investopedia, 2016; BBC, 2019), and the uncertainty about Brexit and its effect on exchange rates is currently a risk, especially for small- and medium-sized companies that do not have a professional trading and hedging department.

2.3.5.3 African Continental Free Trade Area - AfCFTA

The AfCTA entered into force on the 30th of May 2019 and covers 54 of the 55 African Union members. The objectives of the AfCFTA are to boost intra-African trade, to create a single African market for goods and services, and to promote the movement of capital and people across the continent.
In July of 2019, the operational phase of the African Continental Free Trade Area was launched. The AfCFTA will be one of the largest free trade areas since the formation of the World Trade Organisation, given Africa's current population of 1.2 billion people, which is expected to grow to 2.5 billion by 2050. Ghana will assume the secretariat position (African Union, 2019).

Currently intra-African trade is a mere 15%, compared to around 47% in America, 61% in Asia and 67% in Europe, according to UNCTAD data for 2015 to 2017, but the AfCFTA could radically change that. The AfCFTA is expected to boost intra-African trade by 33% once full tariff liberalisation is implemented, attracting additional intra-African investments and creating market opportunities to foster Africa's industrialisation through regional value chains, according to the report (UNCTAD, 2019).

The aim of the member states is that trade of goods under AfCFTA will start July 2020. To take an example, for pineapple juice and desiccated coconut, the regional markets have already proven to be more interesting than the European market for Côte d'Ivoire. The implementation of the AfCFTA could further incentivise this. This would be a threat to a potential intervention aimed at promoting exports to Europe. It should be noted that the implementation of the AfCFTA will probably take time as there are some challenges that need to be overcome (UNCTAD, 2019; Nwite, 2019).

2.3.5.4 Import regulations on social issues in supply chains

In the Netherlands, a bill called *Wet zorgplicht kinderarbeid* was adopted in May 2019. It translates into a duty of care to prevent the delivery of goods and services that have come about with the help of child labour. The bill asks Dutch companies to declare that they are taking the necessary steps to prevent child labour in their supply chains. If, after a complaint and subsequent review of the policy, it appears that the company has not sufficiently complied with its obligations, an administrative fine can be imposed. Directors of companies that have been fined several times can be prosecuted.

This is a first for Europe but is not a standalone. In the US, the Trade Facilitation and Trade Enforcement Act of 2015 (TFTEA), signed in 2016, prohibits all products made by forced labour, including child labour, from being imported into the United States.

There are indications that these social issues also exist in the countries and supply chains that are within the scope of this study (see sections on CSR). It could be a limitation to trade from these countries to Europe. A first step in managing this risk would be to have full traceability of the supply chain for better control. A second step would be certifications like Rainforest Alliance or Fairtrade support actors in standardising processes and control points related to social compliance of their supply chains. The trainings also allow for awareness raising.

2.4 European Requirements

For all of the three the target countries, most of the requirements for the European market are quite challenging. This is because of a lack of adequate material (think of processing and packaging), lack of investment resources, but also a lack of information.

Priority for entry to the EU market would be to obtain the food safety certifications (GFSI approved), showing the European buyer they have control over the processing. Voluntary standard certification. such as Rainforest Alliance, was mentioned the most by local processors and was asked for by buyers to demonstrate compliance to social standards. However, the main constraints mentioned by the supply chain actors with regards to certification have been the high costs of investment and maintaining certification.

European requirements can be summarised into legal requirements (EU laws), industry requirements, and voluntary standards. These regulate food safety and hygiene, packaging and labelling, traceability and sustainability and covers:

- Control of contaminants in foodstuffs
- Control of pesticide residues in plant and animal products intended for human consumption
- Health control of genetically modified (GM) food and novel food
- Health control of foodstuffs of non-animal origin
- Plant health control
- Traceability, compliance and responsibility in food and feed
- Labelling of foodstuffs
- Voluntary - products from organic production

Up-to-date and detailed information on requirements can be found on the CBI website (e.g., for coconut water; desiccated coconut; dried tropical fruits; tropical frozen fruits; tropical fruit purées).

From stakeholder consultations held by CBI, the main developments related to food safety in fruit processing that were put forward are:

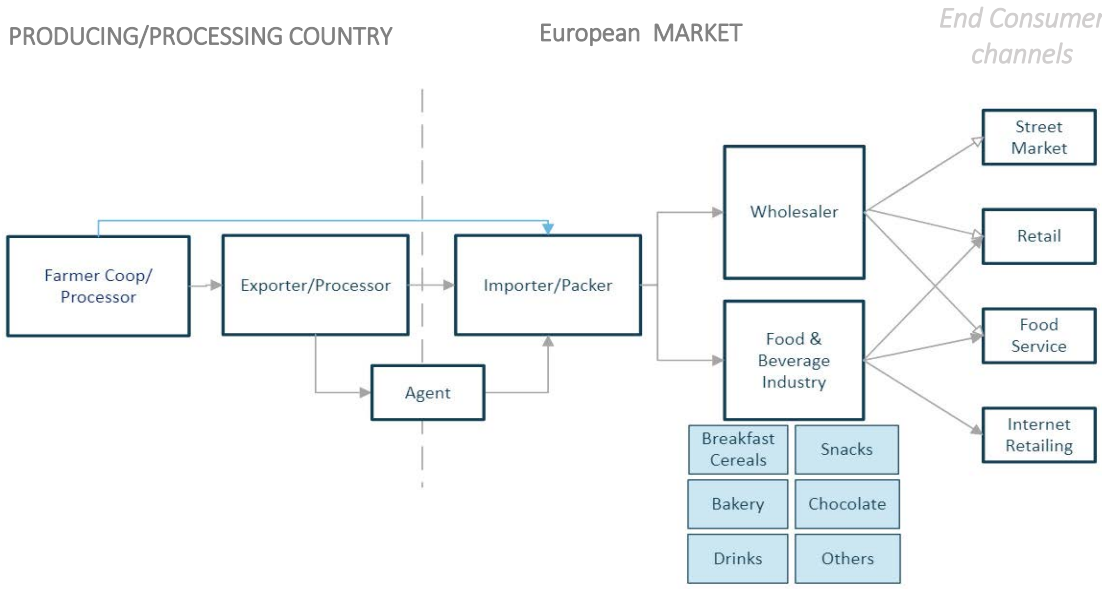
- The European Commission has asked industry representatives to analyse the possible impact of sorbates on human health. A similar investigation is expected for sulphites too. This could lead to changes in the maximum allowed limits for preservatives in dried fruit.
- The most frequent laboratory checks are for residues on pesticides, heavy metals and aflatoxins.
- Food safety certificates commonly accepted in all EU countries are FSSC 22000 and IFS. The only exception is the UK, which prefers BRC over other types of certifications.
- Use of Propylene oxide (PPO) was a common practice for fumigation, but this is now changing and can be changed as there are more natural methods of pasteurisation available.

2.5 Market Channels

The fruit processing sectors all have very similar market channels, with coconut being somewhat of an exception, especially when it comes to coconut water and coconut oil. From the interviews conducted, it became clear that especially the smaller, niche buyers show most interest in the markets that are in scope for this study. When it comes to the PMCs related to processed coconut and pineapple, the larger buyers mostly depend on larger, more well-known supplier countries in Asia and Latin America, with the exception of the dried mango PMC, where Burkina Faso has the largest market share.

A list of major European companies or buyers that have been identified in each segment can be found in Annex II.

The European market is accessed through importers or packers who will distribute to wholesale and retail and to the food and beverage industries. There is a large number of market actors. Data from FoodDrink Europe (2015) shows the existence of 294,000 food and drink manufacturers, 277,000 food and drink wholesalers, 134,000 retail groups, 904,000 food and drink points of sale and 508 million consumers in the EU (FoodDrinkEurope, 2019). According to the same report, France, Germany, Italy, the UK and Spain are the largest European food and drink producers by turnover. The main channels are depicted in the figure below. More detailed supply chain maps are found in the country sections.



Source: (CBI, 2017)
Figure 13 European market channels for processed fruits

The categories of actors include:

- Wholesalers supply supermarkets, small grocery retailers and street markets. There are wholesalers that are be specialised in the supply chains studied in this report or who sell it as complementary products.
- Food & Beverage manufacturers use dried and puréed fruits as ingredients. The larger food and beverage industry players like Unilever and Coca-Cola import directly from origin, while others use traders in between.
- Packers process the largest quantities of dried fruits (CBI, 2017). Packers not only 'pack' but also perform other processing and marketing functions such as blending, mixing, coating and branding of the products, so they have earned a strong position as a product category specialist.
- The food-service industry defines businesses, institutions and companies responsible for any meal prepared outside the home. The food-service industry includes restaurants, school and hospital cafeterias, catering operations, etc. The food-service market has registered a growth of 1.8% in 2017, after several years of stagnation (Paitry, 2018). Growth is expected to continue as consumers are continuing to look for convenience in their food (Mintel, 2019). Looking at trends that apply to this industry, it is very much about location aligning with lifestyle choices, being socially and environmentally responsible, and having tech in balance (Mintel, 2019).
- Grocery retail can be subdivided into different sub-channels. In Europe, the largest retailers are Schwarz Gruppe (Lidl and Kaufland), Aldi (Germany), Carrefour (France), Tesco (UK), Metro (Germany), Ahold Delhaize (The Netherlands), Edeka (Germany and Rewe (Germany) (Farfan,

2019). The traditional brick-and-mortar supermarkets, hypermarkets and discounters are still the main retail channels.

- According to Eurostat (2018), in 2009, online food and grocery shopping in Europe accounted for 13% of the ordered goods and services online. From 2009 to 2018, the share of food and grocery e-shopping has almost doubled (92% growth)--and in 2018, 25% of online orders were made for food and groceries (Angelovska, 2019). In terms of size, the UK, France, Germany and Spain are leading in Europe. The consequence is that major food and beverage chains will be pressured into offering the ecommerce options that consumers are pursuing (Relex, 2018).

Specific information on markets and channels for each of the following products can be found on the CBI websites: Coconut water; Desiccated Coconut; Dried Tropical Fruits; Coconut oil; Virgin Coconut Oil; Tropical frozen fruits; Tropical fruit purées; Jams and Jellies.

2.6 Comparative and competitive position

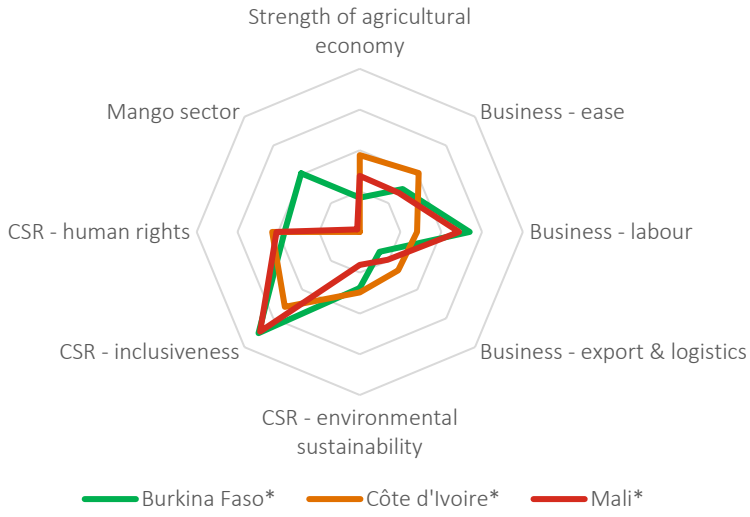
We have compared the three focus countries to key mango origins globally.

We can compare the comparative position across four categories of indicators:

1. Macro-economy
2. Business environment
3. Sustainability and CSR
4. Mango sector

The analysis includes countries with existing processed mango exports to the EU, as well as countries with a large availability of fresh mangoes who would be able to enter into processing. While Spain and Italy also grow some mangoes, we have not included these European countries in the analysis.

Burkina Faso, Côte d'Ivoire and Mali are at the middle to lower end of the comparative analysis. Comparing their strengths (Figure 14), Burkina Faso currently has the strongest mango sector, Burkina Faso and Mali both score relatively high on inclusiveness and labour circumstances, while Côte d'Ivoire ranks better on macro-economy, ease of doing business and logistics.

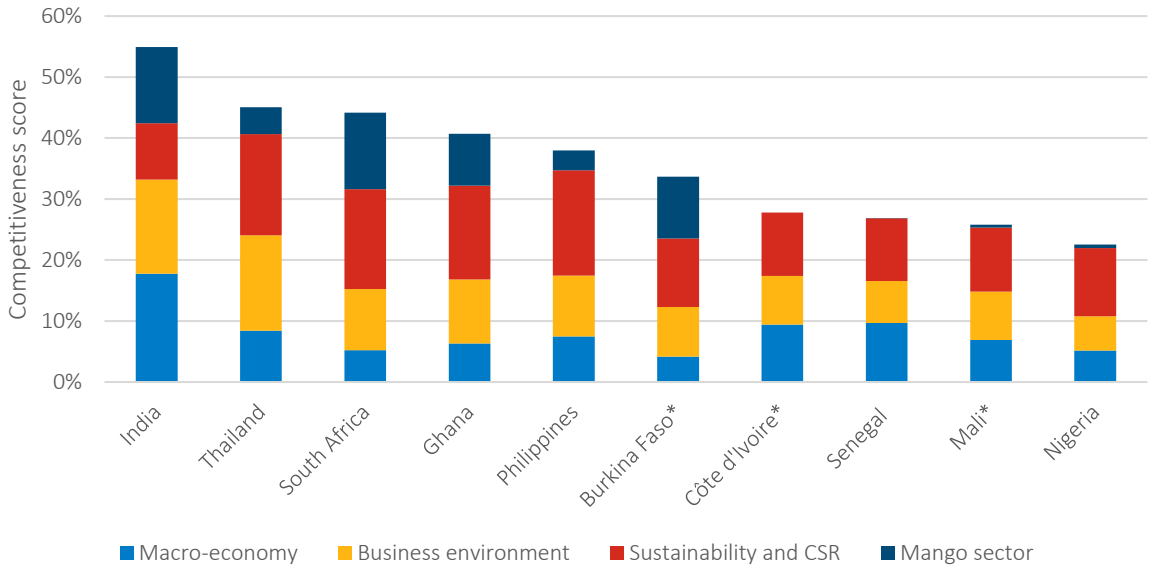


Source: Agri-Logic analysis (refer to Annex IX)
Figure 14 Competitive strengths and weaknesses of Burkina Faso, Côte d'Ivoire and Mali

Comparing origins globally (Figure 15), while India is not currently a prominent exporter of processed mango into Europe, their large availability of fresh mangoes combined with a favourable macro-economy and business environment make it a relevant competitor, specifically in a market segment that is sensitive to price.

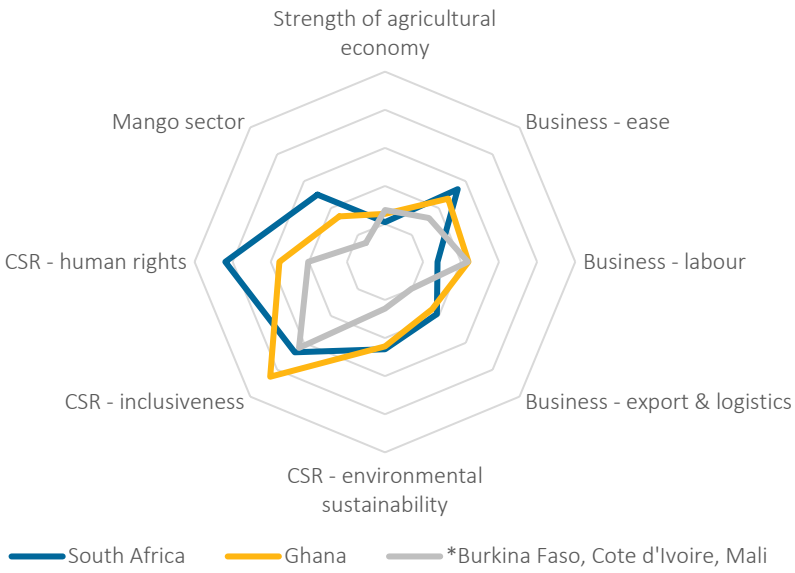
Thailand, the Philippines and Ghana are well-positioned to grow their share of the European market, at the expense of the countries in the scope of this value chain analysis. South Africa is a current leading exporter to Europe, but it struggles with a slow-growing economy, a weak labour market and a challenging business environment.

Senegal and Nigeria also grow mangoes, but their comparative position is weak, mainly because of very little traction in the mango sector and a weaker business environment.



Source: Agri-Logic analysis (refer to Annex IX)
Figure 15 Comparative position of global mango origins

Within Africa, South Africa and Ghana are the leading competitors in processed mango. South Africa is defending its current market share, but its economy and business environment are challenges. Ghana, however, is well-positioned to continue growing its fruit processing and exports. Swiss-Ghanaian company HPW is currently investing in expansion into Côte d'Ivoire, and several South Africa-based processors and traders are looking to invest in West Africa, allowing them to have access to processed mango throughout the year.



Source: Agri-Logic analysis (refer to Annex IX)
Figure 16 Competitive strengths and weaknesses of main African competitors: South Africa and Ghana

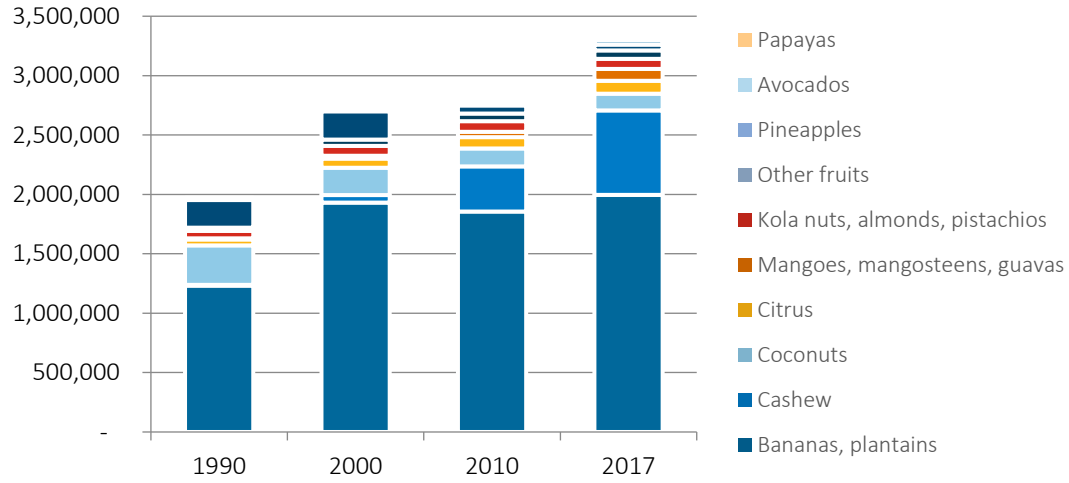
As shown in Figure 16, South Africa is strongest in human rights, their current mango sector and ease of doing business. However, the macro-economy and labour market are major concerns, and stakeholders expect their position to weaken even further. Ghana performs equally or stronger than our focus countries on all dimensions and is expected to improve.

A detailed comparative analysis including all indicators is included in Annex IX.

3 Côte d'Ivoire

3.1 Product Overview

The below graph shows an overview of the main fruit crops produced in Côte d'Ivoire.



Source: (FAO, 2017)

Figure 17 Production of fresh fruits and tree crops in Côte d'Ivoire 1990, 2000, 2010, 2017

For Côte d'Ivoire, pineapple, mango and coconut are considered to be the most promising value chains and are further elaborated upon in the sections on Côte d'Ivoire. The selection criteria were based on the market demand, production value, the scale at which the products are currently being processed, the governance of the sectors and, lastly, how much room there is for potential positive impact for the processing SMEs.

It was considered that in fully vertically integrated supply chains with strong, direct retailer relationships (such as for banana, citrus and also, to some extent, pineapple), there would be less of a role for a programme that would support processed fruits. Cashew nut was out of scope and therefore not considered. The table on the next page gives a short summary of why the fruits were not selected, and Annex VII provides a more detailed overview of the products that were not selected and the reasoning behind it.

To date, there are only a few processors operational in the country. The most dominant fruits being processed are pineapple, mango and coconut. Coconut is mainly processed into copra oil and desiccated coconut.

Table 7 Selection of value chains for the analysis for Côte d'Ivoire

Value Chain	Select	VC description	Demand	Fresh production in CI*	CAGR 2010-2017*	Processing
Mango	**Yes**	Small holder farmers. Fast-growing. Getting more and more organised.	Potential for dried, frozen and purées.	160,000 tonnes. Large oversupply. Potential for processing.	+14%	Limited processing, mainly juices, recent growing production of dried.
Pineapple	**Yes**	Mainly commercial growers, though few individual pineapple growers.	Potential for dried, frozen and purées.	50,000 tonnes. Disease-free and can grow year-round.	+5%	Mainly juices for local regional market, dried negligible.
Coconut	**Yes**	Currently mainly smallholder growers.	Potential for many different products, such as coconut milk, water, desiccated.	200,000 tonnes. Declining.	-1%	Limited. Mainly processed into copra oil. Preference for fresh exports.
Banana	No	Dominated by vertically integrated large international commercial growers.	Potential for purées.	2 million tonnes.	+1%.	No processing/ negligible.
Kola nut	No	Very limited number of buyers for processed product.	Declining demand.	84,000 tonnes.	+1%	No (food) processing.
Cashew apple	No	Tree crop not grown for the purpose of harvesting the apple.	Limited demand. Potential to be used in mixed fruit drinks.	725,000 tonnes.	Not known (cashew nut +11%)	Negligible / non-existent.
Avocado	No	Grown by smallholders.	Demand limited. Possibly frozen for smoothies.	10,000 tonnes.	+4%	No processing.
Papaya	No	Grown by smallholders.	Demand limited. Possibly for mixed tropical fruit drinks and dried.	7,000 tonnes.	+6%	No processing.

*Source: (FAO stats, MINADER)

3.2 Production, Processing and Export

3.2.1 Mango

3.2.1.1 Production

Mango has started to play an important role in the economic development of the country's northern region, which traditionally is a cotton growing region. Production of mango is high. It is estimated that it is somewhere between 140,000 – 160,000 tonnes, of which 92% is grown by individual producers and their cooperatives and 11,425 tonnes by commercial growers. In comparison, Burkina Faso produces 200,000 tonnes and Mali 70,000 tonnes. The total mango production area is 23,662 hectares, mostly dominated by small-holder farmers. About 15% of plantations are smaller than 5 hectares, and these are usually not able to export, while 80% of plantations are between 5-20 ha, and 5% are 20-70 ha (Van den Broek, et al., 2016).

The most common varieties are: Kent (80%), Keitt (7%), Amélie (3%), and other varieties like Brooks, Lippens, Valencia, Palmer and Zille for the remaining 10%. The Kent and Keitt are highly valued for processing into dried mango.

Post-harvest losses are estimated to be between 30 to 60% of production. This relevant as it creates a convincing case for processing of the fruit. The losses are mainly due to fruit flies and lack of markets for sub-quality mangoes. In addition, during the harvest period, the market is flooded with mangoes. The short shelf life, limited storage capacity and inadequate means of transportation further increase the losses.

Mango is mostly exported via Abidjan, but some exports also go to the processing units in Burkina Faso and Ghana or are transported by airfreight via Ouagadougou to Europe (fresh and dried).
Currently, 95% of the fresh mangoes are destined for the European markets (OBAM-CI). Côte d'Ivoire is the largest African supplier of mangoes to Europe, and third-largest supplier overall to the European market. Phytosanitary issues and unreliable suppliers are the major barriers to growth, according to European importers.

In recent years, there have been consistently high numbers of interceptions worldwide, related mainly to the presence the fruit fly (Agrinatura EU, 2019). Côte d'Ivoire has, like many of the other countries, seen an increase in the number of lots that have been intercepted over the last couple of years (Table 8).

Table 8 Number of lots of fresh mangoes intercepted due to fruit fly infestation

Year	# Lots intercepted
2015	11
2016	10
2017	32
2018	20

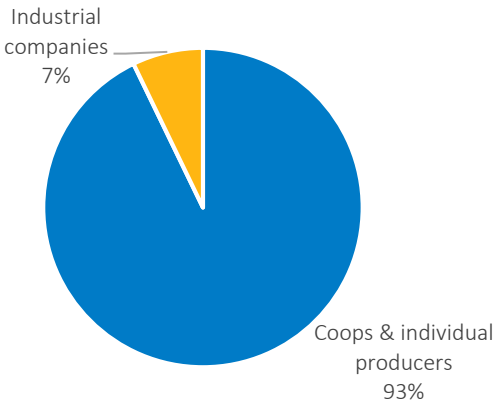
Source: (DPVCQ-RCI)

There are three organisms that are the main cause for interception: fruit flies, the mango stone weevil and a fungus commonly called 'anthracnose'. The bacterial black spot (BBS) disease has also recently come up, putting constraints on fresh exports.

Europe, as a result, is in the process of introducing stricter phytosanitary requirements for a number of imported crops where there have been high numbers of notifications due to quarantine pests. This includes mango, but excludes pineapple, coconut, banana and dates. It will become fully operational

by the 14th of December 2019. There is a worry from producer countries that they will not be able to meet these stricter phytosanitary requirements.

The above regulations are only applicable to fresh fruits and form an important risk for fresh mango producers and exporters to the European market. Processed fruits are easier to import into Europe, which would mitigate this risk. However, it should be noted that a certificate of analysis, resulting from microbiological and physical/chemical tests, would always be needed to ensure that the products are within the maximum residue levels (MRL).



Source: (OBAM-CI)
Figure 18 Mango production by type of producer in Côte d'Ivoire in 2018

Mango orchards are dominated by village plantations (Figure 18) and cover an area of about 47,000 hectares (MINADER). Export volumes have been growing significantly; from 15,269 tonnes in 2012, exports reached 33,064 tonnes in 2018, about 20% of the production. The export potential is estimated at over 60,000 tonnes. More than 95% of the mangoes exported by Côte d'Ivoire are destined for the European market.

3.2.1.2 Demand and processing

The estimated domestic demand for fresh mango in Côte d'Ivoire is:

- 4,500 tonnes for processing units
- 2,000 tonnes for dryers
- 6,000 tonnes for local sellers
- 33,000 tonnes for exporters with an export potential estimated at over 60,000 tonnes

With and estimated domestic demand between 44,000 and 74,000 tonnes and a production of 158,000 tonnes, supply clearly outweighs demand. Some of the mangoes go for processing to Burkina Faso and Ghana but, overall, most of the oversupply goes to waste as the markets are not able to absorb it.

Processing demand is driven by the juice makers, who are responsible for 73%. Dried processing represents about 27% of the demand. The mangoes processed into juices are mainly destined for local and regional markets. Only a very small percentage goes towards export.

Exports of dried mango from Côte d'Ivoire mainly go to Europe, Burkina Faso and Ghana. Official figures show that only about 25% is exported. This figure seems low, and it is possible that part of it crosses the borders to Burkina Faso and Ghana and is exported via air-freight from neighbouring countries.

The figures below give an overview of the supply and demand of mango in Côte d'Ivoire.

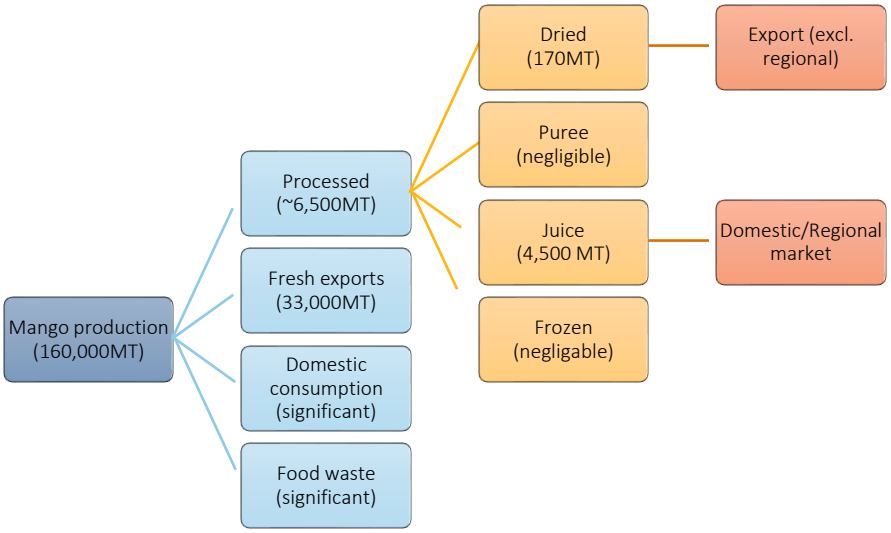
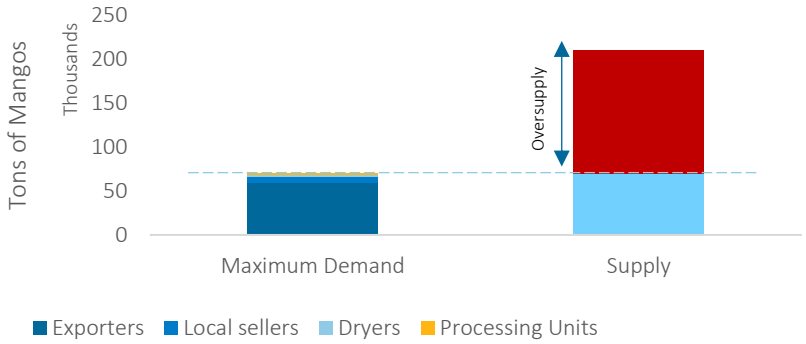


Figure 19 Estimated production, processing and export volumes mango Côte d'Ivoire



Source: (OBAM-CI)
Figure 20 Estimated demand of fresh mango

3.2.2 Pineapple

3.2.2.1 Production

Pineapple is produced in the south-eastern part of Côte d'Ivoire. The climate there is favourable for pineapple growing. Pineapple has the advantages of growing in the regions close to the port and having no real peak season that requires a large number of containers in a short timeframe, as is the case for mango.

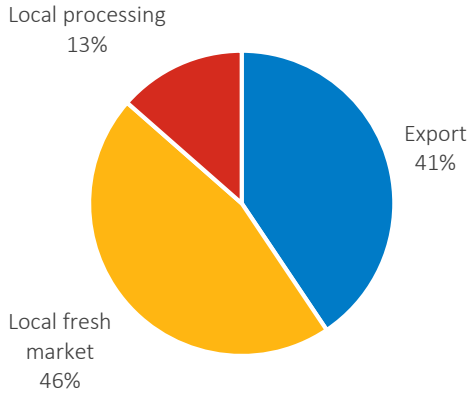
When irrigated, pineapple can be grown year-round and there are no significant pests and diseases attacking the crops. Even small farmers have good yields and a relatively low amount of second and third grades (Van den Broek, et al., 2016; Nugteren, 2018).

The pineapple business is seen as a profitable activity throughout the value chain (Van den Broek, et al., 2016; Nugteren, 2018). In 2002, the area under pineapple cultivation was 15,000 hectares. Currently, a total of 1,909 hectares (OBAM-CI) are used for pineapple growing, of which about 1.4% is fully converted to organic (FiBL & IFOAM, 2018). Depending on the source, production is about 50,000

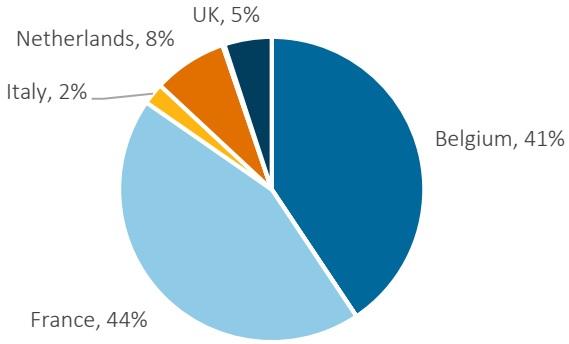
tonnes. In comparison, Costa Rica produces 2.9 million tonnes and Nigeria 1.4 million tonnes of pineapple annually.

A little over half of the total production is exported fresh, destined for the European market. The other half goes onto the local market, of which 10,000 tonnes (20%) is processed. The main variety grown and exported is MD2, which has an estimated market share of 95%. Only about 5% of the exports is Smooth Cayenne. On the local market, mainly second grades are sold, estimated at about 5-10% of production (Van den Broek, et al., 2016).

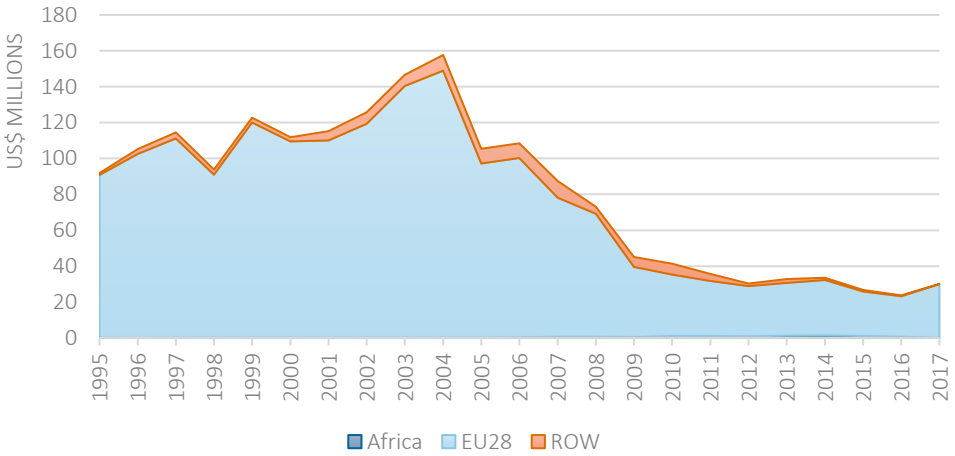
In 2018, imports of fresh or dried pineapple from Côte d'Ivoire into Europe amounted to 24,000 tonnes, equal to an export value of €17.7 million (Eurostat). As the amount of dried pineapple going for export is estimated to be very limited, it can be assumed that the figures are mainly driven by the fresh pineapple exports. The compound annual growth rate for exports to Europe from Côte d'Ivoire between 2008-2017 was -5%, while, globally, exports have been growing at +1.2% (OEC MIT).



Source: (OBAM-CI)
Figure 21 Market demand segments for fresh pineapple



Source: (Eurostat)
Figure 22 European imports of fresh or dried pineapple from Côte d'Ivoire 2007-2018 (volume)



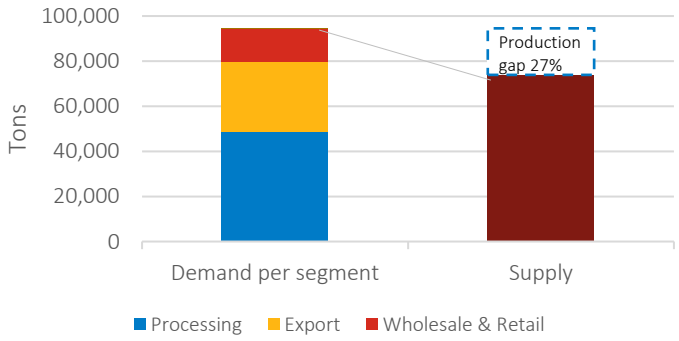
Source: (OEC MIT)

Figure 23 Export value of fresh pineapples from Côte d'Ivoire 1995-2017

Fresh pineapple exports from Côte d'Ivoire are subject to strong competition from Latin American countries, namely Costa Rica, which took over the market with the introduction of the MD2 variety. By the time the MD2 variety became more readily available in Côte d'Ivoire, most farmers had already abandoned pineapple cultivation and replaced it with other crops, such as rubber, cashew or cocoa. In addition, high freight, packaging and phytosanitary costs, no diversification of export markets and absence of a clear policy on the pineapple sector led to a considerable decline in production over the last decade.

The cooperatives and other smallholder grower companies mainly service the domestic market, where they have a market share 94.7% (OBAM-CI). The domestic market serves as an important outlet for unexportable lower grade pineapples. The biggest challenges for exporters are logistics, cash flow and the availability of sufficient quantities of pineapple.

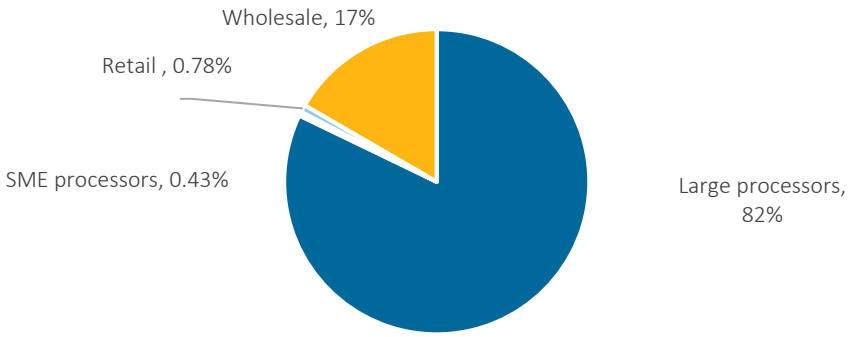
Since 2017, spot market prices of fresh pineapple have been dropping. Demand is slow or even declining in the European market (FreshPlaza, 2019). Côte d'Ivoire produced up to five times what is left of the current production of pineapple. If the competitiveness of the sector can be improved, and land suitable for pineapple production is still available, producers will have the know-how to be able to quickly scale up.



Source: (OBAM-CI)

Figure 24 Côte d'Ivoire demand for pineapples per market segment vs supply

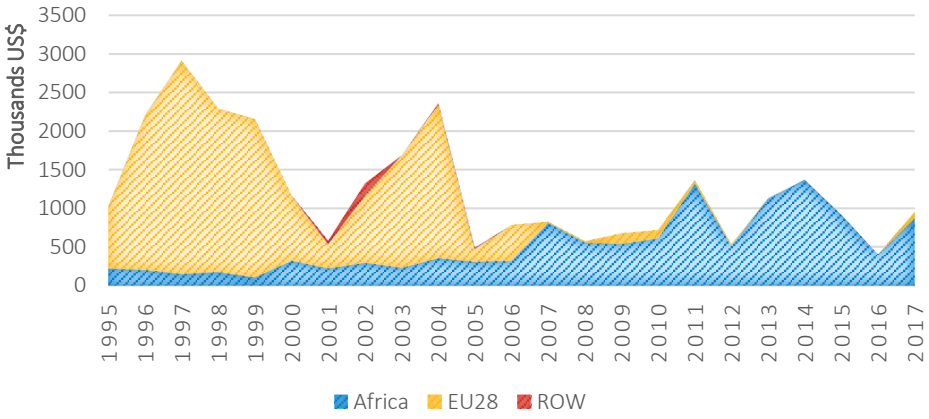
Total local demand for fresh pineapple is estimated at 63,000 tonnes, of which more than 80% goes into processing (Figure 25). About 75% of this processed fraction is also exported. However, only a very small percentage of this goes to the European market <10% (Goutimot, 2015). There is supply gap, which creates high costs for raw material for the processors (
Figure 24).



Source: (OBAM-CI)
Figure 25 Segmentation of fresh pineapple demand Côte d'Ivoire (excl. fresh exports)

3.2.2.2 Processing

Pineapple juice is mainly destined for the regional market (>90%), such as Mali and Senegal, and had a total value of almost US$1m in exports in 2017 (see figures below). Growth of European imports of pineapple juice has grown by 6% between 2007-2018. Growth has mainly come from Costa Rica, which supplies 93% of the juice. In the regions of Benin and Ghana, each supply about 0.4% of the total pineapple juice imports into Europe, and Côte d'Ivoire supplies only 0.06%, equal to €114,000. No information was found on the production volumes and destination of dried pineapple, as there is no specific HS code available for the product and none of the stakeholders were able to provide more insights. From this lack of information and the current level of processing in Côte d'Ivoire, it can be assumed it is negligible.



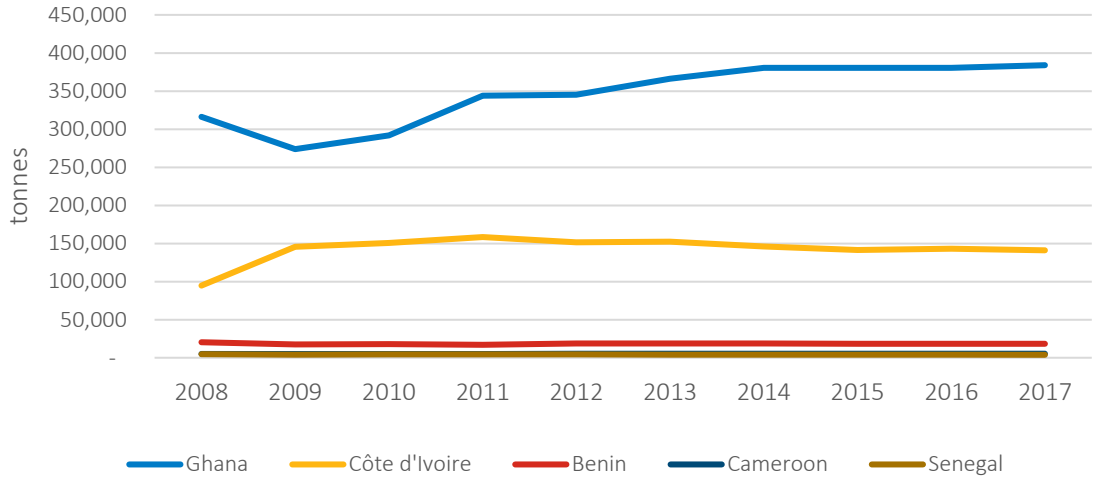
Source: (OEC MIT)
Figure 26 Export value and destinations of pineapple juice from Côte d'Ivoire

3.2.3 Coconut

3.2.3.1 Production

Currently, the estimated area of coconut production lies between 30,000-50,000 ha, with the estimated number of smallholder producers at more than 10,000. The coconut cultivation ensures a production of 70,000-100,000 tonnes of copra (dried coconut destined for oil production). They are mostly planted on the coastal strip and the islands, where the poor soils and salinity make it difficult to grow other crops. About 45% of plantations are smaller than 15 ha, 45% are between 15 and 50 ha, and 10% are between 50 ha and 150 ha (Van den Broek, et al., 2016). The main varieties are Grand Ouest Africain and the Hybrid variety.

Though exports of coconut have increased, coconut production has been declining over the last few decades. Reduced processing capacity (thus demand), urbanisation of the coastal zones, climate change (rising sea level) leading to erosion of the coastal areas, and old, diseased trees (lack of maintenance) are the reasons that are mentioned for the decrease in production.



Source: (FAOstats)

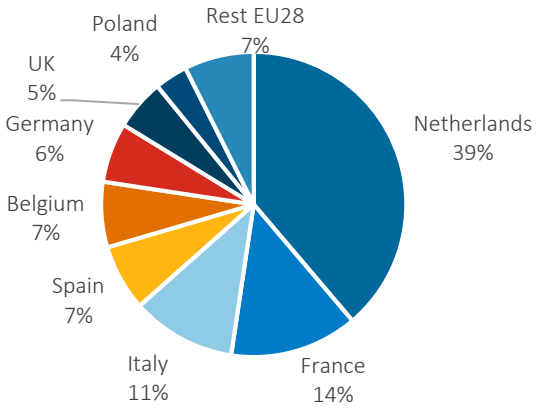
Figure 27 Production of coconut in the West-Africa region

The main disease attacking the coconut plantation is the lethal yellowing disease (CILY). It was first observed in 2013. By 2014, it had already killed more than 8% (over 400 hectares) of coconut groves in the country's coastal regions. After being infected, the tree dies within 4-6 months of the onset of symptoms, leaving only the bare trunk of the palm tree as the crown collapses. Scientists identified a bacteria-like organism called 'phytoplasma' which is now associated with CILY. The best method to combat CILY is monitoring trees regularly and felling them as soon as the trees have been confirmed to be infected. The *Centre National de Recherche Agricole* (CNRA) is now also introducing new varieties that are more resistant and supporting growers in monitoring and controlling the disease.

Coconut was planted in Côte d'Ivoire around the coastal areas in the 1920s and 1930s and was industrialised in the 1960s and 1970s to produce desiccated coconut and coconut oil. Côte d'Ivoire is competing mainly with Asian markets and, regionally, with Ghana, which has an upward production trend, contrary to Côte d'Ivoire. The total value of coconut exports in 2017 was US$19.1M (OEC MIT The main importer from Europe is the Netherlands, followed by France and Italy. The Netherlands and France have seen a clear increase of imports from Côte d'Ivoire over the last decade. For the Netherlands, Côte d'Ivoire's imports represent about 1% of total import value of fresh or dried coconut.

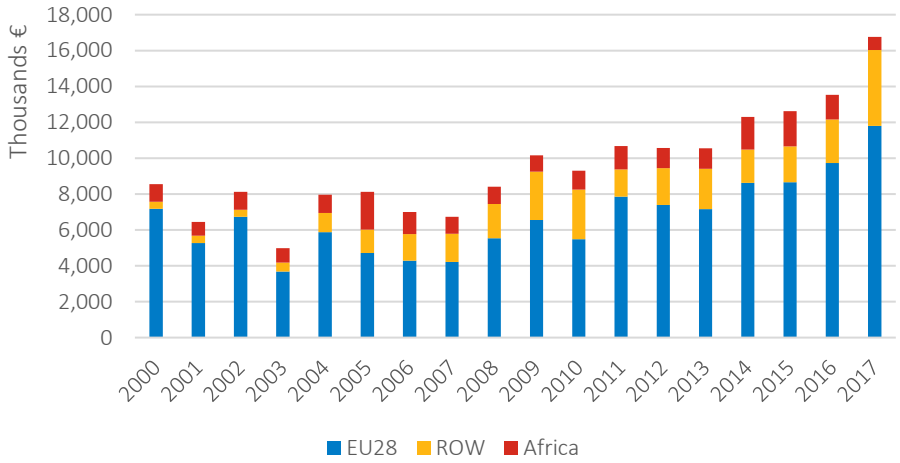
Between 2008 and 2017, the compound annual growth rate of the export value of coconuts (fresh & dry) from Côte d'Ivoire to Europe was 9%. The total export value in 2017 was €12 million. Globally, the

growth in coconut exports over that same period was 10%. Demand from Côte d'Ivoire thus follows global demand trends. See also graphs below.



Source: (OEC MIT)

Figure 28 Export value percentage from Côte d'Ivoire to Europe of fresh and dried coconut (2000-2017)



Source: (OEC MIT)

Figure 29 Export value of fresh and dried coconut from Côte d'Ivoire

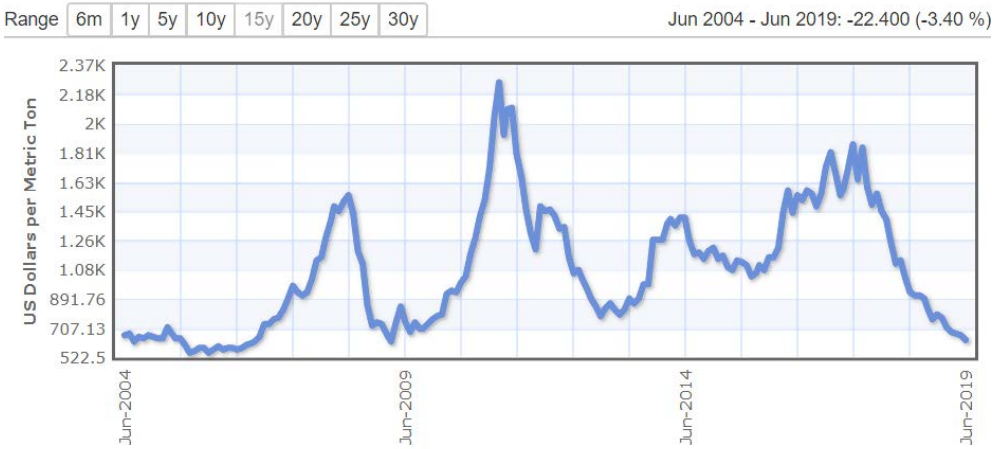
3.2.3.2 Demand and Processing

Only about 20% of the coconut is exported and almost all of the rest is processed into copra oil. The oil is used in foods and cosmetics and mainly goes to the domestic and regional markets. The total production of copra (crude) oil is estimated at 25,000 tonnes. Exports to Europe have been very erratic (see below chart). At its highest, it represented 1.2% of total imports to the Europe and almost 25% of total production in Côte d'Ivoire.

Crude coconut oil

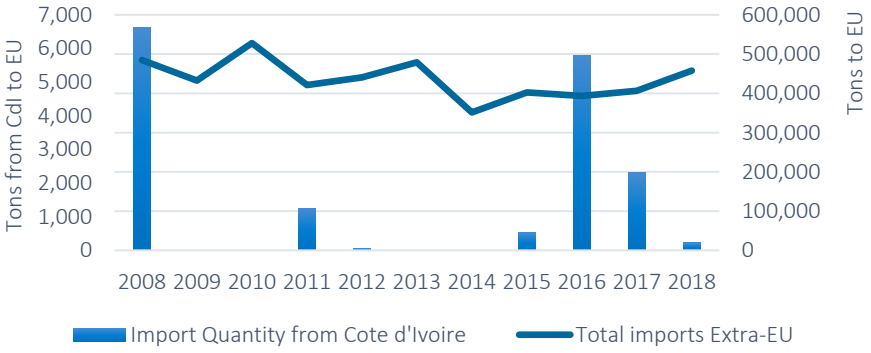
The Netherlands and Germany are the largest importers of crude coconut oil into Europe, each representing about a 30% market share (2017) (OEC MIT). However, the biggest buyers of coconut oil originating from Côte d'Ivoire have been Spain and Italy. The total export value of coconut oil from Côte d'Ivoire is €21.1 million (2017), of which €3.5 million is destined for Europe. Exports to Europe compete mainly with the African markets, such as Senegal, Morocco, Burkina Faso, DRC, Cameroon and Mali (OEC MIT).

Coconut oil from Côte d'Ivoire is not seen as a product that has much potential for the European export market due to declining demand. See also section 2.2.6.2. Therefore, it is a product with a very volatile market that competes with other vegetable oils as a substitution. As a result, Côte d'Ivoire competes with much more efficient producing countries, such as the Philippines, Indonesia and India.



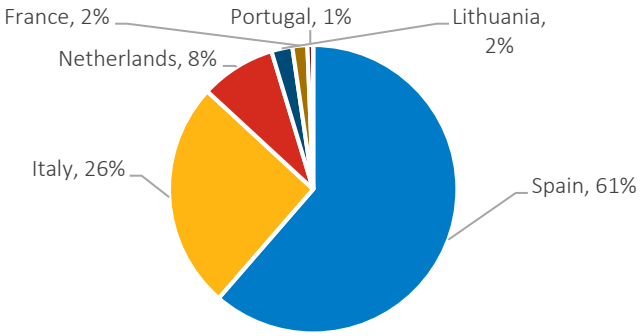
Source: (Index Mundi, 2019)

Figure 30 Coconut Oil Monthly Prices (Philippines/Indonesia), bulk, CIF Rotterdam Jun 2004 - Jun 2019



Source: (Eurostat)

Figure 31 Imports to Europe of crude coconut oil HS15131199 from Côte d'Ivoire and from the world

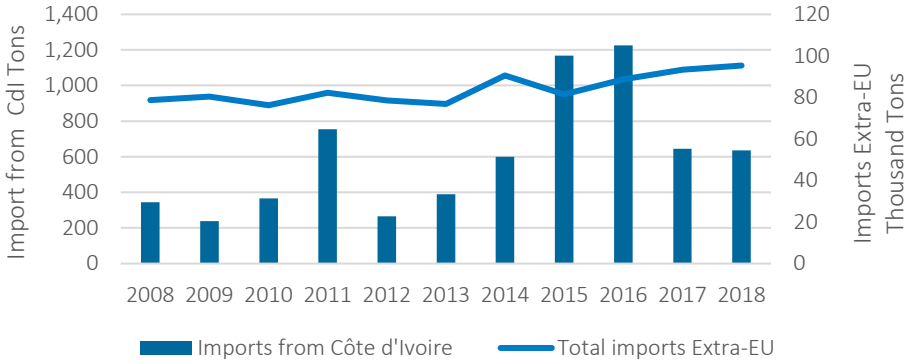


Source: (Eurostat)

Figure 32 European imports of crude coconut oil from Côte d'Ivoire 2008-2018 (value)

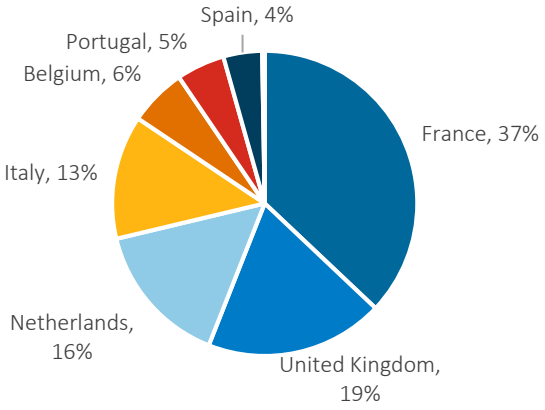
Desiccated coconut

Desiccated coconut imports into Europe are very small and equal to 636 tonnes in 2018 (6,000 – 7,000 of fresh coconut), with a value of about €268,000. It represents about 0.7% of total European imports in volume from 2007 (Eurostat). The largest importer is France (37%), followed by the UK (19%), the Netherlands (16%) and Italy (13%). Imports from Côte d'Ivoire have increased, with a compound annual growth rate of 11% in volume from 2009-2018, and total imports into the EU of desiccated coconut grew over that same period by 3%.



Source: (Eurostat)

Figure 33 European imports of desiccated coconut from Côte d'Ivoire and total imports 2008-2018



Source: (Eurostat)

Figure 34 Share of import value of desiccated coconut from Côte d'Ivoire 2009-2018 by Europe

3.3 Value chain mapping

The section starts off with a value chain map and short introduction to the specific sector to provide further context on the actors in the chain, with a focus on the processing part of the value chain.

3.3.1 Mango value chain

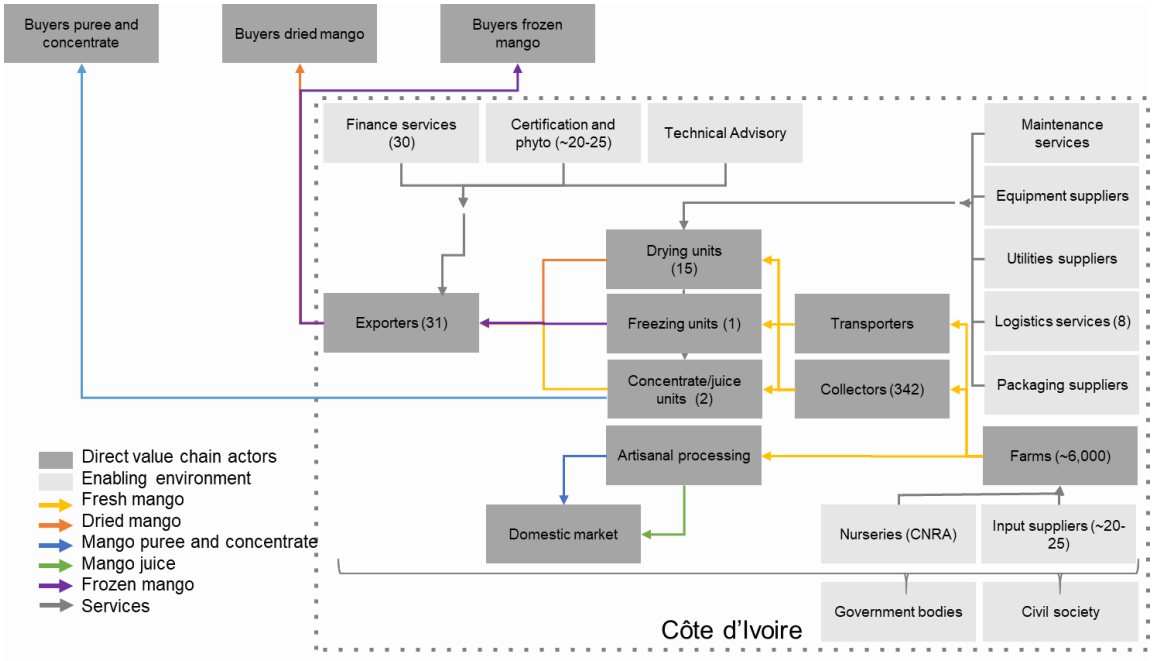


Figure 32 Value chain map for mango from Côte d'Ivoire

There are four main associations that regroup the mango sector (see also Annex III):

- L'Association Régionale des Exportateurs de Mangues (AREXMA);
- L'Organisation Centrale des producteurs-exportateurs d'Ananas, de Bananes et de Mangues (OCAB);
- L'Organisation de producteurs-exportateurs de Bananes, d'Ananas, de Mangues et d'autres fruits de Côte d'Ivoire (OBAMCI) and;
- Inter-Mangue: in December 2018, the inter-professional sector organisation, Inter-Mangue, was set up by the Ministry of Agriculture. It is based in Korhogo and consists of 49 members from the mango sector. It regroups producers, exporters, traders, packaging companies and processors. It is currently supported by the German BDEx *(Bundesverband des Deutschen Exporthandels e.V.*) in its capacity building activities.

A general overview of the sector (producers and processors) is provided in the tables below.

Table 9 Mango Producers

Producer organisation	Production 2018	% of total production
Cooperatives and individual producers	**147 969**	**92.8%**
UPMACI		
FENAMICI		
Non-affiliated cooperatives		
Individual producers		
Commercial growers	**11 425**	**7.2%**
NEMBEL-INVEST		
Vergers de Bandama		
Soleil d'Afrique		
Vergers du Nord		
Ranch de Koba		
Total	**159 394**	

Source: (OBAM-CI)

Table 10 Direct actors in the mango value chain

	Private	Cooperative/ Associated	Total
Producers	2,378	3,298	**5,676**
Collectors & Traders	235	174	**409**
Packing station	6	6	**14**
Processors	9	8	**17**
Exporters	16	18	**34**

Source: (Government of Côte d'Ivoire)

Table 11 Overview of the main mango processing units in Côte d'Ivoire

N	Processing Unit	Location	Mango PMCs	Combined Share of production
1	Usine de Sechage de Mangue de Ouangolo	Tchologo	Dried mango	27% (dried mango)
2	LF Bagoué	Bagoue	Dried mango	
3	Scoops -GNINNANGNON	Poro	Dried mango	
4	Scoops – KOTOWOBIN	Bagoue	Dried mango	
5	Scoops – WOPININWOGNON	Tchologo	Dried mango	
6	Scoops COPROMASI	Poro	Dried mango	
7	Scoops -MAD	Kabadougou	Dried mango	
8	Scoops -COFRUINO	Kabadougou	Dried mango	
9	Ivoire Organic (organic)	Poro	Dried mango	
10	LA & JAB Côte d'Ivoire	Poro	Dried mango	
11	Les Jardins de Koba (organic)	Tchologo	Dried mango	
12	Yao Tropico	Poro	Dried mango	
13	Centre de Séchage de Farako	Kabadougou	Dried mango	
14	SCOOPS CDFLCI	Tchologo	Dried mango	
15	HPW fresh & dry Côte d'Ivoire (organic)	Bas Comoe	Dried mango	
16	ATOU SARL	Abidjan	Mango juice	73% (other)
17	COBEKO	Poro	Mango juice	
18	Boisson d'Afrik	Abobo	Mixed mango juice	
19	Les Jus Pure	Abidjan	Mixed mango juice	
20	COCOPACK	Grand Bassam	Organic mango juice, frozen mango (IQF), pulp, chunks	
21	Canaan Food Services (CFS)	Abidjan Riviera	Mango juice	

Source: (OBAM-CI; Government of Côte d'Ivoire)

There are about 20 mango processors in Côte d'Ivoire, see Table 11.ATOU, and the main mango juice producer on its own represents almost 55% of the demand for processing. The products from ATOU are mainly destined to local and regional markets. A handful of companies process mango juice for the local urban market, such as Boisson d'Afrik.

Of the 170 tonnes of total dried mango volume that was produced, private companies (non-cooperative) represented more than 70% of the total dried mango production (121 tonnes) in 2018.

This percentage will become higher when HPW becomes operational. HPW is a Swiss-owned company that represents the largest plant for fruit drying in West Africa. Yearly, they produce 1,700 tonnes of dried tropical fruit in Ghana, of which 1,200 tonnes are dried mango, which is exported to Europe. Of the total 170 tonnes, only 45 tonnes were exported.

The *Union des Transformateurs de Mangue* de Côte d'Ivoire (UTMACI) regroups eight mango drying processors and represents a 28% market share of the production of dried mango, which is equal to 47 tonnes (see also Annex).

Mango jam is produced at a very small artisanal scale by companies like Carol's. Although small in scale, they were able to secure major clients, such as supermarket chains within the country (Leader Price and Prosuma) and hotel chains (Accor), and they are also sold at the airport's duty-free store. In 2018, they sold 30,000 jars of jam and now employ five full-time staff. They have been forced to turn down new clients because they could not keep up with demand.

3.3.2 Pineapple value chain

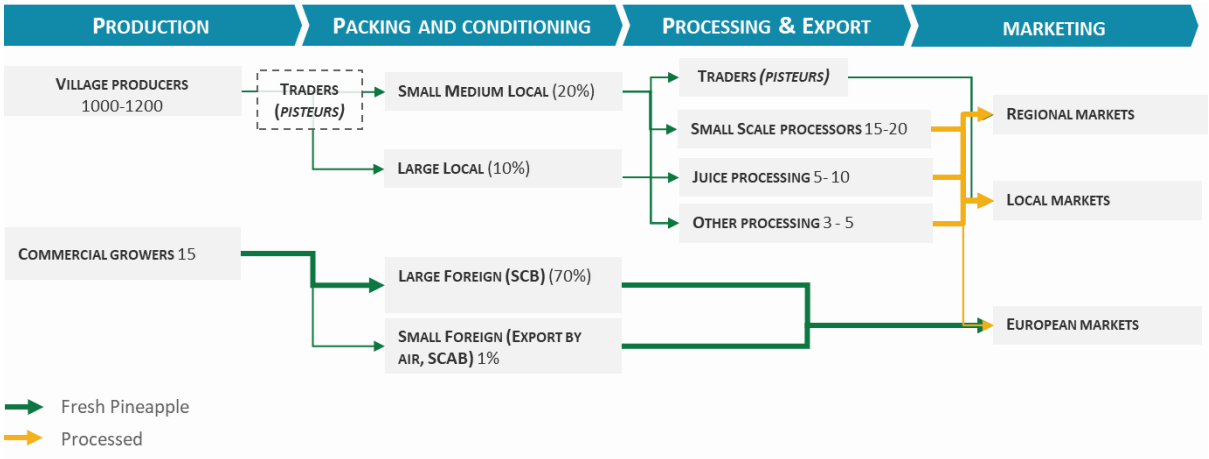


Figure 35 Simplified value chain map pineapple

The pineapple sector in Côte d'Ivoire is represented by:

- OCAB: L'Organisation Centrale des producteurs-exportateurs d'Ananas, de Bananes et de Mangues
  - Within OCAB, there are four cooperatives that produce pineapple and one French commercial producer of pineapples (and bananas) called CANAVESE. The four cooperatives have a total of 345 hectares, but they only produced on 73 hectares in 2018, producing 4,000 tonnes (OBAM-CI).
- OBAM-CI: L'Organisation de producteurs-exportateurs de Bananes, d'Ananas, de Mangues et d'autres fruits de Côte d'Ivoire
  - Within OBAM-CI, there are two cooperatives operational in pineapple production : la Société Coopérative des Planteurs du Sud-Comoé (COSUCO) and la Société Coopérative des Fruits de Bonoua (COFRUIBO). They consist of a total of 28 growers on 89 hectares, producing about 3,440 tonnes (OBAM-CI).

- FENA-COFRUITEL: The Féderation Nationale des Coopératives Fruitières et Légumes de Côte d'Ivoire
    - FENA-COFRUITEL was set up in 2017, consisting of 8 cooperatives and 358 growers, who together have produced 11,700 tonnes on an area of 388 hectares in 2018. However, the total production area is bigger, 752 hectares.
- There are about 10 cooperatives not affiliated to a cooperative union or association. They consist of about 628 growers and have total potential production area of 733 hectares. They produced 23,900 tonnes of pineapple.

SCB (Compagnie Fruitière, French owned) is by far the largest fresh pineapple producer and exporter and accounts for about 90% of the exports. Following SCB is the French company CANAVESE. SCB only produces modest amounts of Smooth Cayenne pineapples, <1% for transport by air to France (Van den Broek, et al., 2016). These companies are all strongly vertically integrated into the value chain.

There are about 1,000-1,200 producers with a production 35,000-40,000 tonnes, mainly for the local market (OBAM-CI). They are regrouped in 28 cooperatives, of which ten are not associated with a union or other private sector organisation (see also section 3.3.2). Commercial growers are responsible for about 70% of the production, producing on an area of about 600 hectares.

Large farms generally have their own packing houses and export by themselves. The smaller farmers rely on the small middlemen or traders, called *pisteurs,* who source the pineapple, organise the labour for harvest, organise transport and sort and pack (Van den Broek, et al., 2016). The *pisteurs* only collect the export grades and the lower grades are sold by the farmer. The pack houses are often rented from cooperatives or independent farmers renting out their pack houses. Cold storage is often lacking, which complicates logistics, as harvest can only be done when there is refrigerated containers available to pack (Van den Broek, et al., 2016).

A large drop in number of pineapple producers began in the 2000s and has had a negative effect on the cooperatives. As a result, many of them have disappeared (Van den Broek, et al., 2016). Even the existing pineapple farmers have turned away from the cooperatives because they blame them for many of the problems they experienced during the crisis (OBAM-CI). At village-level, the sector is said to be very unorganised and, according to OBAM-CI, it now very much resembles an informal sector. This is also a reason for concern when deciding to work with this sector.

Transport of fresh pineapple does not pose too much of a problem, with the exception of the peak season of the mango harvest, when refrigerated containers become difficult to obtain. Competition makes road transport too expensive, and risk of product loss due to inadequate transport modalities is high. This is true for all fruit crops transported in Côte d'Ivoire, which is another incentive to process as early as possible in the chain. Bolloré is the only independent transport company offering door-to-door logistics, as Eolis is very much linked to SCB operations (Van den Broek, et al., 2016).

Pineapple production and processing in Côte d'Ivoire has a long history dating back to the 1940s. Initially, all of its production went to processing. Canned pineapple exports grew steadily until 1978, with up to an impressive 182,000 tonnes of processed pineapples destined for the European market. However, in 1982, the industry started to encounter serious difficulties due to international competition from Asian countries, notably Taiwan and Thailand. By 1985, the production of canned pineapple was completely abandoned, and pineapple was mostly exported fresh (see also previous sections).

Currently, most of the pineapples that go through processing are processed into pineapple juice. This is done by companies such as Atou, which commercialises its flagship brand *Ivorio* in national and

regional markets. Italian-owned Comafruit produces pineapple concentrates that are exported to the European and American markets. Cocopack produces frozen pineapple concentrate and frozen pineapple chunks for export (Table 12). Small- and medium-sized processing units (SMEs) are Boisson d'Afrik, Canaan Foods Service (CFS), Les Jus Pure, and Savannah. An overview of all the processors is given in Annex III.

Cocopack is the most sustainable producer, and regeneration of heat and bio-generation of the produced waste materials to generate electricity is part of the factory design (Nugteren, 2018). They are currently also going for IFS certification.

Table 12 Overview of main pineapple processing units in Côte d'Ivoire

Processing Unit	Location	Pineapple Products	Markets
COMAFRUIT (Golden Boys SARL)	Italy	Pineapple juice and concentrate	Europe and North America
ATOU	Bonoua	Pineapple juice (80% of the activities), other juices (mango, guava, ginger, passion fruit), mixed tropical fruit juices	Mainly domestic and regional markets
COCOPACK	Grand Bassam	Organic, juice, pulp, frozen fresh cut pieces, frozen 'carpaccio', 'kebab' and chunks	Europe (France), Israel
SMEs: Boisson d'Afrik, Canaan Food Service (CFS), Les Jus Pure, Savane	NA	Pineapple juice and mixed juices	Domestic and regional market
Artisanal: Le Banoua, Jus Paly, Carol's	NA	Jams, juices, marmalades, etc.	Domestic markets

Source: (OBAM-CI)

Dried pineapple is produced on a small scale by those who also process mangoes, such as Ivoire Organic, Rescan Industrie, La & Jab Côte d'Ivoire, Les Jardins de Koba as well as Swiss-owned company HPW. Les Jardins de Koba and Ivoire Organics produce organically, as will likely HPW when they become fully operational.

3.3.3 Coconut value chain

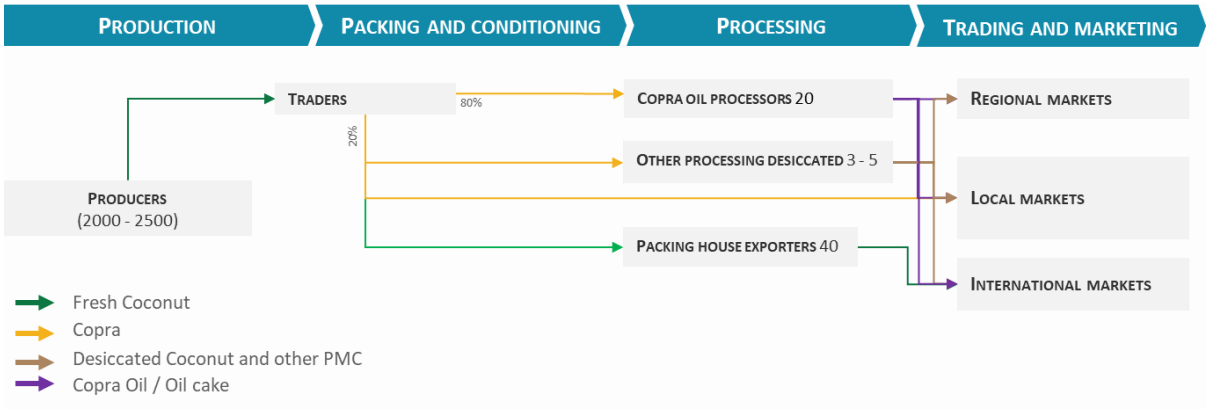


Figure 36 Simplified value chain map coconut

The coconut value chain in Côte d'Ivoire is one of the least-organised agricultural supply chains in the country. There are no unions or sector organisations. At producer-level, there are six producer cooperatives, a little over twenty processors/mills and nine exporters (see tables below and Annex).

Table 13 Coconut cooperatives in Côte d'Ivoire

	Producer Cooperatives	Location
1	SCOOPS-PROCOA Société Coopérative Simplifiée des Producteurs de Coco d'Audoin	Abidjan
2	ADOUVLAIS COOP-CA ADOUVLAIS Société coopérative avec conseil d'Administration	Aboisso
3	ATTAFE coop-ca Société Coopérative avec conseil d'Administration ATTAFE de Grand-bassam	Grand Bassam
4	COOPC 3A SCOOPS Société Coopérative des Producteurs de coco des Alladjans, Ahizis et Akoué, Société coopérative Simplifiée	Jacqueville
5	SCOPCY SCOOPS Société Coopérative des Producteurs de coco de Yaokro Société Coopéiorative Simplifiée	Village V2 SICOR grand Lahou
6	CPCS SCOOPS Société Coopérative des producteurs de coco de Sassandra Société Coopérative Simplifiée	Sassandra

Source: (FIRCA)

Historically, the large commercial processors were vertically integrated into the supply chain and owned large coconut groves. They provided technical assistance to village planters in out-grower schemes. This has all gone now and there is currently very little invested into the sector.

The *pisteur* buys all the coconuts from the plantation, because quality and size can only be assessed once the husk is removed. There are two grades: first and second. Specs include size, the overall state of the nut, if it has not been damaged, if there is still water in it, and if it has not started germinating. About 60%-65% of a hybrid variety is normally first grade and suitable for export (Van den Broek, et al., 2016). The exporters tend to be small, independent businessmen who are often also involved in mango and pineapple exports. Second-grade coconuts are normally processed into copra by the traders. The flesh is removed from the shell and is packed in jute bags and sold to local copra oil factories, or it is exported as copra to the factories in Ghana (Van den Broek, et al., 2016). One second-grade nut yields, on average, 0.13 kg of copra.

There were three main agro-industrial companies active in the coconut sector and owned plantations: SICOR, *Compagnie Agro-industrielle pour l'Importation et l'Exportation* (CAIMPEX) and *Compagnie des*

Produits Agricoles (COPAGRI). Out of the three mentioned earlier, only SICOR is specialised in the coconut processing, mainly producing shredded coconut.

A land dispute in 2006 with different village populations in the coconut grove areas of Jacqueville, Grand-Lahou and Gliké forced SICOR to close its doors and file for bankruptcy. In 2016, an agreement was reached between the coastal communities of Jacqueville and Grand-Lahou through government intervention, allowing SICOR to restart its operations, which included an investment of €9 million (JDA, 2016). SICOR announced its comeback a few years ago, but it is still not operational on the ground. It seems that there is still animosity between the company and the villagers managing the coconut groves (Abidjan.net, 2017).

It is important to note that none of the commercial companies are really operational to date. So, all of the coconut currently produced originates from small village coconut groves.

Next to the companies mentioned earlier, there are around 20 companies involved in copra oil processing, of which 20% have large processing capacities of about 50 tonnes per week, and the smaller ones have capacities of around 10 tonnes per week. The main copra oil processing companies are: SICOR, CAIMPEX, HUTROCI, MIPC, Cocopack, SOCORAPCI, COPROIL, COHUIDI.

Cocopack is the only processing company regularly exporting processed coconut products to Europe. Exports equal to about 20% of its total production. It is also one of the few companies producing, in addition to coconut oil, coconut milk, coconut water and desiccated coconut. There are some small-scale processors that are experimenting with virgin coconut oil, desiccated coconut and coconut vinegar, but in terms of volume, it is quite negligible.

There are a few reasons why export to Europe is limited. One is that the domestic and regional markets are more interesting growth markets with less compliance issues than a European market and a more favourable competitive environment.

Therefore, the coconut processing industry in Côte d'Ivoire is currently struggling to compete with the fresh coconuts exporters. Unlike other fresh products exported, such as unprocessed cashew nut, the fresh coconut is not taxed for export. This has encouraged the export of fresh coconut over processed coconut products.

3.4 Stakeholder Mapping

3.4.1 Governmental Organisations

An overview of all local governmental organisations is given in Annex III.The focus of the ministries in Côte d'Ivoire is mainly on commodities such as coffee, cocoa, palm tree and rubber, which are sectors mostly dominated by international companies.

Very little is done concerning tropical fruits. Food processing falls under two ministries: *Ministère de l'Agriculture et du Développement Rural* (MINADER) and *Ministère du Commerce, de l'Industrie et de la Promotion des PME*. There is no formal working organ, like an inter-ministerial committee between the two ministries. Currently, the *Ministère du Commerce, de l'Industrie et de la Promotion des PME* is the focal point for everything related to food processing.

Conseil National des Exportations (CNE) is a consultative institution that works in association with the *Association pour la Promotion des Exportations* (APEX-CI) and the *Chambre de Commerce et d'Industrie* (CCI). It was established by the *Ministère du Commerce, de l'Industrie et de la Promotion des PME*. One of their goals is to diversify exports from cocoa and coffee. The CNE is in charge of implementing the

National Strategy of Exportation 2015-2020, which has identified six sectors*: ITC services, rubber, textiles, cashew, cassava and tropical fruits.*

Next to the above agencies, the *Agence Côte d'Ivoire des PME* (CIPME) is also worth mentioning. It is a government agency explicitly founded for the operational support of SMEs. Agence CIPME supports SMEs in their business. SME support projects are backed up by government funding and donor agencies. They also have a business incubator centre where they provide different activities, such as training, information sessions and networking activities.

Government programs that will encourage tropical fruit processing are, among others:

- *Projet d'Appui au Renforcement de La Compétitivité du Secteur Industriel (PARCSI)* by the African Development Bank (AfDB) is implemented by the *Ministère du Commerce, de l'Industrie et de la Promotion des PME*. A total of €15m supports the implementation of the Ivorian programme for the restructuring and upgrading of enterprises and the national export strategy. The project will provide technical assistance to 150 companies that have adhered to the programme and will promote investments in the fruit and vegetable sector in order to increase the rate of industrial processing. It also aims to strengthen the competitiveness of the companies and products
- *Projet de Pôle Agro-industriel de la Région du Bélier (2PAI-Bélier)* is the first agro-industrial pole project that the African Development Bank (AfDB) has financed. MINADER will be the executing agency for the project. Its goal is to revitalise agriculture around multiple value chains (rice, maize, cassava, vegetables, etc.) by promoting an integrated approach and providing the region with key infrastructures capable of promoting the development of agricultural and agro-industrial activities (hydro-agricultural developments, tracks, etc.), while providing better living conditions for the populations concerned (drinking water, school canteens, health facilities).
- Through its agency for the management and development of industrial zones, *Agence de Gestion et de Developpement des Infrastructures Industrielles* (*AGEDI*), the Bonoua industrial zone is intended as an important agri-food zone. The goal is to attract companies or industrial groups that will develop value-added activities. Furthermore, the first free zone of Côte d'Ivoire is slowly becoming operational and is called *Village des Technologies de l'Information et de la Biotechnologie* (*VITIB*). This is an interesting initiative because it has an innovation component. Cocopack has already secured land in this area in order to extend its processing lines. SOCORAPCI and COHUIDI have production units in the Yopougon Industrial Zone and FENACO Fruitel is seeking to build a processing plant in the Bonoua Industrial Zone.

Even though initiatives are ongoing, the stakeholders interviewed in the fruit processing industry find that there is little to show for it. They find that the institutional framework does not support the set-up of food processing SMEs and start-ups. It seems to mainly target the larger commodities, such as cocoa and cashew, and it is said that the government focuses on large projects in order to be able to show quick wins/impact for political gain.

SMEs, in particular, need access to finance, information and an enabling export environment. The latter is currently not sufficiently in place. There are too few incentives in place for fruit processors and too many inefficiencies to overcome. Companies who have just started up business or even those already in business for 30 years who want to grow and extend, struggle with all the lengthy procedures set up by the government administration, which slow down their activities by years. Additionally, incentives are not always there. For example, fresh coconut exports do not carry any levy, allowing it to easily compete with the processed products. If there are incentives to obtain benefits, for example, mango processing equipment, they are lengthy and tedious and do not always come through.

Lack of information is an important constraint. Market intelligence on fruit processing is very limited and figures vary greatly. It is difficult for the government to develop any sensible policies if this data is missing. Similarly, the SMEs feel they are not informed well enough about the agencies or policies and regulations that are in place and that could potentially support them.

3.4.2 Trade & Labour Unions

In the larger agricultural sectors, such as cocoa and palm oil, the labour unions are quite well organised. The other sectors do not have dedicated labour unions in place. Below is the list of relevant trade and labour unions for the targeted value chains:

Table 14 Trade & labour unions in Côte d'Ivoire

Trade & Labour Unions	Role & Activities in the Value Chain
CGECI - Confédération Générale des Entreprises de Côte d'Ivoire	CGECI has 26 member institutions and 2000 member companies. Among its member institutions, CGECI's objective is to improve the entrepreneurial ecosystem and act as an interface between the public and private sectors. Recently, CGECI received an additional mandate: promoting entrepreneurship.
MPME - Mouvement des Petites et Moyennes Entreprises Côte d'Ivoire	MPME is an employer's organisation of SMEs and SMIs with a trade union vocation. Its purpose is to defend the interests of its members.
FIPME - Fédération Ivoirienne de Petites et Moyennes Entreprises	With more than 20 professional associations and more than 5000 SMEs throughout the country, FIPME aims to defend the interests of its members and ensure respect for professional ethics in order to guarantee the safety, unity, cohesion and credibility of the Federation.
Worker's labour union in the agriculture sector	• Syndicat National des Travailleurs Agricoles Privés et Assimilés de Côte d'Ivoire (SYNTAPAC) • Syndicat National des Agents du CNRA (SYNA-CNRA) • Réseau Des Operateurs Economiques Du Secteur Agroalimentaire • Syndicat National des Travailleurs Professionnels du Négoce Café, Cacao, Cola et Connexes de Côte d'Ivoire (SYNTRAPRONEC- CI) • Réseau des femmes syndicalistes de Côte d'Ivoire (REFSY-CI)

3.4.3 Service Providers

A full list of service providers in Côte d'Ivoire is provided in Annex III. Below, the most important ones have been highlighted.

3.4.3.1 Logistics

Bolloré supports exporters throughout the entire transport chain, from transit formalities to the shipment of goods to the port of destination, and it will also soon provide services for airfreight. Eolis and AEL are subsidiaries of the French group Compagnie Fruitière (SCB). They generally work with OBAM-CI members and offer two boat departures per week to European ports.

Local transport infrastructure in Côte d'Ivoire is poor. The vast majority of the infrastructure is old, unreliable, slow and unable to cope with the transport volumes. The same trucks are used for all crops. Vehicles often break down on the road. During the cashew mango or coffee/cocoa harvesting season, it is difficult to find carriers for other off-season crops, especially if they need to be refrigerated. 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 (Van den Broek, et al., 2016). Often, there is congestion at the port.

3.4.3.2 Finance

The World Bank scores Côte d'Ivoire 44th (2019) on the criteria of Getting Credit as part of Doing Business. This is up 40% percentage points since 2018. As of late-2018, Côte d' Ivoire had 27 active banks. As the largest economy of the eight-member *Union Economique et Monétaire Ouest Africaine* (UEMOA), it has the highest number of banks and a regional market share of over 31% (Oxford Business Group, n.d.).

Though the official ratings for access to credit are good (World Bank), the SMEs that were interviewed mentioned finance as a major bottleneck. Especially in relation to long-term loans for the larger investments needed to upgrade processing facilities. High interest rates, unrealistic guarantees, products not adapted to the agricultural processing sector and lack of political will were all mentioned as constraints. Financial institutions and investors have many alternative industries and crops to choose from, and the lack of leadership and organisation within the sector does not help with obtaining the financing needed.

Most sectors get some support from Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles (FIRCA), which finances the extension services and the research of different agricultural sectors. However, as the coconut sector is not affiliated with FIRCA, activities need to be financed through the Solidarity Fund, which is funded by sectors such as rubber, oil palm, cotton and cashew nuts.

Currently, the largest contributor to the sector is probably GiZ, through the German government. Before the crisis, CBI supported Cocopack.

Box 1: Examples of funds that are supporting or could potentially support the targeted sectors:

The Competitive Fund for Sustainable Agricultural Innovation (FCIAD), worth 5 billion FCFA (€7.5m), aims through the funding of innovative applied research projects to contribute to the sustainability of agricultural production systems in Côte d'Ivoire over a pilot period of three (3) years. FIRCA has been designated by MINADER as the technical and financial implementation agency of the FCIAD.

In 2017, the Fund for the Promotion of SMEs and Women's Entrepreneurship was set up to facilitate access to bank credit for female entrepreneurs, mainly micro-enterprises. The initiative is a tangible boost to financing for women, advancing financial inclusion. A financing envelope of 5 billion FCFA was made available to the State of Côte d'Ivoire by the Banque Centrale Populaire du Maroc (Banque Atlantique, 2018).

The South African Grofin Investment Fund, which has operations in Côte d'Ivoire, provides financing and supervision to the SMEs, while still allowing its managers to maintain control. They invest in education, healthcare, agri-business, manufacturing and key services (water, energy and sanitation) (GroFin, 2018).

The Farm and Coop Investment Program (FCIP) in Côte d'Ivoire develops the capacity of farmers and cooperatives and supports them with financial products adapted to their needs, including digital loans, insurance and accessible mobile money accounts.

The Deutsche Investitions und Entwicklungsgesellschaft (DEG), a subsidiary of KFW with offices in Abidjan, has been successfully financing companies that are investing in emerging markets and developing countries. They have been supporting, among others, Ivoire Organic. They provide long-term investment capital in the form of loans or equity combined with expert advice. In sub-sahara Afrika it has a portfolio of 1,857 million EUR (DEG, 2019).

3.4.3.3 Certification standard organisations

Three groups of certification standards can be identified: ethical/sustainable such as (i) Rainforest Alliance (RA) and Fairtrade, (ii) organic and (iii) food safety.

Ecocert IMOSwiss ensure most of the organic certification in Côte d'Ivoire, which is managed from its office in Burkina Faso. There is only one organic auditor in Côte d'Ivoire. Generally, the auditors have to come from outside of the country, which is also reflected in the prices of the audits. The largest organic certified sectors are coffee and cocoa. The organisation nitidæ was the first to support cooperatives in getting organic certification. From the Ecocert IMOSwiss and USDA website, the following certificate holders could be identified; note that this list is not exhaustive.

Table 15 Certified organic companies in pineapple, coconut and mango

Company	Organic product
Bio-Soleil Côte d'Ivoire (BSCI) SARL	Fresh pineapple
IFRUITROP	Fresh mango
Les Jardins de Koba	Dried pineapple, banana and mango
SCOOPS Union des Producteurs de Fruits et Legumes de Asse	Fresh pineapple
Pronatura (Togo based exporter)	Fresh pineapple, fresh mango, dried pineapple, dried banana and dried mango
SCOOPS Cooperative des producteurs agricole de Korhogo	Fresh mango
Ranch du KOBA	Mango, pineapple and squash
COPROIL SARL	Coconut

Certification for the ethical and sustainable standards, such RA/UTZ, Fair for Life, Fair Wild, can be audited by Ecocert IMOswiss, Africert and NEPCon. For bananas, RA is quite big. However, in the targeted value chains, these certifications are less common, at least in Côte d'Ivoire. There are five mango exporters who are RA Certified (see also Annex) and one in the coconut sector (Société de Diverses Prestations et d'Exportations). The other certificates do not seem to be present in these sectors.

The main certification bodies that are licensed to conduct food safety audits (e.g., BRC, HACCP, FSSC 22000, Global GAP, IFS) in Côte d'Ivoire are (including those listed above) Bureau Veritas, SGS, Control Union (West-Africa), Bureau Norme Audit Côte D'ivoire (BNA), Intertek and Cotecna Inspection. GLOBAL GAP is the most common certificate held by the processors in Côte d'Ivoire, though it is still held by a minority. It was not possible to check the Global GAP databases. Therefore, the exact numbers are not known. There are no BRC, FSSC 22000 certificate holders outside of cocoa in Côte d'Ivoire.

3.4.3.4 Packaging

Different packaging companies exist in Côte d'Ivoire. However, many challenges were mentioned with regards to the processing industry. Generally, there is a lack of availability, lack of diversity and prices are high.

Support was requested for finding packaging innovations (R&D), preferably by using local materials, but within the specs of international requirements. In addition to that, affordable design and quality of printing were mentioned as constraints by some of the SMEs interviewed.

3.4.4 International Organisations and Projects

There are many international organisations active within Côte d'Ivoire. They are either targeting crops that contribute to local food security or cash crops, such as cocoa, cashew and cotton or fresh produce. Very few international organisations promote fruit processing.

There are a few current programs and organisations in Côte d'Ivoire that are related to the selected PMCs:

- Hortifresh is a programme supported by the Embassy of the Kingdom of the Netherlands, which has prioritised commercial agriculture in its strategic plan of moving from aid to trade. As part of its programme, Hortifresh supports the mango sector, which also includes capacity building in processing. Hortifresh also has an innovation fund, which can include value-addition initiatives such as tropical fruit processing. It has not done so yet because it has not received an application that passed their selection criteria. Hortifresh is, however, still keen to invest in processing.
- 2SCALE is funded by the Netherlands government and implemented by SNV, IFDC and BoPInc. The programme just launched its next phase and is currently in a diagnostic phase. It aims to strengthen market linkages in the value chain, and it includes Burkina Faso, Mali and Côte d'Ivoire in its scope. 2SCALE is still doing its scoping studies and has not yet determined its exact intervention. The main focus in Côte d'Ivoire will be food security, smart agriculture and inclusiveness (youth and women in processing). The programme runs from 2019-2023 and has shown an interest in collaborating with a potential export promotion programme.
- ITC/UNIDO/ECOWAS - The United Nations Industrial Development Organisation (UNIDO) and International Trade Centre (ITC) are supporting Economic Community of West African States (ECOWAS) with the implementation of the EU-funded West Africa Competitiveness Programme (WACOMP). The objective of WACOMP is to strengthen the competitiveness of West African countries and enhance their integration into the regional and international trading system. To reach this overarching goal, the programme will work to improve the performance, growth and contribution to industry, regional trade and exports of selected value chains (such as mango), and to improve the business climate at national and regional levels.
- Sequa GmbH is a German non-profit organisation that is running two projects in Côte d'Ivoire:
    - ARCHIPELAGO (January 2019 – January 2023) EUR15m. This an African-European Technical Vocational Education and Training initiative that addresses youth and vulnerable groups' employability and aims to strengthen the entrepreneurial skills of managers of existing and future MSMEs. The programme organises supports and finances relevant partnership projects contributing to the programme objective. Each partnership project is to last 20 to 32 months and will have a budget of EUR 400,000 to EUR 600,000. The first call is expected in the first quarter of 2019. Countries benefiting from the project include the target countries of this analysis. The grant covers 100% of the total eligible costs of the action more information here.
    - Import Promotion Desk (IPD) (Phase 3) July 2018 – June 2021. The IPD brings together the interests of German importers with those of exporters in emerging growth markets. By giving small- and medium-sized enterprises from selected partner countries access to the European market, they support the creation of jobs and the expansion of export capacities of among other Côte d'Ivoire and Ghana. €6.8m is financed by Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ).

- BDEx *Bundesverband des Deutschen Exporthandels e.V.* is the umbrella organisation of German foreign trade. They will provide capacity building services to Inter-Mangue for a period of two years and collaborate herein with sequa/IPD.
- nitidae, a French-owned consultancy company with multiple offices in different countries in Africa has built up significant expertise in certifications (including REDD+), processing, digitisation of value chains, agro-processing waste recycling, mobile market information, etc. Though they are a commercial company, their expertise is of great value, especially in the mango and pineapple sectors.

3.5 Opportunities and Challenges

3.5.1 Mapping of Value Chain Challenges

Below are the main challenges identified in each of the value chains as a whole and the challenges that are cross-cutting and touch upon the enabling environment of the processing industry. Green indicates what can be resolved in the short term and orange indicates what would require a long-term approach.

3.5.1.1 Cross-cutting challenges

Finance	Lack of access to affordable finance	Lack of information on financing products by SMEs	Lack of knowledge by financial institutions of the processing industry
Quality	Limited knowledge of international food safety standards	Consistency of quality and quantity	Lack of knowledge of processing techniques
Human capital	High labour costs	Labour conditions in processing, especially in coconut	Risk of forced and child labour in agricultural production
Market intelligence	Limited and unreliable data on tropical fruit processing industry	Market data not available at the processor's level	
Infrastructure	Poor roads	Quality processing equipment difficult to come by	
Transport	High cost of transport	Low quality of transport creating high losses	
Packaging	High costs of packaging	Availability and quality of suitable packaging material	
Government support	Lack of policies implementation incentivising fruit processing	Long administrative procedures to set up or expand processing business	
R&D	Limited product innovation and diversification in processing		

(Green: solvable <5 years; yellow: solvable >5 years; red: not solvable)

3.5.2 Demand

Market demand for processed mango and pineapple differs between the segments:

- Dried tropical fruit has a steady and growing demand, but increasing the supply creates the risk of flooding the market as the demand volumes though growing are still limited in competition, see also section 2.2.1
- The European juice market is declining, which affects the demand for purées and concentrates.
- The market for frozen fruit is large and growing, but it is complex.

Coconut products, with exception of coconut oil, show a steady market growth, see also sections 2.2.6 and 3.2.3. However, the European product food safety requirements are difficult to adhere to as the products are easily contaminated and need very hygienic processing environments.

A strategy to diversify products and product segments would need to be made for Côte d'Ivoire or combined with the other two target countries. This means that more detailed market intelligence would be needed to help build an adequate marketing strategy.

More information on the challenges and opportunities on the demand side can be found in Annex VIII.

3.5.3 Supply

Challenges for processors are very similar for each of the value chains and can be summarised as follows:

- Lack of (access to) market intelligence on processed fruit products
- Lack of knowledge on buyer specs, including certification
- Lack of knowledge on Côte d'Ivoire export and European import rules and regulations
- Limited number of products on the market, lack of product diversification and new product development (NPD)
- Lack of international market competitiveness because of the high costs of production
    - Low productivity
    - High labour, transport and packaging costs
- Lack of knowledge on the availability of financial products for SMEs and how and where to access them
- For pineapple and coconut, lack of raw material and declining production
- Packaging materials: not available, no diversification and high prices
- Unfavourable enabling environment for the setup of processing plants (no or limited government incentives)
- Lack of organisation within the tropical fruit processing industry as a whole

3.5.3.1 Mango

Within the mango supply chain, stakeholders have identified that most of the challenges are on the production side. Pests and diseases reduce the length of the season and create large losses. These are also causing health issues with the growers and labourers. Processing is still in its early stages and the most important constraint mentioned was related to the difficulty to set up and expand a business, mostly due to long governmental procedures and regulations.

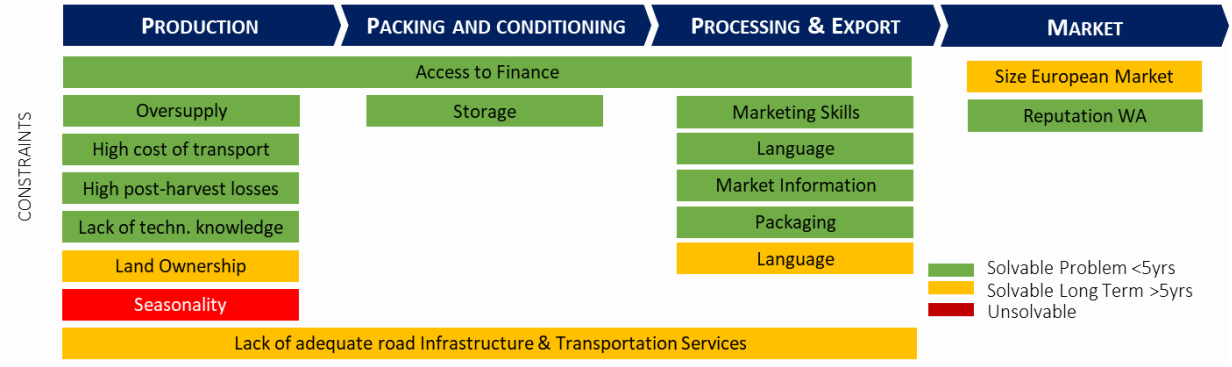


Figure 37 Mapping of key challenges in the mango value chain

Out of the three value chains, however, the most promising is the mango sector. This sector creates the most opportunity because:

- Level of organisation. The newly established inter-professional organisation (Inter-Mangue) seems to be proactive and is being supported by different organisations
- Strong position of mango from West Africa (processed and fresh) on the European markets
- Sufficient availability of quality raw material (over-supply)
- International partners supporting the sector
- Government support (even though this is still limited)
- Can provide an outlet for products from landlocked Burkina Faso and Mali in a joint programme, especially when the region becomes more insecure, which could hamper exports from the region

3.5.3.2 Coconut

Coconut offers many more market opportunities than the other processed fruit products, e.g., desiccated, coconut flour, coconut milk, coconut water. The main constraint for the sector is that the level of organisation is limited throughout the chain, which decreases the attractiveness of the sector for investments and other potential support.

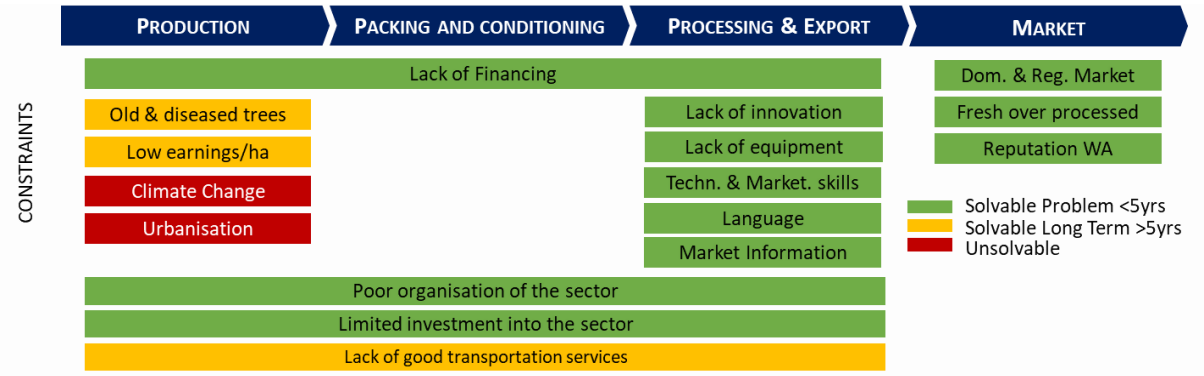


Figure 38 Mapping of key challenges in the coconut value chain

Coconut processing has the additional challenge that coconut products are sensitive to contamination. Therefore, the processing equipment and the related food safety and quality standards of the plant need to be at the highest level if products are to be exported to Europe. This is a serious challenge for almost all of the processing SMEs in the country.

Therefore, the supply of raw material is declining, and this does not seem to be easily resolved because of climate change and urbanisation. Investments would need to be made to introduce high-yield, disease-resistant varieties.

Opportunity lies in the willingness of the sector to organise itself. Also, it offers the opportunity for the mango processors to process coconut into desiccated/dried coconut during the mango off-season. Therefore, taking into account that there is strong competition from the Asian countries as well as Ghana and that contamination is still a risk, a high level of control of food safety processes would be required throughout the chain from production onwards.

The coconut actors that were attending the validation workshop held in Côte d'Ivoire showed interest in initiating the setup of an inter-professional organisation, such as Inter-Mangue in Mango. Interventions for supporting the organisation of the sector would be much welcomed as a first step to address the challenges within the sector.

3.5.3.3 Pineapple

A major challenge lies in production because of a lack of interest in pineapple from growers. This ultimately leads to a lack of raw material for processing. Linked to this is the lack of organisation within the sector and throughout the value chain.

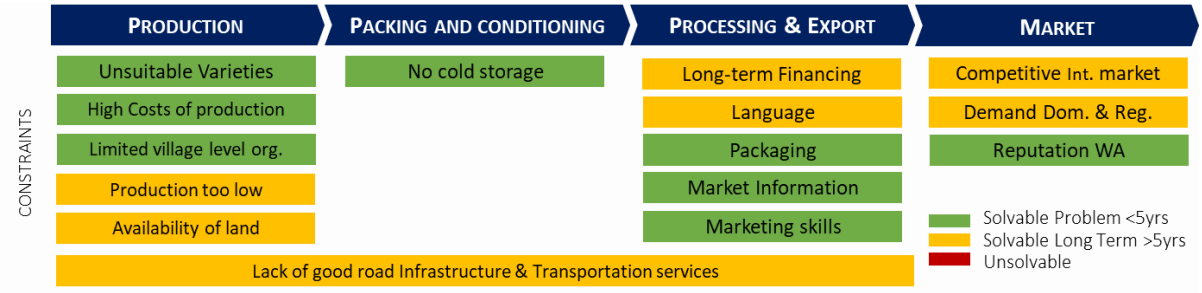


Figure 39 Mapping of key challenges in the pineapple value chain

Pineapple is mainly processed into juice for the local and regional markets. Knowledge of different processing techniques and the availability of the right processing equipment are the constraints specific to pineapple processing. Looking at the attractiveness of the markets, most opportunity would lie in promoting frozen and possibly purées.

Also, opportunities lie in combining pineapple processing with the mango processing sector. It would help mitigate the challenge of the seasonality of the mango processing and support the pineapple processing sector.

Another opportunity would lie in supporting the independent pineapple growers and processors in organising themselves.

3.5.3.4 Enabling Environment Fruit Processing

The enabling environment for the processing industry and export of tropical fruits is lagging behind the commodities of coffee, cocoa and cashew. The government strategy and the export strategy both need to be implemented in order to support investments in the transition to add value to the fresh produce. Opportunities lie in supporting the government in obtaining better information on the sector and supporting them in policy development and implementation.

There is a lot of investment capital in Côte d'Ivoire for different agricultural industries, but there are almost no affordable financing solutions for the fruit processing industry. Most of the processors have fully financed their operations using their own financial means or have received financial support from subsidy facilities, such as the Dutch PSI fund. Opportunity lies in bringing processing industries and

financing sectors together and supporting the processing SMEs in understanding the requirements for financing.

A better organised processing industry would help support the development of the sector and opportunity would lie there. More information on challenges and opportunities on the supply side can be found in Annex VIII.

3.5.3.5 Cost of Production

The costs of production and processing in Côte d'Ivoire are quite high. Competition comes from both regional markets as well as from Asia and the Americas. There is much to be gained in terms of efficiencies in the value chain, as well as in logistics related to road infrastructure and improvements in transportation means.

3.5.3.6 Organic

As many of the crops in Côte d'Ivoire are organic by default, and since the processing industry is still in its early stages, there is an opportunity for Côte d'Ivoire to be a large producer of organic processed fruit products, as Cocopack has also shown. However, there are some challenges, such as the costs associated with conversion to organic and the audits (auditors come from outside of Côte d'Ivoire). There is also limited availability of organic fertilisers and pest-control products.

3.5.3.7 Products 'free-from'

In Asia, many of the fruits (juices, concentrates, pulp, etc.) are processed with sulphites added to the exported products as a food preservative and enhancer. Sulfuring and sulfite dips are among the cheapest and most effective methods for protecting fruit against microbes and browning. The 'free-from' health trend very much promotes the use of products without these sulphites. Côte d'Ivoire being a relatively new origin for fruit processing could tap into this trend from the start. It would, however, mean investments in R&D, as sugars and sulphuring help improve the shelf life of the products.

3.5.4 Competitive Environment

Taking Porter's five forces for the different products, the following analysis can be made:

Table 16 Analysis of Mango, Pineapple and Coconut using Porter's Five Forces model on EU Market

	Pineapple products	Coconut products	Mango Products
Competitive Rivalry	**High** – Côte d'Ivoire is very small in processing and is competing with Costa Rica and the Philippines	**High** – Côte d'Ivoire is very small in processing and is competing with low-cost, efficient, Asian producers of coconut	**Medium –** Not too many mango producing countries with the right qualities. Competition, especially coming from neighbouring countries
Supplier Power	**Low –** production is too low to be of value to most buyers, switching costs are low	**Low –** production is too low to be of value to most buyers, switching costs are low	**Low –** production is too low to be of value to most buyers, switching costs are low
Buyer Power	**High –** limited number of European buyers and can easily switch	**High –** limited number of buyers and can easily switch	**High –** limited number of buyers and can easily switch

	Pineapple products	Coconut products	Mango Products
Threat of Substitution	**High –** many other tropical fruits could substitute	**Medium/High –** coconut products are slightly more difficult to substitute as there is a certain uniqueness to the product	**High –** many other tropical fruits could substitute
Threat of new entry	**Medium** – Barriers are relatively low to start up operations. However, entering the EU market is more challenging	**Low/medium –** coconut products suitable for EU market need a high level of food safety control measures in place. Therefore, it is a relatively high investment	**Medium** – Barriers are relatively low to start up operations. However, entering the EU market is more challenging

To compensate for the limited supplier power, high buyer power and threat of new entries, the processing industry should target products and segments for the EU market that are unique and target the niche markets. Think of organic, frozen products, 'free-from' and certified for food safety and sustainability standards. It would require higher level of organisation within the sectors to adapt to such a strategy and to be able to comply with the standards of these niche markets.

3.5.5 CSR

3.5.5.1 Youth & women

Though there is some information on youth and female employment, the information is limited and does not form an adequate basis to provide concrete intervention activities. Therefore, an opportunity lies in a study on current female and youth employment and their working conditions in tropical fruit processing, so that targeted interventions can be developed.
For youth, this could result in activities such as promoting youth entrepreneurship/self-employment, vocational training to reinforce production and processing capabilities and develop business support organisations to the sector. Also, it would be important to work on strategies that integrate the ideas of youth so that it includes their needs. Supporting the inter-professional organisation in mango processing would be a start.

A potential partner, if an intervention was to be considered, would be sequa gGmbH, especially for the implementation of the recommendations from the study.

3.5.5.2 Child labour & child trafficking

In Côte d'Ivoire, child labour is high on the political agenda and any interventions in the agricultural value chains should be considerate of child labour issues. Côte d'Ivoire's First Lady has made eliminating child labour her "primary commitment".

Having said this, child labour and child trafficking has been most prominent in the cocoa sector. This is mainly due to international exposure and campaigns against child labour on cocoa farmers. However, other sectors, including pineapple and mango, have also been mentioned in different reports and during stakeholder interviews as being at risk of child labour. Risks exist at production level, e.g., applying chemical fertilisers, spraying of pesticides, felling trees, burning and clearing fields, and during harvesting in the mango season. For now, it is unclear if child labour is an issue in processing.

Below are the figures related to child labour from the US Department of Labor (USDOL), which closely monitors this issue.

Table 17 Statistics on children's work and education

Children	Age	%
Working (% and population)	5 to 14	31.5 (1,682,754)
Attending School (%)	5 to 14	63.5
Combining Work and School (%)	7 to 14	21.5
Primary Completion Rate (%)		65.9

Source for primary completion rate: data 2016, published by UNESCO Institute for Statistics, 2018. Source for other data: Enquête Démographique et de Santé en Côte d'Ivoire (EDSCI-III), 2011-2012.

Source: (USDOL)

According to USDOL, in 2017, Côte d'Ivoire made a significant advancement in efforts to eliminate the worst forms of child labour. The government adopted a revised Hazardous Work List that includes prohibitions against children using sharp tools and working in mining, as well as new regulations on Light Work. The child labour monitoring system, SOSTECI, was expanded into 19 new communities and the government launched SOSTECI (2018 – 2020), which aims to expand the system into 33 new departments.

Next to child labour, child trafficking is also considered a risk in Côte d'Ivoire as there are many migrant labourers, and many children are said to travel from neighbouring West African countries (such as Burkina Faso and Mali) to work on agricultural plantations (USDOL, 2017). No specific data, however, could be found on this to confirm it.

Key organisations in Côte d'Ivoire working on addressing child labour are CARE, Save the Children, CNS, UNICEF and ILO. Key social programmes in place to combat child labour can be found in Annex VI. However, none really focus on sectors outside of the large commodities. Due to the limited data available, it is suggested to conduct a follow-up study on this topic for all of the three countries, thereby not only looking at production and harvest, but also at processing.

Child (forced) labour and the related child trafficking is a serious issue in Côte d'Ivoire within the agricultural sectors. For example, see also a recent article in the Washington Post dated June 5th 2019 on child labour in the cocoa industry, where children have crossed the Burkina-Côte d'Ivoire border to work on the plantations (Whoriskey & Siegel, 2019). However, very little is known about child labour within the targeted sectors, especially when going into processing. This is something that would need to be further investigated. According to the stakeholders we spoke to, a good starting point would be sustainability certification.

3.5.5.3 Waste

Processing comes with waste. Collaborations can be sought with the aforementioned companies to process waste into by-products, such as Lono and Greencountries. Also, MVO Nederland has some experience in studies related to by-products, specifically in pineapple. Hortifresh and 2SCALE are two other potential partners that have the means to support initiatives in this area.

3.5.5.4 Environmental footprint

It is important to ensure that environmental awareness is raised within the support provided to the SMEs.

A focus on tree crops does reduce the potential environmental impact. Thereby, the second-largest impact is transportation. In the interventions, the environmental impact of the different PMCs will need to be considered, and this is especially related to the transport of the product. The closer the processing facilities are to the production areas, the smaller the impact. Preference should be given to sea-freight

over air-freight to minimise the environmental impact. Studies on the impact of different (by)products and packaging options should help guide the sector in making choices that are least harmful to the environment. REDD+ certifications, though lengthy processes, are opportunities that could be looked into for the longer term. The French consultancy company nitidae could help support this.

3.6 Conclusions Côte d'Ivoire

There does not seem to be a reason why Côte d'Ivoire should not have a flourishing fruit processing industry, especially for the mango supply chain, which has a high over-supply and post-harvest losses, stricter EU phytosanitary rules for fresh products, and plenty of investment capital in the country. For coconut, there is also potential, proven by a clear growth in market demand for coconut products.

However, Côte d'Ivoire has a very limited processing industry. This is mainly due to the strong focus on the more profitable cocoa, coffee and cashew commodities, which bring in more investments in capital as well technical support. From the analysis, and validated by the workshop in Abidjan, it became clear that the problems and solutions with regards to processing play out across all of the tropical fruit value chains. As a processor often processes more than one fruit type, it therefore also makes sense to look at the entire tropical fruit processing industry, instead of just focusing on one value chain.

3.6.1 Mango

Based on the analysis, the mango value chain is found to have the most potential in the short term to be further developed into a possible export promotion programme. This would focus on the following activities:

- Diversification of products (frozen, purées, fresh-cut, etc). Pineapple (and other fruit products) could be included in this, as it would allow for processing throughout the year.
- Training and support on lobbying on fiscal and tariffs mechanisms that encourage the processing, exports and consumption of tropical fruits (not just focusing on mango).
- Connecting the sector to the different financial institutions and incubators.
- Business export coaching activities, whereby a clear partner would be IPD.
- Marketing and branding.
- Because of the high costs of production, the most promising markets would be the niche markets (high-quality, 'free-from' and certified). However, this requires a high level of organisation and technical capacity from processors, many challenges would need to be overcome at that level, and training and access to adequate processing materials would be crucial.
- Certification.
- When it comes to packaging, processing faces the constraints of lack of availability, lack of diversity and high prices. Support would be needed in packaging innovations (R&D), preferably by using local materials, but within the specs of international requirements.

While the processed fruits and, specifically, the mango sector in Côte d'Ivoire have potential, the following risks need to be considered in a programme:

- Inter-Mangue is already supported by different organisations, including BDEx. Care should be taken to ensure that the activities are complementary, and that the organisation is not over- or double-funded, as it is also a very young organisation.
- The EU market for processed products is limited, especially when targeting niche markets. If, within the programme, not enough focus is put on product and market diversification, markets could easily be flooded. Mitigation of this risk would be to consider other markets, e.g., domestic, regional markets and US markets. For the latter, volumes and ethical standards are important.

- Potentially supporting Côte d'Ivoire in processing could hurt the processors in Burkina Faso and Mali. Côte d'Ivoire can copy the more successful countries and could leap-frog its way into the market, as they have a competitive edge over these countries in terms of distance to ports, investment capital available and production quantities of raw material. Mitigation of this risk would be to align the countries on product mixes and thus diversify between countries and strengthen the region as a whole.
- In Burkina Faso and Mali, mango is grown in an area where there are high security risks. It is not clear to what extent the security situation could threaten the supply of dried mango from Mali and Burkina Faso to EU markets. Even though the north of Côte d'Ivoire is not free from these risks, the involvement of Côte d'Ivoire in a regional mango processing project could potentially mitigate the security risk in Mali and Burkina Faso, which is becoming more paramount.

3.6.2 Coconut

The coconut sector has been explored and is cautiously regarded as a sector with high potential for value addition.

- The sector organisation and production capacity (volumes) of the coconut sector is lagging behind the mango sector. Possible interventions could focus on contributing to its strengthening of the lower end of the value chain (production), higher up in the chain (support to the establishment of a sector organisation) and the processing industry.
- Although demand for coconut products in the EU is rising, the Ivorian sector needs to better tap into the demand from this market.
- If support is to be given to the coconut (and pineapple) processing sectors, it would especially benefit from more general support activities that would help increase their level of organisation. For example, support in setting up inter-professional groups, marketing support and access to information (market intelligence, export/import requirement, quality, food safety and other certifications, financial products, value addition by-products, etc.). Alternatively, this could also be done by helping set up a platform and focusing on fruit processing, which allows for more networking and information sharing.

3.6.3 Pineapple

While pineapple has been explored in this VCA, we do not recommend large-scale programmes supporting processing for European export at this point in time:

- Pineapple has a better level of organisation, but also has become quite informal over the years, not taking into account the large vertically integrated commercial growers.
- In addition to the lack of organisation, the lack of supply forms a major constraint for pushing towards more pineapple processing. Land for pineapple growing is becoming scarce and is not easily converted back from the rubber and/or oil palm plantations they have been turned into.
- Like mango, there is a lack of availability, lack of diversity, high prices and poor connection to the different financial institutions and incubators via different networking events, roadshows, open days, etc.

Based on the analysis, the recommendation is that programmes that aim to help PMC exports to the European markets should focus on mango as an entry point into the processed fruit sector. Coconut (and pineapple) processing can be an entry point for a more general support in setting up a fruit processing industry. Potential interventions are further discussed in section 6.2.

4 Burkina Faso & Mali

4.1 Product Overview

The analysis of the two local value chains in Burkina Faso and Mali are combined because the product groups and challenges in the value chain have similarities. Our analysis has focused on processed mango. Other crops have limited fresh fruit supply (e.g., citrus), offer limited processing opportunities (e.g., watermelon) or limited market demand (e.g., cashew apple).

4.2 Production, Processing and Export

4.2.1 Product Overview

Local production of fresh fruits is the starting point for analysing the potential for processing. Overall, we see that production volumes have increased over time in both countries. Although FAO provides official statistics regarding production volumes, the numbers in absolute terms are not recognised by local stakeholders and we do not consider them reliable. We have used FAO statistics to identify market share for different fruit crops.

Production of fresh mangoes is estimated by value chain stakeholders at 200,000 tonnes in Burkina Faso and 70,000 tonnes in Mali.

Mango is the largest fruit crop in Burkina Faso and Mali. The centre for mango production and processing is at the border area between Burkina Faso and Mali and overlaps to some extent with the Ivory Coast and Ghana. Fresh mangoes are grown and harvested in the area that covers these countries. Bobo Dioulasso in Burkina Faso serves as a hub for processing, trade and technical expertise, especially for dried mango.

4.2.2 Demand and Processing

Product market combinations for processed mango are clustered into four categories:

1. Dried mango
2. Mango jam, purées and concentrate
3. Mango juice
4. Frozen mango

Whereas dried mango, purées, concentrate and juice are currently produced in Burkina Faso and Mali, nobody has reported the current production of frozen mango.

Jams and juices in both countries are produced in small-scale artisanal units, mainly destined for the local market and not for export. Dried mango and mango concentrate are currently the largest processed mango exports.

In Burkina Faso, dried mango is the largest PMC, whereas in Mali, purées and concentrates are more commonly processed.

In Mali, some of the concentrate facilities are also used to process other fruits, including internationally known varieties, such as guava, cashew apple and local fruit varieties. These volumes are, however, negligible compared to mango. This is due to short seasonal availability, the low juice extraction capacity of the equipment, as well as a lack of means of conservation.

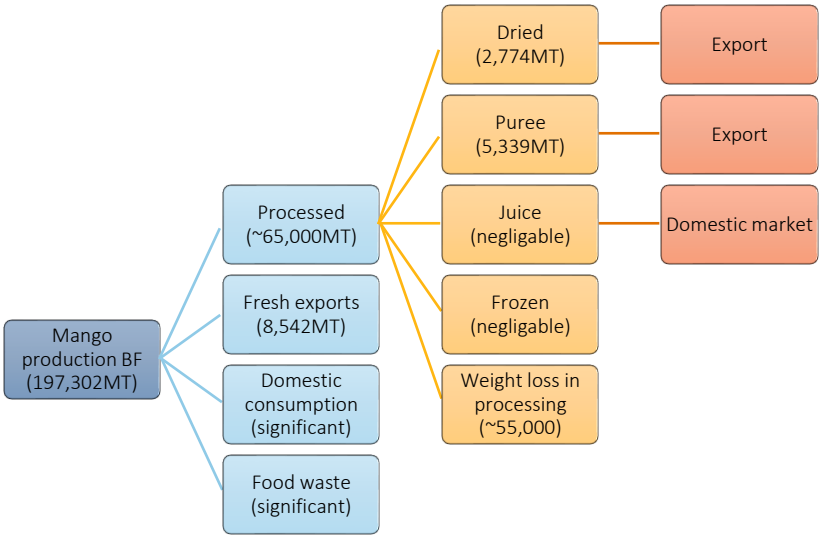
The following ratios have been identified by local stakeholders for transforming fresh mango into processed mango:

Table 18 Ratios for transforming fresh into processed mango

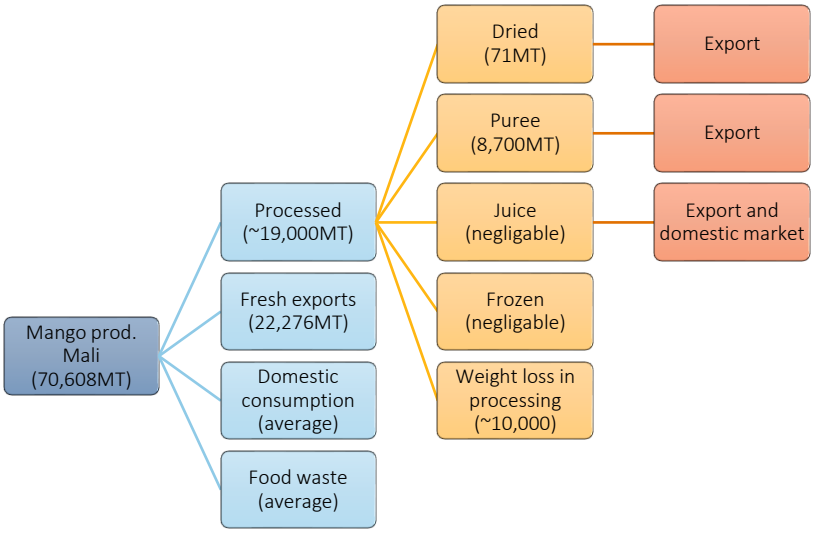
PMC	Ratio fresh to processed
Dried mango	20 kg : 1 kg
Purée	2 kg : 1 kg
Concentrate	4 kg : 1 kg
Juice	1 kg : 1 litre
Frozen	2 kg : 1 kg

For Burkina Faso, approximately 4% of mangoes are exported fresh and 30% of the mangoes produced are currently processed locally, mainly into dried mango. The remaining 66% is unaccounted for and may be consumed locally or not consumed at all. There is no data available on food waste of mangoes that do not reach a market, but based on these estimates, we expect it to be a significant share of production.

For Mali, approximately 30% of mangoes are exported fresh and 30% of mangoes are processed locally, mainly into concentrate. The remaining 40% is consumed locally, and some of this might be wasted.



Source: (APROMAB 2018, stakeholder interviews, Agri-Logic validation workshop)
Figure 40 Estimated production, processing and export volumes mangoes in Burkina Faso



Source: (Interprofession Mangue du Mali, stakeholder interviews, Agri-Logic validation workshop)
Figure 41 Estimated production, processing and export volumes for mangoes in Mali

4.3 Value Chain Mapping

The mango value chain is complex and overlaps national borders. Bobo Dioulasso in Burkina Faso has become a hub for processing (mainly drying) and trade, with the largest presence of service providers. There is a regional cross-border trade for fresh as well as processed mangoes. This trade involves Burkina Faso, Mali and Côte d'Ivoire, but also Senegal and Ghana. Dried mango is produced in Burkina Faso and Mali and is mainly exported by Burkina Faso exporters. Exporters from both countries are involved in the export of purées and concentrates.

Approximately 90% of processed mango leaves Burkina Faso by train to Abidjan and is shipped from there. A small quantity of processed mango is transported by air to global destinations.

The schematic value chain map is displayed in
Figure 42 on page 72. Each stage of the value chain is described in the sections below.

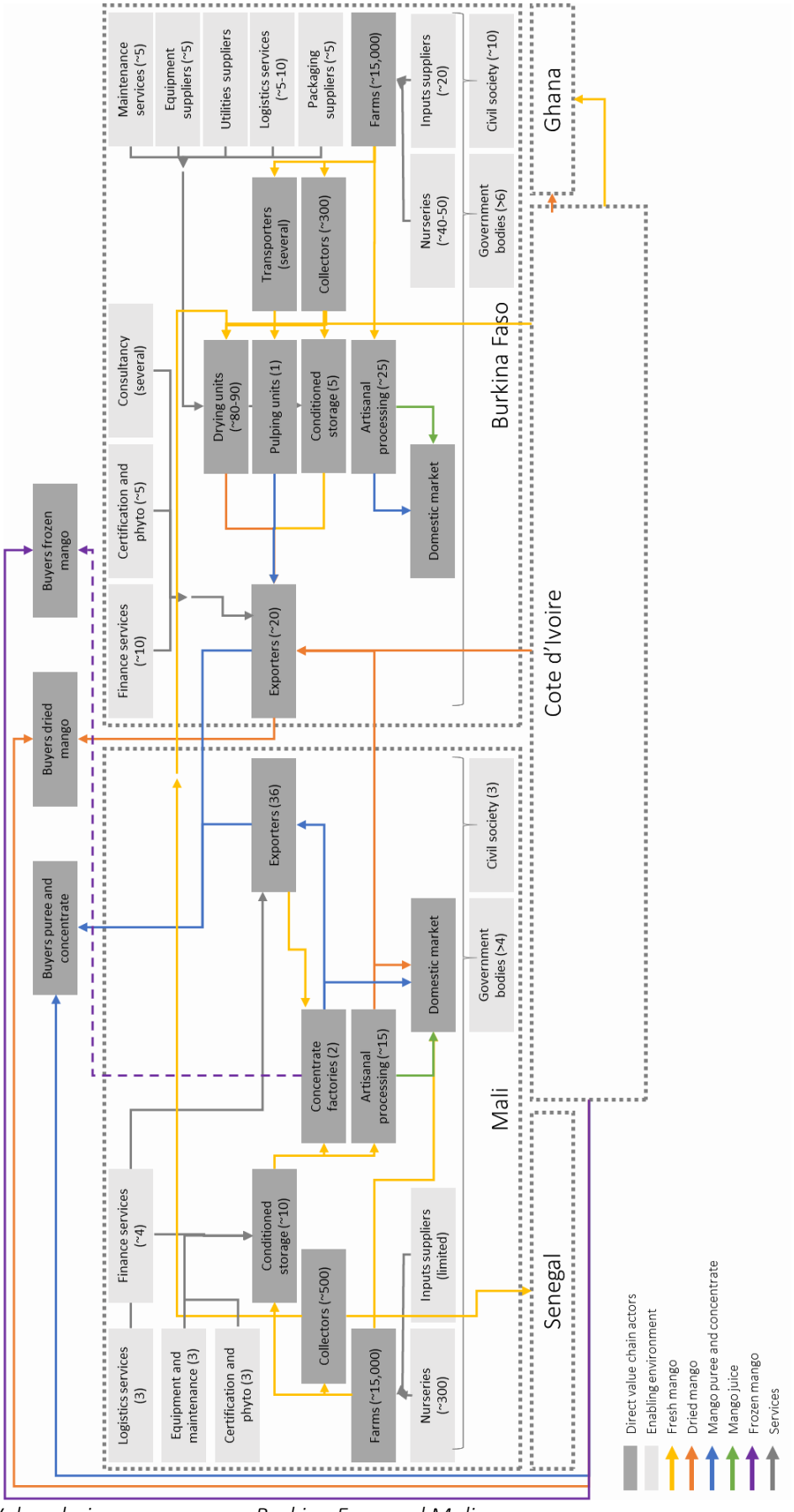


Figure 42 Value chain map mangoes Burkina Faso and Mali

Table 19 Value chain characteristics of mango production in Burkina Faso and Mali

	Burkina Faso	Mali
Inputs supply	Commercial nurseries are well organised and linked to research.	Commercial and community nurseries exist. Suppliers for fungicides, pesticides and fertiliser are present.
Farming	An estimated 15,000 farmers have planted mango on 30,000 ha.	There are a few larger plantations and many smallholders.
Collection	Local collectors (*pisteurs*) buy from farmers, while larger farmers have the choice to sell to these collectors or directly to exporters or processors.	Local collectors (*pisteurs*) buy from farmers, while larger farmers have the choice to sell to these collectors or directly to exporters or processors.
Logistics	Several transporters operate in collection as well as transit for export. Warehouses are in place in main hubs for mango processing and trade.	Some exporters own conditioned warehousing. Others use conditioning centres, the largest of which is PLAZA (realised with Netherlands funding). Warehouses are located in Bamako, Bougouni, Yanfolila and Sikasso.

Table 20 Value chain characteristics of mango processing and export in Burkina Faso and Mali

	Burkina Faso	Mali
Processing	A total of 100 processing companies in Bobo-Dioulasso, Orodara, Toussiana, Banfora, Ouagadougou, Ouahigouya. There are three main categories of processors: small-scale artisanal units often not certified to international norms (<10MT per year), semi-artisanal units with drying tunnels certified to international norms, and industrial, automated units. Several larger drying companies are certified organic. While drying and purée processors are largely able to meet international requirements, fresh juice is a challenge and very few processors are certified. If this segment was grown, there would be a need to modernise equipment, gain access to expertise and training and have a strategy in place for packaging.	Concentrate processing represents 90% of processed mango and is operated on commercial scale, mainly by two companies, CEDIAM (part of Monte-Carlo Fruit) and COMAFRUIT. Two exporters have also expressed interest in entering into processing. COMAFRUIT has installed a freezing facility, which will be operational in the 2020 season. Small, artisanal processors have drying units in place. Installed capacity for mango drying is approximately 100MT, but one processor alone is responsible for 70% of this. Several drying units have indicated they plan to invest in drying tunnels. Availability of electricity is a challenge. Drying has a market demand and requirements are manageable. However, equipment and technical know-how is not readily available, and scale is needed to serve export

	Burkina Faso	Mali
	Five companies also process other crops (cashew nuts, desiccated coconut, dried citrus, dried ginger). Twenty processing companies would be considered SMEs with an annual volume between 20-100MT. There would be an opportunity to produce frozen mango in Burkina Faso, but it would need improved air freight and investments in modern equipment and utilities. Utilisation would be a challenge as supply only exists during the mango season, so this would need to be combined with other products.	markets. Solar dryers may provide an opportunity. There are some examples of artisanal solar dryers (using natural heat) and industrial solar dryers powered by solar panels. Purée and concentrate has both a local and export demand, which allows for faster scaling. Packaging is a general concern for processors as there is low availability, low quality and high cost. Several processors have expressed interest in setting up local hubs that allow shared storage and logistics to reach the quality and scale needed for export.
Export	There are about twenty exporters focusing on fresh and dried mango. Volumes per exporter vary between 50 and 2,500MT per season. Ten exporters would be considered SMEs with an annual export volume between 20-100MT. An estimated ten companies also export other processed crops (cashew, coconut, citrus, ginger). Exporters are frequently present at large trade fairs (Fruits Logistica, SIAL and BioFach in Europe, as well as other regional and global fairs). Most processed mangoes are transported by train to Abidjan and then shipped globally from Abidjan.	Quality control and packaging takes place at the level of the exporters. Contracted logistics providers ensure transit via the port of Abidjan or Dakar, or via air freight. Purée and concentrate are exported directly by Mali. Dried mango is exported by companies in Burkina Faso. Currently, all exports are bulk, not consumer packaging. This may provide an opportunity. Fresh mangoes rejected by exporters are sold to processing units. Most mangoes are transported to Dakar by road and are then shipped from Dakar.

4.4 Stakeholder mapping

4.4.1 Governmental Organisations

The government in Burkina Faso has prioritised mango since around 2000, and together with civil society, the enabling environment is well developed with Bobo Dioulasso as the main regional hub.

An agricultural development policy has been put in place by law and demands a cooperation of actors in the same sector. The national rural sector plan (PNSR, Plan National du Secteur Rural) and the

national economic development program (PNDES, Programme National de Développement Économique) place an emphasis on the processing of agricultural products, specifically mango.

Several ministries are involved in different segments of the mango sector. The different ministries often have several directorates and programmes managed by different people, which add to the complexity of public stakeholders involved.

In Mali, several ministries are involved in different segments of the mango sector. The different ministries often have several directorates and programmes managed by different people.

Although there is indeed a complexity of stakeholders involved, the APEX export promotion agencies in both countries are in charge of market development and will be able to coordinate with other government entities.

A full list of the governmental organisations involved is included in Annex IV.

4.4.2 Private Sector Organisations

Several private sector organisations support the development of the mango value chain. The primary organisations have been identified. These organisations unite stakeholders to decide on the start of the season, management of incidental occurrences, such as market development or weather affection production, and creation of mango clusters. Several organisations play a regional role as coordinators or representatives.

The interprofessional organisations, APROMAB (Burkina Faso) and IM (Mali), unite all value chain stakeholders and would be an appropriate starting point for further developing the sector.

A full list of the private sector organisations involved is included in Annex IV.

4.4.3 Trade & Labour Unions

The main labour challenge is the seasonality of the work, which affects the social security of casual labour. Casual workers move between jobs and sectors.

In Burkina Faso, while there is a freedom of association in unions, the mango sector has not developed any trade or labour unions. Certified companies do have a worker's council in place to represent staff interests. The interprofessional organisations also monitor labour circumstances.

In Mali, the national employers' council (CNPM, Conseil National du Patronat du Mali) organises employers on a voluntary basis. It is currently the largest employers' platform and aims to defend the interests of entrepreneurs. No labour association in Mali specifically focuses on mango.

Respondents do not see the lack of labour unions as a major risk, since there are no barriers in place for workers to organise themselves. Respondents in both countries indicate that sustainability certification addresses workers' rights, but very little protection for labour appears to be in place for non-certified companies. This is further addressed in section 5.1.

4.4.4 Service Providers

Burkina Faso is much further developed in services to the value chain than Mali and Côte d'Ivoire. This is because of the continued promotion of mango processing and export by government and civil society, which has proven to yield results.

Table 21 Service Providers in Burkina Faso and Mali

Service	Burkina Faso	Mali
Input suppliers	There are commercial and community nurseries in place. Several parties distribute crop-protection products and (organic) fertilisers.	Inputs are available to some extent, although accessibility remains a challenge.
Equipment suppliers and maintenance services	Dryers are sold locally, and several small production suppliers and maintenance services have been developed.	Limited availability of equipment and supplies.
Packaging suppliers	Packaging and pallets for export are available through local manufacturers.	Limited availability of packaging.
Logistics suppliers	Several logistics suppliers facilitate transport and exports. This includes both air freight and shipments.	Logistics suppliers are present, although their focus lies elsewhere. Challenges include low quality of infrastructure leading to breakdown of trucks.
Certification service providers	Several laboratories and certification bodies are present in Burkina Faso. Export documentation can generally be applied for, but these laboratories are not certified for all parameters, notably heavy metals. Laboratories in France and Switzerland are sometimes used.	There is a number of laboratories and certification bodies, but they are not equally distributed within Mali.
Financial services	International impact investors and local commercial and micro-finance banks and insurance companies have shown an interest in the mango sector. Exporters and processors have the ability to access financial services for working capital if they meet export requirements, with interest rates between 8-15%. This is generally working capital for the mango season, not a long-term loan for investments. Certain large groups and smaller organic-certified companies receive pre-finance from their European counterparts.	The agricultural development bank (BNDA, Banque National de Développement Agricole) has a mandate to operate in the sector and is financing farmer organisations and processors (working capital and investments) that meet their requirements for stability, market linkages and sustainability. In practice, most processors and exporters have access to working capital at interest rates of 10-18%. Cooperatives generally partner with micro-finance banks and companies with commercial banks.
Consultancy services	Several experts are available to provide advice to companies and other organisations.	Some availability of value chain experts, but they generally do not possess sector-specific expertise.

4.4.5 International Organisations and Current Projects

Several international organisations are active in the mango sector in both Burkina Faso and Mali.

In Burkina Faso, there have been support programs for mango since the early 2000s. World Bank, SNV and AFD have completed large-scale programmess in mango, mainly around Bobo Dioulasso. In Mali, there are a few main actors currently working in the mango value chain, all of them in similar areas (Sikasso, Bamako and Koulikoro). Each of the programmess aims to strengthen the capacity of the chain through quality improvement and creation of employment. They work with the interprofessional mango association to involve the private sector. In addition to their shared ambitions, each of the programmes has their own focus.

There are several current programmes in Burkina Faso that might have an overlap or synergy with a possible programme that supports the export of mango PMCs to Europe:

- PAPEA by SNV and Helvetas promotes inclusive entrepreneurship and professionalisation in the mango sector in Burkina Faso. The programme builds on previous mango sector programmes implemented by the partners. The programme is funded by the Swiss government. Beneficiaries are MSMEs in processing and export. Interventions include training of women and youth, a partnership with the Ministry of Agriculture to improve access to finance, and sector dialogue.
- PACAM implemented in Mali by the Ministry of Agriculture and funded by the World Bank works on a micro- and meso-level across the value chains for mango and animal feed. The overall aim is to increase the production, processing and export volumes of mango. Specific interventions include improving access for fresh mango to drying facilities. Under this umbrella, the government will also invest in rural roads and infrastructure.
- COLEACP's Fit for Market programme supports the mango chain and other sectors with training, certification and capacity building. The programme is funded by the EU and AFD, and it works in the African, Caribbean and Pacific states that are signatories to the ACP-EC partnership agreement. This includes Burkina Faso, Mali and Côte d'Ivoire. The programme works on a micro- and meso-level. Training in food safety, sustainability and market trends is provided to smallholders, cooperatives and outgrower schemes. The programme also has a lobby and advocacy component.
- 2SCALE is funded by the Netherlands government and implemented by SNV, IFDC and BoPInc. The programme just launched its next phase and is currently in a diagnostic phase. It aims to strengthen market linkages in the value chain and includes Burkina Faso, Mali and Côte d'Ivoire in its scope.
- AgriProfocus is supported by the Netherlands government and is a networking platform with Mali as their main focus country. They have a specific focus on youth entrepreneurship and offer business plan coaching, training and bootcamps about investment in agribusiness.
- GIZ, through the CIV programme, is focused on innovation in the value chain. While working to address specific research issues in several crops, intervention in mango aims to develop an integrated management of fruit flies.
- PCESA-Fonds supports enterprise development in Burkina Faso with subsidised banking facilities and includes several mango processors and exporters. It is funded by the European Union and Denmark. This programme addresses challenges related to accessing finance for selected companies but does not cover the entire sector.

Several civil society organisations are interested and supportive of a market-driven intervention in Burkina Faso and Mali. Synergies are mainly expected with SNV based on their long-term experience in the sector, as well as COLEACP who builds technical capacity that may complement export capacity.

4.4.6 European Trade & Industry

The mango sector in Burkina Faso has developed in close partnership with European companies. Several European traders have become exporters in Burkina Faso, either independently or in joint venture with Burkinabe companies. All dried mango is currently exported, and Burkina Faso is the primary global source for organic dried mango.

European companies collect market information, facilitate investments and coordinate collection and processing. Several European companies have succeeded in mobilising funds from private donors and international development organisations to develop the value chain.

Companies are less active in the value chain in Mali. Some European companies will buy mango concentrate, but currently there are limited investments taking place on ground.

Currently, some companies are exploring investment in Burkina Faso (dried mango) and Mali (concentrate and purée). We see three types of drivers for these investments:

1. Socially driven companies targeting sustainability and impact investment.
2. Traders from the Southern hemisphere to realise year-round supply with complimentary mango seasons.
3. Larger traders aiming to secure a supply of mainly organic processed mango.

While there is some investment interest in Burkina Faso and Mali from European companies, most traders and buyers prefer to work on a transactional basis and do not enter into long-term supply relations or vertical integration.

4.5 Opportunities and challenges

4.5.1 Mapping of Value Chain Challenges

The value chain has several challenges and opportunities. The challenges are mapped in the image below, and challenges and opportunities are further described in the next section.

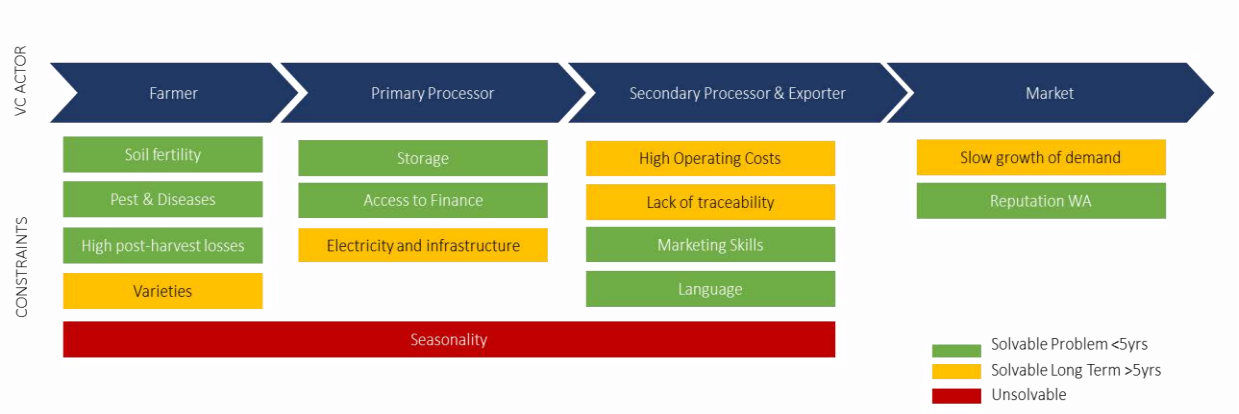


Figure 43 Challenges in mango value chain in Burkina Faso

4.5.2 Demand

Demand is the key opportunity for processed mango from Burkina Faso and Mali. There is a market for it and it is growing. Burkina Faso currently has an existing market share in this market, which forms a good foundation.

Market demand for processed mango differs between segments. The most promising segments for Burkina Faso and Mali include:

- Dried mango has growing demand but increasing supply competition.
- The market for frozen fruit is large and growing but little expertise is available locally.
- Purées are a growing segment, mainly for baby food.

The reputation of West Africa is a challenge, but this can be resolved by professionalisation of processors and exporters. The market demands consistent product quality and certifications, and when these are met, demand is expected to continue to grow. This is a challenge that can be solved in the short term.

The slow growth of demand is a more complex challenge, one that can be solved in the medium to long term. There is currently an oversupply of fresh mango and overproduction of processed mango. Supply has grown faster than demand, and this creates competition within Burkina Faso and between countries in the region. While the market is expected to continue growing, coordination and diversification is required. Until the supply and demand are balanced out, it is expected that losses of fresh mango will continue to occur.

4.5.3 Supply

While the availability of fresh mangoes is an opportunity for both countries, farmers struggle with soil fertility, pests and diseases. Support programmes are in place to address this, notably by government and international civil society partners. These challenges are solvable in the short to medium term, and work on this is already in progress.

A main challenge in both countries is mango seasonality, which leads to underutilisation of capacity and seasonal unemployment. Post-harvest losses occur when processors are unable to process the full crop during the harvest season. Current market demand would not favour an expansion in processing capacity. The current oversupply of fresh mangoes is solvable by growing the market for both fresh and processed mangoes, which could happen in the short to medium term.

Both Burkina Faso and Mali grow a number of different mango varieties. While this has advantages for resilience, different harvest times and different flavour profiles, it is also a challenge in a market that is searching for consistency.

4.5.4 Competitive environment

Burkina Faso specifically has a relatively strong enabling environment in place for dried mangoes, with reasonable to good availability of storage, packaging suppliers, service providers and access to finance. Its capacity in processing concentrate is limited and there is an opportunity to expand into freezing units.

Mali has more challenges with low (perceived) product quality, a lack of suppliers for packaging and equipment, low-quality infrastructure, lack of electricity, a lack of storage conditions and scale, and several social and labour issues. There is also a lack of credibility on the international market due to small-scale operations and the reputation of Mali in general, as well as a lack of market linkages. There are two commercially viable concentrate factories, one of which is now expanding into frozen mango.

Competition is heavy, with a fragmented supply and a centralised market. Specifically, Burkina Faso has a history of development support and grants provided to the sector. If this support would end, we expect that several processors and exporters will be strong enough to continue independently on a commercial basis, while some smaller and weaker companies would likely cease to operate.

Additionally, competition between the different countries should be considered. Based on the information obtained, we suggest a clear focus for each of the countries.

Burkina Faso could strengthen its market leadership in dried mangoes by improving consistency and reliability in supply. Buyer demands are expected to become more stringent once supply grows, with certification for food safety and sustainability being the first demands to be expected. Mali is in need of an enabling and inclusive environment, which will allow a growth in concentrate processing as well as entry into the frozen mango segment.

Taking Porter's five forces for the different products. The following analysis can be made:

Table 22 Analysis of Burkina Faso and Mali on EU Market using Porter's Five Forces model

	Burkina Faso	Mali
Competitive Rivalry	**Medium** – Burkina Faso currently has a significant market share	**High** – Mali is very small in processing and competing with established origins
Supplier Power	**Medium –** Burkina Faso is currently competitive based on price and organic supply	**Low –** production is too low to be of value to most buyers, switching costs are low
Buyer Power	**High –** limited number of buyers and can easily switch, more stringent food safety requirements expected	**High –** limited number of buyers and can easily switch, more stringent food safety requirements expected
Threat of Substitution	**High –** many other tropical fruits could substitute	**High –** many other tropical fruits could substitute
Threat of New Entry	**Medium** – Barriers are relatively low to start up operations. However, entering the EU market is more challenging	**Medium** – Barriers are relatively low to start up operations. However, entering the EU market is more challenging

To compensate for the limited supplier power, high buyer power and threat of new entries, the processing industry should target products and segments for the EU market that are unique and target the niche markets. Think of organic, frozen products, 'free-from' and certified for food safety and sustainability standards. It would require a higher level of organisation within the sectors to adapt to such a strategy and to be able to comply to the standards of the niche markets.

Competition is expected to come from the region, so coordination and diversification is key. Not all origins and companies should be making the same product.

4.5.5 CSR

4.5.5.1 Youth & women

Both Burkina Faso and Mali show high levels of female employment, and several processing companies are owned by women or young entrepreneurs. Inclusiveness is a strength of the mango sector. There is an opportunity in CSR for storytelling. Young entrepreneurs and women in employment are appreciated by buyers and presents an opportunity to distinguish the countries in scope from other origins.

Inclusiveness and employment conditions are further elaborated in the joint analysis in sections 5.1.1, 5.1.2, 5.1.3.

4.5.5.2 Child labour & child trafficking

While child labour is high on the agenda for Côte d'Ivoire (section 3.5.5.2), it is a less prominent concern in the mango sector of Burkina Faso and Mali. While children are sometimes involved on farms, this generally does not fall under hazardous child labour. There is no data available on child work interfering with school attendance.

The US Department of Labor (USDOL) closely monitors child labour globally and reports occurrences in Burkina Faso, mainly in cotton, gold and granite, and in Mali, mainly in cotton, gold and rice (USDOL, 2017; USDOL, 2017).

Table 23 Statistics on children's work and education in Burkina Faso and Mali

Children	Age	Burkina Faso %	Mali %
Working (% and population)	5 to 14	42.1 (2,116,752)	25.1 (1,216,300)
Attending School (%)	5 to 14	41.9	46.0
Combining Work and School (%)	7 to 14	21.7	13.4
Primary Completion Rate (%)		61.7	51.0

Source for primary completion rate: data 2016, published by UNESCO Institute for Statistics, 2018. Source for other data: Enquête Démographique et de Santé en Côte d'Ivoire (EDSCI-III), 2011-2012.

Source: (USDOL)

Child trafficking is a concern, with children from Burkina Faso and, to a lesser extent, Mali reportedly working on cocoa farms in Côte d'Ivoire (section 3.5.5.2). According to USDOL, governments in Burkina Faso and Mali are making moderate advancements in addressing child labour and child trafficking.

While child labour and trafficking does occur in Burkina Faso and Mali, it does not appear to be a major issue in the mango sector based on the limited information available, as we could not find extensive studies on the topic for this sector.

4.5.5.3 Environmental footprint

It is important to ensure that within the support provided to the SMEs, environmental awareness is raised.

As already indicated in section 3.5.5.4, a focus on tree crops does reduce the potential environmental impact. Thereby, the second-largest impact is transportation. In the interventions, the environmental impact of the different PMCs will need to be considered, as this is especially related to the transport of the product. The closer the processing facilities are to the production areas, the lesser the impact. Preference should be given to train-to-sea freight over air-freight to minimise the environmental impact. Studies on the impact of different (by)products and packaging options should help guide the sector in making choices that are least harmful to the environment. REDD+ certifications, though lengthy processes, are opportunities that could be looked into for the longer term.

West Africa has a global competitive advantage in organic mangoes (fresh and processed). This is an opportunity for market access. Certification for food safety and sustainability will grow in demand and is needed to defend and expand the market share of West Africa for mangoes.

4.6 Conclusions: Burkina Faso & Mali

The dried mango sector in Burkina Faso has been supported by government and civil society for over two decades and has a current 25% share of the European market. The value chain and enabling environment are reasonably well-organised. The mango sector in Burkina Faso now needs to become independent from development support by establishing direct connections to the market, professionalising processing by implementing international standards for food safety and sustainability certification, and mitigating the challenges of mango seasonality by diversification. Burkina Faso is well-positioned to capture the growth of the market and possibly increase market share by improving its competitive position compared to other origins, notably South Africa. A risk is the growth in the number of mango processors in Burkina Faso and the region, as well as the growth in volume by individual processors. Currently, supply grows faster than demand and this may affect price and profitability.

Mali has some artisanal drying units near the border with Burkina Faso, which are directly linked to the value chain and exporters in Burkina Faso. We see very little potential for Mali to become a significant origin for dried mango, and those drying units that have potential can be considered part of the regional mango trading system. However, Mali has some traction in processing juices, concentrates and purées for export, with two factories currently operating and two exporters having expressed interest in investing in processing.

Specifically, Burkina Faso has potential to expand its position in the market for dried mangoes and diversify into other processing types for mango, notably purées and frozen mango. There is a foundation in place and market demand continues to grows. For Mali, this may be more difficult with two strong, larger companies and several very small companies with limited viability. In a coordinated regional programme, local value addition to juices, concentrates and purées can be increased in Mali. While in Burkina Faso mango is the major fruit crop present in the market, Mali has opportunities to diversify into other fruits as well using the same facilities.

5 Joint Analysis

5.1 Sustainability of the Value Chain

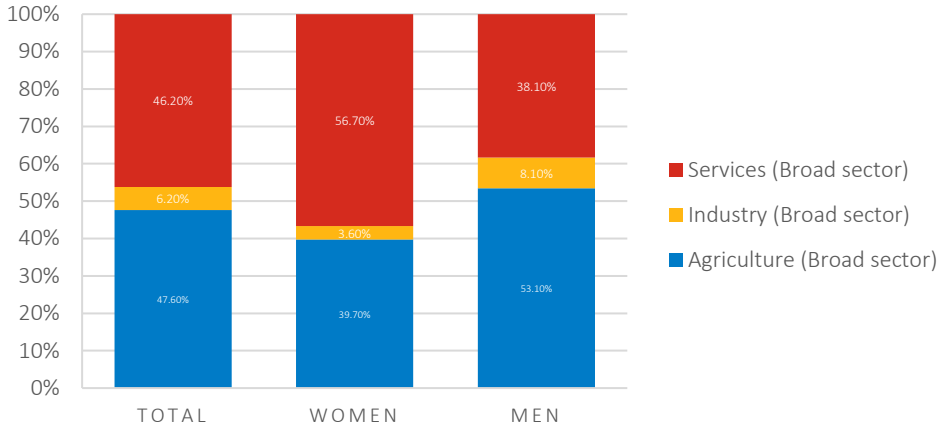
The mango value chain has shown a potential to boost socio-economic development in West Africa. Production is competitive and organic certification is a distinguishing factor in markets. Burkina Faso and Côte d'Ivoire, at a very small scale, has already been able to capture some of this value, whereas the sector in Mali is less developed.

5.1.1 Labour & Employment

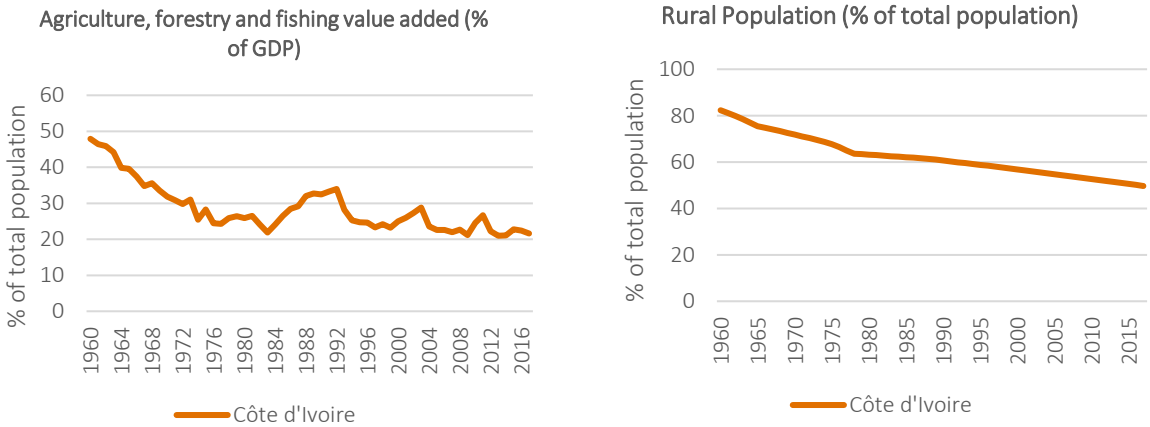
5.1.1.1 Employment

While the rural population as share of total population declines steadily, agriculture represents a significant share of GDP (21% in Côte d'Ivoire, 29% in Burkina Faso, 38% in Mali) (World Bank, 2017) and employment (48% in Côte d'Ivoire, 29% in Burkina Faso, 65% in Mali) (ILO, 2018).

Table 24 Employment distribution in Côte d'Ivoire by economic activity and by sex

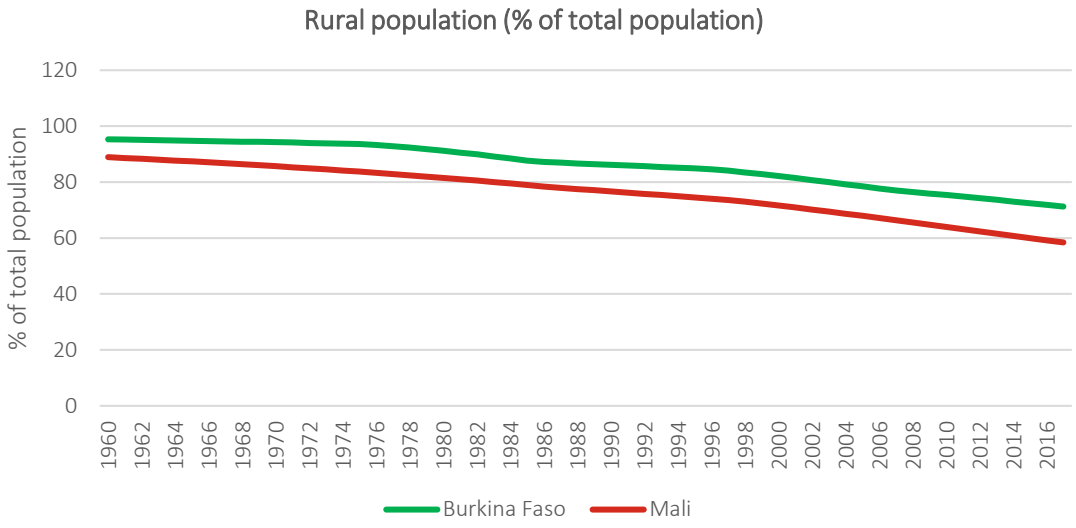


Source: (ILO, 2018)



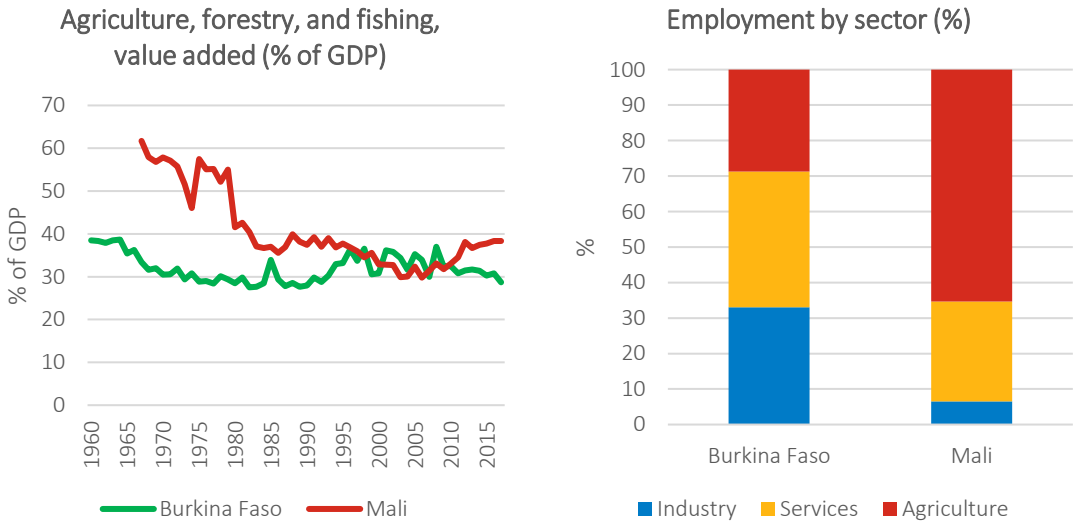
Source: (World Bank, 2017)

Figure 44 Contribution Agricultural GDP and rural population as % of total population in Côte d'Ivoire



Source: (World Bank, 2017)

Figure 45 Rural population as % of total population in Burkina Faso and Mali



Source: (World Bank, 2017) (ILO, 2018)

Figure 46 Contribution of agriculture to GDP and employment in Burkina Faso and Mali

Although no numbers are available with regards to employment in the selected value chains for Côte d'Ivoire, an estimation was made based on input from the sectors.

Table 25 Estimate employment in mango, pineapple and coconut in Côte d'Ivoire

Sector	Employed directly (estimate)
Mango	7,000 - 10,000
Pineapple	1,000 - 3,000
Coconut	3,000 – 4,000

Source: own estimation

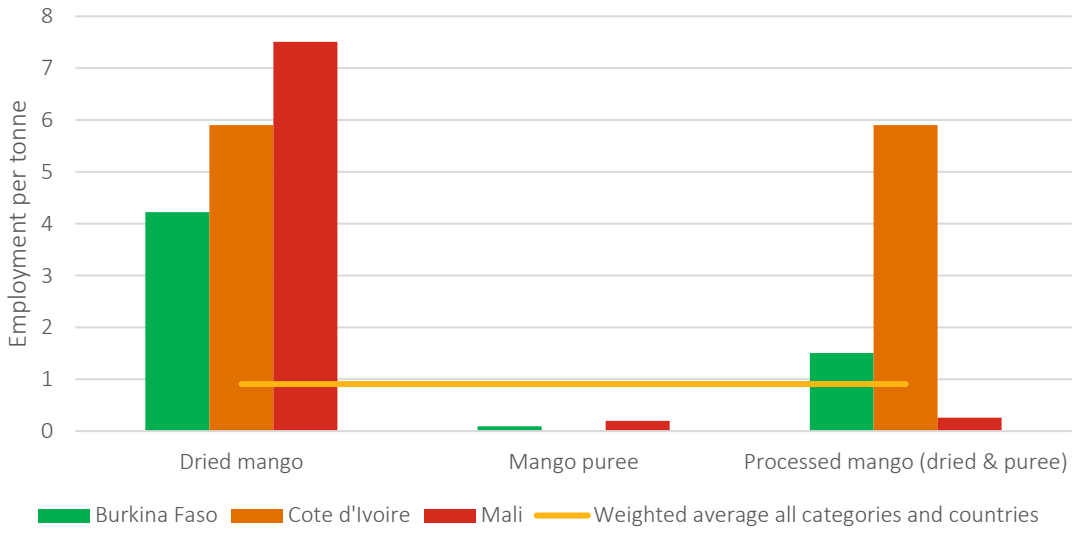
In Mali and Burkina Faso, the mango value chain has a high labour intensity. Estimated employment in the mango sector in Burkina Faso is 18,000 jobs, while in Mali, an estimated 7,000 jobs exist in the sector.

Table 26 Estimated employment in the mango sector in Burkina Faso, Mali and Côte d'Ivoire

	Burkina Faso	Mali	Côte d'Ivoire
Direct employment in processing and export	~18,000	~2,500	~1,000-2,000 *(rough est.)*
Farmers	~15,000	~15,000	~6,000
Collectors	~300	~500	~400
Nursery holders	~300	~1750	Not known

Employment in processing and export is 5-10% permanent and 90-95% seasonal in each of the countries. In Mali and Burkina Faso, the number of jobs have grown in recent years in line with the growth of export. In Mali, most of the growth is seen with nursery holders.

Mango processing creates employment. Mango drying is more labour intensive than processing into purée, largely because of the high volume of fresh mango that needs to be selected, cleaned and peeled. There are also differences between the countries. The number of jobs in relation to production volume is displayed in Figure 47.



Sources: (Agri-Logic calculation based on data from APROMAB, IM, InterMangue)
Figure 47 Employment created per tonne of processed mango output

Table 27 Main Labour Risk in Côte d'Ivoire, Mali and Burkina Faso

Mali & Burkina Faso	Côte d'Ivoire
• Seasonal unemployment outside of the mango harvest season • Unsafe working conditions on farms and in small processing companies	• Seasonal unemployment outside of the mango harvest season • Unsafe working conditions on farms and in small processing companies • Child labour and child trafficking in pineapple production and during harvesting for mango *(needs more research)* on non-commercial farms • Vulnerable groups involved in seasonal labour (migrants) and processing (women)

Extending the harvest season for mango through new varieties and technologies, longer shelf life through improved storage, or diversification of processing into other fruits would allow the creation of year-round employment. This would support the employees with year-round income and prevent loss of knowledge for employers.

For Côte d'Ivoire combining coconut, with pineapple processing would support the employees with year-round income and would create a more attractive employment opportunities for middle and higher management who would be needed to effectively run the factories.

Employment conditions vary between companies, but those that are certified for export generally have health and safety policies, facilities for workers (sanitary, canteen, school) and non-discrimination policies. There is a need and opportunity to professionalise SMEs to grow the sector and improve labour conditions. The market may regulate this through international norms.

5.1.1.2 Child labour and Child trafficking

Child labour and child trafficking is discussed in the respective country chapters, sections 3.5.5.2 and 4.5.5.2. Child labour and modern slavery are also included as human rights indicators in the comparative analysis, further detailed in section 2.6 and Annex IX.

5.1.2 Gender

The gender situation shows large differences between the countries. Generally, processing mainly creates employment for women and offers positive CSR opportunities. For example, in Côte d'Ivoire, 80% of the Cocopack employees involved in peeling and cutting are women, and interviews with the processors of dried mango indicate that the processing is mainly done by women (80%). In the coconut value chain, women are often responsible for removing the flesh from the harder outer shell. However, they only receive the shells in return for their labour (Van den Broek, et al., 2016). The women use the shells for charcoal production, which they can sell on.

In Burkina Faso, mango processing and export has created a large number of jobs for women. An estimated 90% of total employment in processing and export is held by women. Farmers and farm workers are largely men. Women are reported to be respected and safe in their employment. Several women's associations exist and provide support to women.

In Mali, however, women report social constraints as they are expected to take care of their children, they work under unsafe working conditions and sexual violence is a risk they face. They are mostly unable to own land. There would be opportunities for women to find employment in processing and export similar to the situation in Burkina Faso.

In all three countries, women are not frequently occupying management positions, and female entrepreneurship is an opportunity that is promoted by civil society. Access to land, as mentioned for Mali, is also relevant to Côte d'Ivoire and is noted as a challenge.

5.1.3 Youth

In the mango sector, youth are employed for activities such as harvest, quality control and packaging. Youth are not frequently entrepreneurs. However, in Burkina Faso, this is being promoted through civil society programmes. There are a relatively large number of young entrepreneurs entering into processing.

There is an opportunity for youth to work in service providers that enable the value chain. Specifically, manufacturing of equipment is suitable for young entrepreneurs and workers. Access to finance is their main challenge. In Côte d'Ivoire, sequa and AfDB with ENABLE support youth programmes in agri-processing.

Côte d'Ivoire and Mali rank among the 10 lowest countries on the Youth Development Index published by the Commonwealth for 2016, together with countries like Chad and the Central African Republic. Burkina Faso ranks 155 out of 183. All three countries score low on education and Côte d'Ivoire scores particularly low on Health and Wellbeing.

According to ILO statistics (2016), the percentage of youth not in education, employment or training between 15-24 is 36% (men 23.7%, women 46.5%). This is lower than the figures from Mali (44%) and Burkina Faso (52%).

A potential programme targeting skills development for current and future needs would be important. For Côte d'Ivoire, a special focus should be put on ensuring the health and wellbeing of the youth employed in the sectors.

5.1.4 Climate change

The stakeholders interviewed did not mention climate change having a strong impact on the sectors analysed, with exception of coconut. Research by the World Bank, however, shows that climate change may improve conditions for production in Burkina Faso, while Mali and Côte d'Ivoire are expected to experience a negative impact on yields and revenue.

Côte d'Ivoire ranks 147th out of 178 countries (ND-GAIN, 2017), Mali 166th and Burkina Faso 161st. Out of the three, Côte d'Ivoire scores least susceptible to climate change. This is mostly due to its lesser vulnerability. None of the countries score high on climate change readiness.

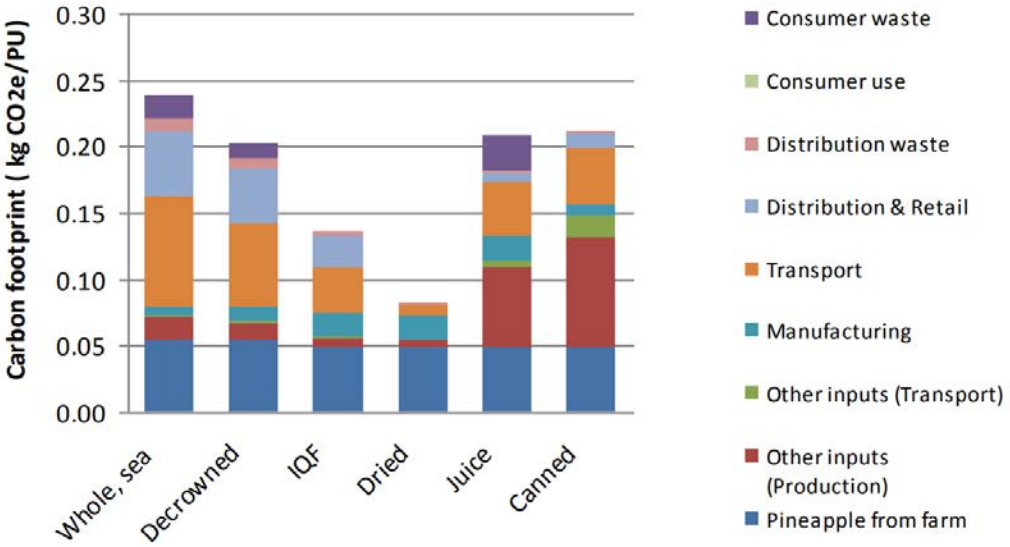
In Côte d'Ivoire especially, the coastal zones are under threat due to climate change, with the losses of beaches and dunes threatening both its infrastructure and agriculture. This is especially relevant for the coconut groves (World Bank, 2018). Also, the country has lost 26% of its stock of natural capital between 1990-2014. Almost 60% of forests have disappeared since 1990, largely because of the country's cocoa production.

5.1.5 Environment

Côte d'Ivoire ranks 139th on the Environmental Performance Index (EPI) out of 180 countries, which is 29 points lower than its baseline rank. Mali ranks at 147th and Burkina Faso even lower at 154th. All three dropped ranks since their baseline rank. Mali is the only one to climb by a few points. All three score very low on water and sanitation. Burkina Faso also scored very low on climate and energy (emissions of greenhouse gases).

To give an indication of what would cause high emissions in agriculture, the example of pineapple is used. From an analysis completed by Solidaridad West-Africa (2011) on pineapples in Ghana, it can be seen that nitrogen fertilisers contribute to 73% of total farm emissions. Together with fuel, they account 89% of farm emissions and should therefore be the main target for any mitigation efforts. Other environmental risks related to the production of pineapple are groundwater pollution due to pesticide usage and related soil erosion and loss of soil organic matter, which, in Costa Rica, actually led to conflict and damaged the reputation of the country. When taking the processed products into consideration, dried and individual, quick-freezing (IQF) products seem to have the lowest carbon footprint (WAFF, 2011).

Table 28 Carbon footprint of different processing methods for pineapple, excl. air freight



Source: (WAFF, 2011)

Mango and coconut are tree crops that are grown under low-input agriculture. The largest impact on the carbon footprint is related to its transportation. The earlier in the supply chain that the products are processed, the lower the impact on the environment. Coconut-based ecosystems offer good possibilities for enhancing carbon sequestration through crop combinations involving a variety of plants, including food crops, tubers, vines and tree crops. For climate-change adaptation, the annual intercrops planted under coconuts could be managed for optimum benefit to the whole system (Nair, et al., 2018). This is very similar for mango. The balance of sequestration versus the emissions reduces the industry's overall carbon footprint and therefore also promotes its investment. The footprint becomes high when products are transported by plane.

In a potential intervention, care should be taken to develop products that can be shipped by sea-freight instead of airfreight, significantly reducing the carbon footprint of the product.

5.1.6 Waste management

Food waste is a concern for all countries. Most of the waste in the value chain is due to food loss, especially for mangoes, which incur losses of 30-60%. The market demand for, in particular, fresh and processed mangoes is still not sufficient to utilise the full production of fresh mangoes in the countries in scope. Diversification of processing methods and markets is needed to address this.

Fruit crop residues are mainly used as livestock feed and as organic fertiliser. In some cases, they are also transformed into briquettes to be used as an alternative to charcoal, such as in coconut processing. Briquetting densifies loose combustible materials into solid composites of different shapes and sizes, using pressure and binding agents. This helps offset some of the ecological impact of intensifying agricultural production. In Côte d'Ivoire, SICOR has the intent to produce briquettes from coconut husk. Cocopack Biotech is exploring the use of waste as a potential energy source for industrial applications, such as dryers or steam generators.

Increasing processing capacity combined with marketing activities, improving storage and handling and making the process more efficient should all contribute to reducing food loss. The processing of the fruits results in by-products that could be transformed into value-added products (Table 29).

Table 29 Fruit products, by-products and value-added products

Fruit	Major products	By-products	Value added products
Pineapple	Juice, juice concentrate, jams, purée, candies, canned/sliced pineapple, frozen and	Core (10%), peel (30-42%), crown, pulp	Bioethanol, flour, vinegar, biogas, bromelain (enzyme), citric acid, cellulose/fibre (paper production), jam, extruded products, animal feed, lactic acid, starch (see also flow chart from MVO Nederland in 0)
Mango	Pulp, purée, dried	Cull fruits, peel (7-24%), seed kernel (9-40%)	Mango pickle, jam and chutney (peel), flour (peel), mango seed kernel oil, fibre (peel), pectin (peel), starch, enzyme production, animal feed, ethanol, biogas
Coconut	Desiccated coconut, coconut oil, coconut milk, coconut water, desiccated coconut powder	Coconut husk, coconut shell	Shell: fuel, food packaging material, charcoal, fine grade activated carbon, coir (fibre), coconut protein powder, coconut dietary fibre, coconut vinegar, coconut hone

Sources: (Sharma & Kaur, 2018; Roda & Lambri, 2019; Siddiq, et al., 2018)

Especially for coconut, there are (low) tech solutions to add value to the by-products. As waste valorisation (other than feed, biogas and briquetting) is very specific to each of the value chains, it would be advisable to commission a separate study on which value-addition opportunities for by-products would create the best business case for the targeted countries.

5.2 Country comparison

While comparing the focus countries, we have identified different strengths in each of the countries:

- Burkina Faso: leading in processing in general and dried mango specifically
- Côte d'Ivoire: leading in fresh mango exports
- Mali: traction in purées and concentrates

This comparison provides a starting point for a regionally coordinated diversification and strengthening of the chain.

Table 30 Comparative analysis of mango production, processing and export in focus countries

(tonnes)	Burkina Faso	Mali	Côte d'Ivoire
Total production of fresh mango	197,302	70,608	~160,000
Fresh export	8,542	22,276	~35,000
Fresh mango used for processing	~65,000	~19,000	~5,000
Local market and food waste	~125,000	~30,000	~120,000

Source: CBI validation workshops

Table 31 Comparative analysis of types of mango processing in focus countries

(tonnes)	Burkina Faso	Mali	Côte d'Ivoire
Dried	2,774	71	~170
Purée	5,339	8,700	Negligable
Juice	Negligable	Negligable	Negligable
Frozen	Negligable	Negligable	Negligable
Weight loss in processing	~55,000	~10,000	~4,000

Source: CBI validation workshops

There is strong competition in a market that only grows slowly, and Ghana specifically should be monitored closely. Compared to other African mango origins, the focus countries have the following strengths, which can be leveraged to maintain and expand market position:

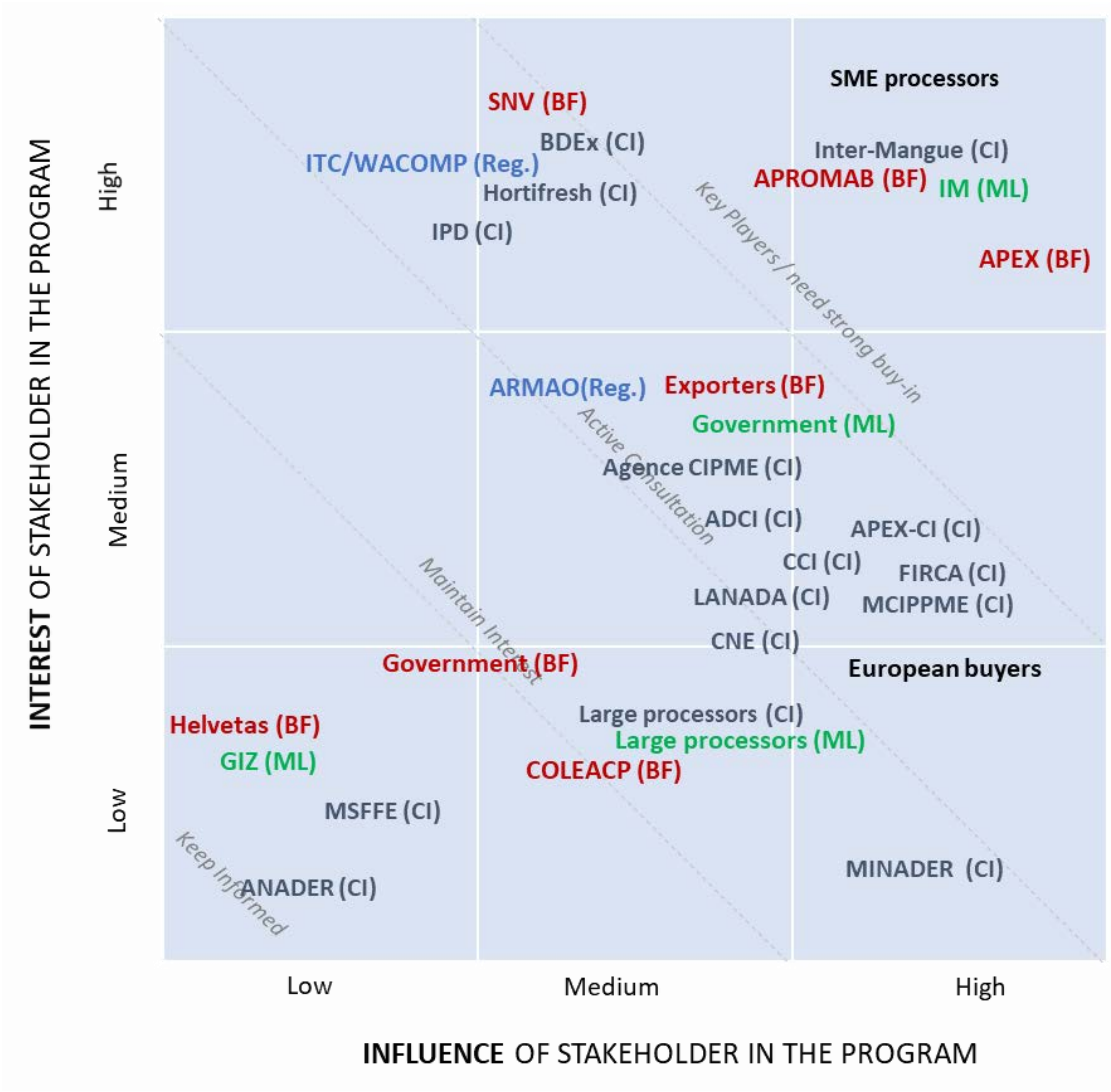
- Burkina Faso: large existing market share with a track record of inclusiveness and organic agriculture and is suitable for markets demanding organic products and storytelling. Dried mango is the most promising segment.
- Côte d'Ivoire: well-developed agricultural economy and business environment in comparison to the other countries in the region, allowing it to potentially kickstart the mango processing sector relatively quickly. Côte d'Ivoire is a transport hub for landlocked neighbouring countries.
- Mali: opportunity to tap into premium niche markets for dried mango that are interested in storytelling about inclusiveness and environmental sustainability. Some traction in purées and concentrates.

Overall, Burkina Faso has the strongest position, Côte d'Ivoire can probably kickstart a sector relatively quickly, and Mali is the weakest of the countries in scope, but it is the only one with an existing position in juice and concentrates.

5.3 Stakeholder assessment

Building on the stakeholder mapping in sections 3.4 and 4.4, and focusing on the mango sector, which we feel is most promising, we have assessed the stakeholders and stakeholder groups on their level of interest in and influence on a potential programme.

Overall, there is a large interest among SME processors in all three countries, as well as from the interprofessional mango organisations in all three countries and their umbrella body ARMAO, which forms a foundation for a successful market-oriented programme. Several civil society organisations are interested and supportive. Specifically, Burkina Faso has a strong government interest, but this is low to medium for Côte d'Ivoire and Mali.



Legend: Burkina Faso (BF), Côte d'Ivoire (CI), Mali (ML) and Regional (Reg.)

Figure 48 Stakeholder assessment grid mango sector

In most cases, stakeholder interest is in line with the importance of the programme. Some concerns exist in relation to large processors, mainly in Côte d'Ivoire and Mali, who have limited interest in the programme but a potentially large influence. Also, while some European buyers have shown interest, many of them have little dedication to a long-term relationship with processors and exporters in the region.

5.4 Fit between sector needs and CBI mandate

CBI has the mandate to promote imports from developing countries to the European market. CBI's 'integrated' projects offer a range of interventions and services (market and policy intelligence, human resources development, export coaching, institutional development advisory services, and process facilitation) and are designed based on an analysis of market opportunities and bottlenecks in the export value chain.

Interventions fall into two categories:

1. Export-enabling environment (EEE) interventions
2. Business export coaching (BEC) interventions

CBI aims to increase exports to Europe and create employment in developing countries within the project duration of three to five years. Other markets outside of Europe are not the core expertise or focus of CBI, but would be included in the business export coaching as a stepping stone to the European market or for the purpose of market-risk diversification.

Based on this value chain analysis, the mango sector in Burkina Faso, Côte d'Ivoire and Mali offers the best fit between sector needs and the CBI mandate. There are sufficient foundations in place to support the enabling environment and local SMEs to grow their exports and become independent and sustainable businesses. We recommend a programme that connects the three countries, in line with the existing interconnectedness of the value chains. Exports of various types of processed mango could be increased within the three- to five-year timeframe. Potential interventions and key development partners are identified in the sections below.

For the other sectors explored in this study, pineapple and coconut, CBI is not the right partner at this time. Currently, there is very little to build on in these value chains, and CBI does not have the core expertise required to develop a sector from scratch. Also, it is not expected that significant exports could be realised within the CBI targeted timeframe. Other development partners would be better positioned to provide added value at this stage. We would appeal to programmes, including HortiFresh and 2SCALE, to support the development of processing from the current existing fresh-fruit trade.

6 Current Constraints and Potential Interventions

6.1 Constraint Analysis

Several constraints have been identified in the value chain analysis and validation workshop. These have an impact on export opportunities and need to be resolved in order for the sector to be economically sustainable.

On the next pages, the constraints, their limitations to export and related opportunities have been laid out for each of the countries. For all three countries, the main focus is the processing mango sector, but for Côte d'Ivoire, the constraints in some cases can also be observed as being more general and for the processing industry as a whole.

Table 32 Current constraints and analysis of multi-stakeholder solutions

Observed constraints	Limitations for export	BF	ML	CI	Critical? (Y/N)	Solvable in short term? (Y/N)	Which (donor) organisation is providing this solution? (CBI, or others)	Related opportunities
1. Seasonality of the mango sector.	Inability to supply year-round limits competitiveness compared to multi-origin suppliers.	✓	✓	✓	N	N	Interprofessional organisations.	Possibility to incorporate other fruits (e.g., pineapple, coconut, papaya) with mango processing facilities, especially for CI.
2. Financial and technical capacity of the sector organisation (interprofessional).	Ability to adequately facilitate (export) sector development in setting a sector strategy, lobbying power, data collection, sanitary issues, etc.	✓	✓	✓	Y	Y	Inteprofessional organisations, BDEx (CI), WACOMP.	Interprofessions willing to collaborate and already in close contact with multiple donors. ARMAO can function as regional integration and collaboration.
3. Capacity SMEs (language, marketing, market knowledge, financial record keeping, quality, certification, tariffs and fiscal legislation, etc.).	Difficulty connecting with and understanding international buyers.	✓	✓	✓	Y	Y	Interprofessional organisations, BDEx (CI), WACOMP, Agence PME/FIRCA/ADCI (CI), LANADA (CI), SMEs, Hortifresh (CI), 2Scale, IPD (CI), other government SME support agencies, COLEACP, APEX.	Many support organisations are active in capacity building.
4. Lack of political support for the processing industry.	Challenges to compete internationally.		✓	✓	N	N	Interprofessional organisations and government, WACOMP, CNE (CI), APEX, CCI-CI.	Burkina Faso and Côte d'Ivoire have political policies in place to promote processing.

Observed constraints	Limitations for export	BF	ML	CI	Critical? (Y/N)	Solvable in short term? (Y/N)	Which (donor) organisation is providing this solution? (CBI, or others)	Related opportunities
5. Limited size of European market for processed fruits.	Insufficient market demand to expand the processing export market significantly.	✓	✓	✓	N	N	SMEs, interprofessional organisations and partners, buyers.	Not limit focus on European export, look at regional and US exports. Opportunity to focus on niche (organic) products to fend off competition, as product is more difficult to copy. Though limited, there are buyers showing interest in this market.
6. High cost of production (labour, transport, energy, equipment).	Challenges to become profitable and compete internationally.	✓	✓	✓	N	N	SMEs, interprofessional organisations and partners.	West African region is developing more favourably than other regions, notably South Africa. Established market for dried mango and is favoured because of the taste of the product.
7. High cost of certification.	Not having appropriate certificates limits access to specific market segments.	✓	✓	✓	Y	Y	SMEs, Hortifresh (CI), 2SCALE, IPD (CI), government SME support agencies, COLEACP, APEX.	Support organisations available in all three countries to help with initial costs and, therefore, the opportunity exists to support development of local certification service providers.
8. Packaging material (availability, quality, cost).	Inability to meet European market requirements for packaging.		✓	✓	Y	Y	Interprofessional organizations and partners.	Knowledge of packaging material available.
9. Access to finance.	Inability to invest and acquire the right		✓	✓	Y	Y, partly	Interprofessional organisations and partners, FIRCA.	Investment capital available (not accessible), especially in Côte

Observed constraints	Limitations for export	BF	ML	CI	Critical? (Y/N)	Solvable in short term? (Y/N)	Which (donor) organisation is providing this solution? (CBI, or others)	Related opportunities
	equipment to obtain export quality.							d'Ivoire. Collaboration with financial institutions.
10. Limited organisation within the processing industry (beyond mango).	Limits product diversification and supplier strength.			✓	Y	Y	SMEs, government, CNE, CCI-CI, APEX-CI.	Willingness from the sector.
11. Quality of fresh mango for processing.	Limits the opportunity to meet quality specs for export.	✓	✓		N	N	Research institutions and NGOs, government.	Many initiatives to improve quality.
12. Chemical control for pest and diseases are a risk for certified supply (food safety, organic).	Risk if target export market is organic.	✓	✓	✓	N	N	GIZ (BF, ML), Hortifresh government.	Research and knowledge available from bio-control companies.
13. Labour and employment conditions, especially for vulnerable groups	Policy development restricting imports of products with high social risk *e.g., Wet zorgplicht kinderarbeid*	✓	✓	✓	Y	Y, partly	NGOs, government.	Early stages, so opportunity exists to investigate and implement measures. Opportunity to develop awareness in the sector on labour conditions. For CBI-supported SMEs, the problem can be solved, not for the country/sector.
14. Lack of processing capacity.	Not enough capacity to meet demand and be competitive.			✓	Y	N	CNE, CCI-CI, APEX-CI, WACOMP, FIRCA, Hortifresh, 2SCALE.	Oversupply of mango and stricter EU phyto rules for fresh mango incentivises processing, creating more willingness to invest into processing. Therefore, policies and the political environment are in place to support processors who want to organise themselves.

Table 33 Current Opportunities and analysis of multi-stakeholder solutions

Observed opportunities in value chain (incl. CSR)	Opportunity for Export	BF	ML	CI	Critical opportunity? (Y/N)	Short term benefit (Y/N)	Which (donor) organisation is providing or should be providing support / stimulate this opportunity? (CBI, or others)
Established market in Europe for dried mango PMCs .	Known as a supply origin to European buyers, easier to gain interest of European buyers.	✓	✓		Y	Y	CBI, WACOMP, APEX.
Established track record for organic dried mango.	Comparative advantage, as many other mango origins have limited organic supply available and demand for organic increases.	✓	✓		Y	Y	Interprofessional organisation, SNV, COLEACP, WACOMP, CBI.
The processing sector creates employment for women of all ages.	It allows for storytelling, which can increase sales volume and price for certain niche markets.	✓	✓	✓	N	Y	CBI, APEX, WACOMP, IPD.
The taste of the mangoes from target countries is favoured by the market.	Competitive advantage over other origins outside of Africa, difficult to copy, thus increasing barriers to entry.	✓	✓	✓	Y	Y	CBI, IPD, WACOMP to help market the taste in the European market and interprofessional organisations keep the sector informed of market demand.
Growing market in Europe.	Allows to develop and grow export market of processed mango products.	✓	✓	✓	Y	Y	CBI, IPD, WACOMP.

6.2 Potential Interventions

Table 34 Potential interventions for a CBI mango program

Value Chain Challenges	Interventions	BF	ML	CI	Key actors	Outcome	SDGs
1. Seasonality of the sector.	1a. Support development of diversification strategy and implementation (for CdI, this could be other crops, such as pineapple, coconut and papaya).	✓	✓	✓	SMEs, CBI	Create more and more attractive employment opportunities.	1, 8, 9
	1b. Conduct study on opportunities for value addition of by-products during off-season and support implementation of recommendations.	✓	✓	✓	Interprofessional organisation, CBI	Have recommendations on business cases for by-product processing with the most potential.	
2. Financial and technical capacity of the sector organisation (interprofessional).	2a. Support annual meetings by the inter-professional organisations and ARMAO.	✓	✓	✓	Interprofessional organisations, CBI, BDEx (CI)	Interprofessional organisations better serve the needs of their processing and exporting members.	8, 9
	2b. Provide business and strategy skills training (focusing on processing), possibly jointly for all three countries simultaneously in order to work on complementarity and/or via ARMAO.	✓	✓	✓			
	2c. Facilitate participation in international trade fairs for the most promising processing and exporting SMEs.	✓	✓	✓			
	2d. Facilitate inter-regional (BF, ML, CI) exchange platforms and/or support ARMAO in developing its regional strategy.	✓	✓	✓			
3. Capacity SMEs (language, marketing, market knowledge, financial record keeping, quality, certification, tariffs and fiscal legislation, etc.).	3a. Facilitate training on import/export regulations (tariffs and fiscal legalisations).		✓	✓	BDEx (CI), WACOMP, Agence PME/FIRCA/ADCI (CI), LANADA (CI), SMEs, Hortifresh (CI), 2SCALE, IPD (CI), other government SMEs	SMEs better meet the needs of the international market. Improves the negotiation power of SMEs.	8, 9
	3b. Facilitate training on quality requirements in the European market and certification standards.		✓	✓			
	3c. Facilitate training on marketing skills (incl. storytelling).	✓	✓	✓			

Value Chain Challenges	Interventions	BF	ML	CI	Key actors	Outcome	SDGs
	3d. Facilitate training on financial skills.	✓	✓	✓	support agencies, COLEACP, APEX		
	3e. English language courses.	✓	✓	✓			
4. Lack of political support for the processing industry.	4a. Support interprofessional organisations in lobbying activities.		✓	✓	Interprofessional organisations and government, WACOMP, CNE (CI), APEX. Availability of supply and demand data.	Improve government awareness of the importance of processing. Support government in making the case for policy incentives to promote processing.	9
	4b. Support interprofessional organisations in developing a national (mango) and inter-regional processing strategy.		✓	✓			
	4c. Support interprofessional organisations in setting up a more accurate data collection system with relevance to the processing industry, also for other fruit value chains that are processed by the mango processors.		✓	✓			
	4d. Search collaboration with other fruit processors in order to strengthen their negotiation position.		✓	✓			
5. Limited size of European markets for processed fruits.	5a. Provide support in coaching of processors and exporters of mango concentrate and dried mango. Market positioning.	✓	✓	✓	SMEs, CBI, Hortifresh (CI), 2SCALE, IPD (CI), government SME support agencies, investors and banks, European buyers, APEX.	Build a strategy to better meet the demands of the markets in order to prevent flooding the markets with unwanted products.	9
	5b. Facilitate knowledge transfer and investment into freezing units and other potential new products.	✓	✓	✓			
	5c. Support international market information sessions on processed fruits and involve other development actors working on trade in West Africa in networking activities (e.g., USAID).	✓	✓	✓			
	5d. Support SMEs in new product development (NPD) together with European buyers.	✓	✓	✓			

Value Chain Challenges	Interventions	BF	ML	CI	Key actors	Outcome	SDGs
	5e Conduct a study on how tropical fruits could serve as a substitute for non-tropical fruits.						
6. High cost of production (labour, transport, energy, equipment).	6a. Via interprofessional and/or 2SCALE agri-clusters, facilitate development of new joint business models that could bring costs down in, e.g., transport, renewable energy, packaging (mutuel). 6b. Conduct a study and facilitate access to and availability of alternative energy sources (biogas, solar, etc).	✓ ✓	✓ ✓	✓ ✓	SMEs, CBI, Hortifresh (CI), 2SCALE, government SME support agencies, experts in alternative energy sources	Value chain efficiencies are improved, and the costs of production are decreased.	7, 9
7. High costs of certification.	7a. Financial support in the conversion to certified-organic or GFSI-recognised food-safety certifications.	✓	✓	✓	SMEs, CBI, investors	Access to certification improved.	8, 12, 13
8. Packaging material (availability, quality, cost).	8a. Support R&D in packaging so that costs are reduced and meets import requirements. 8b. Facilitate exchange between the countries on materials used.	✓ ✓	✓ ✓	✓ ✓	SMEs, packaging companies, European buyers	Accessibility and availability of packaging meets the needs of the buyers.	9
9. Access to finance	9a. Map financial service providers and incubators in the country that are interested in the processing industry. 9b. Organise networking events between the financial and processing sectors. 9c. SME training on financial skills and record keeping.	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	Financial service providers, SMEs, Investors, 2SCALE, Hortifresh, government agencies, CBI	Improved knowledge of the sector by financial services sectors. Improved knowledge of SMEs on requirements to obtain financing.	8, 9
10. Limited organisation of the processing industry.	10a/14a. Provide technical and financial support for the setup of processing industry platform organisations in order to stimulate fruit processing.			✓	2SCALE (agri-business clusters), CBI, IPD, CCI-CI, CNE, APEX-CI		

Value Chain Challenges	Interventions	BF	ML	CI	Key actors	Outcome	SDGs
11. Quality of fresh mango for processing related to varieties and poor quality due to pest (fruit fly) attacks.	11a. Create a joint platform (BF, ML and CI) via interprofessional organisations that exchanges information and learnings on pest and diseases in mango. 11b. Support the development of a multi-year strategy to adapt varieties to needs of the market.	✓ ✓	✓ ✓	✓	CBI, research institutions, government technical support agencies, Interprofessional organisation, GiZ	Supply better adapted to processing (thus market) needs.	12
12. Chemical control for pest and diseases are a risk for certified supply (food safety, organic).	12a. Collaborate with companies like Koppert biological systems to inform the sector (via the interprofessional organisations) of alternative solutions to pest and disease control.	✓	✓	✓	Companies delivering bio-control systems, SMEs, interprofessional organisations, government technical support agencies	Reduced use of chemical crop-protection products. Create awareness among farmers of the use of alternatives ways to control pests.	8, 12
13. Labour and employment conditions, especially for vulnerable groups.	13a. Conduct study on labour and employment conditions in the mango value chain and other fruit chains that are linked to the mango processing facilities and support implementation of recommendations. Focus on processing. 13b. Work with the CBI-selected processors to implement processes and standards to manage adequate labour conditions in their supply chains.		✓	✓	sequa, NGOs, CBI, social projects, government agencies supporting women and children, certification standards	Understand current labour and employment conditions within the processed fruit industry. Awareness raising among SMEs of good practices when it comes to labour conditions. Increased transparency and traceability of the value chains.	5, 8, 9, 10
14. Lack of processing capacity.	14a/10a. Provide technical and financial support for the setup of processing industry platform organisations in order to stimulate fruit processing. 14b. Advocate implementation of policy.			✓	2SCALE (agri-business clusters), CBI, IPD, CCI-CI, CNE, APEX-CI	More active, sustainable and organised processing within the industry (beyond mango and including coconut).	1, 8, 9, 12

6.3 Key Development Partners

We have identified the following key partners for a CBI mango programme in Burkina Faso, Côte d'Ivoire and Mali.

The interprofessional organisations in each of the countries, with ARMAO as their umbrella body, are well-positioned to serve as an entry point to the mango processing sector.

Table 35 Key development partners for a CBI mango program

	Burkina Faso	Mali	Côte d'Ivoire
Interprofessional sector organisations as main entry point to the mango processing sector	ARMAO & APROMAB	ARMAO & IM	ARMAO & Inter-Mangue
Government	APEX Burkina Faso for positioning, export promotion, and market information sharing	APEX Mali for positioning, export promotion, and market information sharing	Agence CIPME and ADCI/PARCSI for business support to SMEs; FIRCA/LANADA production, processing, food safety and certification training
International organisations	SNV for historical sector expertise and support to those smaller processors that are very inclusive or experiment with solar processing; COLEACP for technical coaching on processing	AgriProfocus and 2SCALE for sector information sharing	Hortifresh and 2SCALE for financial and technical support to processing SMEs; IPD for market linkages; BDEx support to Inter-Mangue; sequa gGmbH, ENABLE as partners on youth and women

6.4 Risk Assessment

While a programme targeting mango processing provides opportunities for employment creation and inclusiveness, there are risks. These risks are mainly related to politics, security, market demand and competitiveness.

Political and security risks relate to uncertainty about elections coming up in Côte d'Ivoire and Burkina Faso, and to religious and tribal tensions in border areas between Burkina Faso and Mali. These need to be monitored closely by all stakeholders in order to ensure their security and maintain access to market.

Market demand and competitiveness are also risks. An increase of processing in Côte d'Ivoire and Mali may be a threat to Burkina Faso's current leading position in the market. Also, while market demand does grow for dried fruits, frozen fruits and purées, supply in the dried fruits segment is currently growing faster than demand. This can lead to competition between the focus countries, as well as with

other supply countries like Ghana and South Africa. The key to mitigating these risks lies in diversification, coordination and market-growth initiatives.

An overview of risks, their impact and the proposed mitigation are assessed in the table below.

Table 36 Risk assessment, impact and proposed mitigation

Risk	BF	CI	ML	Impact	Likelihood	Impact	Mitigation
Political instability and insecurity in the region, and presidential elections in 2020	✓	✓		Political instability can cause indecision, delays and can affect security	M	H	Liaise with NL embassy in the country to understand the current situation
Security risk in producing areas due to religious and tribal tensions	✓		✓	Safety of employees, facilities and project staff	H	H	Liaise with NL embassy in the country to understand the current situation
Implementation AfCFTA could make growth of less demanding regional markets preferential to European markets	✓	✓	✓	SMEs would target the other African markets instead of European markets	M	H	Relationship building with buyers in Europe. Most likely, it will take time to implement, so this is not a short-term threat
Overlap with programmes by other actors	✓			Lack of synergy between the technical and donor support organisations, e.g., double-funding of the same activities because of a lack of communication	M	M	Coordinate with other programme implementers
Reputational risk to CBI due to labour exploitation as focus is mainly on processing	✓	✓	✓	Labour conditions are likely to be poor in certain parts of the value chain and include child labour, though still unclear at what severity	H	H	Conduct a baseline study and determine actions relevant to the sector
Mango seasonality	✓	✓	✓	Inefficient use of equipment and loss of employment	H	L	Diversification (ginger, pineapple, papaya) for regional market
	✓	✓	✓	Expertise might leave the sector after the season	M	M	Ensure inclusion of company owners and sector stakeholders
Supply grows faster than demand	✓	✓	✓	Smaller companies cannot compete in consolidating market	H	L	Selection criteria to include economic viability, including minimum volumes and certification requirements

Risk	BF	CI	ML	Impact	Likelihood	Impact	Mitigation
	✓	✓	✓	Loss of market share for focus countries	M	H	Contribute to growing market through origin branding Include other fruit products so not only dependent on mango
	✓	✓	✓	Key competitors South Africa and Ghana gaining market share at the expense of focus countries	H	H	Consider including Ghana in regionally coordinated programme for diversification and standardisation through ARMAO
CI overtakes BF and Mali in production and exports because of more favourable investment climate, security and distance to port	✓		✓	Success of the programme in CI could create hurt markets in BF and ML	H	H	Focus on building a joint strategy, segmenting markets and diversifying products
Loss of market share based on new market requirements for certification	✓			Existing clients might turn to other more professionalised origins	M	H	Focus on food-safety certification and storytelling
Lack of production and market data	✓	✓	✓	Growth of supply may be too fast or inappropriate product quality	H	H	Support interprofessional organisations and APEX to annually collect and share data
Lack of English language skills with exporting companies	✓	✓	✓	Misunderstanding market opportunities and requirements	H	M	Focus on employing at least one English-speaking employee

7 Value Chain Analysis Conclusions

While the scope of this study started off with many different potential value chains, the intention was to work towards two programmes: one for Côte d'Ivoire and one for Mali and Burkina Faso jointly. The result of the analysis has shown that the most potential lies in a joint approach for the mango value chain.

There is a growing and relatively established market for mango products. There is also sufficient foundation in the three countries to build upon. There is a certainty of supply, even oversupply, and an increasing constraint for export of fresh mango to Europe because of the stricter phytosanitary rules. Therefore, it has the support of all three of governments. The latter is most positively felt in Burkina Faso.

In order to increase the positive impact of the sector, key factors need to be considered in supporting companies and their enabling environment:

1. Diversification: to address the challenges related to the seasonality of the mango sector and stronger competition due to fast-growing supply, different types of processing, new product development, different fruits, value addition of by-products and different markets.
2. Professionalisation: packaging, quality consistency, standard setting, food safety, and sustainability certification, the latter especially in order to also be able to address social issues.
3. Market growth: build buyer/supplier relationships, niches (organic, 'free-from'), substitute non-tropical fruits with mango, storytelling.
4. Coordination: regional interconnected mango value chains, coordinating market focus, and sector support, integration of other value chains (processing sector development).

Building a joint programme in three countries creates the opportunity to develop a regional mango strategy and support the northern region as a whole. Facilitating exchange and learning between the countries' SMEs, government parties and the European buyers will be important in order to ensure that the market follows supply.

Coconut and pineapple have been explored in Côte d'Ivoire. Although they provide opportunities, the sectors also deal with significant challenges, heightening the risk factor for intervention when it comes to promoting exports to Europe.

Coconut, with its range of possible value-adding products, has a promising market in Europe. However, challenges need to be overcome, both in the enabling environment, processing capacity and innovation, as well as in its raw material supply. Long-term interventions within a system approach would be required to support the sector towards a more conducive and competitive environment for exports of coconut products.
Initial interventions should focus on organising the sector and supporting its stakeholders in obtaining the necessary information to build a strategy upon. A possibility would be to look at joining forces with the other West African coconut producers to create sufficient supply, as the taste of coconut products is often related to a specific geographical region.

Pineapple has a long history in Côte d'Ivoire and is also well-known in its processed form. It is a crop that is basically disease-free, can be harvested throughout the year, has a growing cycle of one year and is said to be profitable for all supply chain actors involved. On the other hand, in Côte d'Ivoire, it is a sector that has known multiple crises, and many of the pineapple areas were converted to palm oil, rubber and cocoa plantations. Farmers have become discouraged. This has led to a significant supply gap, adding to the already high costs of production. This makes Côte d'Ivoire unable to adequately

compete on the international markets with countries like Costa Rica. The processed pineapple products therefore mainly go towards the domestic and the regional markets, which also shows the most potential for successful growth.

We would advise against a full-fledged programme for either coconut or pineapple, at least within the timeframe of a CBI program. However, if interventions in these processing sectors are considered, they should be focused around organising the (processing) sector and providing support with regards to market information (supply and demand). This is to both strengthen the supplier base and to improve lobbying and advocacy capacity towards government. While the coconut sector has the most market potential, it would be the most difficult to realise.

Both the coconut and pineapple can be processed by the mango drying units in the mango off-season, allowing these processors to create the opportunity for year-round income. Therefore, integrating coconut and pineapple in a programme via the mango processing sector would allow the intervening actors to further get to know the sectors and increase their potential for processing and organising themselves.

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Annex I. List of HS and PRODCOM codes

The below HS and PRODCOM codes have been used to analyse the market scope. Note that some of the HS codes still include out-of-scope elements, and the data has been adjusted based on expert assumptions.

HS4	HS6		PRODCOM	
Dairy products with fruit inclusions				
0403	040310	Dairy produce; yoghurt, whether or not concentrated or containing added sugar or other sweetening matter or flavoured or containing added fruit or cocoa	10515245	Flavoured liquid yoghurt or acidified milk (curdled milk; cream; yoghurt and other fermented products flavoured or containing added fruit; nuts or cocoa)
	040390	Dairy produce; buttermilk, curdled milk or cream, kephir, fermented or acidified milk or cream, whether or not concentrated or containing added sweetening, flavouring, fruit or cocoa (excluding yoghurt)		
Dried fruits				
0803-0804-0805-0813-0814	080300	Fruit, edible; bananas, (including plantains), fresh or dried	10392920	Dried fruit (excluding dates, pineapples, avocados, guavas, mangoes, mangosteens, citrus fruit and grapes); mixtures of dried nuts and/or dried fruits
	080310	Fruit, edible; plantains, fresh or dried	10392410	Peel of citrus fruit or melons, fresh, frozen, dried or provisionally preserved in brine, in sulphur water or in other preservative solutions
	080390	Fruit, edible; bananas, other than plantains, fresh or dried		
	080410	Fruit, edible; dates, fresh or dried		
	080420	Fruit, edible; figs, fresh or dried		
	080430	Fruit, edible; pineapples, fresh or dried		
	080440	Fruit, edible; avocados, fresh or dried		
	080450	Fruit, edible; guavas, mangoes and mangosteens, fresh or dried		
	080510	Fruit, edible; oranges, fresh or dried		
	080521	Fruit, edible; mandarins (including tangerines and satsumas), fresh or dried		
	080540	Fruit, edible; grapefruit, including pomelos, fresh or dried		
	080550	Fruit, edible; lemons (Citrus limon, Citrus limonum), limes (Citrus aurantifolia , Citrus latifolia), fresh or dried		
	081350	Nuts, edible; mixtures of nuts or dried fruits of chapter 08		
	081400	Peel; of citrus fruit or melons (including watermelons), fresh, frozen, dried or provisionally preserved in brine, in sulphur water and other preservative solutions		
Frozen fruits				
0811	081190	Fruit, edible; fruit and nuts n.e.c. in heading no. 0811, uncooked or cooked, frozen whether or not containing added sugar or other sweetening matter		
Oil				
1513	151311	Vegetable oils; coconut (copra) oil and its fractions, crude, not chemically modified	10415800	Refined coconut (copra) oil and its fractions (excluding chemically modified)
	151319	Vegetable oils; coconut (copra) oil and its fractions, other than crude, whether or not refined, but not chemically modified		
Cereal products with fruit inclusions				
1904	190410	Food preparations; obtained by the swelling or roasting of cereals or cereal products	10613351	Muesli type preparations based on unroasted cereal flakes
	190420	Food preparations; obtained from unroasted cereal flakes or from mixtures of unroasted cereal flakes and roasted cereal flakes or swelled cereals	10613353	Other prepared foods obtained by the swelling or roasting of cereals
	190430	Prepared foods obtained by the swelling or roasting of cereals or cereal products (e.g. corn flakes); cereals, not maize (corn), in grain form or		

HS4	HS6		PRODCOM	
		in the form of flakes or other worked grains, from bulgur wheat		
Baked products with fruit inclusions				
1905	190510	Food preparations; crispbread, whether or not containing cocoa	10711200	Cake and pastry products; other bakers' wares with added sweetening matter
	190520	Food preparations; gingerbread and the like, whether or not containing cocoa	10721230	Gingerbread and the like
	190530	Food preparations; sweet biscuits, waffles and wafers, whether or not containing cocoa	10721253	Sweet biscuits; waffles and wafers completely or partially coated or covered with chocolate or other preparations containing cocoa
	190531	Food preparations; sweet biscuits, whether or not containing cocoa	10721255	Sweet biscuits (including sandwich biscuits; excluding those completely or partially coated or covered with chocolate or other preparations containing cocoa)
	190532	Food preparations; waffles and wafers, whether or not containing cocoa		
	190540	Food preparations; rusks, toasted bread and similar toasted products, whether or not containing cocoa		
Jams and purees				
2007	200710	Jams, fruit jellies, marmalades, fruit or nut puree and fruit or nut pastes; homogenised, cooked preparations, whether or not containing added sugar or other sweetening matter	10392230	Citrus fruit jams, marmalades, jellies, purees or pastes, being cooked preparations (excluding homogenised preparations)
	200791	Jams, jellies, marmalades, purees and pastes; of citrus fruit, being cooked preparations (excluding homogenised), whether or not containing added sugar or other sweetening matter	10392290	Jams, marmalades, fruit jellies, fruit or nut purees and pastes, being cooked preparations (excluding of citrus fruit, homogenised preparations)
	200799	Jams, fruit jellies, marmalades, purees and pastes; of fruit or nuts n.e.c. in heading no. 2007, cooked preparations (excluding homogenised), whether or not containing added sugar or other sweetening matter	10861050	Homogenised preparations of jams, fruit jellies, marmalades, fruit or nut puree and fruit or nut pastes
Preserved fruits				
2008	200820	Fruit; pineapples, prepared or preserved in ways n.e.c. in heading no. 2007, whether or not containing added sugar, other sweetening matter or spirit	10392950	Fruit, prepared or preserved, n.e.c. (excluding Müsli)
	200830	Fruit; citrus, prepared or preserved in ways n.e.c. in heading no. 2007, whether or not containing added sugar, other sweetening matter or spirit		
	200892	Fruit, nuts and other edible parts of plants; mixtures (other than those of subheading no 2008.19), prepared or preserved in ways n.e.c. in heading no. 2007 and 2008, whether or not containing added sugar, other sweetening matter or spirit, n.e.c.		
	200897	Fruit, nuts and other edible parts of plants; mixtures (other than those of subheading no 2008.19); prepared or preserved in ways n.e.c. in headings 2007 and 2008, whether or not containing added sugar, or other sweetening matter or spirit, n.e.c.		
	200899	Fruit, nuts and other edible parts of plants; prepared or preserved, whether or not containing added sugar, other sweetening matter or spirit, n.e.c. in heading no. 2008		
Fruit juices				
2009	200911	Juice; orange, frozen, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter	10321210	Frozen unconcentrated orange juice
	200912	Juice; orange, not frozen, of a Brix value not exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321220	Unconcentrated orange juice (excluding frozen)
	200919	Juice; orange, not frozen, of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321230	Orange juice n.e.c.

HS4	HS6		PRODCOM	
	200921	Juice; grapefruit (including pomelo), of a Brix value not exceeding 20, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter	10321300	Grapefruit juice
	200929	Juice; grapefruit (including pomelo), of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321400	Pineapple juice
	200930	Juice; of single citrus fruit (excluding orange or grapefruit), unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter	10321700	Mixtures of fruit and vegetable juices
	200931	Juice; of single citrus fruit (excluding orange or grapefruit), of a Brix value not exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321910	Unconcentrated juice of any single citrus fruit (excluding orange and grapefruit)
	200939	Juice; of single citrus fruit (excluding orange or grapefruit), of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321920	Unconcentrated juice of any single fruit or vegetable, not fermented and not containing added spirit (excluding orange, grapefruit, pineapple, tomato, grape and apple juices)
	200940	Juice; pineapple, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter	10321930	Other fruit and vegetable juices n.e.c.
	200941	Juice; pineapple, of a Brix value not exceeding 20, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter	10321210	Frozen unconcentrated orange juice
	200949	Juice; pineapple, of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321220	Unconcentrated orange juice (excluding frozen)
	200980	Juice; of any single fruit or vegetable n.e.c. in heading no. 2009, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter	10321230	Orange juice n.e.c.
	200989	Juice; of any single fruit or vegetable n.e.c. in heading no. 2009, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter		
	200990	Juices; mixtures of fruits or vegetables, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter		

Annex II. List of European stakeholders for selected PMCs

PMC	Description	*European companies*
Dried tropical fruits	Approximately 60% of the total imported dried tropical fruit in Europe is used as an ingredient for further processing, while some 40% is re-packed and sold by retailers or used in the food service segment (CBI, 2017). In the food processing industry, dried tropical fruit has many applications in breakfast cereals, the bakery and confectionery industry, fruit preparations for dairy industry and snack bars (CBI, 2017). When it comes to natural dried tropical fruits (without added sugar) a much larger share is sold as a snack in the retail segment.	*Importers*: Community Foods, Chelmer Foods, Evolution Foods, Global Grains, Derby Ingredients, Catz International, Nutland, Tradin Organic, Rhumveld Winter & Konijn, Egesun, Besana, Manning Impex, Voicevale, Mango Trading Company, Seeberger, Kluth, Agro Sourcing, BC Agro Fruits Sec, Afrifruta, Delinuts, King Nuts & Raaphorst, Gebana; *Agents (also wholesalers):* QFN Trading and Agency, HPM Warenhandelsagentur, Zieler, Besana, Noberasco *Packers (retail):* Whitworths, Forest Feast, Seeberger, Farmer's Snack, Noberasco, Richard Janssen, Rapunzel, Maître Prunille, Brover Brouze Vergez *Processors*: Viba, Fulwell Mill, The Food Doctor, Mighty Bee, Bösch Boden Spies, Rude Health, Van Mook, De Vau Ge, HPW
Fruit Juices and concentrates	About 60% of the fruit purées go to a processors. Think of use in marmalades, jellies, candies, cereal-based products, ice-cream and fruit yoghurts. New channels such as juice and smoothies bars, fresh juice stores, raw food restaurants and juice corners are increasing market share. Those channels are in line with the general healthy living trend (CBI, 2017). An increasing share led by organic banana purée is going to the baby food industry. The beverage industry mainly buys concentrates since fresh juice has a limited shelf life.	Passolongo; Excelfoods; Doehler; Refresco; Eckes-Granini; Austria Juice; SVZ; Frutco; Verbruggen Juice Trading; Riedel; AgroFair; Firmenich. Most juice companies are members of AIJN, the European Fruit Juice Association.
Tropical frozen fruits	The specialized importer and food processor is the preferred channel for market entry in this sector. About 70% of the products go to the frozen foods industry. Processing industry includes dairy processing industry for use as an ingredient in yoghurts, other milk-based drinks and deserts. Also the ice-cream sector mainly uses frozen fruits (CBI, 2019). An important segment developing fast in Europe is the smoothies segment. In this segment innovative and new companies use frozen fruit and fruit purees as their main ingredients (CBI, 2019).	Examples of companies processing frozen fruits are Döhler, Agrana, Cobel, SVZ, Refresco, Eckes-Granini, Coca Cola; PepsiCo; Unilever (Magnum brand), Milcobel (Ysco brand), Vivartia S.A. and Nestle. Examples of companies that supply to this segment include Ardo Group, Agrana, Grunewald International, Valio, Fuerst Day Lawson, Louis Dreyfus, Loragro, Friesland Campina, Kühne + Heitz, Excelfoods, Chirimvita,

Coconut water/ Coconut milk	The majority of imported coconut water in Europe is used by the beverage industry in three main ways, listed here in the order of used quantities (CBI, 2018): • in the bottling and production of 100% coconut water made from concentrate • as ingredients for the production of nectars, fruit drinks, soft drinks and other beverages. • in bottling of not-from-concentrate (NFC) coconut water Liquid coconut milk is the leading segment. Powdered coconut milk follows. Europe accounted for a considerable market share of 21.72%, as of 2016 according to Market Research Future. The surging demand for plant-based beverages and products containing natural ingredients are crucial determinants fuelling regional growth	The leading coconut water retail brand in Europe is Vitacoco followed by Chi coconut water. Other important brands which are predicted to increase market share on the European market are: Zico (international brand of Coca-Cola), Green Coco, O.N.E. (international brand by PepsiCo) and Vai-Vai (CBI, 2018). Danone; Fairtrade Original, Wallaroo
Desiccated coconut	From information on CBI website, approximately 60% of all desiccated coconut imported into Europe is re-packed and sold by retailers. Usually, low-fat products are used for re-packing. Final consumers are the food service sector and individual consumers in their households. Around 35% of imported desiccated coconuts are used by the food processing industry as an ingredient for final products. The largest share goes to the confectionary industry as fillers inside chocolate bars as an ingredient for other confectionary products (CBI, 2019).	Importer (wholesaler): Catz International, QFN Trading and Agnecy, TM Duché & Sons; Packer: Crazy Jack, Whitworths, East End; Processors: Nestlé, Mars, Mondelēz International, Ferrero, August Storck (CBI, 2019).

Annex III. List of stakeholders in Ivory Coast

Mango stakeholders

Processors

N	Production Unit	Sector Organisation	Location
1	Usine de Sechage de Mangue de Ouangolo	UTMACI	TCHOLOGO
2	LF Bagoué	UTMACI	BAGOUE
3	Scoops -GNINNANGNON	UTMACI	PORO
4	Scoops - KOTOWOBIN	UTMACI	BAGOUE
5	Scoops – WOPININWOGNON	UTMACI	TCHOLOGO
6	Scoops COPROMASI	UTMACI	PORO
7	Scoops -MAD	UTMACI	KABADOUGOU
8	Scoops -COFRUINO	UTMACI	KABADOUGOU
9	Ivoire Organic (organic)		PORO
10	LA & JAB Côte d'Ivoire		PORO
11	Les Jardins de Koba (organic)		TCHOLOGO
12	COBEKO		PORO
13	Yao Tropico		PORO
14	Centre de Séchage de Farako		KABADOUGOU
15	SCOOPS CDFLCI		TCHOLOGO
16	HPW fresh & dry Côte d'Ivoire (organic)		BAS COMOE
17	ATOU SARL		LAGUNE
	Total Market Share UTMACI dried mango	**28.6% (49 tonnes)**	
	Total Market Share Private companies	**71.4% (121 tonnes)**	

Exporters

N	Production Unit	Sector Organisation
1	SIPRAG	OBAMCI
2	COMAKO (RA certified)	OBAMCI
3	TROPIC MANGO (RA Certified)	OBAMCI
4	COFRUIBO	OBAMCI
5	SODIPEX SARL (RA Certified)	AREXMA
6	APEX-KO SARL	AREXMA
7	IVOIRE AGREAGE	AREXMA
8	SPEM	AREXMA
9	VERGER DU BANDAMAN	AREXMA
10	VERGER DU NORD (RA Certified)	AREXMA
11	ROCFED SARL	AREXMA
12	OUATTARA TRADING (RA Certified)	AREXMA
13	NEMBEL INVEST SA	AREXMA
14	C.F.A	OCAB
15	GIE -FCI NOUVELLE	OCAB
16	SIPEPT	OCAB
17	SCOOPS-COOPEXA	OCAB
18	MAMO IMPORT EXPORT SARL	OCAB
19	SOLEIL D'AFRIQUE	-
20	IFRUITROP (CHAKER JOSEPH) (Organic certified)	-

N	Production Unit	Sector Organisation
21	NOCOCI	-
22	IMS ENTREPRISE NOUVELLE SARL	-
23	COPANO-SI	-
24	SEPAM-CI	-
25	IVOIRE ORGANICS	-
26	KONE FANTA (LYMAC FRUIT)	-
27	CELEF IMPORT – EXPORT	-
28	ADF-AGRO	-
29	ESM	-

Fruit processors

#	Company	PMC	Fruit 1	Fruit 2	Fruit 3	Fruit 4
1	COCO HUILERIE DISTRIBUTION (COHUIDI)	Oil	Coconut			
2	COPROIL AGRO INDUSTRIE	Oil	Coconut			
3	HUILERIE MODERNE D'ABIDJAN	Oil	Coconut			
3	HUILERIE TROPICALE DE CÔTE D'IVOIRE	Oil	Coconut			
5	Ivoire Coco Huilerie	Oil	Coconut			
6	SOCIETE IVOIRIENNE DE COCO RAPE (SICOR)	Grated	Coconut			
7	Romeo Dou	VCO	Coconut			
8	BAKTHI	Juice	Ginger			
9	N'Zantoukou	Liquor	Ginger	Hibiscus	Passion	
10	Eléphant Gourmand	Liquor	Ginger	Passion	Citrus	Palm tree
11	NATURE IVOIRE	Juice	Hibiscus	Ginger	Passion	
12	Mantava	Juice	Mango			
15	CENTRE DE SECHAGE DE FARAKO	Dried	Mango			
16	IVOIRE ORGANICS (since 2008, cultivation are 1,172ha. Certification BSCI, Naturland, EU Organic, Global GAP + GRASP)	Dried	Mango	Pineapple	Coconut	Papaya
17	LA & JAB CÔTE D'IVOIRE	Dried	Mango			
18	LES JARDIN DE KOBA	Dried	Mango	Pineapple	Banana	
19	LF BAGOUE	Dried	Mango			
20	SCOOPS - KOTOWOBIN	Dried	Mango			
21	SCOOPS - WOPININWOGNON	Dried	Mango			
22	SCOOPS - GNINANGNON	Dried	Mango			
23	SCOOPS -MAD	Dried	Mango			
24	SCOOPS CDFLCI	Dried	Mango			

#	Company	PMC	Fruit 1	Fruit 2	Fruit 3	Fruit 4
25	SCOOPS COPROMASI	Dried	Mango			
26	USINE DE SECHAGE DE MANGUE DE OUANGOLO	Dried	Mango			
27	YAO TROPICO	Juice	Mango			
28	CAROL'S	Jam	Papaya	Water-melon	Banana	Mango
29	ATOU	Juice	Pineapple	Papaya	Mango	Guava
30	LES CONFITURES DE TATI	Jam	Passion fruit	Papaya	Ginger	Guava
31	COCOPACK	Frozen	Pineapple	Mango	Coconut	
32	COMAFRUIT *(Golden Boys)*	Juice	Pineapple			
33	Jus Paly	Juice	Pineapple	Hibiscus	Ginger	Lemon
34	Pure Nature	Juice	Pineapple	Mango	Passion	Lemon
35	RESCAN INDUSTRY	Dried	Pineapple	Mango		
36	Sikka	Liquor	Pineapple	Coconut	Passion	Ginger
37	LE BONOUA	Juice	Pineapple			
38	Boisson d'Afrik	Juice	Pineapple	Ginger	Tamarind	Baobab
39	HPW	Dried	Pineapple	Mango	Coconut	Papaya

Government

Ministere de l'Agriculture et du Développement Rural (MINADER)

Agency	Role & activity in the value chain
ANADER - Agence Nationale d'Appui au Développement Rural	Public limited liability company jointly owned by the State (35%), professional organizations (33%) and private companies (32%). Ensure the supervision of production for the sector: • Train producers on Good Agricultural Practices; • Contribute to strengthening the organization, management capacity and performance of existing takeovers and consolidate other types of takeovers; • Estimate production and bagging needs
CNRA - Centre National de Recherche Agronomique	The sustainable increase in production and productivity in the agricultural and agro-industrial sectors through: • research on crop, animal and forest production, production systems, conservation and processing methods, as well as the adaptation of technological innovations in rural areas • the transfer of scientific and technical knowledge to public and/or private, local and/or external operators
DOPA - Direction des Organisation Professionnelles Agricoles	Ensure the promotion and development missions of the cooperative movement (Inform, train, raise awareness and ensure follow-up in the transformation of cooperatives into cooperative societies).

DPVCQ - Direction de la Protection des Végétaux, du Contrôle et de la Qualité	The DPVCA mission can be broken down into 3: 1) crop protection; 2) plant health inspection; 3) participation in the development of quality standards in accordance with national realities, and monitoring their application.
FIRCA - Fonds Interprofessionnel pour la Recherche et le Conseil Agricole	Ensure the financing of agricultural sector development activities by financing sector development activities with resources from the sectors.
LANADA - Laboratoire d'Analyse et d'Appui au Développement Agricole	In all areas aimed at preserving and improving the quality of animal and plant production or production conditions, in particular concerning: food hygiene and quality, agricultural product quality, animal health, animal nutrition and reproduction, veterinary pharmacy and plant health products, plant protection and plant production and environmental protection.
OCPV - Office d'Aide à la Commercialisation des Produits Vivriers	The OCPV is responsible for helping to improve the marketing of food products in Côte d'Ivoire, but this is done as a supervisory, training, assistance and advisory body. The OCPV has four main activities that range from the collection and dissemination of economic and commercial information, to the promotion of infrastructure and equipment, support for commercial transactions, to logistical and organizational support.

Ministere du Commerce, de l'Industrie et de la Promotion des PME

Agency	Role & activity in the value chain
ADCI - Agence pour le Développement et la Compétitivité des Industries de Côte d'Ivoire	Implementing agency of the PARCSI programme (Oct 2014-2020, AfDB) aimed at developing the competitiveness of the Ivorian industrial sector. The services provided are aimed at the modernisation and professionalisation of industrial enterprises, technical assistance and easier access to finance. The programme also aims to set up a label "Fruits Qualité Côte d'Ivoire.
Agence CIPME	Agence CIPME, is a Government agency explicitly founded for the operational support of SMEs. It has 55 employees. Its definition of SME describes a company which has less than 1.5 Mio Euro of annual turnover and less than 200 employees. By this definition, about 95% of companies in Côte d'Ivoire are SMEs. 40.000 companies are in the agency's database, which is a large part of the SME in the country. The mission of the Agence CIPME is to support SMEs in becoming more competitive and, of course, develop their businesses successfully. To reach this objective, the Agence CIPME implements projects financed by different sources, such as the Ivorian Government, but also donor agencies. They also cooperate with the CCI and GIZ. The Agence CIPME has a large business incubator centre, where different activities, such as trainings, information days as well as B2B activities can take place *(Source: IPD)*

ADEGI - Agence de Gestion et de Développement des Infrastructures Industrielles	The mission of the agency is to prepare studies, carry out industrial developments and equipment, but also to examine applications for land for industrial use.
CCI-CI Chambre de Commerce et d'Industrie en Côte d'Ivoire	Founded in 1992. 320 Employees and 16 local offices. Following the mandate of the Ministry of Commerce, Handicrafts and SME Development, CCI-CI has deployed multiple initiatives in the areas of entrepreneurship, strengthening SMEs, professionalisation of the sector and international trade. Every company in the country needs to register export activities with the CCI. About 10% of the CCI's budget comes from the Government. Furthermore, the Chamber offers many paid services to companies, such as courses and classes, but also delegation travels to foreign countries as well as B2B meetings and activities. The CCI defines four pillars of its missions, namely: • Private sector representation; • Organizing trainings, • Service provision and; • Accompanying and coaching of companies CCI-CI issues certifications for agricultural products bound for export.
CNE - Conseil National des Exportations	The main objective of the CNE is to mobilize economic and social actors for the implementation of the National Export Strategy, in short SNE, defined by the Government with the support of the private sector and to discuss any issue related to trade and exports at the national, regional and international levels. The CNE monitors the implementation of the National Export Strategy and gives recommendations to the Government but does not execute projects. CNE carries out sector studies, and organizes a regular exchange with the private sector. For each focus sector, there exists a commission of experts who give input to the CNE.
CODINORM - Côte d'Ivoire Normalisation	CODINORM is the national standards and certification body entrusted with the following tasks. CODINORM was jointly established by the private sector and the government in 1992. It is managed by a Board of 23 members, 14 of which being from the private sector and 9 from the Government. CODINORM is the National Standards and Certification body entrusted with the following missions: • the development, registration and dissemination of Côte d'Ivoire standards; • the management of a national product certification and quality management system (ISO 9000 series);

	• the promotion of quality management in companies; • the management of a technical documentation collection and of a bookstore for standards and quality-related works; • the management of the national WTO enquiry point on standards and regulations; • the representation of Côte d'Ivoire in international standardization bodies.
LANEMA - Laboratoire National d'essais de Qualité de Métrologie et d'Analyses	LANEMA's activities are numerous, but mainly oriented towards analysis, testing and metrology work. However, it is also involved in other areas such as training, advisory assistance and hygiene awareness. The laboratory exercises its skills in the analysis of agro-industrial, food and chemical products.
Agence Côte d'Ivoire PME	Its mission is to support the promotion and development of Small and Medium-sized Enterprises (SMEs), mainly in four sectors, the issue of access to finance and the market, capacity building, the business environment and finally innovation and entrepreneurship. The objective is for the State to be able to further optimise its intervention by centralising all its resources within an organisation for the needs of Ivorian SMEs.

Ministère de l'Environnement et du Développement Durable

Agency	Role and Activity in the Value Chain
CIAPOL - Centre Ivoirien Anti-Pollution	CIAPOL's missions and responsibilities include fighting against pollution and the prevention of risks and nuisances generated by economic activities, whether industrial or agricultural, in accordance with the legislations and regulations of installations classified for the protection of the environment
ANDE - Agence Nationale de l'Environnement	1. Ensure the coordination of the execution of development projects of an environmental nature; 2. Build and manage a portfolio of environmental investment projects; 3. Ensure that environmental concerns are taken into account in development projects and programmes; 4. Ensure the establishment and management of a national environmental information system; 5. Implement the impact assessment procedure and the environmental impact assessment of macroeconomic projects; 6. Establish an ongoing relationship with NGO networks; 7. Develop environmental profiles and management plans for local authorities; 8. Carry out environmental audits of works and companies; 9. Educate, inform, sensitize/ communicate on environmental protection.

Presidency

Agency	Role & activities in the value chain
BNETD - Bureau National d'Études Techniques et de Développement	Provides assistance and advice in the agricultural sector on behalf of the State and individuals. This is reflected in the development of studies in the various fields of agriculture such as animal and fish resources, forestry, applied pedology, rural development and rural land. It also has the database of agricultural sectors in Côte d'Ivoire. In addition, the department contributes to the development of strategies for the industrial transformation of Ivorian agricultural production. Finally, it carries out programmes for the development and restructuring of agricultural sectors, project management of rural engineering works and study control.
CEPICI - Centre de Promotion des Investissements en Côte d'Ivoire	Created in 2012 as a mandate directly from the Office of the President of Côte d'Ivoire, CEPICI is the one-stop shop for investment in the country. CEPICI's missions are transversal in nature, giving it a role dedicated to supporting the private sector and acting as an interface between the private sector and the State, in order to increase private investment in Côte d'Ivoire.

Private sector

Name	Role & activities in the value chain
Afruibana	AFRUIBANA is an association whose headquarters are in Douala and which has a representation in Brussels before the European institutional bodies. AFRUIBANA was created by bringing together several fruit producers and exporters associations from Côte d'Ivoire, Cameroon and Ghana. The association represents and wishes to bring the voice of African fruit producers to international institutions in the negotiation of bilateral and multilateral trade.
ANOPACI - Association Nationale des Organisations Professionnelles Agricoles de Côte d'Ivoire	ANOPACI brings together about 30 professional organizations. It is the only one in Côte d'Ivoire to have such a diversified network of apexes of the main agricultural, livestock and microfinance sectors. After the dissolution of the chambers of agriculture in 2002, ANOPACI was considered as the privileged interlocutor of the public authorities in the consultation bodies of the agricultural sector. From the beginning, ANOPACI has given itself for main missions: Ensure the defence of producers' interests, promote the professionalization of agriculture by improving in particular the negotiating skills of its members within the interprofessional organisations, improve farmers' incomes and living conditions and enhance the value of the farming profession.
APEX-CI Association for the Promotion of Exports of Côte d'Ivoire	Is a trade promotion agency set up in 2000, in a time when Côte d'Ivoire mainly exported unprocessed goods. It was founded by key stakeholders such as local private sector companies, the Ivorian State and the World Bank which assists small medium-sized companies interested by exporting in the international market place. Its mission is the promotion of high value-added products and the advisory of private processing companies. It is an association with about 200 official members. Members pay an entrance fee into the association – and then fees for services

AREXMA - Association Régionale des Exportateurs de Mangues	AREXMA representing the mango sector is a regional Association implemented in the savannah region whose purpose is to : • Strengthen professional and solidarity links between mango exporters in the savannah region, • Undertake communication and promotion actions for the benefit of exporters, • Create a synergy for the development of the quality of mango for export to supply to European markets, • Make quality and food safety a reality, • Recognition and respect for environmental and social responsibility Some of the members are: C.F.A ; GIE -FCI NOUVELLE; SIPEPT; SCOOPS-COOPEXA; MAMO IMPORT EXPORT SARL
COLEACP - Comité de liaison Europe-Afrique-Caraïbes-Pacifique	COLEACP is a civil society organisation (CSO) established in 1973 whose main purpose is to support the development of a sustainable and competitive agriculture and agribusiness.
FENA-COFRUITEL – La fédération Nationale des Coopératives Fruitières et Légumes de Côte d'Ivoire	Founded in 2017, and regroups 8 cooperatives (pineapple) and 358 members, which produce 11 700 tonnes of pineapple on 388 hectares. They have 752 hectares available for production
FENAMACI – La Fédération Nationale des Acteurs de la Mangue de Côte d'Ivoire	They have 6 cooperative members. They produce on 4,220 hectares with a total production of 19,607 tonnes • La Société Coopérative des planteurs de Mangues de Oulo (SCOOP-CA Plamo) • La Société Coopérative LONYA de Korhogo, SCOOP-CA (CLK) • La Société Coopérative des exploitants de Mines de Korhogo (SCOOP-CA-YENSMINE) • La Société Coopérative FOUNGNIGUE pour le fruits des legumes de Côte d'Ivoire (SCOOP-SOCOFFLECI) • La Société Coopérative des producteurs de Mangues du Worodougou (SCOOPS-COPROMA-WORODOUGOU) • La Société Coopérative (SCOOP-COPRAKO)
Inter Mangue - Interprofession Mangue	Set up in 2018, Inter-Mangue's mission is to address key challenges such as plant health, processing, price, etc. in the mango value chain. The association will also strive to professionalize the sector and have a unified voice for the private sector. Inter-Mangue has a total of 49 members of which producers (60%), exporters(20%), processors (7%), packaging providers(7%), and the harvest technicians and traders (6%),

OBAM-CI Organisation des producteurs-exportateurs de Bananes, d'Ananas, de Mangues et d'Autres fruits de Côte d'Ivoire	Founded in 2009. Some of the main members are:
	• Société d'Etude et de Développement de la Culture Bananière (*SCB*) of the Compagnie Fruitière group, comprising an integrated group of companies, a group of supervised companies and a group of small producers with whom it maintains a technical and commercial partnership. The group exports nearly 65% of banana production in Côte d'Ivoire.
	• *BANACI SA* (Bananas Antilles Côte d'Ivoire) created in 2013 by a private West Indian group; BANACI SA, a subsidiary of the Martinique Paillade group, operates 250 hectares of banana plantation. BANACI is member of OBAMCI since 2018.
	• COSUCO La Société Coopérative des planteurs du Sud-Comoé (pineapple)
	• COFRUIBO La Société Coopérative de Fruits de Banoua (pineapple)
	• Exporters (Mango)
	  • SIPRAG
	  • COMAKO
	  • TROPIC MANGO
	  • COFRUIBO

OCAB Organisation Centrale des Producteurs Exportateurs d'Ananas et de Bananes	Founded in 1991 largest members are: • *EGLIN-SBM* of the Belgian SIPEF group, accounts for 8% of production. • *SCAB*: Société coopérative d'exportation d'ananas et de bananes; this entity is composed of medium and small plantations; it exports 16% of the banana production, with a French majority shareholder (CANAVESE). • WANITA (BATIA and SPDSCie plantations), a group created in 2013, from the CFA cooperative of independent producers. It ensures the export of 6% of the banana production. • SIAPA SA (Société ivoiro-antillaise de Production Agricole) created in 2010 and a subsidiary of the Guadeloupe cooperative group specialising in bananas. It produces 4,000 to 5,000 tonnes of banana per year. • CANAVESE – part of the French CANAVESE groupe. In CdI they have 4 production companies, and one exporting company. They exploit 2,000 hectares of bananas and pineapples. They empoy 2,400 people. Brands known in France are KINI and ANANGO. • 4 Pineapple cooperatives 73 hectares of 4000 tonnes
SCOPACI-SCOOPS - Societé Cooperative des Producteurs Agricoles de Cote d`Ivoire Societe Cooperative Simplifiee	Founded in 2015 is a successful organic fresh pineapple export cooperative of small farmers around Bonoua. It was set up in a collaboration with a Dutch importer OTC organics.

UPMACI – L'Union des Producteurs de Mangue de Côte d'Ivoire	Comprises of 11 cooperatives. In 2018 they exploited 12,142 hectares and produced a total of 53,408 tonnes of fresh mango. • La Société Coopérative WOPINN WOGNON • La Société Coopérative des Producteurs de Mangues de Sinématiali (COPROMASI) • La Société Coopérative Agricole GNINNAGNON • La Société Coopérative WOBIN (SCOOP-S WOBIN) • La Société Coopérative de Producteurs Agricoles de Nongoplékaha de Sinematiali (COPANO-SI) • La Société Coopérative Agricole Kotognongontala Wobin (S. KOTO.WOBIN-SCOOP-CA) • La Société Coopérative des producteurs de mangue du Denguélé (SCOOP-S-COOPMAD) • L'Union de des Sociétés Coopératives Nargadenin de Korhogo (UCONAKO-SCOOP-CA) • La Société Coopérative Agricole la Fruitière de la BAGOUE (SCOOP-CA-LFB) • La Société Coopérative simplifiée des Producteurs de Mangues du department de Niakara (SCOOP-S PROMANI) • La Coopérative Simplifié COFRUNO
UTMACI **Union des Transformateurs de Mangue de Côte d'Ivoire**	Union that represents 9 companies that dry mangoes. Responsible for a total production of almost 50 tonnes, equal to almost 30% of the production volume. It is currently chaired by the *Usine de Sechage de Mangue de Ouangolo.*

Service providers

Type	Names
Agricultural input	Louis Dreyfus Commodities, Yara, Agro West Africa Abidjan (AW2A), AF-CHEM-SOFACO, Société d'Engrais d'Amendements et de Phytosanitaire de Côte d'Ivoire (SEAP-CI), Bayer Cropscience, BASF, Corteva, Callivoire Agri-Plus, ALM International, RMG Côte d'Ivoire (ex-SYNGENTA), Office Chérifien des Phospates (OCP), Eléphant Vert CI (Biopesticides, organic fertilizer) Croplife CI regroups: Bayer, AF-CHEM-SOFACO, ALM, BASF, CORTEVA, RMG, Syngenta, Solevo and Adama. *Association des Petites et Moyennes Entreprises Phytosanitaires de Côte d'Ivoire* (AMEPHCI): Is a network of phytosanitary professionals, most of whom are mainly business owners in agriculture ALL-GRO, GCM, GREEN PHYTO, PHYTOTOP, SYNERGY TRADING, TROPICAL DISTRIBUTION, VOLCAGRO-CI).

Agric services (BSO)	AES-investigation Côte D'ivoire, Tope Topohonnon Louise Côte D'ivoire, Cabinet Agro Expertises Côte D'ivoire, Soro Sibirina Côte D'ivoire, Cabinet Enval Côte D'ivoire, Equatorial Services Côte D'ivoire, Kouassi Kouadio Henri / Université Jean Lorougnon Guédé Côte D'ivoire, Cabinet De Formation Eloim Conseil Côte D'ivoire, Simpa Côte D'ivoire, Hortus Côte D'ivoire, Management Consulting & High Technology (Mc&Ht) Côte D'ivoire, Agro-med Côte D'ivoire, Eco-agro-holding Côte D'ivoire, Cost Management Côte D'ivoire, Hala N'klo Côte D'ivoire, Kallo Vessaly Côte D'ivoire, Beera Côte D'ivoire, Solides Conceptions Et Livraisons Côte D'ivoire, Organisation des petites et moyennes entreprises de Côte d'Ivoire (OPMECI)
Certification companies	With offices in Côte d'Ivoire: Bureau Veritas Côte d'Ivoire, Rainforest Alliance, SGS, Control Union (West-Africa), Bureau Norme Audit Côte D'ivoire (BNA); Ecocert IMOswiss AG, Intertek and Cotecna Others outside of Côte d'Ivoire that provide audit services in Côte d'Ivoire: AfriCert (Ghana); NEPCON West Africa (Ghana); SCS global services (US); TÜV NORD Integra (Belgium)
Waste	Green countries, Lone, FIBRIVOIR
Logistics	The main ones for the sector investigated are: Bollore Transport et Logistiques - Present in the logistics, port, rail transport and shipbuilding sectors through our subsidiaries, Bolloré Transport & Logistics offers multimodal logistics solutions (rail, road, air, sea) in all sectors of activity that govern economic life in this country. Eolis Logistiques - Specialized in conventional maritime transport, in dry and refrigerated containers of various products; in particular, fruit and vegetables. To carry out its activities, in particular the transport of fruit and various products, they make use of the AEL - Africa Express Line, which has a fleet of 8 regular line vessels that connect the Mediterranean (South Line) and the North Atlantic (North Line) to African ports, and a container fleet of around 1500 units of refrigerated containers and 1,000 units of dry containers.
Transit and shipping agents (10)	Bolloré Africa Logistics, Delmas-CI (CMACGM), Getma, Koda Maritime and Simat, Maersk Line, Sea Invest, Eolis, Athena Shipping, and Supermaritime,
Finance	DEG, Injaro Investment, Incub 'Ivoir, Comoe Capital, Banque Atlantique Côte d'Ivoire, Société Générale and Angel investors: Ivoire Angels and Eagle investment Capital Some examples of financing facilities for SMEs: SME credit facility: Line of credit of 10 billion FCFA, partnership between the ministry of Commerce, Industry and Promotion of SMEs du Commerce and la Société Générale / Banque Atlantique / Cauris Banque

	Line of guarantee of 20 billion FCFA by the government in partnership with la Banque Nationale des Investissements more info here ARIZ (Accompaniment of the risk of financing private investment in the intervention zone) is a final loss guarantee proposed by AFD to financial institutions to cover 50% to 75% of an individual loan or a portfolio of loans to SMEs and microfinance institutions (MFIs).
Youth	Enable Youth Côte d'Ivoire Project by African Development Bank in partnership with Ministry of Agriculture and Animal Resources and Youth Employment Agency

International organisations

Name Organisation	Role & activities in the value chain
AFD - Agence Française de Développement	ARIZ (Accompaniment of the risk of financing private investment in the intervention zone) is a final loss guarantee proposed by AFD to financial institutions to cover 50% to 75% of an individual loan or a portfolio of loans to SMEs and microfinance institutions (MFIs).It allows companies, from the artisan to the structured SME, to access investment credit to microfinance institutions to finance themselves and develop their lending activity to our financial partners to share the credit risk, reduce the level of security required, be supported in the development of an SME strategy and offers and increase their intervention capacity through the improvement of their solvency ratio and AFD's signature.
AfDB - African Development Bank	Projet De Développement des Chaînes de Valeur dans La Région de l'Indénié-Djuablin (PDC-ID). The installation of processing units will make it possible to process cassava, tomato and honey. They will make it possible to set up the premises of the agri-food industry in the Indénié-Djuablin region and to develop an agribusiness approach. Standardisation, labelling and access to appropriate packaging for finished products will aim to promote products in value markets in order to ensure their competitiveness The Empowering Novel Agri-Business-Led Employment (ENABLE Youth) program is being championed by the AfDB in collaboration with the International Institute of Tropical Agriculture (IITA) and aims to develop the next generation of Africans agriculture entrepreneurs, or "agripreneurs". The goal is to build the capacity of young graduates to start businesses along the agriculture value chain through agribusiness incubators where they receive training in skills development. Following their incubation, the graduates receive support in obtaining financing to launch their businesses. Projet d'appui au Renforcement de La Compétitivité du Secteur Industriel (PARCSI) supports the implementation of the Ivorian programme for the restructuring and upgrading of enterprises and the national export strategy. It aims to strengthen the competitiveness of industrial companies and the processing of products in the fruit and vegetable

	sector, in order to meet the challenges of trade liberalisation and job creation. Projet de Pôle Agro-industriel de la Région du Bélier (2PAI-Bélier), is the first agropole project that the bank financed. The project's goal is tol revitalize agriculture around multiple value chains (rice, maize, cassava, vegetables, etc.), by promoting an integrated approach and providing the region with key infrastructures capable of promoting the development of agricultural and agro-industrial activities (hydro-agricultural developments, tracks, etc.), while providing better living conditions for the populations concerned (drinking water, school canteens, health facilities).
BEDx	Federation of the German Export and Trade. The *Bundesverband des Deutschen Exporthandels e.V.* (BDEx) is one of the head Organisations of German export business. Part of their activities include support to developing countries. Via sequa they support Inter-Mangue
CIRAD - Centre de Coopération Internationale en Recherche Agronomique pour le Développement	The CIRAD is the French organization for agricultural research and international development cooperation in the tropical and Mediterranean regions. In Côte d'Ivoire they work both on the mango as well as the pineapple sector. For FIRCA they had conducted a scoping study on coconut value added products.
CORAF - Conseil Ouest et Centre Africain pour la recherche et le Développement Agricoles	CORAF is an international non-profit association working to enhance prosperity, food, and nutrition security in West and Central Africa. CORAF has 14 projects in Côte d'Ivoire, with a total investment of 617,5m FCFA (€1m). As a research coordination organization, CORAF works hand-in-hand with the national agricultural research systems of Côte d'Ivoire as well as the regional centre of specialization on Banana and Plantain to devise science and technology solutions to enable agriculture actors to deal with some of the agriculture development challenge
ECOWAS - Economic Community of West African States	The Economic Community of West African States (ECOWAS) was created by the Treaty of Lagos in Lagos, Nigeria, on 28 May 1975. It was created to promote economic trade, national cooperation, and monetary union, for growth and development throughout West Africa. There are currently 15 member countries in the Economic Community of West African States. The founding members of ECOWAS were: Benin, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania (left 2002), Niger, Nigeria, Senegal, Sierra Leone, Togo, and Burkina Faso (which joined as Upper Volta). Cape Verde joined in 1977.

FAO - Food and Agriculture Organization	FAO's assistance focuses on three priority areas: Improving the productivity, sustainability and resilience of agro-sylvo-pastoral and fisheries operations; Improving the competitiveness of value chains and promoting healthy, efficient and inclusive diets; Supporting the formulation, implementation and monitoring of national policies, plans and programmes.
GiZ - Die Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ is working on behalf of the German Federal Ministry for Economic Development and Cooperation (BMZ) and the German Federal Foreign Office is implementing the following agricultural projects: Professionalising Cocoa Producers and their Organisations in Sustainable Cocoa Production Protecting and developing the Taï and Comoé nature conservation and economic areas Sustainable Smallholder Agribusiness in Western and Central Africa Adapting to climate change and increasing the resilience of the population in south-west Côte d'Ivoire Competitive Cashew Initiative (ComCashew) GIZ runs as PPP with a mango exporter and village producers. They offer technical and financial assistance in Ferkessedougou region to farmers' organization to decrease losses and increase revenue. Focus is on product quality and distribution of improved varieties that are sought by the market. According to them the local demand market for high quality mango is not met yet.
IFAD - International Fund for Agriculture Development	IFAD's Programme d'appui au développement des filières agricoles (PADFA) is an initiative that aims to improve sustainably food and nutrition security and farm incomes for rice, market gardeners and mangoes. The growing demand for rice, mangoes and horticulture produce on national and international markets are offering new opportunities in processing, value-added activities and commercialisation. Projet D'appui A La Production Agricole et à La Commercialisation Extension West (PROPACOM – Extension West) supports the development of food and horticultural sectors as the main means of creating wealth, increasing rural incomes and improving the food security of small producers. It will target 240,000 smallholders, particularly women and youth who are involved in food production, processing and marketing in an effort to improve their incomes and livelihoods.

ILO - International Labour Organization	The ILO is a United Nations agency whose mandate is to advance social justice and promote decent work by setting international labour standards. Projects: Strengthening Labour Governance in MSMEs and Supporting the Transition from the Informal to the Formal Economy in Africa From 2016 -2019. Countries: Togo, Tunisie, Burkina Faso , Madagascar and Côte d'Ivoire. The project aims at supporting Micro, Small and Medium Enterprises (MSMEs), including in the informal economy, to prevent occupational risks, improve working conditions, and promote respect for Fundamental Principles and Rights at Work (FPRW). it supports national labour inspectorates to better ensure compliance it increases the capacities of Governments, of employers, workers and their representatives, as well as those of Governments and other public Institutions (such as National school of Administration and Judicial Institutes) to promote implement FPRW and Occupational Safety and Health (OSH) issues regulations on the ground.
ITC/UNIDO/ECOWAS	The United Nations Industrial Development Organisation (UNIDO) and International Trade Centre (ITC) are supporting Economic Community of West African States (ECOWAS) with the implementation of the European Union (EU)-funded West Africa Competitiveness Programme (WACOMP). The objective of WACOMP is to strengthen competitiveness of West African countries and enhance their integration into the regional and international trading system. To reach this overarching goal, the programme will work to: • improve the performance, growth and contribution to industry, regional trade and exports of selected value chains (a.o mango), and; • improve the business climate at national and regional levels.
nitidae	nitidæ was born from the merging of two associations (Etc Terra and Rongead) in December 2017 and goes back to 1983. They have around 70 staff members in six different countries. In Côte d'Ivoire, they work with several cooperatives in the South Eastern region. Its mission is to design, develop and lead projects that preserve the environment while contributing to the local economy with offices in Abidjan and Ouagadougou (BF). They help develop REDD+ projects for tree crops such as cashew and cocoa. They conducted diagnostics studies on how to add value to waste from Mango processing for COLEACP and are behind M-Agri a market information app in Côte d'Ivoire in collaboration with Orange. They also work on energy recovery equipment for agro-industrial waste in Côte d'Ivoire, from the cashew, cassava and shea sectors, particularly in the cities of Bouaké and Korhogo, by ensuring a transfer of skills for replication of these technologies.

sequa gGmbH	Globally operating non-profit development organisation. sequa offers know-how and long-term experience in capacity development for chambers and associations (BMOs), vocational education and training, private sector development and trade. The organisation is based in Bonn, Germany. Projects currently running in Côte d'Ivoire are: ARCHIPELAGO (January 2019 – January 2023) EUR15m an African-European Technical Vocational Education and Training initiative addressing youth and vulnerable groups' employability and to strengthen the entrepreneurial skills of managers of existing and future Micro, Small and Medium Enterprises (MSMEs). The programme will organise 2 to 3 Calls for Proposals to select, support and finance relevant partnership projects contributing to the programme objective. Each partnership project will last 20 to 32 months and will have a budget of EUR 400,000 to EUR 600,000. The first call is expected for the first quarter of 2019. Target countries are Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Guinea, Cameroon, Mali, Mauritania, Niger, Nigeria, Senegal, Chad. The grant covers 100% of the total eligible costs of the action more information here Import Promotion Desk (IPD) (Phase 3) July 2018 – June2021. The IPD brings together the interests of German importers with those of exporters in emerging growth markets. By giving small and medium-sized enterprises from selected partner countries access to the European market, we support the creation of jobs and the expansion of export capacities (Ethiopia, Ecuador, Côte d'Ivoire, Ghana, Indonesia, Kyrgyzstan, Colombia, Nepal, Peru, Sri Lanka, Tunisia, Ukraine). 6.8m EUR financed by Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) Furthermore they supported the Ivorian SME Ivoire Organic in its transformation to organic obtained in 2014.
SNV - Netherlands Development Organisation	The Hortifresh initiative is supported by the Embassy of the Kingdom of the Netherlands and implemented by the WUR, SNV Ghana, Resilience, SENSE and Advance Consulting, which has prioritized commercial agriculture in its strategic plan of moving from aid to trade. The programme's mission is to establish "a sustainable and internationally competitive fruit and vegetable sector that contributes to inclusive economic growth, food and nutrition security" in Ghana and Côte d'Ivoire. The aim of the programme is to reach 15,000 farmers and increase their productivity by 20% in 2021.
ONUDI - Organisation des Nations Unies pour le développement industriel	Private sector development. Initially the agency piloting the PARCSI program, before the transfer to ADCI. In 2016, UNIDO deployed "La Finance S'Engage" after the transfer to CGECI. In 2016, PRODIJE (Youth Entrepreneurship Programme), managed by UNIDO, AfDB and others, is also launched. Ensure agricultural research on the sector: • Conducting the Varietal Research Program • Support the multiplication of improved plant material; • Train registered nurseries; • Develop strategies for disease and pest control;

	• Develop technical itineraries adapted to the different agro-pedo-climatic zones; • Improve grafting and grafting techniques; • Develop conservation and processing techniques • Assess the socio-economic impacts of cultures • Strengthen the capacities of producers (preparation of technical data sheets, training).
USAID - United States Agency for International Development	USAID work on the ground to reduce the cost and risk of doing business in Africa, levelling the playing field and cutting through red tape to make investment and trade freer and fairer for everyone. USAID is engaging with partners across sub-Saharan Africa to: • Deepen regional economic integration • Promote two-way trade with the U.S. under the African Growth and Opportunity Act (AGOA) • Attract investment that drives commercial expansion within the region and to global markets There agricultural programme is relatively small in Côte d'Ivoire (1,5m US$). Through the Trade Africa Initiative, USAID helps export-ready firms in targeted value chains to compete in trade, as well as work with regional partners to attract investment into the region so as to boost regional and global trade. In 2017, the Trade Hub provided technical assistance to more than 21 producers, exporters and processors to improve the quality of the country's exportable mango. It organized the Mango Symposium in partnership with the Interprofessional Agricultural Research and Advisory Fund and the Ivorian Chamber of Commerce, attracting buyers from the U.S., EU, West and South Africa, including JAB (USAID, 2017). On February 2018, USAID and Entrepreneurial Solutions Partners signed an agreement to promote small and medium-sized enterprises (SMEs) in Côte d'Ivoire. USAID is providing $690,498 to support this activity to build the capacity of SMEs, and will contribute through this program to the creation of approximately 2,500 jobs, including 1,500 in rural areas. This public-private partnership aims to transform the entrepreneurial landscape and to inspire a generation of youth and women leaders.

Annex IV. List of stakeholders in Burkina Faso & Mali

Government Burkina Faso

	Role and activities in the value chain
Ministry of commerce (APEX Burkina, ABNORM, CIR, DDI, LNSP)	This ministry approves permits for installing processing capacity, adherence to investment code and set manufacturing norms. The agency for export promotion has validated a strategy for mango promotion in 2017. An electronic portal exists for this purpose, which was developed with support by CBI. Sector support programs for companies are also defined by this ministry, these are listed in section 0.
Ministry of agriculture (DGPV, DGPER)	Two special directorates are implicated in the mango chain. This ministry ensures phytosanitary controls and export documentation, monitors and responds to rejections of exports to the EU, and implements a regional program to combat fruit flies to sustain production and quality.
Ministry of environment and economy	The ministry develops environmental legislation and certification.
Ministry of research and innovation	Research into new drying technologies and value creation from waste. Development of new varieties and production techniques.
Ministry of youth and employment	Promotes and implements tax incentives for entrepreneurship among youth. Funds provide an opportunity to access financing in the mango sector.
Ministry of economy and finance (customs)	The ministry develops fiscal legislation. Taxation affects competitiveness of the value chain. Customers services also fall under this ministry, which affect lead times and efficiency of exports.

Government Mali

	Role and activities in the value chain
Ministry of agriculture	The national directorate of agriculture (DNA, Direction Nationale de l'Agriculture) is responsible for elaborating and implementing the national agricultural policy. This includes growth, modernization, training, quality control and human resources. There are centralized and decentralized bodies. The institute for rural economy (IER, Institut d'Economie Rurale) is the primary research body focused on productivity and sustainability of natural resources and development. As part of the fruit and vegetables program, IER organizes training and combats fruit flies.
Ministry of commerce	The export promotion agency (APEX, Agence pour la Promotion des Exportations) organizes promotional activities, implements development programs, aims to set up an enabling services environment including banks, insurance and technical support, and collects and shares trade data. The unit for implementation of an integrated framework (UMOCI, Unité de Mise en Œuvre du Cadre Intégré) implements an initiative funded by six international organizations (CCI, CNUCED, OMC, UNDP, World Bank and IMF) to strengthen commercial capacity of the least developed countries aiming to insert them into multinational commercial systems. The program includes training, acquisition of equipment, implementation of quality management and export promotion. The national norm agency (AMANORM, Agence Malienne de Normalisation) implements standards development and accreditation, in partnership with stakeholders.

Ministry of industry	The agrofood development agency (CDA, Centre de Développement Agroalimentaire) promotes national manufacturing of food. The structure emphasizes empowerment of women and youth. It also develops models for value creation from waste, for example as animal food or construction materials. The national agency for food safety (ANSSA, Agence Nationale de la Sécurité Sanitaire des Aliments) evaluates risks and coordinates food safety. They have developed a self-assessment guide for companies in the mango chain. The permanent assembly of chambers of agriculture (APCAM, Assemblée Permanente des Chambres d'Agriculture du Mali) represents the agricultural profession in the public sector.
Ministry of environment	The national directorate of sanitation (DNACPN, Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances) is responsible for sanitation and waste management policies and controls. In the mango sector, their main interaction is with the ministry of agriculture in relation to valuation of waste in the Macro-wast project initiated by the Malian diaspora. There is no specific waste policy for agriculture.

Private sector organisations

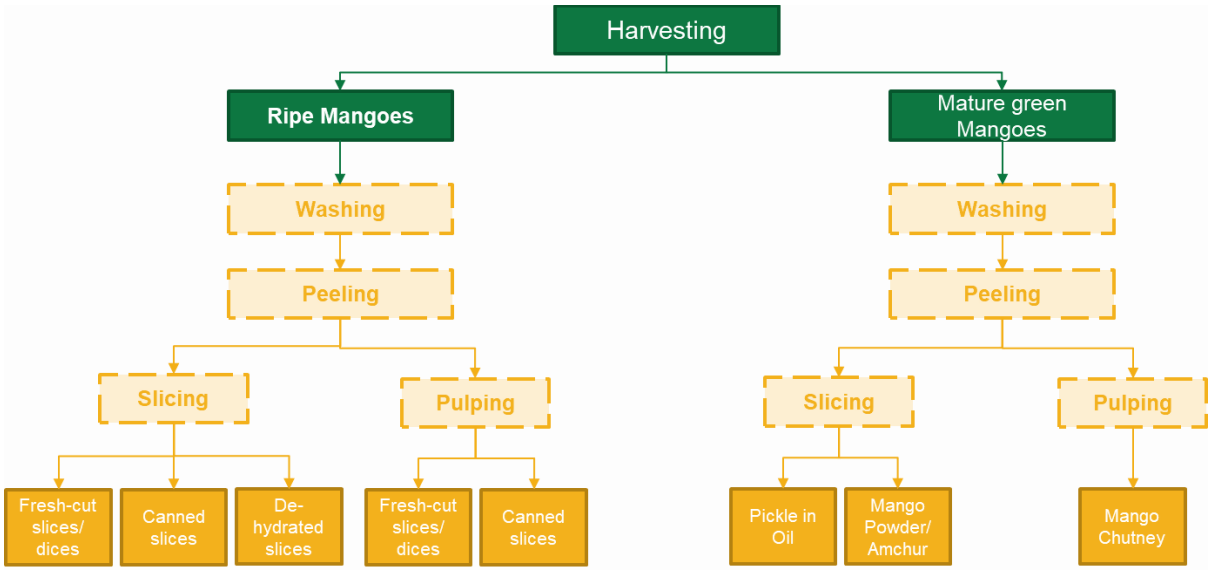
	Role and activities in the value chain
APROMAB	The interprofessional mango association of Burkina (Association Interprofessionnelle Mangue du Burkina) is recognized by the government to manage and represent sector interests. A strategic plan 2015-2019 is in place financed by the state. Tasks include strategy, data collection, advocacy. Three sub-entities are organised for processors (PTRAMAB), exporters (APEMAB) en producers (UNPMB).
IM	The interprofessional mango association of Mali (Interprofession Mangue du Mali) includes five main stakeholder groups: nurseries, farmers, collectors, marketers and exporters, processors. The association promotes and defends the interest of the sector.
ARMAO	The regional alliance for West African mango (Alliance Régionale Mangue pour l'Afrique de l'Ouest) unites interprofessional mango associations from 15 West African countries and was created in 2018. In addition to strategy, data collection and advocacy, the alliance identifies challenges and solutions in regional corridors.
AAFEX	The African agro-export association (Association Afrique Agro-Export) was created in 2002 and groups African food exporters from sixteen countries including Burkina Faso, Mali and Côte d'Ivoire.
PNCE	The national platform for fair trade in Burkina Faso (Plateforme Nationale de Commerce équitable Burkina) is an association that aims to integrate sustainable practices in the value chain. The organisation develops niche markets and promotes certification.
Mango cluster Hauts-Bassin	This mango cluster unites all mango stakeholders in the triangle Banfora, Bobo Dioulasso, Orodara in Burkina Faso and was installed following a participative effort by the chamber of commerce and APROMAB.
AMALEF	The fruit and vegetables exporters association (Association Malienne des Exportateurs de Légumes et Fruits) offers her members in Mali a platform and coordinates their actions towards partners.
AJEX	The association of young exporters (Association des Jeunes Exportateurs) is a professional organization in Mali that supports young entrepreneurs in fruit and vegetables, plants and flowers.

Service providers

	Role and activities in the value chain
Laboratoire National de santé Publique	Public laboratory in Burkina Faso
IRSAT	Public laboratory in Burkina Faso
Laboratoire central vétérinaire	Public laboratory in Mali
Institut national de santé publique	Public laboratory in Mali
Laboratoire central vétériniarele laboratoire de technologie alimentaire	Public laboratory in Mali
Prolabs-Microbio Consultung	Private laboratory in Mali
Ecocert	Organic certification body
Certisys	Organic certification body
BNDA	Banque Nationale de Développement Agricole in Mali
Banque Internationale du Mali	Commercial bank in Mali
Bank Atlantique	Commercial bank in Mali
Banque Malienne de Solidarité	Commercial bank in Mali
Kafo Jiguinew	Micro-finance bank in Mali
Root Capital	International investor in Burkina Faso
ShareInterest	International investor in Burkina Faso
CBAO	Commercial bank in Burkina Faso
SGBB	Commercial bank in Burkina Faso
Ecobank	Commercial bank in Burkina Faso
Coris Bank	Commercial bank in Burkina Faso
Fédération Nationale des Caisses Populaires	Micro-finance bank in Burkina Faso
Credit Mutuel	Micro-finance bank in Burkina Faso

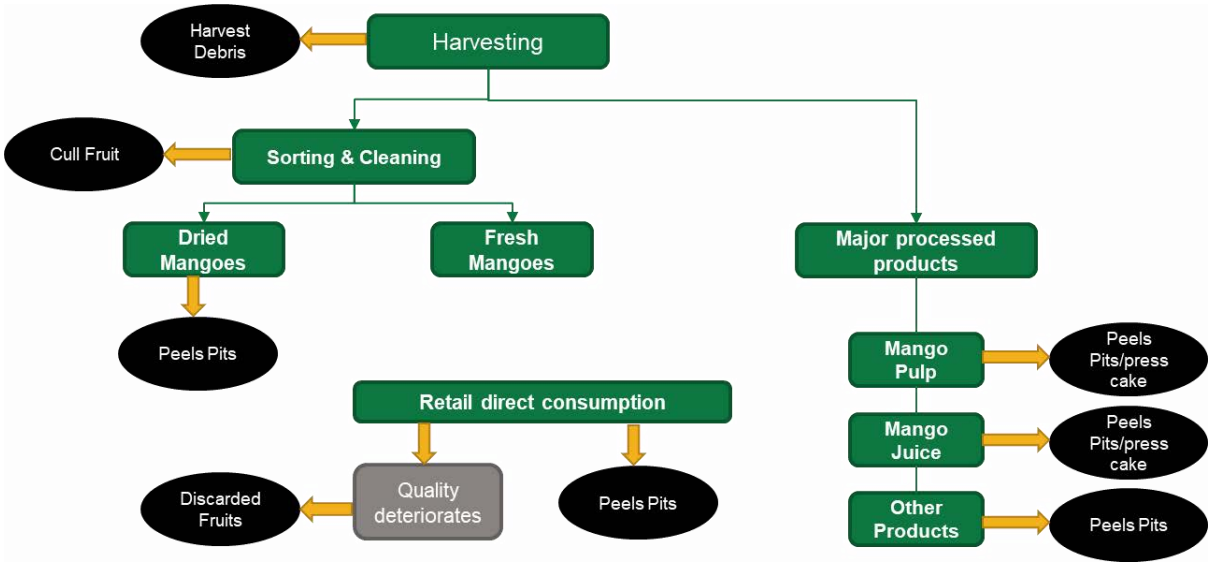
Annex V. Flowcharts processing

Mango processing



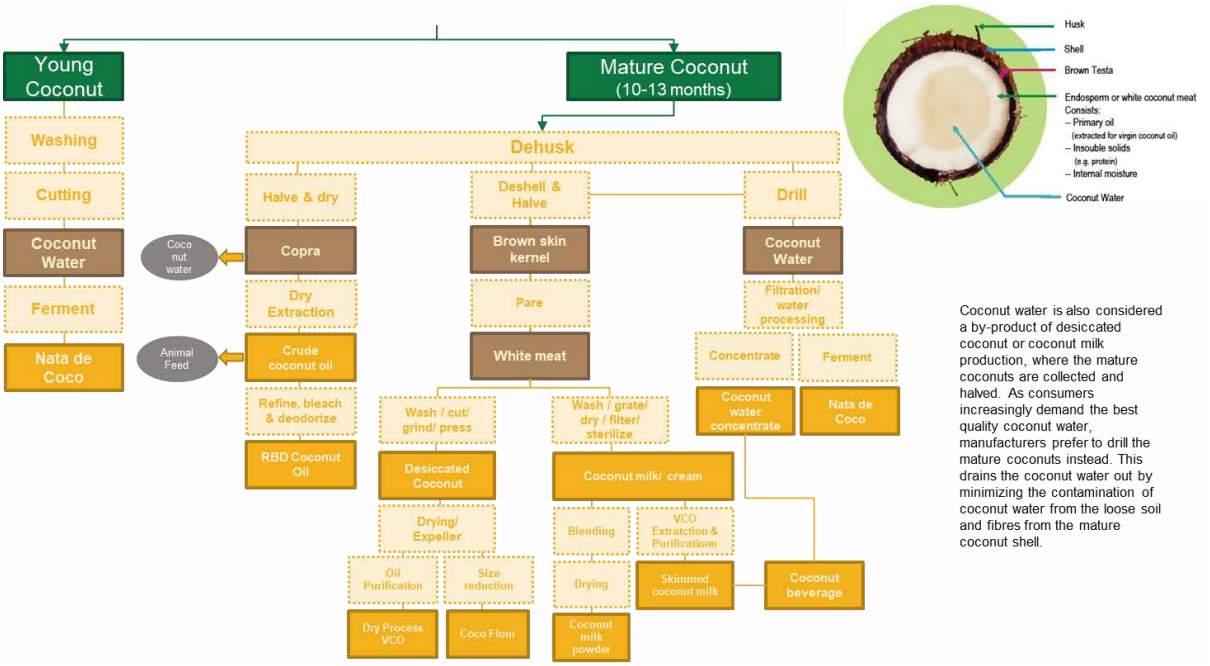
Source: (Siddiq, et al., 2018)

Waste generation at different stages of mango processing



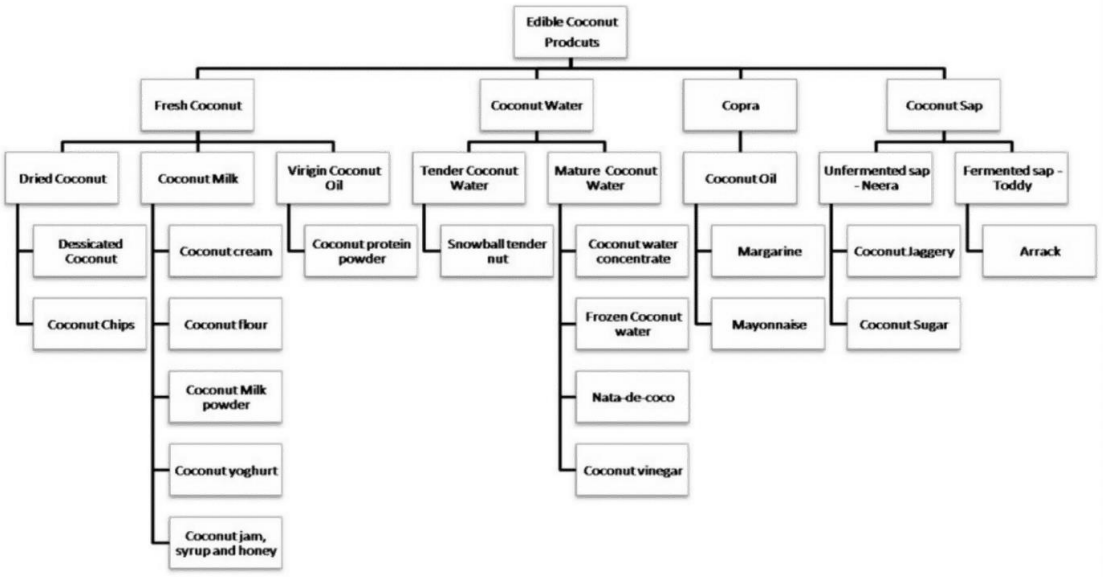
Source: (Siddiq, et al., 2018)

Coconut processing

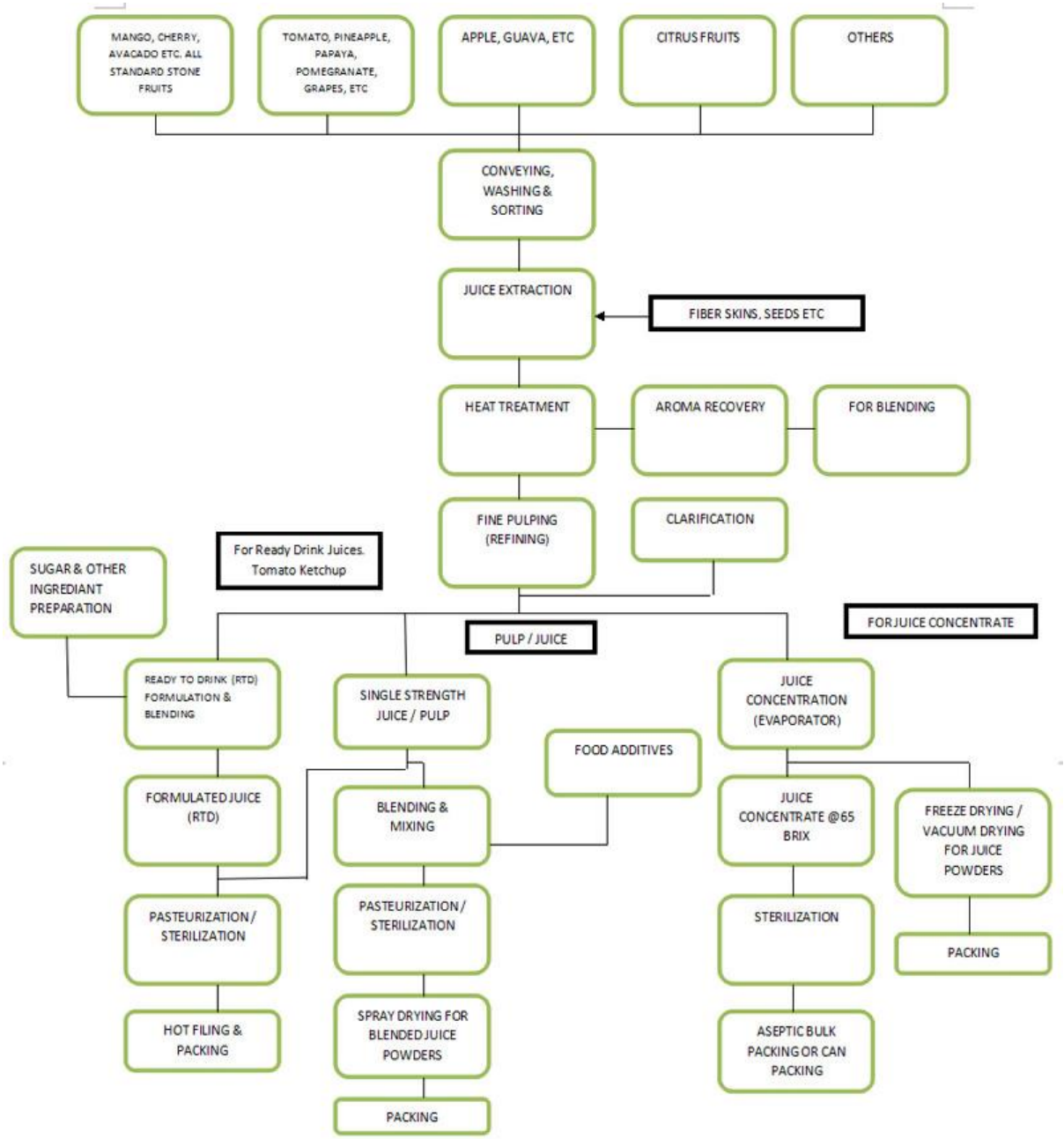


Source: based on (TetraPak, n.d.)

Edible Coconut Products

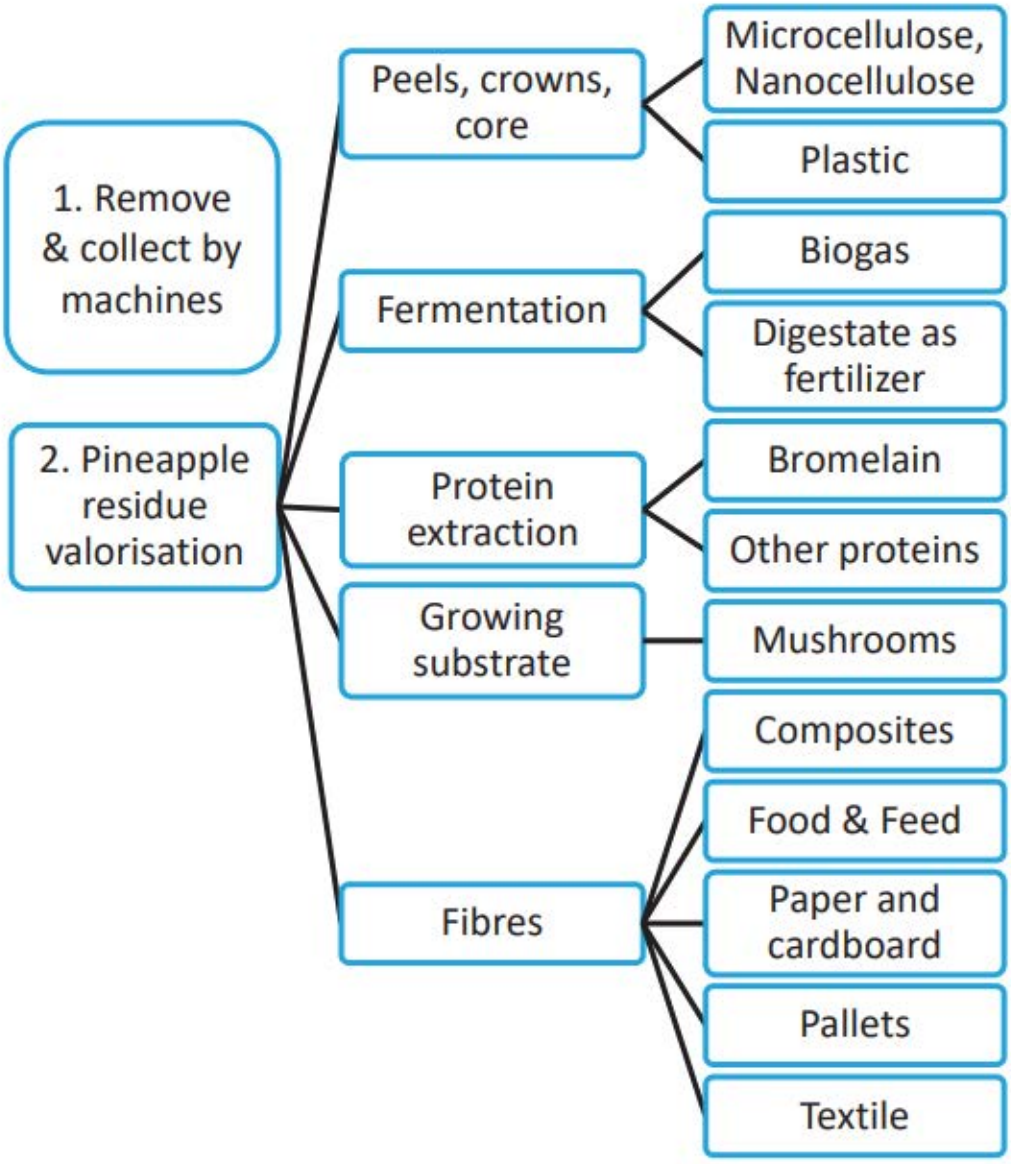


Juice processing



Source: website [SSP India limited]

Pineapple residue valorisation options



Source: (MVO Nederland, 2018)

Annex VI. Key programs to address child labour in Côte d'Ivoire

Program	Description
National Action Plan for the Fight Against the Worst Forms of Child Labor (NAP) (2015–2017)	Coordinated by the CNS and the CIM, $24.4 million project aimed to significantly reduce the number of children engaged in the worst forms of child labour by improving the legal framework, sensitizing high-risk communities to the dangers of exploitative child labour, improving victim services, building the capacity of law enforcement, and improving educational infrastructure. In 2017, received a budget of approximately $7.5 million. At the IV Global Conference on the Sustained Eradication of Child Labour, the government pledged to develop a new National Action Plan to Combat Trafficking, Exploitation, and Child Labour.
National Action Plan and Strategy Against Human Trafficking (2016–2020)	With the support of UNODC and coordinated by CNLTP, $14.8 million project that aims to prevent human trafficking, expand social services for victims by improving physical infrastructure, provide training for law enforcement personnel and other stakeholders, promote coordination, and collect data on human trafficking. This plan will begin implementation after the CNLTP becomes functional.
National Awareness Campaign Against Child Labor (2015–2017)	CNS-led national awareness campaign against child labour which disseminated information to increase public awareness through television and radio broadcasts, billboards, and newspapers in French and local languages. Called on national actors to take a greater role in media campaigns to raise awareness about child labour. In 2017, held two awareness campaigns and revised a 2013 agreement with the media to promote children's rights and combat child labour, which was signed by 191 media partners.
USDOL-Funded Projects in Support of the 2010 Declaration	USDOL projects in cocoa-growing areas of Côte d'Ivoire and Ghana that aim to eliminate child labour through research, improved monitoring and enforcement, and implementation and expansion of SOSTECI. These projects include: Country Level Engagement and Assistance to Reduce Child Labor (CLEAR) (2013–2017), $7.95 million project implemented in at least 10 countries by the ILO; Assessing Progress in Reducing Child Labor in Cocoa-Growing Areas of Côte d'Ivoire and Ghana (2015–2019), $3 million project implemented by NORC at the University of Chicago; and Eliminating Child Labor in Cocoa (2015–2019), $4.5 million project implemented by the International Cocoa Initiative. For additional information, please see our website.
Industry-Funded Projects	Industry-funded projects to increase sustainability in the cocoa sector, improve farmer livelihoods and access to education, and combat the worst forms of child labour in cocoa-growing areas. Some projects support World Cocoa Foundation (WCF)'s CocoaAction (2014–2020) strategy and the spirit of the 2010 Declaration.
Centers for Vulnerable Children	Operates approximately 90 MWCPSA- and MEPS-funded social centers and 36 special education centers throughout the country that receive women and children who are victims of crime or violence, including

Program	Description
	children who are victims of the worst forms of child labor. International NGOs also operate additional centers that provide meals and basic education. In 2017, provided assistance to 167 victims of child trafficking or labor exploitation.
Programs to Promote Education	These programs aim to raise school attendance rates in rural areas, particularly among girls, by providing school meals, birth registration, and constructing community schools (*écoles de proximité*). Programs include: the Integrated Program for Sustainable School Feeding, a $42.5 million WFP-funded program; the Ministry of National Education School Feeding Program; and the McGovern-Dole School Feeding Program, a $31 million joint initiative between WFP and the U.S. Department of Agriculture, in coordination with the Ministry of National Education; and the Birth Registration Program, a MOJ and UNICEF program that aims to provide birth registration to 1 million children who are currently enrolled in primary school. In 2017, provided birth certificates to 1,165,325 primary school students.
World Bank-funded Projects	Programs aim to improve access to education and provide poverty relief. Includes: Emergency Support Project for Basic Education (2012–2017), $41.4 million project to construct and rehabilitate classrooms and school latrines; Second Fiscal Management, Education, Energy and Cocoa Reforms Development Policy Operation (2017–2020), $125 million project to increase the number of primary school teachers; Productive Social Safety Net (2015–2020), $50 million cash transfer project to poor households in the Central, Northern, and Western regions of Côte d'Ivoire. By the end of 2017, recruited or trained 24,000 teachers, built or rehabilitated 1,272 classrooms, provided cash transfers to 5,000 households,
Community Animation Program for Child Protection (2015–2020)	$228,168 MWCPSA program as part of the National Policy on Child Protection, implemented with technical assistance from UNICEF, provides a service package for behavior change and improving communication at the community level that can be tailored to meet local needs. At the IV Global Conference on the Sustained Eradication of Child Labor, the government pledged to intensify social protection programs and continue support for the Community Animation Program.
National Solidarity Fund	$2.5 million fund that provides assistance to poor households, including victims of human trafficking.) In 2017, provided funding to assist in the repatriation of human trafficking victims.

Source: (USDOL, 2017)

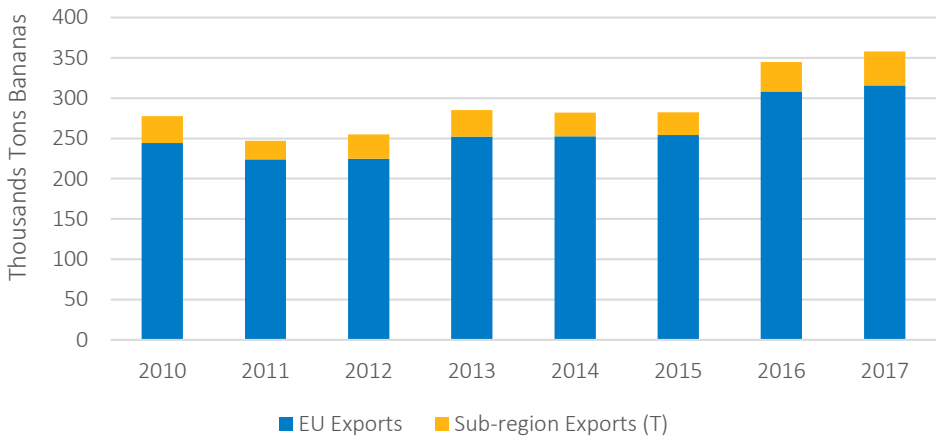
Annex VII. Crops that have not been selected

Several crops have been explored but not selected. Reasons for this include: insufficient foundation for processing in countries in scope, a lack of market demand, or a mismatch with the CBI mandate.

Banana

Côte d'Ivoire is the 13th largest banana producer in Africa and comes second after Cameroon in West Africa. Banana exports represents 8% of the agricultural gross domestic product (GDP) and 3 to 4% of the national GDP. Of the almost 400,000 tonnes produced in the country, 80-90% is exported, of which only 10-15% is destined to regional markets (Figure 49).

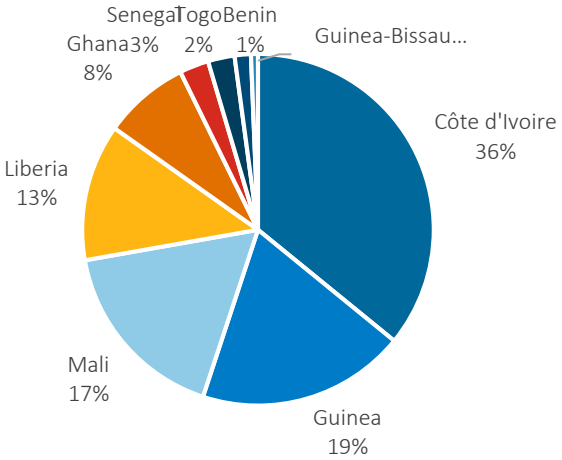
Figure 49 Exports banana Côte d'Ivoire



Sources: (COMTRADE, Eurostat, Fruitrop, Stat. Douanière)

West Africa represents about a 6% market share in production volume from Africa, of which Côte d'Ivoire represents about 2% of it. Côte d`Ivoire is the largest producer in West-Africa of bananas (Figure 50). The banana production in Côte d'Ivoire is further expected to increase to 500,000 tonnes in the next two years thanks to two the foreign direct investors and the installation of new rural entrepreneurs funded by EU's Méchanisme d'Appui à la Banane (MAB). Exports to Europe from Côte d'Ivoire represented in 2017 about 5% of total banana imports (OBAM-CI).

Figure 50 Production of bananas in West-Africa



Source: (FAO, 2017)

While Europe remains the preferred market for Ivorian bananas, neighbouring countries (Senegal, Mauritania, Burkina, Niger, Mali), have proven to be a growing market with an estimated demand that could rise up to 70,000 tonnes. Regional exports have shown an average year on year growth of 5.6%.

Banana in Côte d'Ivoire is mostly grown on large commercial plantations. Six export structures ensure both the production and the marketing of fresh bananas to the EU. These are Société d'Étude et de Development de la culture Bananiere (SCB) part of the French group Compagnie Fruitière, EGLIN SA part of the Belgian groupe of companies SIPEF, *Société Coopérative d'exportation Ananas et Banane* (SCAB), Wanita, BANACI, SIAPA. Marketing is done via umbrella organisations OBAM-CI (*producteurs-exportateurs de Bananes, d'Ananas, de Mangues et d'Autres fruits de Côte d'Ivoire*) and OCAB (*Organisation Centrale des producteurs-exportateurs d'Ananas et de Bananes*).

Main production regions are Tiassalé (2800ha), Bandama (200ha) Camoé (800ha), Niéky-Azaguié (2000ha), Sud Comoé (1500ha). Village production of bananas and plantains represents only a very small part of the almost 400,000 tonnes produced in the country, whereby 75% of exports is done by OBAM-CI and the rest by OCAB. The European criteria are so stringent that companies need to be vertically integrated into the value chain, from production to commercialization. This makes it that the banana trade to the EU is dominated mainly by the companies SCB (65%) and SCAB (16%).

The banana sector is being supported by the EU, which is financing a 10-year plan composed firstly of a consolidation phase to enable the sector to be more competitive against Latin American competition, and secondly a phase to improve commercialisation on the local market and increase sales to neighbouring countries (Oxford Business Group, n.d.).

Banana however, is not processed in Côte d'Ivoire, with exception to one processor (Cocopack) which produces negligent amount frozen organic banana chunks from condition station rejects. As the banana sector is dominated by large industry players and processing of the bananas is only at very small scale, it has been decided to discard banana processing from the analysis at this stage.

Kola nut

Although Côte d'Ivoire, according to FAOstats, is the second largest producer of kola nuts, with a 20% share of world production, after Nigeria (53%) and it is the second largest importer to Europe (after India), it has not been selected for this analysis. The main reasoning is, that processing of kola nuts in the country is still very limited and thereby it is mostly processed into dyes. In addition, demand for kola nuts in Europe have declined since 2012 (CAGR -2.4%) and lastly the sector is not well organised and buyer power is large, as there are just a handful of big buyers worldwide. It is therefore, estimated that within the timeline of 2-3 years it is not realistic to intervene in this sector.

Cashew apple

Côte d'Ivoire produces almost 20% of the world cashew nuts. Cashew apple however, is not much valued as a product, and generally not considered as consumable product in Côte d'Ivoire. GiZ is running a program in Côte d'Ivoire on cashew, which includes looking for value addition possibilities for the cashew apple. GiZ ran awareness campaign on the consumption of cashew apple and commissioned a marketing study on the cashew apple, which was not completed yet at the time of this study.

Cashew apple is said to be a difficult product to handle and process. The cashew apple ferments quickly and the trees on which they grow, are too tall to allow for harvesting of the fruit, as they were not grown for that purpose. This means that if processed they are harvested directly from the ground they fell on. When harvesting the (often already bruised) fruit in that way, they will need to be processed immediately or else it will start fermenting. Processing would need to take place very close the

production area. In dried form it is said that the cashew apple, has the most value as it can be used as cattle feed and/or briquetting. For the cashew industry this might be an opportunity to add value to the waste from cashew processing.

Cashew apple concentrate could potentially be an alternative blending component for the juice industry, but while notably Brazil already processes cashew apple, global uptake has been limited, and the demand for juice in general is under pressure by a health lobby.

Papaya

Though papaya is a relatively large product for Côte d'Ivoire, and small scale drying is being done by some of the processors, demand of processed product is limited. Importers of fresh papaya according to research commissioned by Hortifresh, do not see a market for fresh papaya from West-Africa, as they are competing with large suppliers from India, Brazil, Mexico, Indonesia. Demand is though slow to grow. It is also not trending in the EU markets. With only a small demand in the market it would be easy to flood the market with processed papaya. However, as it is a relatively large crop for Côte d'Ivoire and also quite easily susceptible to damages during transport (high losses), there is an opportunity to add this product to existing processing when demand picks up. There would be potential to develop a regional demand, which is outside of the mandate of CBI.

Avocado

Avocado though promising as a fresh product for export (Sense, 2018) has not been selected here, as it is not being processed at all in Côte d'Ivoire. Thereby there is a very limited demand for processed avocado in the market now, with exception maybe of a small growing frozen market and Côte d'Ivoire would have to compete with large more efficient avocado suppliers like Mexico. It might be an opportunity for the future, when the production of avocados is better established in the country.

Annex VIII. Value Chain SWOT Côte d'Ivoire

Mango

Strengths	Weaknesses
• Relatively close to European markets compared to competitors • Kent and Keitt very much valued for processing (90% of production) • Interprofession Mangue since 2018 • Limited use of inputs (easier to convert to organic)	• Cooperative management skills • Old plantations • Soil degradation • Lack of maintenance • High pest and disease pressure shortening the growing season • Lack of skills in good agricultural practices of village producers • Competition from Burkina Faso and Mali • Lack of financing and low level of investments • Limited market for dried fruits • High labour costs • Expensive and unreliable logistics • Lack of adequate equipment • Limited support by government for processing Poor infrastructure especially in the northern regions • Distance to ports and to Abidjan • (Short) seasonal crop which does not allow for year round work for all actors in the value chain. • No reliable production and trade data on processed mango products • Quality and quantity of the products (consistency, moisture levels, colour, food safety, reliability, service, homogeneity
Opportunities	**Threats**
• External support processing (e.g Hortifresh, IPD) • Government support from actors like OBAM-Ci for processing • Learning opportunities from Burkina Faso and Mali who have more experience • Stable economic growth	• Low EU demand for dried mango • Strong local and regional demand • Socio political instability in the northern regions including cross border into Mali and Burkina Faso • Political instability (elections in 2020)

Pineapple

Strengths	Weaknesses
• Relatively close to European markets compared to competitors • Long history so know-how with farmers • History in canning of pineapple • Limited disease pressure • Production close to ports • Higher demand than supply of fresh pineapple • Experienced sector with regards to export • Profitable for actors in the chain • Relatively short production cycle • Favourable climate, year round production • Atou, Cocopack and Comafruits are well established, successful processors of tropical fruits from which the sector can learn • Small scale processing of dried pineapple	• Certified pineapple suckers are not abundantly available limiting growth in production • Poor irrigation infrastructure • Difficult to obtain organic fertilizer • Lack of raw material • High cost of organic certification • limited EU market demand for juices and dried pineapple • labour abuse in the supply chain • Limited village level organisation • No cold storage to extend shelf life at packing level • Abandoned pineapple production areas, difficult to recuperate as they were transformed rubber and oil palm plantations during the crisis • High rents on land for production • High labour costs • Limited investments in R&D on new varieties and products • Inefficient supply chain • Insufficient raw material, processors sometimes obliged to buy export qualities • Insufficient diversity in packaging material • Packaging available at high costs • No reliable production and trade data on processed pineapple products • Quality and quantity of the products (consistency, moisture levels, colour, food safety, reliability, service, homogeneity
Opportunities	**Threats**
• Frozen and organic growing markets for exotic fruits • Learning opportunities from other countries in the region e.g Ghana (Hortifresh) • Stable economic growth	• Growing regional and domestic demand threat to EU exports • Competitive alternative land uses • International competition from large pineapple growing regions • Climate change as most of the farms still rely on rainfall • Political instability (elections in 2020)

Coconuts

Strengths	Weaknesses
• Many products can be made from coconut as a raw material including value added products from the husk • Diversified market and risk • Learnings from Cocopack • Many opportunities to add value to by-products from the processing • Willingness to organise and set up an inter-mangue	• no factory producing large volumes of processed coconut products other than crude coconut oil for local/regional market • declining production old diseased trees, takes time to plant new groves • no investments made into the sector since the crisis in 2010 • disputes between villagers and the large commercial coconut growers • weakly developed value chain • mostly an informal sector • lack of market EU market information • labour conditions of especially women • lack of reliable data on sector and trade performance • Quality and quantity of the products (consistency, moisture levels, colour, food safety, reliability, service, homogeneity) • Export duties on processed coconut higher than on fresh
Opportunities	**Threats**
• Stable economic growth Côte d'Ivoire • Proximity to the EU market • Growth in demand from EU for coconut products (e.g. water, milk, desiccated coconut) and for coconut oil growing regional demand.	• Long-term investments needed but compete with many other investment opportunities • Climate change and urbanisation threaten the coconut plantation • Products currently produced better suited for regional and northern African market than for EU market (markets easier to enter and fast growth) • Political instability (elections in 2020) • Competing with exports of fresh mangoes

Annex IX. Detailed comparative analysis

The comparative analysis combines data from different sources (FAO, 2017; World Bank, 2017; Environmental Performance Index, 2018; ND-GAIN, 2017; FiBL, 2017; Transparency International, 2018; The Commonwealth, 2016; GIWPS, n.d.; UNICEF, 2017; Global Slavery Index, 2018). We have used average values of the period 2015-2018 where available, to minimize the effect of volatility on the analysis of comparative position.

A value of 100% means that the country scores most favourable on the indicator out of the ten countries in scope of this comparison.
A value of 0% means that the country scores least favourable on the indicator out of the ten countries in scope of this comparison.

Macro-economy

Table 37 Comparative analysis macro-economic indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
GDP growth	World Bank	67%	100%	65%	58%	81%	0%	0%	78%	39%	94%
GDP per capita	World Bank	0%	16%	3%	23%	12%	28%	90%	40%	100%	21%
GDP value	World Bank	0%	1%	0%	2%	0%	17%	13%	12%	18%	100%
Agriculture value	World Bank	0%	1%	1%	2%	0%	22%	1%	7%	9%	100%
Agriculture growth	World Bank	17%	70%	69%	41%	100%	37%	0%	11%	3%	40%
Category total		**17%**	**38%**	**28%**	**25%**	**39%**	**21%**	**21%**	**30%**	**34%**	**71%**
Category rank		**10**	**3**	**6**	**7**	**2**	**9**	**8**	**5**	**4**	**1**

Business environment

Table 38 Comparative analysis ease of doing business indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Time to start a business	World Bank	82%	97%	90%	79%	100%	60%	0%	35%	72%	47%
Domestic credit	World Bank	12%	8%	9%	1%	11%	0%	100%	24%	100%	27%
Ease of doing business	World Bank	0%	23%	5%	30%	8%	4%	56%	22%	100%	60%
Access to electricity	World Bank	0%	53%	22%	71%	51%	42%	80%	89%	100%	87%
Corruption Perception	Transparency	78%	44%	28%	78%	100%	0%	89%	50%	50%	78%
Agriculture orientation	FAO	7%	18%	9%	24%	16%	18%	0%	0%	10%	100%
Category total		**30%**	**41%**	**27%**	**47%**	**48%**	**21%**	**54%**	**37%**	**72%**	**66%**
Category rank		**8**	**6**	**9**	**5**	**4**	**10**	**3**	**7**	**1**	**2**

Table 39 Comparative analysis labour market indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Employment industry	World Bank	100%	0%	1%	47%	26%	19%	65%	43%	66%	69%
Employment agriculture	World Bank	40%	72%	100%	49%	46%	53%	0%	36%	44%	66%
Labour force	World Bank	1%	1%	1%	2%	0%	11%	4%	8%	7%	100%
Participation Rate	World Bank	75%	39%	93%	78%	0%	27%	41%	57%	100%	24%
Category total		**54%**	**28%**	**49%**	**44%**	**18%**	**28%**	**28%**	**36%**	**54%**	**65%**
Category rank		**3**	**7**	**4**	**5**	**10**	**8**	**9**	**6**	**2**	**1**

Table 40 Comparative analysis export and logistics indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Export share	World Bank	26%	40%	21%	39%	19%	0%	34%	33%	100%	15%
Export growth	World Bank	1%	46%	44%	75%	49%	46%	0%	100%	18%	26%
Export value	World Bank	0%	2%	0%	3%	0%	9%	21%	19%	63%	100%
Logistics performance	World Bank	28%	19%	12%	23%	0%	21%	100%	37%	64%	75%
Category total		**14%**	**27%**	**19%**	**35%**	**17%**	**19%**	**39%**	**47%**	**62%**	**54%**
Category rank		**10**	**6**	**7**	**5**	**9**	**8**	**4**	**3**	**1**	**2**

Sustainability and CSR

Table 41 Comparative analysis environmental sustainability indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Environmental Performance	Yale	70%	89%	52%	100%	71%	0%	70%	89%	52%	100%
Climate Change Vulnerability	ND-GAIN	32%	20%	84%	48%	100%	43%	32%	20%	84%	48%
Organic land	FiBL	3%	3%	1%	100%	24%	61%	3%	3%	1%	100%
Category total		**35%**	**38%**	**46%**	**83%**	**65%**	**35%**	**35%**	**38%**	**46%**	**83%**
Category rank		6	5	3	1	2	7	6	5	3	1

Table 42 Comparative analysis inclusiveness indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Youth participation	World Bank	77%	32%	100%	50%	15%	0%	8%	45%	48%	21%
Women participation	World Bank	83%	57%	91%	95%	27%	60%	65%	57%	100%	0%
Women to men rate	World Bank	81%	72%	78%	100%	51%	92%	81%	56%	82%	0%
Youth Development	YDI	81%	72%	78%	100%	51%	92%	81%	56%	82%	0%
Women, Peace, Security	GIWPS	29%	26%	0%	81%	31%	19%	100%	82%	60%	16%
Category total		**70%**	**52%**	**69%**	**85%**	**35%**	**53%**	**67%**	**59%**	**74%**	**7%**
Category rank		**3**	**8**	**4**	**1**	**9**	**7**	**5**	**6**	**2**	**10**

Table 43 Comparative analysis human rights indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Child labour	UNICEF	30%	54%	0%	61%	59%	55%	100%	80%	86%	79%
Modern slavery	GSI	61%	38%	83%	55%	99%	10%	100%	8%	0%	34%
Political Rights	Freedom House	50%	50%	50%	100%	83%	67%	83%	67%	0%	83%
SDG Index	UN	23%	35%	14%	65%	41%	0%	57%	70%	100%	55%
Human Development	UN	0%	21%	1%	51%	25%	33%	83%	83%	100%	65%
Global Peace Index	VOH	58%	61%	97%	0%	13%	100%	80%	87%	69%	93%
Category total		**37%**	**43%**	**41%**	**55%**	**53%**	**44%**	**84%**	**66%**	**59%**	**68%**
Category rank		**10**	**8**	**9**	**5**	**6**	**7**	**1**	**3**	**4**	**2**

Mango sector

Table 44 Comparative analysis mango sector indicators

Indicator	Source	Burkina Faso	Côte d'Ivoire	Mali	Ghana	Senegal	Nigeria	South Africa	Philippines	Thailand	India
Mango production	FAO	1%	0%	0%	0%	0%	4%	0%	3%	19%	100%
EU market share	CBI	81%	0%	3%	68%	0%	0%	100%	23%	16%	0%
Category total		**41%**	**0%**	**2%**	**34%**	**0%**	**2%**	**50%**	**13%**	**18%**	**50%**
Category rank		**3**	**10**	**8**	**4**	**9**	**7**	**1**	**6**	**5**	**2**