



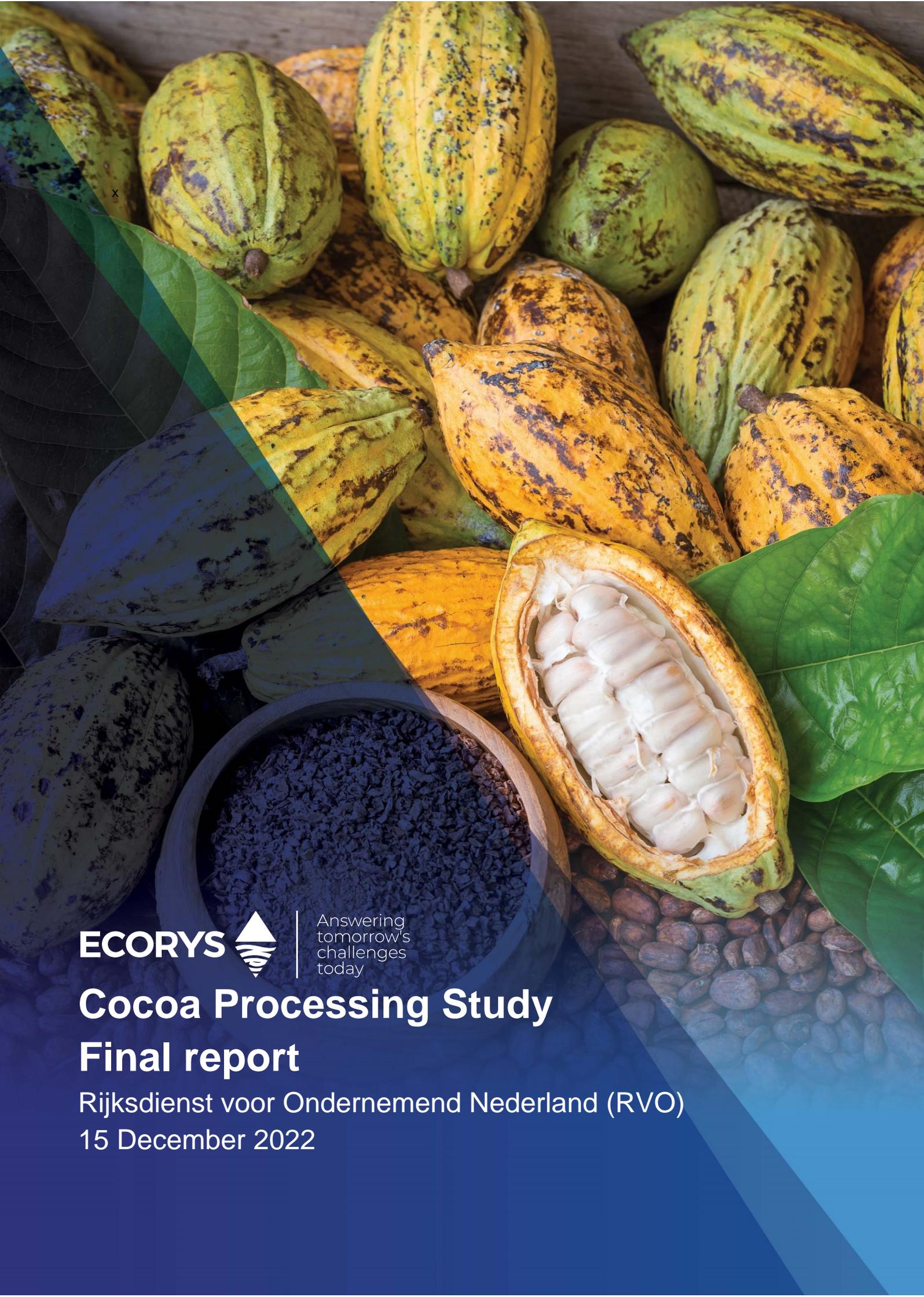
Ministry of Foreign Affairs

Cocoa Processing Study

Final report

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Cocoa Processing Study

Final report

Rijksdienst voor Ondernemend Nederland (RVO)

15 December 2022

Cocoa Processing Study: Final Report

Client: Rijkdienst voor Ondernemend Nederland (RVO)

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Rotterdam, December 15, 2022

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List of acronyms

Acronym	Full name
AfCFTA	African Continental Free Trade Area
CCC	Conseil du Café-Cacao
CHED	Cocoa Health and Extension Division
CMC	Cocoa Marketing Company Limited
COCOBOD	Ghana Cocoa Board
DUS	Droit Unique de Sortie
FOB	Free on Board
GCCSFA	Ghana Cocoa, Coffee and Shea Nut Farmers Association
ICCO	International Cocoa Organization
ISSER	Institute of Statistical, Social and Economic Research
LBC	Licensed Buying Company
MNC	Multinational Corporation
MOFEP	Ministry of Finance and Economic Planning
NTBT	Non-Tariff Barrier to Trade
PPRC	Producer Price Review Committee
QCC	Quality Control Company
SPU	Seed Production Unit

Summary

- Owing to a combination of foreign direct investment (FDI) and government incentives including tax breaks and subsidised prices for light-crop beans, Ghana has substantially increased its primary domestic processing capabilities in recent years. Ghana-based processors have sufficient installed capacity to process approximately 514,000 metric tons of cocoa—equivalent to over 60% of an average harvest.
- Currently, however, only about 50% of installed processing capacity is utilised. In 2019, approximately 259,000 metric tons of cocoa were processed into cocoa liquor, powder, butter, and paste. Secondary processing, and particularly the manufacturing of chocolate products, remains extremely limited in Ghana.
- The limited supply of raw cocoa beans is a key barrier to both primary and secondary processing in Ghana. Supply issues arise from the limited availability of relatively cheaper light-crop cocoa beans—which are substantially more economical to process—and from the high price of main-crop beans. Partly owing to subsidies, the price of light-crop beans on the Ghanaian market tends to be, on average, 20 percent lower than the price of main-crop beans.
- The low productivity of cocoa production is a key driver of these supply issues. Farmers' low income is a key constraint to raising productivity, hindering investment, business expansion, and the diffusion of more sustainable agronomic practices. To increase production, farmers tend to work on the extensive margin, by clearing forested land. This, together with the misuse of pesticides, and the ageing of trees in cocoa plantations, aggravates the problem of deforestation and biodiversity loss. Climate change is emerging as a significant threat to production. The impact of draughts, the intensity of which seems to be increasing, is a case in point.
- The financing structure of the industry is another key constraint to the supply of cocoa beans. The export of raw cocoa constitutes an important source of foreign exchange generation for Ghana, disincentivising domestic processing activities.
- Low capacity utilisation for processing is increasingly prevalent in other cocoa-producing and processing countries, such as Cote d'Ivoire. The drive to expand domestic cocoa processing has resulted in overcapacity at the global level.
- An unfavourable business environment, which includes the high fixed costs of production, high costs of inputs, and high electricity prices, creates additional barriers to processing. Secondary processing in particular is hindered by the high costs of importing inputs (sugar, powder milk, and cocoa powder and liquor) for chocolate manufacturing and high fixed costs. Additionally, the export of locally processed cocoa products is hampered by non-tariff barriers to trade and by the specificities of the supply chain, with chocolate manufacturers requiring intermediary products on a just-in-time basis.
- Despite these challenges, Ghana is a competitive global player in all primary processing activities. Business opportunities exist in this market segment, with untapped potential and a relatively less competitive environment in the production of cocoa paste and butter.

Addressing supply issues and the business environment are key for the country to retain its competitive edge.

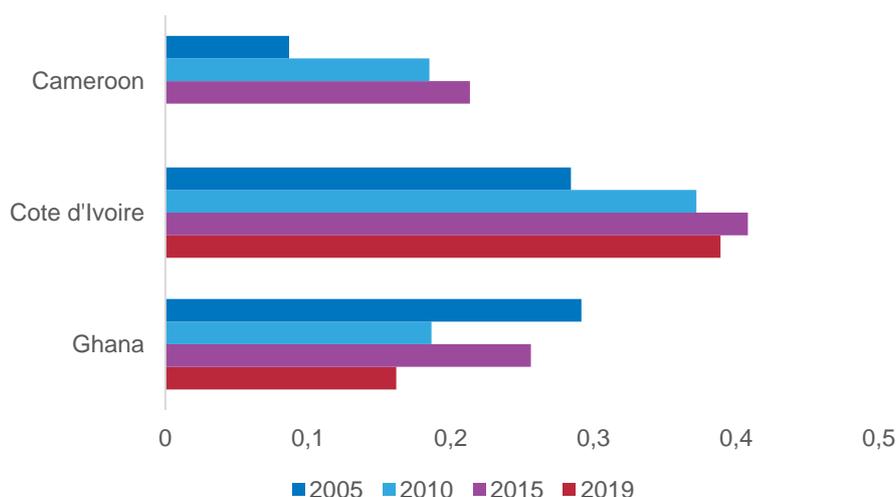
- There is also untapped potential for cocoa market diversification and investments in small-scale, high-end chocolate manufacturing; and in the production of cocoa by-products (including food products, soap, and animal feed), which can increase the resilience of Ghana's cocoa industry.
- These niche market segments could offer important business opportunities. At least at the national and regional level, they remain shielded from international competition. Innovative business models and branding strategies, access to capital, and significant market know-how, however, are important requirements for local entrepreneurs to seize these opportunities.

1 Cocoa processing in Ghana

1.1 The cocoa processing challenge

Since its introduction to the country in 1879, cocoa has played a key role in Ghana's economy. Cocoa is Ghana's dominant export crop and an important source of employment and foreign exchange generation. Ghana is the world's second-largest exporter of cocoa, after Côte d'Ivoire. In recent years, Ghana has been relatively successful in diversifying its export basket and reducing its dependence on cocoa exports. During the last two decades, the share of cocoa in Ghana's total exports has oscillated between 30 and 16 percent, with a clearly declining trend (Figure 1)¹.

Figure 1 Cocoa exports as a percentage of total exports in selected West African countries



Source: Own elaboration based on UN-COMTRADE data. Note: Data on exports includes cocoa beans as well as processed cocoa.

While Ghana is gradually diversifying away from cocoa, it now faces the challenge of increasing its value-added share within the cocoa industry. There are two major value-addition steps in the cocoa industry. The first is primary processing, consisting of grinding and the production of intermediate products such as cocoa liquor, butter, and powder. Secondary processing consists mainly of the manufacturing of chocolate, other cocoa confectionary products, and niche products (including food products such as cocoa milk and juice; cosmetics; and fertilisers).

Increasing the share of primary processing that is carried out domestically is an important first step for cocoa-producing countries such as Ghana to move up and upgrade in the cocoa global value chain. Yet primary processing adds a comparatively small share of value added relative to secondary processing². As we discuss in greater detail in Section 1.3 below, according to recent estimates, a cocoa producing and processing country such as Ghana is able to retain a mere 18% of the total value generated by the sale of consumer chocolate in EU markets³.

¹ This is a clear departure from past trends. In the mid-1970s, the sector reportedly accounted for over 75 percent of the country's foreign exchange earnings. See Williams, 2009, *An African Success Story: Ghana's Marketing System*, *IDS Working Paper No. 318*.

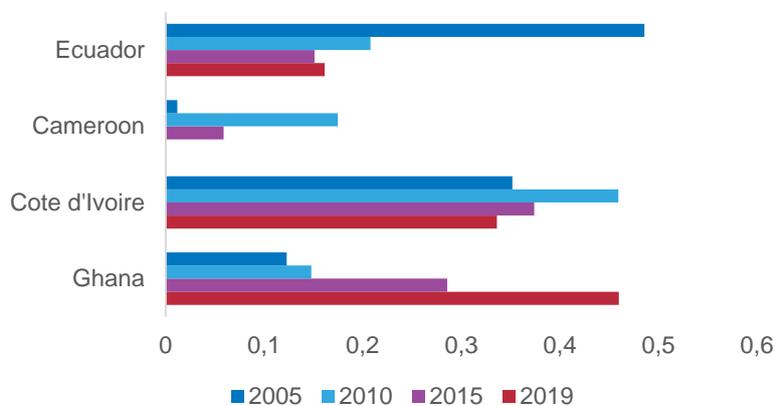
² See, for instance, Grumiller et al., 2020, *Strategies for Sustainable Upgrading in GVCs: the Ivorian and Ghanaian Cocoa Processing Sectors*. *OFSE Policy Note*.

³ FAO and BASIC, 2020, *Comparative Study on the Distribution of Value in European Chocolate Chains*.

Expanding domestic primary and secondary processing would enable Ghana to capture a higher share of value added in the value chain, further diversify its export basket, and reduce its exposure to a volatile world price for raw cocoa. Increasing domestic processing and value addition capabilities may also be seen as part of a process of agriculture-based industrialisation, which, under appropriate conditions, might raise aggregate productivity, generate additional employment and stimulate linkages with a variety of other economic sectors⁴.

In this study, we focus on Ghana’s processing challenge. We find that Ghana’s primary processing capacity has increased substantially in recent years. Capacity increases were driven by government incentives to attract foreign direct investment (FDI). In 2019, Ghana processed over 40% of the cocoa harvest (Figure 2). The country appears to have thus caught up with Cote d’Ivoire—a leader in primary cocoa processing among cocoa-producing countries globally. Ghana is also becoming closer to meet the government’s objective of processing 50% of the country’s cocoa harvest.

Figure 2 Processed cocoa as a percentage of total cocoa exports, selected producers



Source: Own elaboration based on UN-COMTRADE data.

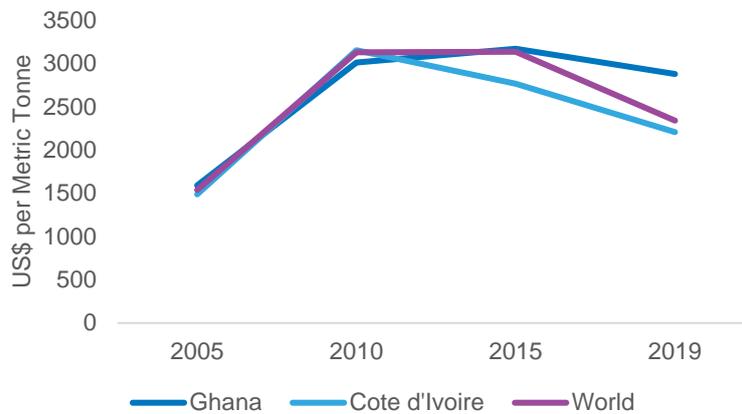
Challenges remain, however. In this study, we identified two key challenges. The first concerns capacity utilisation. According to our estimates, Ghana already possesses sufficient installed processing capacity to meet the government’s 50% target. Yet actual processing falls short of that target. The second challenge lies in value chain upgrading. While Ghana has the capabilities to become a competitive global player in all the intermediate cocoa products deriving from primary processing (i.e. liquor, butter, and powder), breaking into secondary processing remains a challenging prospect.

According to our analysis, these challenges can be traced back to several barriers and obstacles. We group barriers to processing according to whether they occur upstream (i.e. in cocoa production) or downstream (i.e. in cocoa processing, marketing, and distribution). Several constraints exist **upstream**. Ghana’s cocoa beans are considered among the world’s highest quality beans (Figure 3), owing, in part, to the quality management system of Ghana’s Cocoa Board

⁴ See, for instance, Newfarmer, R., Page, J., Tarp, F., 2019. Industries without Smokestacks: Industrialization in Africa Reconsidered. WIDER Studies in Development Economics. Oxford University Press, Oxford, New York.

(COCOBOD), which oversees the cultivation, evaluation, transportation, and export of the cocoa crop^{5, 6}

Figure 3 Unit values for cocoa beans exports



Source: Own elaboration based on UN-COMTRADE data. Note: Unit values are calculated as the ratio of dollar value to quantity. Unit values in this figure refer to the HS product code 1801.

Indeed, reforms to the country's marketing board starting in the mid-1980s are widely considered a success, enabling Ghana's government to rein in inefficiencies, introduce a degree of liberalisation on the domestic cocoa market, and to invest in inputs, infrastructure, and extension services⁷. Substantial improvements in production and prices were key outcomes of the reforms, which, to this day, stand out from other experiences with marketing board reform across Sub-Saharan African economies⁸.

Yet our research suggests that several threats to production have arisen in recent years. These include the impact of climate change on farm yields and productivity⁹, as well as the impacts of illegal mining on the extent of land under cultivation. Harvests in the 2019/2020 and 2021/2022 seasons were particularly vulnerable to the impacts of droughts, an outbreak of swollen shoot virus, illegal mining, and other shocks. Despite an exceptional harvest during the 2020/2021 season, production and export of cocoa appear to be stagnating (Figure 4).

⁵ COCOBOD superseded the Cocoa Marketing Board (CMB) in the mid-1980s. Established during the colonial period, CMB had become a byword for administrative inefficiency during the 1960s and 1970s. The board was substantially downsized during the 1980s, and the internal marketing system was opened up to competition, giving rise to private-owned licensed buying companies (LBCs).

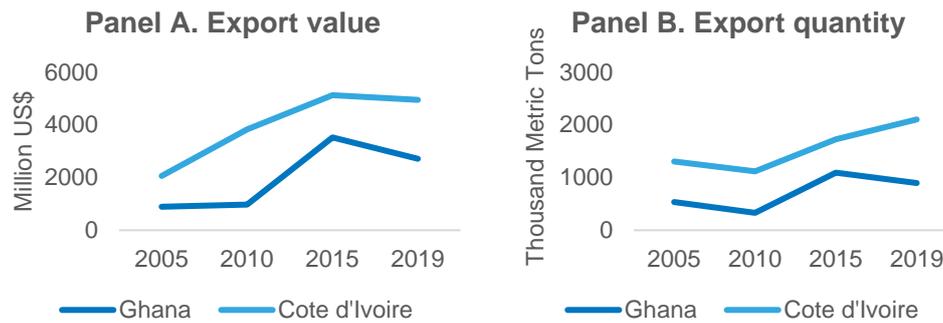
⁶ At least one stakeholder, however, has noted that challenges to quality maintenance may be increasing with issues such as inadequately dried cocoa, black and purple beans, mixing beans of different sizes. These issues appear to be heightened during periods of low harvest. We are not yet able, however, to assess how widespread these issues are.

⁷ Williams, 2009; Kolavalli and Vigneri, 2017, *The Cocoa Coast: The Board-Managed Cocoa Sector in Ghana*

⁸ To this day, there is substantial debate on the experience of marketing boards. While there is near-consensus on the inefficiencies of Sub-Saharan African marketing boards, structural adjustment-induced reforms have also come under fire. Too often, liberalisation and privatisation of the agricultural sector was not accompanied by investments in agricultural infrastructure and extension services which would have been crucial to raise yields and maintain production levels. See Bates, 1981, *Markets and States in Tropical Africa*, University of California Press; and Oya, 2010, *Agro-pessimism, capitalism and agrarian change: trajectories and contradictions in Sub-Saharan Africa*, in Padayachee (ed.), *The Political Economy of Africa*, Routledge.

⁹ Rabobank 2017. *Unlocking blended finance for CSA investments in the Ghanaian cocoa sector*

Figure 4 Are Ghanaian exports of cocoa beans declining?



Source: Own elaboration based on UN-COMTRADE data.

A relatively small harvest constrains access to sufficient quantities of raw beans to grind and process. This is widely reported as the main driver of idle capacity. Light-crop beans are particularly scarce. Their scarcity is a key bottleneck to processing, because grinders and producers rely predominantly on the light-crop harvest, which is cheaper than the main crop. Owing to its quality, main-crop beans sell at a premium. By contrast, light-crop beans are sold to processors at an overall discount of 20 percent¹⁰. Most processors use a blend of light- and main-crop beans. When combined with the high price of the main crop, the relatively scarce supply of light-crop beans is a substantial constraint to domestic processing.

The limited supply of raw beans is compounded by the organisation of the **downstream** section of the supply chain, and particularly marketing. The export of raw, main-crop cocoa represents a key source of foreign exchange generation for the government. Each season, Ghana International Bank, majority-owned by the Bank of Ghana, enters into a syndicated loan agreement—denominated in US dollars—with several international banks, using forward contracts with multinational processors as collateral. The loan amount is deposited at the Bank of Ghana, which transfers the amount in local currency to COCOBOD to purchase cocoa beans¹¹. The use of raw cocoa as a source of financing for the government disincentives domestic processing.

Moreover, both challenges are compounded by a difficult business environment. Processors and manufacturers face comparatively high operating costs, including for electricity and key imports; a high cost of capital; logistical challenges; and limited domestic technological know-how. These costs act as a break to the competitive performance of Ghana-based firms in cocoa processing, particularly those active in secondary processing segments.¹² Taken together, the barriers we identify in this report result in Ghana being able to process fewer beans than it would be capable of; and in challenges for Ghana to enter into chocolate manufacturing.

Looking forward, however, our report also identifies opportunities. First, we provide evidence that Ghana is currently globally competitive across all primary processing activities—liquor, butter, and powder. Our analysis also suggests that there is significant untapped export potential in the production of cocoa paste and butter. While most of this potential seems to lie in EU markets, opportunities may open in West African markets thanks to AfCFTA. Addressing issues in the supply

¹⁰ The price of light-crop beans tends to be, on average, 12.5 percent lower than the price of main-crop beans. The discount buyers receive from COCOBOD thus entails a subsidy of 7.5 percent. The subsidy is reportedly undergoing review.

¹¹ For a thorough discussion of the financing of Ghana's cocoa sector, see IMANI, 2019, Exploring Revenue Management and Producer Pricing Mechanism Within Ghana's Cocoa Sector. See also, van Huellen and Abubakar, 2021, Potential for Upgrading in Financialised Agri-food Chains: The Case of Ghanaian Cocoa. *European Journal of Development Research*, 33.

¹² An additional sources of cost is related to the organisation of the value chain. Since the vast majority of chocolate manufacturing takes place in Europe, cocoa powder and butter also need to be solidified—which requires energy—and packaged before being exported for further processing.

of beans would contribute to closing the gap between the country's current processing capabilities and its ambitions.

With regard to secondary processing, we find that, at least over the short term, large-scale manufacturing activities in the chocolate and confectionary sector is likely to remain concentrated in industrialized economies. Limited domestic and regional demand, combined with the high costs of production, are the main drivers of this trend. There may be opportunities, however, in smaller-scale chocolate manufacturing targeting sustainability-conscious consumers in higher-end markets. Opportunities may also exist in niche segments of the cocoa industry, such as cosmetics. Access to capital, clear branding strategies, and market know-how are all important prerequisites for these opportunities to materialise. An more in-depth market study would help to further understand and contextualise these opportunities.

The remainder of this study is organised as follows. Section 1.2 provides an overview of the main stakeholders active in the Ghanaian cocoa sector. Section 1.3 reports up-to-date estimates on Ghana's current processing capacity, and describes the global cocoa value chain. Section 1.4 outlines our SWOT analysis for the sector. In the second part of the study, in Section 2.1 we leverage trade data to provide evidence on Ghana's current and future competitiveness in the cocoa sector. Section 2.2 identifies potential business opportunities for investment in Ghana's cocoa sector.

1.2 Overview of the Ghanaian cocoa sector: the main stakeholders

Ghana Cocoa Board (COCOBOD)

Unlike other African countries, Ghana did not undergo a process of complete liberalisation of the cocoa market sector. The Ghana Cocoa Board (COCOBOD) still regulates the activities of the stakeholders in the industry, from production to export. One of the main services provided by COCOBOD is external marketing and quality control of cocoa. Additionally, the Board is a promoter of the cocoa industry, which supports through additional interventions including cocoa research, road infrastructure development, input supply subsidies, and even welfare-oriented programmes such as the farmers housing scheme¹³. The COCOBOD finances these services by retaining a portion of the Free on Board (FOB) price to operate multiple specialised divisions.

The Producer Price Review Committee (PPRC)

In 1983, the Ghanaian Government established the Producer Price Review Committee (PPRC), in charge of the allocation of the FOB based on the recommendations of different stakeholders. The Committee is chaired by the Ministry of Finance and Economic Planning (MOFEP) and includes COCOBOD (including the quality control division), the Bank of Ghana, Institute of Statistical, Social and Economic Research (ISSER), LBCs, cocoa transporters and representatives of farmers¹⁴.

The determination of the cocoa price is dependent on the forecasting of cocoa revenues and the deliberations of the PPRC. The PPRC provides the first projections of FOB prices in USD and the crop size for the following crop year. In this assessment, the PPRC also consider the price in neighbouring countries, to limit smuggling. The Cocoa Marketing Company (CMC) and the Bank of Ghana also provide their forecast prices and exchange rates. From 2001, COCOBOD changed the estimation of producers' share in order to achieve a price that would allow it to reach the producer share while retaining some revenues to finance "industry costs", which include some of the additional services provided by COCOBOD to the cocoa industry, such as the disease and pest control, the child labour programme or the fertilisers subsidies. Such costs are subtracted from the projected export revenues; the difference is then divided to the projected production to obtain the

¹³ Kolavalli & Vigneri, 2017

¹⁴ Ibid.

net FOB price, which is then split among all stakeholders. The PPRC provides suggestions on the share of (net) FOB prices for all agents involved in the cocoa production and marketing, including COCOBOD, whose budget will need to be approved by MOFEP. The Board announces the producer price before the opening of the main cropping season in October.

Cocoa Research Institute of Ghana (CRIG)

The CRIG was established in 1938 to investigate the problems of diseases and pests that affected cocoa production in the Ghanaian Eastern Region. It is regarded as a centre of excellence in the study of cocoa and one of the best-funded research centres in the area¹⁵. Its main mandate is to undertake research into all problems related to the cocoa production, including soil fertility and good agricultural practices, with the view to increasing yield and farmers' income. The Institute is in charge of identifying new processing techniques and consumer products and by-products, and ensure the transfer of knowledge of the technologies and agronomic practices to the farmers¹⁶. The CRIG recently expanded its scope to include kola, coffee, shea nut, and other indigenous and introduced tree species, which produce fats similar to cocoa butter.

Seed Production Unit (SPU)

The Seed Production Unit was established in 2001 with the aim of distributing high quality cocoa – and coffee – planting materials to farmers. SPU currently operates in 27 cocoa stations, where it multiplies high-yielding cocoa hybrids (selected through CRIG) and distributes them to farmers at a subsidised cost as seeds and samplings.

Cocoa Health and Extension Division (CHED)

The Cocoa Health and Extension Division was formerly known as the Cocoa Swollen Shoot Virus Disease Control Unit (CSSVDCU), active since 1945, right after the virus was identified for the first time in the 1930s. The mission of the Division is to control the spread of the virus, but also assist farmers in replanting improved cocoa varieties in the treated farms, pursue effective pest control programmes and provide technology to meet the needs of old and new cocoa farmers¹⁷.

Quality Control Company (QCC)

The QCC is in charge of inspection, grading and sealing and cocoa (as well as coffee and shea nut) and supervises the respect of the cocoa quality standards at all stages of the supply chain. Its activities include the inspection of the Licenced Buyer Companies' (LBC) and Cocoa Marketing Company's (CMC) cocoa, which is then assigned a Grade of I (superior quality), II (slightly inferior) or Substandard (SS). QCC also checks samplings of cocoa at the arrival at port warehouses (in Tema, Takoradi, and Kaase) and before export to ensure that the cocoa meets the local and international standards and to ensure that their quality has not been compromised during storage. The Company is also responsible for the disinfestation of warehouses where cocoa is stored, as well as the fumigation of cocoa and other produce.

Cocoa Marketing Company Limited (CMC)

The CMC has been established in 1961 as the wholly owned subsidiary of the Ghana Cocoa Board. Today, is the largest single seller and exporter of premium cocoa from origin, and the only entity legally permitted to sell Ghanaian cocoa in the world market. Its main scope is to sell Ghanaian cocoa to local and international processors and traders; store Ghana's cocoa in the designated warehouses in Tema, Takoradi and Kumasi, as well as managing sales and collecting receipts.

¹⁵ Ibid.

¹⁶ World Bank. 2013. Ghana : Cocoa Supply Chain Risk Assessment. Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/16516> License: CC BY 3.0 IGO.

¹⁷ <https://ched.com.gh/applications/website/about-us/company-profile/index.html>.

Farmers

Cocoa in Ghana is produced by more than 800 000 households, mostly smallholders, concentrated in the Western, Ashanti, Brong Ahafo, Eastern, Central and Volta regions in the south of the country. According to a field survey from IMANI (2019), cocoa producers are mostly older males, while only a minority of females and youth participates in the cultivation of cocoa. The vast majority of farmers cultivate cocoa in small-sized farms averaging 3 to 4 hectares¹⁸. Around 70% of farmers declare to own the land that they cultivate, and 38% report to have legal title for the farms they own. 20% of the farmers are sharecropping¹⁹.

Cocoa is the most common crop cultivated on the farms, but other relevant plantations include oil palm, plantain, cassava, and maize. Farming households are almost exclusively dependent on income from cocoa sales. In a 2011 survey, 38% of smallholders reported having zero income from crops other than cocoa²⁰.

While there is a positive link between cocoa production and poverty reduction, the low productivity of cocoa and the income generated from it is often not enough to push farmers out of poverty²¹. Increasing land productivity would be important to make cocoa cultivation an effective instrument for poverty reductions. Attempts to increase productivity have been made through sprayings and increased use of fertilisers, subsidised by COCOBOD, although sustained productivity growth could be reached only by research into soil fertility and climate change adaptation.

There are multiple associations representing farmers, the most relevant of which is the Ghana Cocoa, Coffee and Shea Nut Farmers Association (GCCSFA). The farmers are also present in the board of COCOBOD with the aim of increasing their influence in the cocoa industry decision making process.

Licensed Buying Companies (LBCs) and hauliers

The LBCs purchase the cocoa from farmers at the guaranteed floor price ("producer price") determined by COCOBOD. The LBCs hire hauliers for the transportation of cocoa to the takeover points. Hauliers' remuneration is based on the fixed rates established by the PPRC. LBCs are responsible for compliance with the strict QCC standards (quality and cocoa size, compliance with the drying process) and sell the cocoa to CMC for export at a fixed price. The revenues for LBCs are determined by the volumes of cocoa marketed, and each LBC receives a subsidised rate-loan based on their market share.²²

The increased competition and the presence of a fixed price scheme has encouraged LBCs to access farmers' cocoa through different means. These include cash payment and non-economic incentives, such as services, credits, provision of small inputs (machetes, soap, pens and school books), or even by organising farmers awards or delivering scratch lots with the promise of winning spraying items or money²³.

¹⁸ IMANI, 2019. Exploring revenue management and producer pricing mechanism within Ghana's cocoa sector.

¹⁹ Hainmueller J, Hiscox M, Tampe M. 2011. Sustainable Development for Cocoa Farmers in Ghana. MIT and Harvard University. January 2011.

²⁰ Ibid.

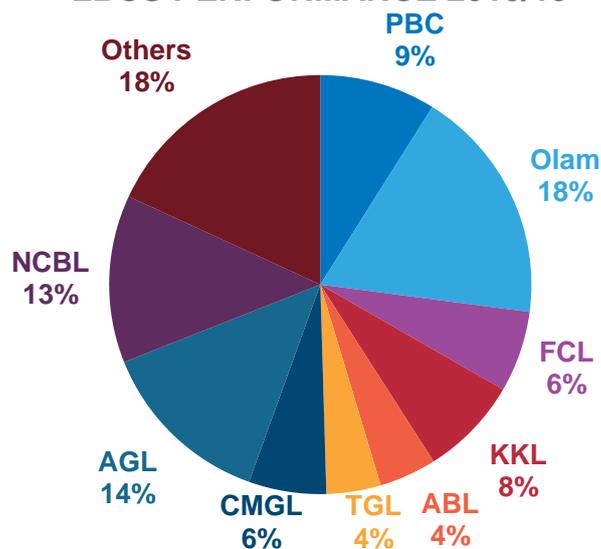
²¹ Vigneri & Kolavalli, 2018. Growth through pricing policy: The case of cocoa in Ghana. Background paper to the UNCTAD-FAO. Commodities and Development Report 2017. Commodity markets, economic growth and development.

²² At least one stakeholder reported that regulations may have changed since the 2019/2020, with access to subsidised loans becoming more difficult. However, we were not able to assess whether this is indeed the case.

²³ Bakang et al, 2021. Competitive strategies for purchasing of cocoa by licensed buying companies in Ghana: The determinants and performance implications.

At the beginning of the 2018/19 season, 48 LBCs were licenced to engage in the internal marketing of cocoa, out of which 40 were active and purchased cocoa during the year. Cocoa purchased for 2018/19 season was 811,747 tonnes, a decrease of 10.28%, compared to the 904,740 tonnes recorded in 2017/18 crop year²⁴. The Produce Buying Company, once COCOBOD subsidiary before being privatised and listed in the Ghana Stock Exchange, remained for many years the largest buyer. However, in 2019 it controlled 16% of the market and was only second to Olam Cocoa Ltd (Olam), with a 17% market share. An overview of the share of cocoa purchases per LBC in the 2018-2019 crop year is provided below.

Figure 5 LBCs Performance 2018-2019
LBCS PERFORMANCE 2018/19



Source: COCOBOD 2019.

Input suppliers

Input suppliers include providers of seedlings, fertilisers, insecticides and other agrochemicals, as well as farm equipment and tools. Through the SPD, COCOBOD maintains an active role in the distribution of planting material, while the CHED supports the distribution of seedlings, delivers fertiliser and sprays cocoa farms. The private sector supply is made of small-scale suppliers operating at the local level. They usually re-sell inputs sourced from wholesalers concentrated in the major urban areas in Accra and Kumasi²⁵. The inputs are sold on a cash-and-carry basis, because cocoa farmers are often viewed as a high credit risk category. Few input suppliers offer training for their products.

²⁴ COCOBOD 2019. Annual Report and consolidated financial statements – 2019.

²⁵ World Bank. 2013. Ghana: Cocoa Supply Chain Risk Assessment. Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/16516> License: CC BY 3.0 IGO

1.3 The current processing sector: size and capacity

1.3.1 The stages of cocoa processing

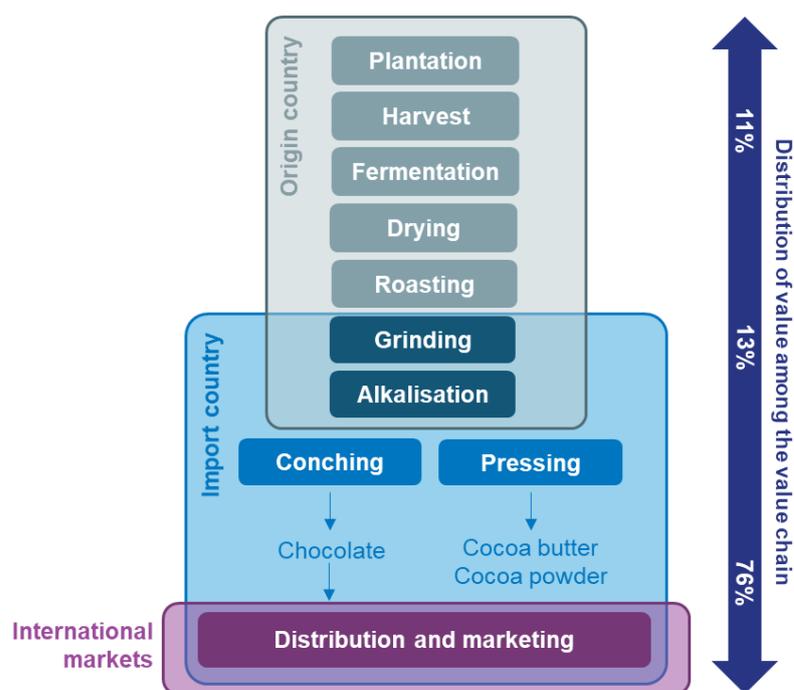
Unlike coffee or other commodities, cocoa undertakes a substantial transformation before reaching costumers. Such transformation entails four different stages, which are sketched in Figure 6:

1. Raw to minimally processed cocoa beans
2. Semi-finished products such as cocoa paste/liquor, cocoa butter, cocoa powder
3. Coverture or industrial chocolate
4. Finished chocolate products

There are two main processing stages, one to achieve the intermediate products and the second one to achieve the final product.

The preparation of the beans for market is very labour intensive, and has not changed significantly over the years for producers. After the harvest of the cocoa pod, the beans undergo a fermentation process, which takes from 5 to 8 days and is useful to acquire the colour and flavour usually associated with chocolate. The beans are then dried under the sun for 5 to 12 days to reduce their moisture content from 60 to 8%²⁶. The beans are then ready to be sold and processed.

Figure 6 The cocoa value chain



Source: Own elaboration based on IDDRI (2019) and Van Huellen and Abubakar (2021)

Primary and secondary processing are treated as two different segments of the value chain. The **primary processing** of cocoa begins with the roasting and grinding of the beans for the production of intermediate products. Subsequently, for powder production, the beans can be subjected to a “dutching” or alkalinisation process, which helps develop the flavour. The nibs are then milled to obtain a cocoa liquor, which can be further processed into cocoa butter and cocoa powder.

²⁶ Kolavalli and Vigneri, 2017.

Primary processing only accounts for 5% of the final value; **secondary processing** throughout the manufacturing of the final product generates the most value. The main constraint towards secondary processing in origin countries is the cost of inputs such as sugar, milk, packing materials, and cocoa powder and liquor from other origin countries, as well as the high energy and transportation costs.²⁷ Secondary processing is mostly done in destination countries. The Netherlands is the largest importer of cocoa, followed by the United States²⁸, and has the world's largest cocoa grinding industry.

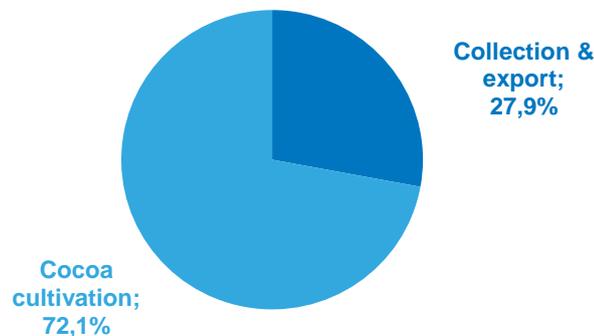
1.3.2 Market dynamics

The cocoa supply chain has a typical “bottleneck” shape, with over 5 million producers, most of whom cultivate a few hectares of cocoa, and millions of potential consumers downstream, with a small number of companies in the middle of the chain that carry out two-thirds of the grinding capacity and the confectionery retail trade. This has resulted in three general cocoa value chain patterns. First, major multinational corporations (MNCs) that are vertically integrated into the whole value chain from bean processing to the manufacturing of the chocolate and distribute their final products through global distribution channels. Secondly, multinational grinders and processors, who are based in both origin and destination countries, and carry out primary processing activities. Finally, artisanal or independent chocolate manufacturers which source cocoa paste and butter from other independent cocoa processors.

Domestic value chain

The domestic value chain is highly dependent on the input costs for the cocoa crop producers and the height of the FOB established by the COCOBOD. In aggregate terms, one recent study has performed an in-depth analysis on the value distribution of aggregate cocoa beans exported from Ghana and other major cocoa-producing countries in 2018. This analysis provides insights on the composition of the domestic value distribution in a situation where the cocoa beans are processed abroad and is presented in Figure 7.

Figure 7 Value distribution, aggregate cocoa beans exported from Ghana in 2018



Source: FAO and BASIC (2020) Comparative study on the distribution of value in European chocolate chains.

The share of collection and export to the domestic value distribution was estimated at 27.9%. These costs include the margins, taxes and other relevant costs borne by intermediate parties in Ghana between the farmers and cocoa processors. Collection and export costs include warehousing and road and sea transport. The share of value for the cocoa farmers is estimated to lie at 72.1% of the total domestic value distribution. These estimates lie higher than in other major cocoa-producing countries such as the Cote d'Ivoire where the estimated domestic value distribution for cocoa farmers lies at 62.8%.

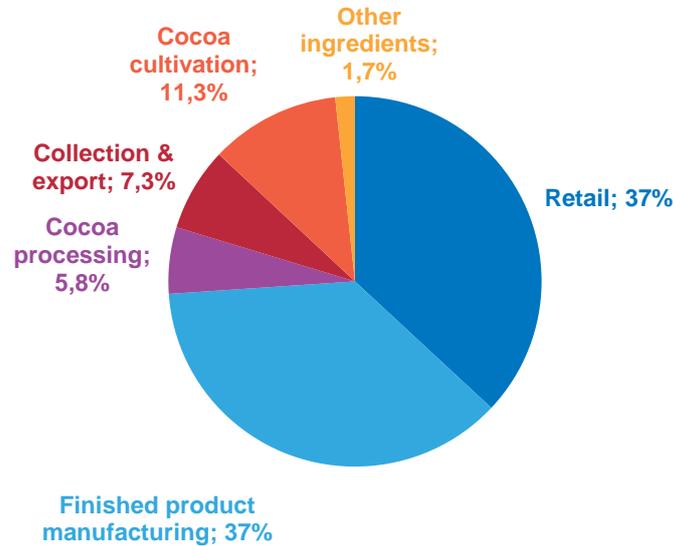
²⁷ Currently, Ghanaian cocoa tends to be used in the production of multi-, rather than single-origin chocolate. Chocolate manufacturing would therefore require the import of cocoa from other origin countries.

²⁸ <https://wits.worldbank.org/trade/comtrade/en/country/ALL/year/2019/tradeflow/Imports/partner/WLD/product/180100>.

International value chain

The international value chain is comprised of all steps required to manufacture the ultimate finished product: chocolate. This includes cocoa cultivation and the collection and export of crops. Followed by the processing steps for the creation of the intermediate cocoa products (liquor, cake, butter and powder). Hereafter the manufacturing of the finished goods takes place, which are then distributed across various retail outlets. An aggregate overview of these steps can be found in Figure 8.

Figure 8 Distribution of cocoa value chain, from farmers to end-consumers



Source: FAO and BASIC (2020) Comparative study on the distribution of value in European chocolate chains.

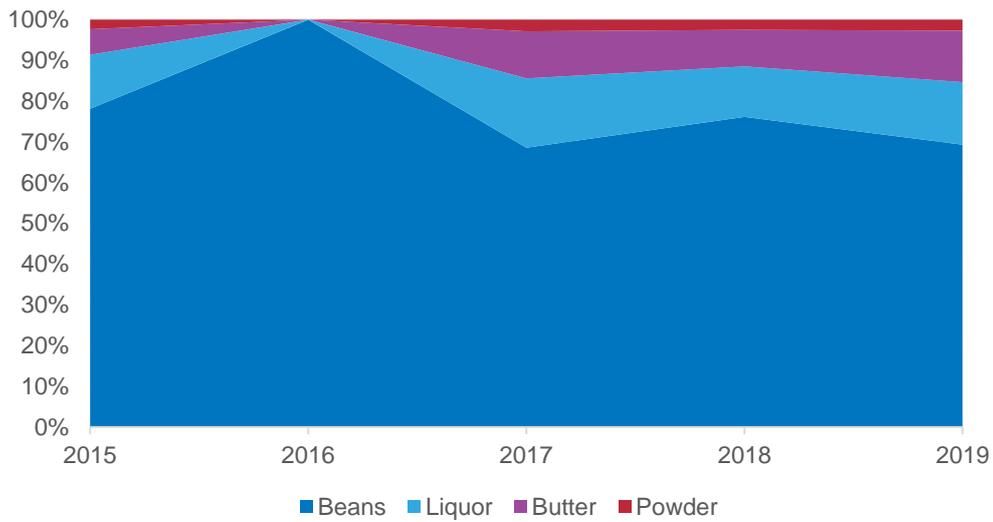
In their study, FAO and BASIC (2020) estimate that, on average, for each kilogram of dark chocolate that is sold in French retail outlets, more than 70% of the total value from cocoa farmers to end consumers accrued during the last two steps in the value chain for cocoa/chocolate (see Figure 8). Indeed, the retail and the finished product manufacturing parties each capture 37% of the total value distribution, respectively. Following the previous steps of the value chain, the cocoa processors are attributed 5.8% of the total value distribution. Hereafter, the collection and export components of the value chain earn 7.3% while the cocoa farmers earn 11.3%. These estimates suggest that on average, only 18.6% of the total value from the entire cocoa/chocolate value chain (from farming to the export of beans) is generated by stakeholders in cocoa-producing countries.

Ghanaian authorities have put much emphasis in recent years on improving the value capture of the cocoa/chocolate value chain by promoting local processing activities for semi-final goods of cocoa (liquor, butter and powder). For these three semi-final goods, the results of these incentives have been varying. As the export of Ghanaian cocoa beans has experienced a significant decline of 32% between 2015 and 2019, increased export of intermediates has, across the board, not been able to compensate for this decrease in terms of export value. More specifically, the total export value for both primary and secondary cocoa goods was valued at \$3.5 billion USD in 2015 and declined to \$2.6 billion USD in 2019.

Moreover, while the export of cocoa butter has significantly increased by 53%, from \$218 million USD in 2015 to \$337 million USD in 2019, the export of liquor, as well as cocoa powder have both decreased by 11%, respectively. All in all, semi-final cocoa goods represented 44% of all primary and secondary cocoa goods exported from Ghana in 2019, up from 28% in 2015, marking a

profound shift from solely focusing on the export of whole beans towards more added value cocoa products along the global value chains for chocolate.

Figure 9 Share of primary and secondary cocoa goods in Ghanaian cocoa exports

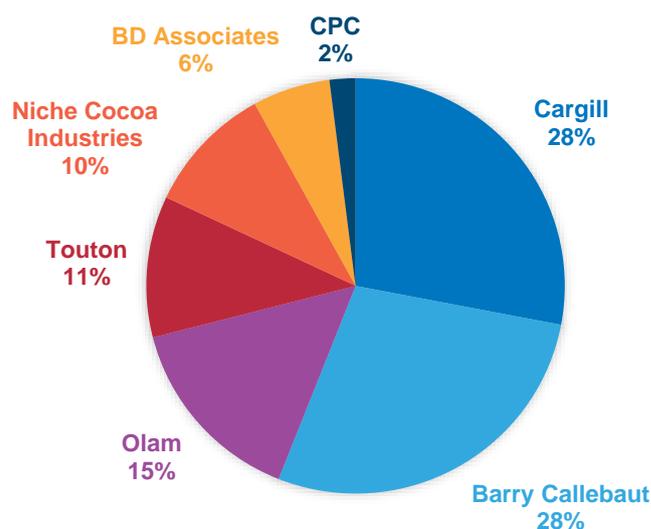


Source: Own elaboration based on UN-COMTRADE data.

The processing market in Ghana is considerably concentrated around a few multinational processing firms. In 2015-2016, more than 70% of the cocoa processing activities for the manufacturing of secondary cocoa products were in the hands of three firms. As shown in Figure 10, these firms are Barry Callebaut (Switzerland), Cargill (USA) and Olam (Singapore). For these multinational processors, concerns have arisen in recent years about the availability of sufficient cocoa beans for the full utilisation of their factories.

As considerable capital investments are required to set up a cocoa processing facility with the required machinery, multinational grinders are often reported to be forced to import beans from abroad, most notably from Cote d'Ivoire, to mitigate local bean shortages that have resulted in low utilisation of their processing capacities. Such imports at higher prices have, however, experienced a decline. While \$43 million USD or 1448 tonnes of cocoa beans were imported from Cote d'Ivoire in 2015, this volume decreased to \$28 million USD or 1251 tonnes in 2019. These trends suggest that local shortages for cocoa beans persist in the Ghanaian cocoa processing industry.

Figure 10 Company market share in cocoa processing in Ghana, 2015-2016



Source: COCOBOD, 2019

The worldwide market share of Ghana in the export of intermediate cocoa products (husk, liquor, butter and powder) is limited compared to neighbouring Cote d'Ivoire and major cocoa bean importing countries (Figure 11). More specifically, while Ghana accounted for 23% of worldwide cocoa beans export, it only possessed a worldwide market share of 5% for cocoa husk, shells and skin, a 14% market share in exports for cocoa liquor, 6% for cocoa butter, 3% for cocoa butter, and 0.1% for chocolate.

Other major cocoa bean producing and export country includes Malaysia, accounting for 3% of the worldwide export of cocoa beans. Despite this relatively small market share, the Asian country holds a significant market share in secondary high-value-added cocoa products, including an 11% world market share in the export of cocoa butter and 12% in cocoa powder. As the country has a relatively small market share in the export of chocolate, the collected trade data implies that the country keeps a significant portion of its cultivated cocoa beans for local processing and exports much of the secondary cocoa products to be used in the manufacture of chocolate abroad.

Unequivocally, the major international players in cocoa processing are located in Western Europe. The Netherlands leads the region with an 18% and 28% world export market share for cocoa liquor and cocoa butter.²⁹ However, the country's highest market share for secondary cocoa products lies in the export of cocoa powder, for which it exported 298 thousand tonnes, or \$689 million USD and possessed a market share of 30% in 2019. As the country holds a relatively smaller world market share for end-manufactured chocolate (7%), the gathered trade data suggest the country exports most of the processed cocoa products.

The second largest player in the processing of cocoa beans is Germany. With a world export market share varying between 9% and 12% for cocoa liquor, butter and powder. The country is also one of the largest chocolate manufacturing countries in the world, accounting for 18% of the world's exports of chocolate. In 2019, German manufacturers exported 931 thousand tonnes or \$5.1 billion USD of chocolate to countries around the world.

²⁹ It is worth noting that these statistics may be biased upwards, as they include re-exports.

Figure 11 Worldwide export market share of cocoa beans, intermediate cocoa products and chocolate for the top 5 cocoa bean exporting countries (green) and the top 5 cocoa bean importing countries (blue) in 2019



Source: Own elaboration based on UN-COMTRADE data

1.3.3 Size and capacity of cocoa processing in Ghana

In 2020, Ghana's government announced that it aims at increasing the country's cocoa processing capacity to up to 50% of annual cocoa output—up from the current level of 40%. Measures to incentivise local processing include a 20% discount on the price of light-crop cocoa beans and fiscal and financial incentives associated with location in a Free Trade Zone (FTZ) area³⁰. Currently, ten large cocoa processors are based across the country's FTZs (Tema, Takoradi, and Kumasi). Of these, six are foreign processing firms, and four are Ghanaian-owned firms.

According to COCOBOD estimates, current installed processing capacity is at approximately 514,000 metric tons.³¹ For comparison, grindings have been estimated at 590,000 metric tons in Côte d'Ivoire for the 2018/2019 season.³² Ghana's current processing capacity is equivalent to 49% of cocoa output for the 2020/2021 season—which, was, however an exceptionally large harvest—and over 60% of the cocoa output which has been estimated for the 2021/2022 season. Foreign-owned processors account for 279.000 metric tons of processing capacity; the remaining four Ghanaian-owned companies process 235.500 metric tons.³³

³⁰ FTZ incentives include fiscal incentives, and access to reliable energy and water supply. Firms based in the FTZ must export at least 75% of their production, while the remaining 25% can be sold on the domestic market.

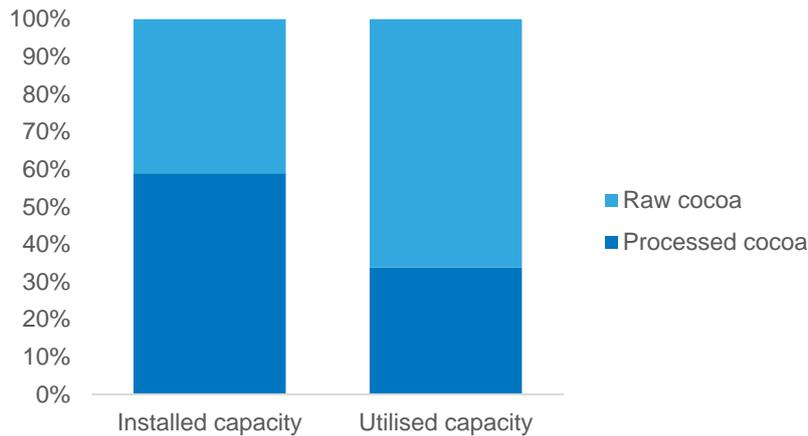
³¹ This is a large increase relative to the last reported estimate, which put processing capacity at between 300,000 and 400,000 metric tons. See: Ghana Rainforest Alliance 2017. Unlocking blended finance for CSA investment in the Ghanaian cocoa sector. There appears to be wide agreement among stakeholders that these estimates are approximately correct.

³² COCOBOD 2019.

³³ COCOBOD estimates, reported to us during an interview.

Yet in Ghana, the actual utilisation ratio of processing facilities is reportedly not higher than 40%³⁴. In 2019, A total of 259,416 metric tons of cocoa beans were processed by ten local processing companies into semifinished and finished products. Cargill and Niche Cocoa Industries Limited had market share of about 26% and 17% respectively, accounting for 43% of domestic cocoa processing in 2019³⁵. Figure 12 reports the gap between current installed capacity and utilised capacity. Assuming a cocoa harvest of 872,000 metric tons, which is the average estimated annual cocoa harvest over the past six years, at current levels Ghana would be able to process approximately 58% of its cocoa output. In 2019, it processed approximately 33%. There is thus a gap of 25%, corresponding to over 210,000 metric tons which could be, but are not processed.

Figure 12 Installed and utilised capacity in Ghana’s cocoa processing sector



Source: Own elaboration based on COCOBOD (2019) and stakeholder interviews.

Notes: The share of processed cocoa is calculated on the average annual cocoa output during the 2016-2022 period.

The main challenge towards the full utilisation of local capacity resources is the low supply of local beans for grinding. This applies in particular to the supply of light-crop cocoa beans, the supply of which is constrained. COCOBOD supplies local processors with beans to continue production; however, the competition for lower quality beans is increasing, hindering the supply of affordable, quality cocoa. Processors have reportedly been forced to import light crop cocoa beans from Côte d'Ivoire to meet their demand as not enough local beans are available.

The business environment in Ghana is a further obstacle to domestic processing. Stakeholders have indicated that the lack of stable electricity supply, high electricity prices, and the cost of credit tend to discourage local processing. Starting up a cocoa processing business is a relatively costly endeavour, requiring substantial upfront investment and capital to mitigate risks arising from volatility in world prices and in the domestic market environment. International factors compound these issues. Norms and regulations in importing countries are particularly important, including EU phytosanitary standards. In addition, the remoteness of chocolate manufacturers, which often need the intermediary cocoa products on a just-in-time basis, makes origin grinding less advantageous³⁶.

³⁴ See, for instance, Rabobank 2017. The issue of idle capacity has been raised by virtually all stakeholders we have interviewed in Ghana, who have also tended to confirm that only about half of installed processing capacity is currently in use.

³⁵ COCOBOD 2019. Annual Report and consolidated financial statements – 2019.

³⁶ Kolavalli and Vigneri, 2017.

In addition to larger processors, there are several artisanal, small-scale processors that supply the domestic consumers' markets. These companies (including '57 Chocolate, Midunu Chocolates and Chocoluv) process significantly lower amounts of cocoa (below 12.5 metric tons). They often started as suppliers or buyers of larger processors. Artisanal processors operate outside the FTZs, and they do not benefit from the tax exemptions allocated to other local processors. Consequently, they are burdened by an unfavourable fiscal regime, and the costs of importing other raw materials such as sugar or milk. Because of the small amount of beans used, artisanal processors do not purchase from COCOBOD, which can sell a minimum of 1 ton of beans³⁷. Artisanal processors therefore purchase directly from the farmers, employing bean-to-bar business models.

1.4 The Ghanaian case in contrast – the cocoa sector in Côte d'Ivoire

To better understand the current status of the Ghanaian processing sector and identify its main weaknesses and strengths, it is worth looking at the status of processing industry in neighbouring Côte d'Ivoire. Côte d'Ivoire is the world's largest cocoa producer—accounting for 45% of global production³⁸—and a leader in cocoa processing.

1.4.1 Institutional setting

The Conseil du Café-Cacao (CCC) is the parastatal institution that regulates the marketing of cocoa in Côte d'Ivoire. Like COCOBOD, the CCC can fix export prices and margins before the season via forward sales through a cost structure called *barème*. Between 70 and 80 percent of the expected crop is bought by international buyers, while the rest is sold through spot contracts during the season. Exporters need to auction so-called *déblocage* permits from the CCC to obtain authorisation to export a specified quantity of beans. Moreover, the CCC sets an auction reference price based on the London cocoa futures price adjusted to the "origin differential" and the exchange rate conversion from GBP to CFA.

It should be noted that the price-setting power of the two parastatal institutions is an exception among other cocoa producers and in the cocoa market more broadly. It is generally accepted by grinders and exporters because the ability of the two institutions to guarantee high volumes and quality outweighs the risk of possible price changes³⁹. Unlike COCOBOD, however, the CCC does not centralise the physical handling and export of cocoa beans, which is managed by private local and foreign exporters. Around 70 licenced exporters source their beans through private intermediaries (*pisteurs*) and local and multinational exporters (*traitants*). The CCC does not have control over the quality of the beans before export.

1.4.2 Cocoa production

Both in Ghana and Côte d'Ivoire, the low productivity of cocoa is an important weakness of the sector (as further discussed in the Section 1.5 of this report). The increasing presence of low-yielding old trees, the challenges of smallholders to access finance as well as the low supply of labour are some of the main drivers of the low productivity of cocoa production in the two countries⁴⁰.

³⁷ COCOBOD is in dialogue with Cocoa Value Addition Artisans Association of Ghana (COVAAAGH) to create a dedicated unit to allow the purchase of lower quantities of high-quality beans from the board.

³⁸ According to recent data from the International Cocoa Organization (ICCO), available at the following [link](#).

³⁹ Staritz, C., Tröster, B., Grumiller, J. et al. Price-Setting Power in Global Value Chains: The Cases of Price Stabilisation in the Cocoa Sectors in Côte d'Ivoire and Ghana. *Eur J Dev Res* (2022).

⁴⁰ However, Kolavalli & Vigneri (2017) suggest that Ghanaian farmers are on average older than Ivorian ones; characteristic that can further impact productivity.

In order to address deforestation and increase yield productivity, the Ivorian government has launched the Programme *Quantité-Qualité-Croissance (2QC) 2014-2023*, which includes multiple strategic actions aimed at improving the productivity of coffee and cocoa farms; improve quality, traceability and sustainability standards, improve marketing of products, promote processing, consumption and valorisation of products, improve of the living and working environment of producers and their communities and professionalise producers and their organizations. Additionally, the Cocoa Fertilizer Initiative has started a programme in 2012 to deliver fertilizers to 200 000 farmers by 2020.

1.4.3 Cocoa processing and marketing

Côte d'Ivoire has total grinding capacity of 712,000 tonnes, and competes with the Netherlands for the spot of leading grinder at the global level. Like Ghana, cocoa processing in Côte d'Ivoire is highly dependent on international grinders and exporters. Barry Callebaut, Olam International and Cargill are among the six largest grinding companies in the country, and together with SUCDEN and Touton they are the top five exporters of raw and processed cocoa. These six firms controlled approximately 80 percent of all export contracts for the 2018-2019 season⁴¹.

Following the trend towards origin grinding, the Ivorian government has implemented multiple measures to encourage investment in the sector. The main incentive for cocoa processors to grind in Côte d'Ivoire is the single export tax (*droit unique de sortie*, DUS) on cocoa (and coffee) products. In 2016, the DUS was reformed with the goal of attaining 50 percent of local processing by 2020: processors who agreed to increase their capacities between 7.5 and 15 percent, depending on their size, within five years, were eligible to export processed cocoa products at a reduced DUS rate (between 1.4 and 5 percent reduction for cocoa paste, butter and powder and duty-free exports for finished chocolate products).

The DUS reform has resulted in an increase in local processing of 14 percent over the 2017-2019 period. In light of its success, the measure has been extended until March 2023 in order to achieve the target goal of 1.072 million tonnes of cocoa processed locally by October 2023⁴². In addition to the DUS, additional investment incentives such as a deduction of investment share from taxable income and tax benefits (especially an exemption on corporate tax) are provided in investment zones to further incentivise local grinding. While cocoa beans grown in Côte d'Ivoire are of comparatively lower quality, the lower electricity prices are a good basis for promoting capital and electricity intensive industries, in particular grinding and chocolate manufacturing.

⁴¹ <https://www.reuters.com/article/cocoa-ivorycoast-estimate-idUSL5N22C3N8>.

⁴² https://www.gouv.ci/_actualite-article.php?recordID=13595&d=3.

Table 1 Promotion of local cocoa processing: Ghana vs. Cote d'Ivoire

Côte d'Ivoire	Ghana
Incentives	
<ul style="list-style-type: none"> • Conditional tax breaks on cocoa products and chocolate • Deduction of investment share from taxable income • Suspension of corporate income tax 	<ul style="list-style-type: none"> • 20% discount on light beans • Tax free importation for production from EPZs • Suspension of corporate income tax to free zone-based companies for the first 10 years of operation • Higher price of cocoa beans relative to Côte d'Ivoire
Strengths	
<ul style="list-style-type: none"> • Reliable electricity and low prices 	<ul style="list-style-type: none"> • Higher quality of cocoa beans on average
Weaknesses	
<ul style="list-style-type: none"> • Lower quality of cocoa beans on average • Overcapacity and decreased margin 	<ul style="list-style-type: none"> • High electricity prices and unreliable power supply • Overcapacity and decreased margin

The production of chocolate products in Côte d'Ivoire is limited. The local manufacturer Chocodi was founded by the French company Cacao Barry (SACO) and is currently one of the few examples of a producer for the domestic market. The French chocolatier Cémoi expanded its grinding facility to produce chocolate for the local and regional market, and the grinder Tafi also specialised in the production of chocolate products such as cocoa drinks and spreads. Nevertheless, high competition from global chocolate manufacturers and the high fixed and operational costs tend to hinder the expansion of the chocolate manufacturing sector in Côte d'Ivoire. As we further discuss in Section 2.2, chocolate production in Ghana faces similar obstacles.

1.5 SWOT Analysis

The current SWOT analysis is the result of the desk research regarding the status of the cocoa processing sector in Ghana. Given the complexity of the cocoa value chain, the analysis looks separately at the cocoa production process, from land preparation to the grading and bagging of beans, and the cocoa processing and marketing, which includes all the steps undertaken after the beans enter the market, from grinding to export. The results of the analysis were integrated with the outcomes of the first round of interviews with the relevant stakeholders.

1.5.1 Cocoa production

As described above, the production of cocoa is a labour-intensive process, including a high number of steps (land preparation, cocoa seedlings, harvesting, extraction and drying of beans, grading and bagging of beans) and actors. The analysis below aims at identifying the main internal and external factor that support and hinder the production of cocoa in Ghana: relevant data were collected and analysed, and grouped as strengths, weaknesses, opportunities or threat based on the impact in the cocoa sector and beyond.

Table 2 SWOT Analysis - Cocoa production

Cocoa production		
	Strengths	Weaknesses
	<p>S1: COCOBOD oversees and supports national cocoa production and delivers large quantities of cocoa to the market</p> <p>S2: High quality cocoa produced, which receives premium in the market</p> <p>S3: Public measures such as subsidised fertiliser use increase productivity⁴³</p> <p>S4: Significant share of world market</p>	<p>W1: Cocoa production has poor yield per acre</p> <p>W2: Labour and input intensive process with heterogenous application of efficient technology</p> <p>W3: Insufficient income for farmers from cocoa production</p> <p>W4: Limited access for youth and women entrepreneurs</p> <p>W5: Lack of access to finance for farmers</p> <p>W6: Unsatisfactory land tenure policies discourage producers to invest</p> <p>W8: Poor agronomic practices hinder soil fertility</p> <p>W9: Quality control causes delays in certification</p> <p>W10: Lack of transparency of COCOBOD operations and cocoa price definition</p> <p>W11: Low influence of farmers in cocoa price definition</p> <p>W12: Farmers receive the lowest share of cocoa value</p> <p>W13: Illicit practices from LBCs (e.g., cheating on cocoa weight) can negatively affects producers</p> <p>W14: High reliance on farmers on cocoa crop increase vulnerability and poverty risk</p>
Internal		
	Opportunities	Threats
	<p>O1: Increase production volume</p> <p>O2: Improve access to land and finance to attract young farmers</p> <p>O3: Improve skills training and education</p> <p>O4: Growing demand for cocoa in emerging markets</p> <p>O5: Increase efficiency of COCOBOD departments</p> <p>O6: Introduce elements of competition among LBCs to deliver cocoa at lower price</p>	<p>T1: Competition from higher capacity cocoa producing countries</p> <p>T2: Farming methods associated with deforestation and biodiversity loss</p> <p>T3: Use of child labour in cocoa production</p> <p>T4: Impact of climate change in cocoa production</p> <p>T5: Land degradation from small and medium miners and from illegal miners</p> <p>T6: Fertilisers shortage due to geopolitical situation</p> <p>T7: Cocoa price volatility</p>
External		

Source: Own elaboration

Summary

Ghana has benefitted from the action of the COCOBOD, which through a centralised management of cocoa production has managed to increase the Ghanaian cocoa market value by delivering a high-quality product. Throughout the years, the Board has managed to increase the producer share of export prices while delivering additional services in support of the sector, which have resulted in an increase in productivity. This includes the subsidies of fertilisers or public efforts to eradicate crop diseases.

⁴³ Several stakeholders reported that gaps exist in the distribution of fertilisers, an issue which seems to have increased during the 2021/2022 season.

Despite the efforts, yields of cocoa in Ghana are lower than other producing countries. The intensification of land use is a major driver for production which is largely untapped in the country, due the high costs of labour and the low income of farmers. Productivity is higher in smaller farms, where family labour is available and the farmers can efficiently implement the yield enhancing public subsidies⁴⁴. The obstacle to access labour force is also one of the main culprits for the use of child labour, which is still widespread in the country. In some circumstances, children can be involved in hazardous tasks, such as fertilisers spraying and managing of sharp tools for the opening of cocoa pods; and their involvement in the cocoa production comes at the cost of limited access to education and development, which contributes to the household's impoverishment and hinders the breaking of the poverty cycle.

Poverty is still widespread among farmers, which often struggle to meet basic needs. The low financial literacy and low education level of farmers is an additional obstacle: without access to saving systems or access to loans, farmers cannot invest in their land nor they can improve their agricultural practices and undertake trainings. The consequent soil degradation and the aging of the cocoa plants causes many farmers to rely on clearing additional forest land to increase their yield, contributing to deforestation and biodiversity loss⁴⁵. Additionally, extreme weather events, prolonged dry seasons, less rainfalls, and the emergence of new pests and diseases linked to climate change are expected to negatively affect the production of cocoa and increase its unpredictability.

The road infrastructure in Ghana is still inadequate, increasing the costs of transportation and reducing the revenues for farmers. The use of illicit practices from the LBCs, which have been at times accused to cheat on cocoa weight to increase their profit, damages producers.

Finally, cocoa production in Ghana is strongly dependent on international market prices. The positive trend of prices has positively affected the productivity of production and consequent poverty reduction, but the system does not seem to be fit to support the producers in a less favourable price regime.

1.5.2 *Cocoa processing and marketing*

For the purposes of the analysis, processing is defined as the action of transforming the cocoa bean into intermediary and final products which are sold to consumers. The analysis identifies the main internal and external factors that support and hinder the processing and marketing of cocoa in Ghana: relevant data were collected and analysed, and grouped as strengths, weaknesses, opportunities or threat based on the impact in the cocoa sector and for the national development.

⁴⁴ Kolavalli & Vigneri, 2017.

⁴⁵ IDDRI, 2019. Agricultural value chains facing the biodiversity challenge: the cocoa-chocolate example. IDDRI, Study N°05/19.

Table 3 SWOT Analysis - Cocoa processing and marketing

Cocoa processing and marketing		
Internal	Strengths	Weaknesses
	S1: Increasing capacity for local grinding S2: COCOBOD incentivises local processing of cocoa S3: Access to cheap raw material for cocoa processing S4: Easy access to labour force for local processing	W1: Local processing has limited capacity due to scarce beans availability, particularly light beans W2: High concentration of processing companies W3: High cost of importing inputs for secondary processing W4: Cocoa is sold in USD to local and multinational buyers, benefitting the latter over the former W5: Low number of manufacturers and processors accounts for a large share of the global market
External	Opportunities	Threats
	O1: Further support from Ghanaian government for local processing capacity O2: Increase in production to support local processors O3: Employment opportunities from cocoa processing O4: Investment opportunities for local entrepreneurs O5: Generation of internal revenue O6: Generation of cocoa by-product industry that can diversify cocoa usage and processing in the country (animal feed, soap production, etc.) O7: High technological knowledge and skills capital imported by multinational grinders O8: Potential for value addition in chocolate manufacturing and branding at lower scale in local and emerging markets (Africa, Asia)	T1: Regulations in import countries make it expensive to process in origin countries (e.g. food safety regulations) T2: Low access to finance, knowledge and training opportunities for local grinders T3: High domestic taxes for cocoa products in Ghana favours export T4: Large front payments and high borrowing costs hinder access to market to new processors T5: High electricity prices and unstable electric grid increase cost of local processing T6: Change in consumers demand for cocoa products T7: Low opportunities for export chocolate manufacturing products

Source: Own elaboration

Summary

Ghana is aiming to move up the cocoa value chain and increase its share of local processing. COCOBOD supports these efforts through financial incentives and subsidies. However, the capacity for local processing is limited; just a small percentage of low-grade beans is given to local processors for the production of intermediary products, while the large majority of cocoa is exported for both primary and secondary processing. Were local processors to enter the market, they would not be advantaged by the current system, which requires the purchase of beans from COCOBOD in USD. While multinational processors have direct access to the currency through their parent companies abroad, local processors have to rely on the domestic banking system and export development banks, which have lower availability of foreign exchange. Additionally, COCOBOD utilises the cocoa industry to obtain loans in US dollars by using cocoa contracts as a collateral. However, since local buyers tend to have poor credit ratings, the collaterals are made by contract signed with multinational companies only, which maintain a strong influence and leverage on the country.

As observed in this analysis, primary processing accounts for only 6% of the final value of cocoa (see Figure 8), while nearly 76% comes from manufacturing and marketing of chocolate. The latter happens almost entirely outside Ghana. Further investments in origin country processing would

provide employment and investment opportunities within the country and stimulate the diversification of the industry towards the production of other cocoa derivatives, such as cocoa by-products.

Policies prioritise cocoa trade for foreign exchange rather than adding value domestically. Cocoa processing companies operate in the Ghana Free Zone, where they obtain tax benefits if they export at least 70% of their production. Meanwhile, local, small size processors are burdened by low access to finance, high taxes on cocoa products and the cost of importing raw material.

While there are small opportunities to export chocolate manufacturing products due to the high international competition, an internal market of artisanal small scale chocolate producers is growing, with opportunities to expand in emerging markets in (West) Africa and, potentially, Asia. There is prospect to focus on niche markets, for example through the production and marketing of bean-to-bar chocolate that involves cocoa cooperatives or guarantees high standards of production, potentially guaranteed by a certification scheme.

Primary processing facilities often prefer to operate in geographic proximity of the secondary processing industry, while the latter prefers to operate in proximity of the end-consumers, which are predominantly in industrialised economies. In order to anticipate and react to demand dynamics, having immediate access to raw materials such as butter or powder seemed to be an important priority. Furthermore, consulted primary processors have indicated that the volume of beans they can receive from one origin market fluctuates each year. They therefore tend to buy beans from several markets in order to diversify risks of one market failing to supply enough beans following bad crops and group these imported beans in one central location which is often close to the secondary processors.

Nevertheless, consulted processors have indicated that their commitment will continue, or increase, processing activities in Ghana as it continues to hold various opportunities. One consulted stakeholder indicated that it is seeking to explore such opportunities in Ghana following stricter EU legislation on contaminants. Additionally, some stakeholders have indicated to see potential in the AfCFTA, though the consensus is that opportunities may only materialise in the medium – to long – term.

2 Business opportunities to promote cocoa processing and value addition in Ghana

2.1 Cocoa processing: competitiveness, benchmarking and potential

2.1.1 Ghana's competitiveness in the cocoa value chain

Increasing local processing and value addition is seen as a critical policy priority for Ghana to fully take advantage of its position as one of the world's foremost cocoa-growing countries. The cocoa value chain, however, is complex and globally fragmented. Understanding which segments of the value chain offers the greatest opportunities is therefore important in formulating strategies for the sector. In the following section, we leverage trade data from the UN-COMTRADE database to provide a first understanding of Ghana's competitiveness in the cocoa value chain.

In Table 4 on page 29, we provide an overview of Ghana's revealed comparative advantage (RCA) in the cocoa sector⁴⁶. We compute RCA indices at the six-digit product level, for each cocoa sub-product, i.e., cocoa waste, paste, butter, powder, and chocolate⁴⁷. Product-level RCA indices reflect whether the ratio of exports of a given product over an exporter's total exports exceeds the same ratio for the global economy as a whole. The intuition is that if, relative to the rest of the world, a country exports more of a given product than would be expected, then that country is globally competitive in that product line. An RCA value greater than one indicates that a country's is globally competitive in a given product. Cells reporting an RCA value greater than one are marked in green.

Table 4 also serves to benchmark Ghana's competitiveness level against that of other producers. The final column reports a selection of countries which have an RCA higher than 1 in each sub-product to provide an assessment of competition. We marked in red all cells reporting other highly competitive exporters which are both industrialised economies and which also tend to be active in a similar market as Ghana, especially in the EU. We marked as green cells wherein key exporters are countries at a similar level of development as Ghana; or countries which are not necessarily exporting to the same markets. The idea is that competitors based in industrialised economies tend to have advantages in terms of infrastructure, logistics, and branding, among others.

Our analysis of RCA indices suggests that Ghana is currently highly competitive in all stages of cocoa processing, up until the manufacturing of chocolate and confectionary. This finding is corroborated by our interviews with key stakeholders in the cocoa sector. There seems to be a consensus among stakeholders that Ghana has the capability to carry out all primary processing stages domestically—provided supply bottlenecks are monitored and addressed. Our analysis, however, also suggests that there is strong competition across all primary processing activities. Among these, expanding production and export of (defatted) cocoa paste may be a low-hanging fruit. Ghana is competitive, and it does not face substantial competition from established producers in industrialised economies such as France, Belgium, or the Netherlands.

⁴⁶ We calculated countries' RCA using Balassa indices, which are among the most intuitive and simplest to derive measures of comparative advantage.

⁴⁷ It is worth noting that international product-level data is only available at the six-digit HS level. This is a relatively aggregated level, which includes several different products, characterised by different degrees of sophistication and value added. Not all products included under a single six-digit HS code have the same value-addition potential. See also footnote 47 below.

Ghana's competitiveness in the secondary processing stages is substantially lower. Ghana is not internationally competitive in the production of cocoa-based food products, nor in the production of chocolate in either bulk or smaller format. While Ghana's competitiveness in this market segment is relatively low across the board, it is higher in the production and export of bulk chocolate, corresponding to HS code 180620, than in the production of chocolate bars for retail consumers. Bulk chocolate is a product which Cote d'Ivoire is currently exporting competitively, suggesting that it may be within Ghana's reach. Moreover, international competition in these higher-value added segments is extremely high, with the presence of world leaders such as the Netherlands, Belgium, and Switzerland.

Table 4 Overview of Ghana's revealed comparative advantage (RCA) in the cocoa sector

Product category	Ghana's RCA	International competitors
Cocoa shells, husks, skins, and other cocoa waste (180200)	> 1	Cameroon, Cote d'Ivoire, Dominican Republic, Ecuador, Netherlands, Indonesia, Belgium
Cocoa paste, not defatted (180310)	>1	Cote d'Ivoire, Cameroon, Ecuador, Netherlands, Indonesia, France
Cocoa paste, wholly or partly defatted (180320)	>1	Cote d'Ivoire, Cameroon, Indonesia, Ecuador, Singapore
Cocoa butter, fat, and oil (180400)	>1	Cote d'Ivoire, Cameroon, Indonesia, Netherlands, Malaysia
Cocoa powder, not containing added sugar or other sweetening material (180500)	>1	Cote d'Ivoire, Netherlands, Indonesia, Ecuador
Cocoa powder, containing added sugar or other sweetening material (180610)	>1	Lebanon, Bahrein, Guatemala, Belgium, Hungary, Netherlands
Chocolate and other food preparations containing cocoa, in blocks or bars, or in liquid, paste or powder form, weighing more than 2kg (180620)	<1 (0.15)	Cote d'Ivoire ⁴⁸ , Lebanon, Belgium, Canada, Belgium, Italy, Netherlands
Chocolate, in blocks, slabs or bars, filled, weighing 2kg or less (180631)	<1 (0.02)	Lebanon, Egypt, Lithuania, Poland, Netherlands, Germany, Belgium
Chocolate, in blocks, slabs or bars, not filled, weighing 2kg or less (180632)	<1 (0.03)	Switzerland, Poland, Bulgaria, Belgium

Source: Own elaboration based on UN-COMTRADE data. Note: We only report RCA values lower than one as they offer a glimpse into how far an exporter is from achieving comparative advantage in a given product line; by contrast, comparisons between RCA values greater than one are rarely meaningful.

The challenges faced by Ghana in secondary processing are corroborated by interviews with stakeholders. There seems to be a consensus that chocolate production is best placed closer to end-consumers, to react swiftly to changes in demand. Consumer demand for chocolate remains limited in Ghana and across West African markets more generally. Moreover, significant challenges exist in transport and logistics, as the costs of establishing, operating, and maintaining cold chains tend to be higher in Ghana than in consumer markets such as the EU or the US.

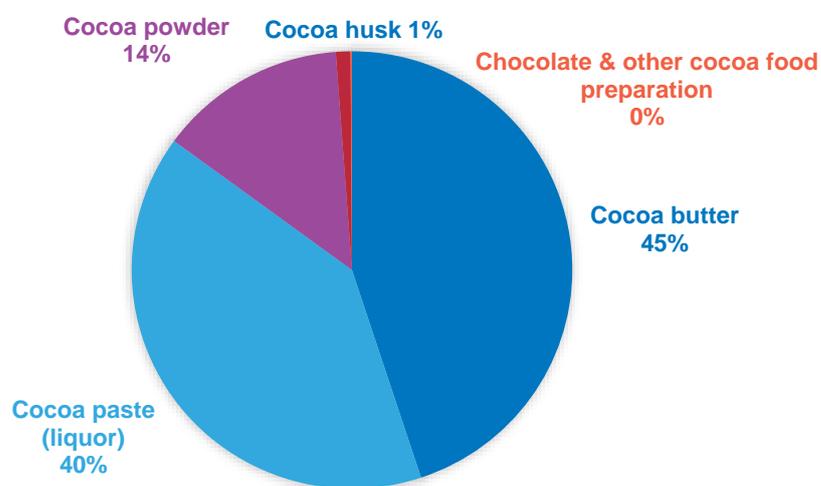
⁴⁸ Cote d'Ivoire's presence in the HS180620 product code may reflect the country's recent expansion into the production of couverture, which, from a value added perspective, is almost indistinguishable from other results of primary processing.

2.1.2 Ghana's export potential across cocoa sub-products

The identification of potential markets for a country's exports is crucial to take advantage of international opportunities as well as to promote export diversification. Based on the ITC export potential tool, which evaluates export performance, target market demand, market access conditions and bilateral linkages between the exporting and importing countries, in this section we provide an overview of untapped export opportunities for the Ghanaian cocoa sector in selected regional and country markets.

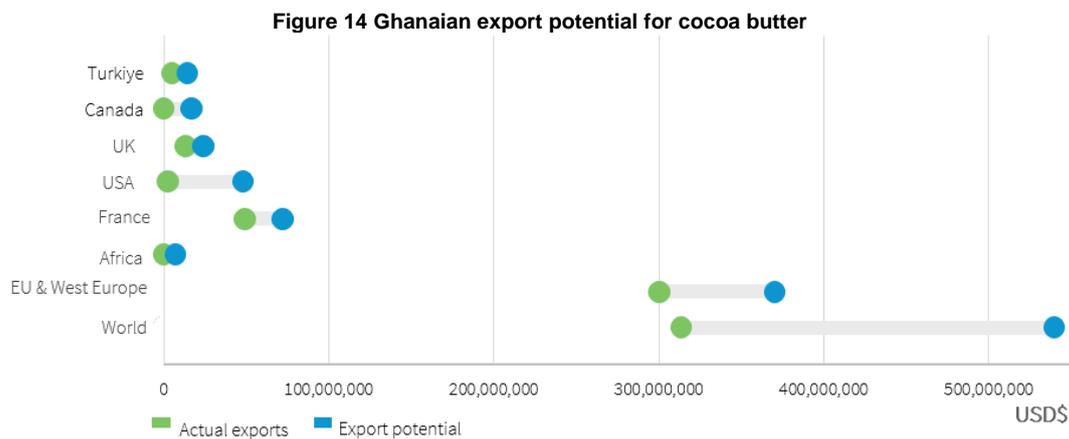
Figure 1 provides an overview of such export potential across 4 distinct cocoa processing products and chocolate confectionary sector. The figure confirms that primary cocoa processing remains the prominent target sector for Ghanaian cocoa exports. More specifically, exports of cocoa butter and cocoa paste—as already inferred in Section 2.1.1 above—form the majority of untapped export potential. The former, is estimated to have an untapped export potential (the difference between actual export and the potential export) of USD 225 million while the latter, is estimated to have an untapped export potential of USD 201 million.

Figure 13 Overview of Ghanaian cocoa untapped export potential



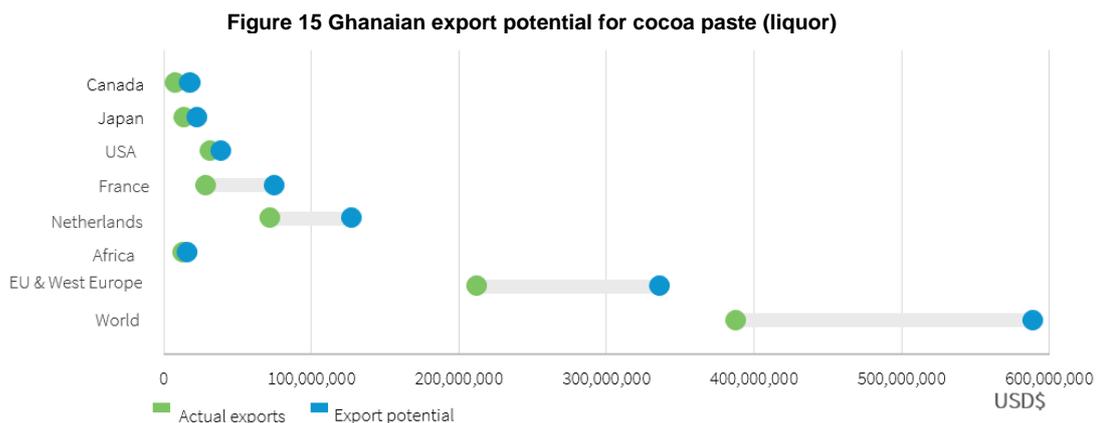
Source: Own elaboration, based on ITC export potential tool

Investigating the export potential for cocoa butter further, it is evident from Figure 14 that the majority of the export potential lies in the top 5 cocoa bean importing countries as previously shown in Figure 11. As shown in Figure 14, the untapped export potential is visible from the grey area between the green dot (actual exports) and the blue dot (estimated export potential). For the export of Ghanaian cocoa butter, the main export potential is estimated to lie in the EU and Western Europe. Export potential within the African continent is however, currently lacking. The main exporting destination with considerable export potential is estimated to be France (USD 2.3 million untapped export potential) and the United States (USD 4.6 million untapped export potential).



Source: Own elaboration, based on ITC export potential tool

Similarly for the potential export of cocoa paste (also known as liquor), the main export destination with considerable untapped export potential lies in the EU and West Europe with roughly USD 124 million untapped export potential. The Netherlands and France are estimated to hold the largest, country-level, export and untapped export potential. Accordingly, it is estimated that Ghanaian exporters have an untapped export potential of USD 5.6 million in the Netherlands and USD 4.6 million in France for cocoa paster. On an aggregate level, the African continent is estimated to not hold any significant export potential opportunities for Ghanaian export of cocoa paste.



Source: Own elaboration, based on ITC export potential tool

2.2 Identifying business opportunities in the cocoa value chain

2.2.1 Are there opportunities in chocolate manufacturing?

Our analysis and consultations with stakeholders suggest that significant challenges remain towards the large-scale local manufacturing of chocolate. While chocolate demand appears to be growing in the emerging economies of East Asia, large chocolate markets remain located in industrialised economies. It is perhaps no coincidence that Niche Chocolate—a successful case of Ghanaian-based and owned processing, including in the confectionary sector—is reportedly expanding its operations and opening up manufacturing facilities in the EU and the US.⁴⁹

⁴⁹ Information received from Ghana-based stakeholders with an understanding of the country's cocoa industry.

Compounding access to market issues are the high fixed and operating costs associated with chocolate manufacturing in Ghana. Comparatively high prices of electricity are accompanied by the high cost associated with the import of intermediate products, such as milk and sugar, the supply of which is limited in Ghana. Logistical challenges, such as the establishment of a cold chain in a context where the grid is not always stable or reliable, are also widely reported as key barriers to domestic chocolate manufacturing by stakeholders in the sector.

Nevertheless, we found that opportunities may arise in high-end, niche chocolate markets. Ghanaian chocolate manufacturers could target markets in industrialised economies with innovative branding strategies which focus on the achievement of high labour and environmental standards, especially if supported by third-party certifications, or on close-knit relationships with cocoa farmers under a bean-to-bar business model. Farmers cooperatives such as the Kuapa Kokoo Farmers' Union, which co-owns Divine Chocolate, could have an important role to play in these market segments.

2.2.2 *Alternative niches in the market*

Cocoa producers in Ghana could benefit from the creation of alternative cocoa products that can breach into the Ghanaian and African market. The market for cocoa compounds—including cocoa-based drinks, cookies, and other sweets with relatively low cocoa content—is a case in point. Niche Cocoa provides an interesting example. In 2019, Niche partnered with Sidel for the distribution of chocolate milk products in Ghanaian schools. The aim of the campaign is to reduce the consumption of sugary, carbonated drinks in favour of healthier alternatives, and promote the local consumption of cocoa products.

Cocoa products can have a culinary application outside the chocolate market. Multiple products can be derived from the cocoa pulp juice. Ghana-based firm Volta Winery, for instance, produces wine from the fermentable sugars in the pulp wine juice when pasteurized and fermented with appropriate wine yeast. The Swiss-Ghanaian start-up Koa extracts the lost cocoa pulp using solar panels and pasteurises it for the production of multiple products, including fruit juice and other soft drinks, ice cream, pastries and chocolate, including products made by Lindt and Sprüngli. Koa recently partnered with a small Dutch-Ghanaian company, Kumasi, founded thanks to the support of RVO and aiming to export cocoa juice in the European market while supporting Ghanaian's farmers income and creating a market for cocoa juice within the country⁵⁰.

Another potential market for processed beans is the one of cocoa by-products for applications in various sectors. COCOBOD's CRIG has established a New Products Development Trust for the development of possible by-products and their production and marketing. According to recent literature for instance, cocoa pod husk may be applied in production of cheap animal feed, which could partially substitute the more expensive corn and soybean.⁵¹ However, their application has been hampered by an anti-nutritional substance called theobromine, which has been found to be toxic to livestock. Further research is needed to develop strategies and treatment that improve the nutritional value of cocoa pod husk and produce cheaper animal feed.

Burnt dry pod husk (potash) can be extensively used in the cosmetic industry for the production of soap, while cocoa butter is also extensively used in the cosmetic industry. Demand for products containing natural and renewable ingredients is growing fast across the world, and it represents a business opportunity in the Ghanaian and international market. A more in-depth market study into

⁵⁰ Koa has recently received approximately EUR 3 million in funding from the Landscape Resilience Fund and the IDH Farmfit Fund.

⁵¹ See, for instance, Oduro-Mensah et al. 2020. Nutritional value and safety of animal feed supplemented with *Talaromyces verruculosus*-treated cocoa pod husks *Scientific Reports* (10).

these opportunities, however, would be required to more accurately gauge Ghana's upgrading potential.

Table 5 Overview of business opportunities for medium to large scale investing in cocoa processing in Ghana.⁵²

Business opportunities for medium to large scale investment in cocoa processing		
Product	Opportunities	Challenges
Liquor, butter and powder	<ul style="list-style-type: none"> Expand production and export to take advantage of country's competitiveness Tap into the market for cocoa compounds (cocoa-based drinks, cookies, and other confectionary products) 	<ul style="list-style-type: none"> High fixed and operational costs Low supply of (light crop) beans
Chocolate	<ul style="list-style-type: none"> Design branding strategies targeting sustainability-conscious consumers, including through the utilisation of third-party certification schemes 	<ul style="list-style-type: none"> High fixed and operational costs Main market in industrialised economies High costs of imports Challenging to establish, operate, and maintain a cold chain
Juice	<ul style="list-style-type: none"> Cocoa wine Juice as a healthy and sustainable drink Confectionary industry 	<ul style="list-style-type: none"> High fixed and operational costs Niche market with limited demand
Cocoa husk	<ul style="list-style-type: none"> Animal feed Soap production Cosmetic application (moisturisers, creams) 	<ul style="list-style-type: none"> High fixed and operational costs

⁵² Providing cost estimates for these different business opportunities is challenging, due to differences in sectors and firm sizes. If initiatives such as the Agri-Tech Challenge sponsored by the Kosmos Innovation Center (KIC) offer any indication, agri-processing start-ups in Ghana may require between 50.000 to 100.000 USD in funding to scale up from embryonic to development stage.

3 Conclusions

Ghana is diversifying away from the export of raw cocoa. The country now faces the challenge of increasing its value-added share within the cocoa industry. Expanding the country's cocoa processing capabilities is a key step in this direction. In this study, we draw on a comprehensive review of the existing evidence, data analysis, and interviews with key stakeholders in Ghana's cocoa industry to provide evidence into the country's current capabilities in primary and secondary cocoa processing; and to suggest possible ways forward to increase Ghana's value-added share in the industry.

Our findings indicate that Ghana currently has sufficient processing capacity to grind and process over 514,000 metric tons of cocoa. This is equivalent to well over half the average annual harvest. Yet in recent years, between a quarter and half of all installed capacity has remained idle. The key bottlenecks to full capacity utilisation are the limited supply of raw cocoa beans—particularly of the cheaper, light-crop variety, which COCOBOD subsidises—and comparatively high operating costs, and particularly the cost of electricity.

Supply constraints seem to be driven by a combination of factors, occurring both upstream and downstream in the value chain. Upstream, the low productivity of cocoa farming is a key barrier to increasing supply. Concerns over the impacts of climate change and illegal mining compound this issue. Further downstream, supply is limited by the industry's current financing model, which prioritises the export of raw, main-crop cocoa beans thus disincentivising domestic processing. Raw cocoa beans represent a key source of foreign exchange generation for Ghana.

Bottlenecks to primary processing result in Ghana being able to capture a lower share of the world market for intermediate cocoa products (husk, paste or liquor, butter, and powder) than it would be able to at full capacity utilisation. Primary cocoa processing remains concentrated in Western Europe and other industrialised economies. So does secondary processing—and most notably, chocolate manufacturing—which accounts for the largest share of value added in the cocoa value chain. Industrialised economies remain the largest markets for chocolate worldwide. The importance of having access to raw materials to anticipate the demand for chocolate-based end-products has been identified as an important factor for the geographic proximity of primary processors and secondary processors.

In spite of these challenges, our findings suggest that, provided supply issues are addressed, Ghana has the potential to competitively expand in all primary processing activities. Substantial untapped potential exists in the production of cocoa paste and butter. We also identify potential for diversification in small-scale, high-end chocolate manufacturing; and in the production of cocoa by-products. Quantifying this potential, however, would require an in-depth study into existing demand at the EU and West African level, and into new business models and sustainability-oriented branding strategies.

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