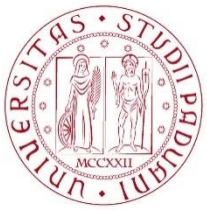

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Verified sourcing areas (VSA) initiative: assessing the opportunities and challenges in six selected cocoa communities in the Prestea-Huni Valley District of Ghana

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ABBREVIATIONS AND ACRONYMS

AFD	*Agence Francaise de Developpement*
ANOVA	Analysis of variance
CLUA	Climate and Landuse Alliance
CNN	Cable News Network
COCOBOD	Ghana Cocoa Board
EC	European Commission
FAO	Food and Agricultural Organization
FO	Freight on Board
GBN	Ghana Business News
GHC	Ghana cedis
GIS	Geographic Information Systems
GLSS	Ghana Living Standards Survey
GoG	Government of Ghana
GREL	Ghana Rubber Estate Limited
ICCO	International Cocoa Organization
IDA	International Development Agency
ILO	International Labour organization
IMF	International Monetary Fund
IPEC	International Programme on the Elimination of Child Labour
IPEC	International Program on the Elimination of Child Labour
KPMG	Klynveld Peat Marwick Goerdeler
LBC	Licensed Buying Company
MFL	Ministry of Lands and Forestry
MLNR	Ministry of Lands and Natural Resources
MOFEP	Ministry of Finance and Economic Planning
NASA	National Aeronautics and Space Administration
OECD	Organization for Economic Cooperation and Development
VSA	Verified Sourcing Area
WRI	World Resources Institute
WWF	World Wildlife Fund for Nature

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SUMMARY

Cocoa production has been associated with deforestation and current management conditions/practices has raised concerns on how social issues are addressed along the cocoa supply chain. The Verified Sourcing Areas (VSA) mechanism developed by IDH is one of the numerous initiatives to address sustainability issues in the cocoa sector. The study was conducted to preliminary assess the gap between the VSA approach and the targeted communities. 200 cocoa farmers and 8 key informants were interviewed from six randomly selected communities in the Prestea-Hunni Valley District in the South-Western part of Ghana. Land use conversion has increased in recent years: while in 2000-2003 only 2% of farmers had converted various land use, the percentage increased up to 53% from 2016-2019 mostly at the expense of forests and fallow lands. In most cases, conversion was done to expand the cultivated area for increased production. Between 58-232 hectares of forest cover have been converted from 2000-2019 and there is pressure on peatlands. Labour preference for men has resulted in limited access and wage gap against women. Children aged under 18 have been used in cocoa production. 57% and 90% of farmers do not have permanent tenure and official land titles respectively. Rising cost of inputs was identified as the major challenge for the future of cocoa production whiles availability of affordable inputs was identified as a major driver. An important requirement during trade of cocoa beans were beans dryness and type/nature of weighing scale for License Buying Companies (LBCs) and farmers respectively. The main opportunities for VSA identified included high prevalence of active labour and young vital cocoa farms, organized farmers and unlikely future labour drain. The major challenges were high prevalence of customary land tenure regimes, low production trends and low or no intensification. There are gaps between the study area and all key-themes of the VSA approach.

1. INTRODUCTION

Deforestation is defined as the permanent conversion of forestland into other land uses (EC, 2019). Global gross deforestation has been estimated to be around 239 million hectares with an annual average of 13 million hectares (about the size of Greece) for the period of 1990-2008 (Cuypers *et al*., 2013). Between 1990-2000, the global rate of deforestation when losses from natural disasters were considered was around 16 million hectares per year (FAO, 2010a). The agricultural sector is a major driver of deforestation with four commodities (palm oil, soy, cattle and wood products) responsible for 40% of global deforestation with an annual average of 3.8 million hectares (Henders *et al*., 2015). An overall estimate of 132 million hectares (55%) of global gross deforestation is attributed to forest conversions for crop production, livestock production and logging (Cuypers *et al*., 2013). Deforestation in the tropics has been accelerated by the market-driven increased production of agricultural commodities (Leblois *et al*., 2017; Persson *et al*., 2014) most of which are meant for export, thus making international trade in these products responsible for embodied deforestation[1]. For instance, between 1990-2008, the European Union (EU) imported from other regions of the world 9 million hectares of deforestation embodied in crop and livestock products (Cuypers *et al*., 2013).

Besides the "big four" commodities acting as main deforestation drivers, additional "minor" commodities are at play. Production of cocoa has conventionally been an impacting activity on tropical forests as forest trees are cleared by farmers for establishment of cocoa farms (Kant and Redantz, 1997). Forest destruction in the Amazon from cocoa plantations has been recorded by satellite technology the National Aeronautics and Space Administration (NASA) (WRI, 2015). Recent reports have also indicated the conversion of rainforests in the Peruvian Amazon and the Cavally Forest in Côte d'Ivoire in order to increase land availability for cocoa production (allAfrica, 2016; Bloomberg, 2016; WRI, 2015). Analysis from scenarios of land use change reported that non-pursuance of intensified cocoa technology that had been developed since the 1960s resulted in over 21,000 km^2 (2.1 million hectares) of deforestation and forest degradation in Cote d'Ivoire, Ghana, Nigeria and Cameroon (Gockowski and Sonwa, 2011). Wessel and Quist-

[1] The deforestation embodied (as an externality) in a produced, traded, or consumed product, good, commodity or service. It is the deforestation associated with the production of a good, commodity or service (EC, 2019).

Wessel (2015) based on a 5-year field trial reported that with fertilizer application there can be as high as 50 percent increment in cocoa yield in Ghana but the effect is however minimal on yield in the first 2 years of use and required investments are costly making them unattractive (and hardly viable) for poor farmers. Thus, smallholder farmers continue to clear new forests instead of adopting alternative management solutions as a response to reduced yields from older less productive areas with degraded soil fertility (CNN, 2008).

Cocoa production in Ghana increased over recent years as a result of combining intensified labour and non-labour inputs with increment in the cultivated area (Onumah *et al*., 2013). Ghana is the second largest producer of cocoa in the world (Gockowski *et al*., 2011; Mattyasovszky, 2015) and accounted for 19.3% of world cocoa exports in 2013 (Bangmarigu and Artan, 2018). Cocoa has the reputation as the country's dominant cash crop and as the most significant export commodity. It is the main economic activity for about 700,000 households with about 6.3 million population (i.e. about 30% of the country's total population) deriving their living from cocoa. Small-scale farming characterizes the country's cocoa production with an estimated average productive area of 2 hectares per household (Barrientos *et al*., 2008). In Ghana the average national cocoa yield per hectare is 400 kg, this is relatively lower than other producing countries like Cote d'Ivoire and Malaysia (Aneani and Ofori-Frimpong, 2013). The recorded low yield therefore poses a great deal of challenge to cocoa farmers and serves as an incentive for deforestation as farmers try to compensate their low yield by expansion, which also has implications for the long-term sustainability of the cocoa sector. The most critical and problematic aspects associated to this will be discussed in the next sub-session.

The growth of deforestation trends has gone hand in hand with the raising of attention by public and private actors. Zero deforestation commitments by companies and multinational businesses have seen a sharp increase from the last 10 years. These are declarations by private businesses on their aims to halt deforestation along their supply chains (Brown and Zarin, 2013; CLUA, 2014; Donofrio *et al*., 2017; Lambin *et al*., 2018). Commitments spans across the whole value chain which includes producers, processors, traders, manufacturers and retailers (Donofrio *et al*., 2017). As of 2017, commitments to halt deforestation and to heighten sustainability by non-profit organizations along their commodity supply chain totaled 447 (Donofrio *et al*., 2017). The focus of these commitments is to promote the global efforts at sustainable development.

1.1 Problem statement

Ghana's cocoa sector has witnessed several alterations in aspects such as the total cultivated area, outputs and the technology used for production (Kuwornu *et al*., 2011). According to Aneani and Ofori-Frimpong (2013), crop production is dependent on area under production and crop yield and to increase production one must raise either of them. Embarking on increasing the land area under cultivation in Ghana continues to pose threats to the environment due to clearing of forests. Deforestation in Ghana, especially in the Western Region of the country, is mainly attributed to the continuous conversion of forestlands to cocoa farms (Ruf, 2001; Ruf and Schroth, 2004). The forests of Ghana are under pressure and there are calls for action to ensure the survival of the nation's forests which is declining at a rate of 135,000 ha annually (MLNR, 2015). In Ghana's Western Region (the last frontier for cocoa expansion) growing of cocoa is done under full sun systems with related forest conversion and wildlife habitat destruction. Larger part of the recent increment in Ghana's cocoa output occurs at the expense of forest conversions in the region (Victor *et al*., 2010). Concerns about the environmental impact of cocoa and its sustainability has increased (Victor *et al*., 2010). This has prompted an increasing concern for producer countries and the chocolate manufacturing industry on sustainability, which has triggered a debate to shift to purchasing and trading activities that focuses on sustainability. Regardless of the chocolate industry being lucrative for large corporations in the developed countries that are responsible for chocolate processing, marketing as well as distribution, most of the smallholder farmers responsible for growing of cocoa live below the poverty line as farmers are entitled to only 3% of the price of each bar of chocolate sold (Oxfam, 2013).

Extending the benefits of sustainability initiatives to low-level cocoa farmers or producers rather than just a small segment of the supply chain requires sustainable management and the incorporation of sustainable purchasing practices as part of the criteria and culture of mainstream cocoa buyers (Philips and Tallontire, 2004). To counter the highlighted imbalances between demand and supply and to address sustainability challenges as well as improving farmers' livelihoods and community wellbeing, the IDH Sustainable Trade Initiative (hereinafter, IDH) has launched the Verified Sourcing Areas (VSA) approach. The VSA is a mechanism that can stimulate efforts to address sustainability challenges in the cocoa supply chain. It aims to enhance sustainability at the local (or production) level by linking entire production areas to global markets and ensuring that the sourcing of commodities by companies resonates with their sustainability

commitments at both competitive scale and price (IDH, 2018). However, similarly to what usually happens in any interactive process or initiative involving powerful external forces (government officials, global traders or companies) and less powerful peripheral local peoples (cocoa farmers or producers), VSA is subject to the times lack of understanding of ground realities that drives ignorant intervention or implementation characterised with the unrealization of local impacts and concentration of benefits to top actors (companies) (Fairtrade Foundation, 2016). Thus, the introduction of VSA as a viable mechanism for addressing sustainability challenges under diverse environmental and socio-economic conditions require empirical assessment of ground realities. Such assessment is imperative to understanding the existing opportunities and potential challenges for designing and implementing the initiative. This is not only important for making informed decision on implementation but will also generate understanding of the effectiveness of the initiative in addressing ground problems and the potential impacts on local livelihoods, thereby creating conducive environment for support and policy consideration in other sectors and countries.

Targets of sustainability pertaining to forest and peat protection, labor, land tenure, governance and transparency can take broader perspectives in terms of scale and impacts. A bottom up approach to implementation built on prevalent conditions at the producer level is necessary if significant impact is to be made at the producer section of the cocoa supply chain. Studies focusing on the producer level will make available producer level information needed for an efficient bottom up design and implementation of the initiative.

1.2 Objectives and research questions

Within this section the research general and specific objectives (1.2.3) as well as questions (1.2.1) are presented in detail.

1.2.1 Research questions

1. What is the link between cocoa production and forest conversion/deforestation in Ghana, with a special focus on the targeted cocoa communities?
2. What are the opportunities and potential challenges of VSA initiative in the targeted cocoa communities?
3. Which of the key requirements of the VSA initiative are applicable in the targeted cocoa communities?

4. What challenges and drivers are perceived by farmers to play vital role in future developments in cocoa production?
5. What are the requirements of farmers and buyers during trading of cocoa beans?

1.2.2 General objective

To explore the impact of cocoa growing on land use, highlighting farmers and other key-informants' perceived challenges and opportunities associated to the applicability of the IDH Sustainable Trade Initiative's VSA Mechanism in the targeted cocoa growing communities in the Prestea-Hunni Valley District of the Western Region of Ghana.

1.2.3 Specific objectives

1. To assess land use change from newly established cocoa farms over the last 20 years in the targeted communities.
2. To determine the opportunities and potential challenges for developing a VSA mechanism in the selected communities.
3. To determine the feasibility of the key requirements of a VSA mechanism in the targeted communities.
4. To identify the main drivers and challenges perceived by farmers to affect future developments in cocoa production.
5. To identify farmers' and buyers' requirements during trading of cocoa beans.
6. To draw general considerations and lessons learnt on sustainable practices associated to cocoa growing in the targeted communities in Ghana.

1.3 Structure and outline of thesis

This subchapter presents an overview of how the thesis has been structured. Chapter 1 sets the background to the study building on a review of available literature on related topics. It then follows up with the research questions whiles setting out both the general and specific objectives and the outline of the thesis.

Chapter 2 provides detailed information on the theoretical background by highlighting the global production of cocoa and associated challenges focusing on deforestation and other major challenges at the producer level of the cocoa supply chain. It finishes by introducing the VSA mechanism and its focus areas.

Chapter 3 provides a description of the research methodology. All methods employed for the study are described, including data collection and analysis methods.

Chapter 4 presents results of the study including results from key informants and farmers. Largely, results are summarized into tables with a few figures in order to address the research questions and the study objectives.

Chapter 5 provides a detailed discussion of research results. The implication of the findings of the study on the focus areas of the VSA initiative are discussed. The possible challenges and opportunities for the initiative are also discussed. Research findings are appropriately compared with relevant literature. Requirements by Licensed Buying Companies and farmers during trading of cocoa beans and famers' perceived challenges and drivers of future developments in the cocoa sector are also discussed.

Conclusions of the study are presented in chapter 6. Finally, the thesis is completed by providing a list of bibliographic references used for the aims of the study and two Annexes. In Annex 1, the interview guide for key informants is presented whiles in Annex 2 the structured questionnaire used for interviewing farmers is presented.

2. THEORETICAL BACKGROUND

This chapter provides an overview of global cocoa production and its associated challenges, with a specific focus on implications for global tropical forest degradation and deforestation. The chapter then narrows down to some of the major producer related challenges. The chapter has been developed into 8 subchapters. In the first subchapter global cocoa production and trade is presented. The second and third subchapters highlight the structure of the cocoa sector from the global perspective to country (Ghana) scale. The fourth subchapter focuses on developments and trends in the West African cocoa marketing structure. The impacts and challenges associated with cocoa production are highlighted in the fifth subchapter. The sixth subchapter is dedicated to problems and challenges in cocoa production. The seventh subchapter focuses on initiatives to address the impacts and problems in the cocoa sector focusing on combating deforestation risk. Finally, the eighth subchapter introduces the IDH Sustainable Trade Initiative on VSA.

2.1 Cocoa production and trade: a global perspective

Global production of cocoa recorded for 2017 amounted to more than 5.2 million tons (Figure 1), with an annual average increase of 3.9% between 2013 and 2017. Africa accounted for about 69% of the global production of cocoa beans (Figure 2) with an average annual increase of 5.2%. Production in the Americas followed with 15.5% with an annual average increase of 4.5% between 2013 and 2017. Asia was third with a global percentage share of 14.6% and witnessed an annual average decline of 1.3% in the 2013-2017 period.

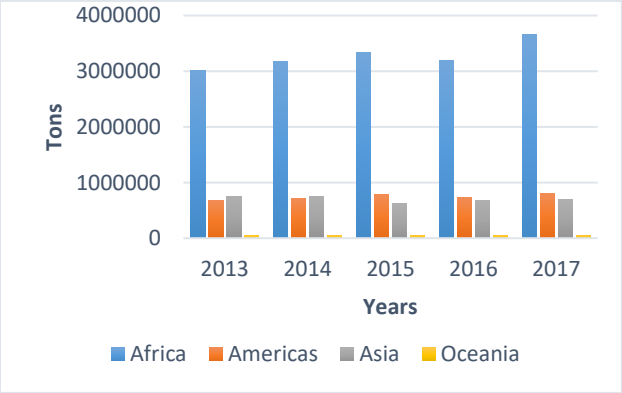

Figure 1: Global production of cocoa per region, tons (2013-2017)

Source: FAOSTAT database[2]

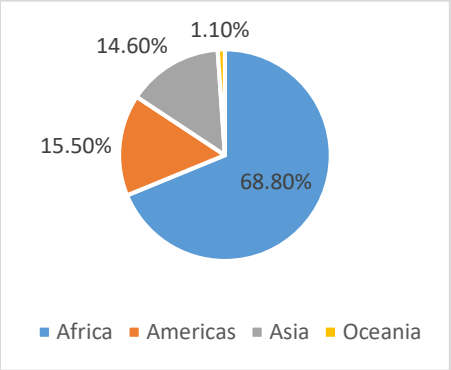

Figure 2: Regional percentage production of cocoa beans (2013-2017)

Source: FAOSTAT database

Global export of cocoa beans

The most recent available data from the FAOSTAT database on global exports of cocoa at the time of the author's compilation dated back to 2016. From Figure 3, Cote d'Ivoire and Ghana led the global export volumes of cocoa between 2013 and 2016 with over 4.4 million tons and 2.4 million tons respectively. Ecuador ranked third with over 840,000 tons. The fourth leading exporter was Cameroon with over 785,000 tons. The Netherlands, a non-producing country, was the fifth highest exporter of cocoa beans with more than 752,000 tons.

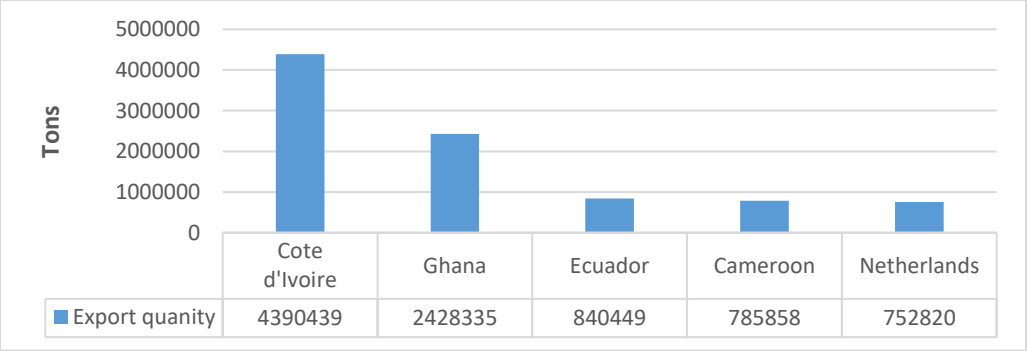

Figure 3: Cocoa beans exports by the top-five producing countries, tons (2013-2016)

Source: FAOSTAT database.

[2] Author's compilation using the most recent data available for production, exports and imports, April, 2019 (FAOSTAT database) for all figures and tables referenced as such. The most recent available data for production is 2017 and 2016 for imports and exports.

Global import of cocoa beans

Netherlands was the leading importer of cocoa beans between the years 2013-2016 with over 2.4 million tons, followed by the United States of America with over 1.7 million tons. The third highest global importer was Germany with over 1.5 million tons. The fourth and fifth importers were Belgium and Malaysia with over 1 million tons each. The imports for Belgium exceeded that of Malaysia with 3,321 tons (Figure 4).

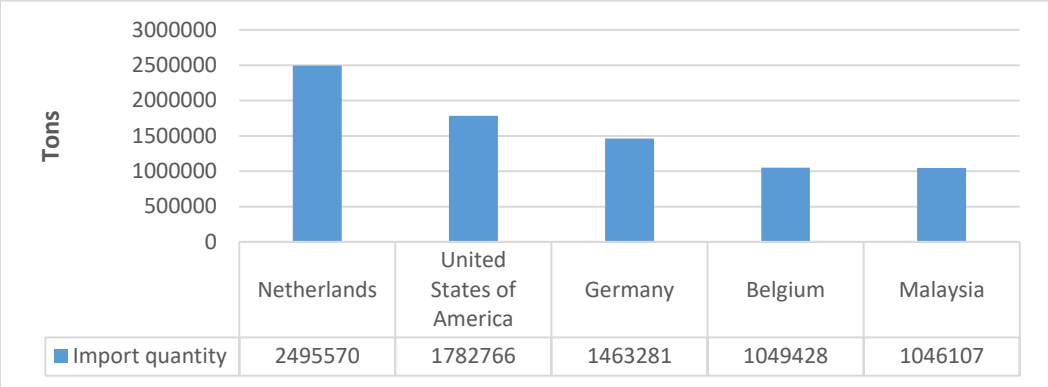

Figure 4: Cocoa beans imports by the top-five producing countries, tons (2013-2016)

Source: FAOSTAT database.

World leading cocoa producing countries

The Cocoa Market Situation report of the International Cocoa Organization (ICCO) mentioned fourteen producing countries namely: Cote d'lvoire, Ghana, Nigeria, Cameroon, Ecuador, Indonesia, Mexico, Peru, Venezuela, Papua New Guinea, Malaysia, Brazil, the Dominican Republic and Colombia (ICCO, 2014). Data on production for these countries were extracted from FAOSTAT database in order to highlight the leading global producers between 2013-2017 (Figure 5). 2017 was chosen as the last year because it was the most recent year for which data was available at the time of access.

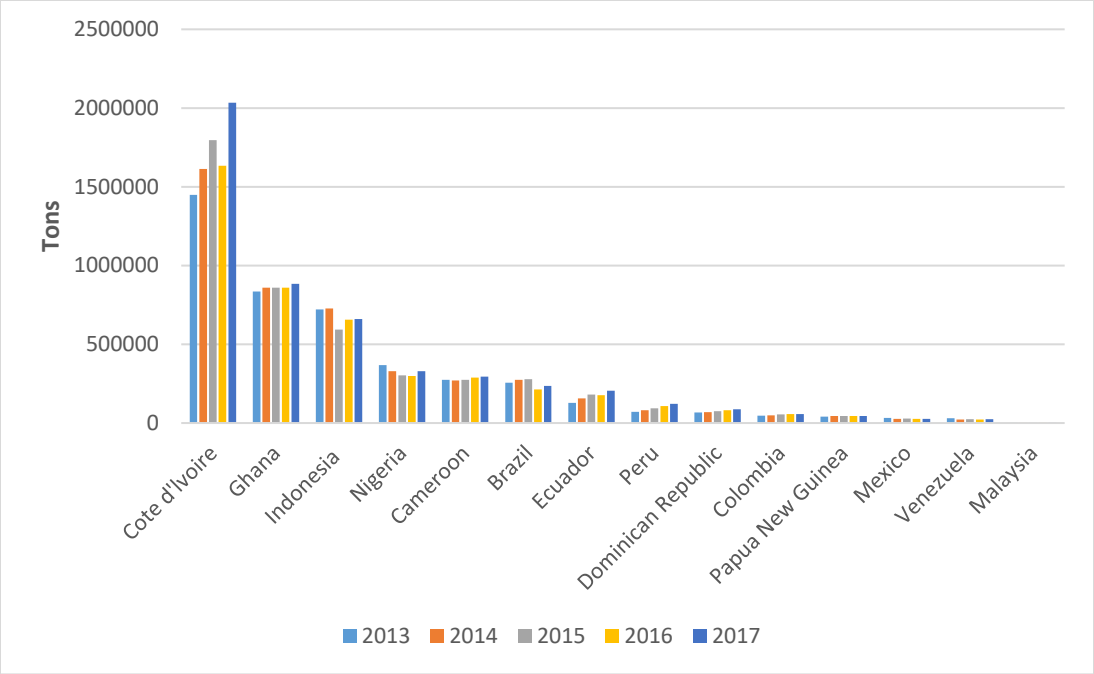

Figure 5: Production levels of leading cocoa-producing countries (2013-2017)

Source: FAOSTAT database.

Seven of the leading global producers namely Cote d'Ivoire, Ghana, Ecuador, Peru, Dominican Republic, Colombia and Papua New Guinea witnessed annual increase in cocoa production whereas the remaining half on the other hand witnessed a decline in the annual cocoa production between 2013-2017 (Table 1).

Table 1: Average cocoa production and annual production changes for fourteen leading global producers, tons (2013-2017)

COUNTRIES	AVERAGE ANNUAL PRODUCTION IN TONS (2013-2017)	AVERAGE ANNUAL PODUCTION GROWTH/DECLINE (2013-2017)
Cote d'lvoire	1,705,247	9.5%
Ghana	859,056	1.4%
Indonesia	671,845	-1.6%
Nigeria	325,046	-2.4%
Cameroon	280,625	-1.8%
Brazil	251586	-1.1%
Ecuador	169,672	12.9%
Peru	95,033	14.4%
Dominican Republic	76,256	6.2%
Colombia	52,572	5.1%
Papua New Guinea	43,966	2.0%

Mexico	28,482	-4.4%
Venezuela	24,671	-5.2%
Malaysia	1,998	-20.0%
TOTAL	**4,586,055**	**15.0%**

Source: FAOSTAT database.

2.2 Structure of the cocoa sector and market: from global scale to Ghana

In this section an overview of the cocoa sector and market from the global scale to Ghana is provided.

2.2.1 Cocoa production worldwide and in Ghana

Despite being originally from South America, cocoa today is mostly grown in West Africa (Young, 2007: 2-3) mostly in Côte d'Ivoire, Ghana, Nigeria and Cameroon. These countries are leading world cocoa production since the 1930s (Afoakwa, 2010). According to the Cocoa Barometer (2018), there are a total of 2 million cocoa farmers in Cote d'lvoire and Ghana alone. In West Africa, the average size of smallholder cocoa farms has been estimated to be between one to four hectares (Barrientos, 2016; Wessel and Quist-Wessel, 2015). Though West Africa continues to maintain its leading role in the production of the commodity, production has been partly shifting to other countries (Kroeger *et al*., 2017). For example, the increase in global demand and productivity decline in West African countries attributed to changing climate, soil degradation, prevalence of pests and diseases, aging cocoa farms as well as political instability is expected to drive growth in Latin American countries like Brazil and Ecuador, as well as in other African countries particularly in the Congo Basin (Kroeger *et al*., 2017).

Cocoa covers an area of 1.8 million hectares (Kroeger *et al*., 2017) of land in Ghana. With over 3.2 million farmlands the sector employs over 800,000 farmers distributed across more than six out of the ten regions of Ghana, particularly the forest areas of Eastern, Ashanti, Brong Ahafo, Volta, Central and Western regions (COCOBOD, 2019; Tutu, 2011). As a backbone of the country's agrarian economy, the crop generates in excess of $2 billion[3] annually in foreign exchange, which translates into 30% of the country's total export and serves as the source of income for over six million people (COCOBOD, 2019; Gockowski *et al*., 2011).

[3] $ = United States of America's Dollar

Local processing facilities that in many cases are part of larger, multinational groups in the Ghanaian cocoa sector include: Barry Callebaut, Olam Ghana Limited, Cocoa Processing Company limited (CPC), BD Associates, Niche Cocoa Industries Limited, Touton Ghana and Cargill (Ghana) Limited. These companies processed 201,869 tons of cocoa into semi-finished products in 2016 (COCOBOD, 2016) representing 23.5% of the total production of 858,720 tons (FAOSTAT, 2019). The two major ones, Barry Callebaut and Cargill (Ghana) Limited, are part of multinational groups which operate globally (COCOBOD, 2016). Cargill and Barry Callebaut Limited with 28% share equivalent each were responsible for about 56% of Ghana's domestic cocoa processing.

2.2.1 Cocoa supply and value chain

The cocoa supply chain consists of three mains sets of actors: smallholders, traders and producers/sellers. Global production of cocoa largely depends on over 5-6 million smallholders who produce an estimated 90% of the global supply of cocoa (Afoakwa, 2014; Kroeger *et al*., 2017) with production heavily concentrated in Africa (Kroeger *et al*., 2017). About 40 to 50 million people in developing countries depend on the growing of cocoa as their primary source of livelihood (Afoakwa, 2014). Beyond production at the smallholder level lie a highly concentrated value chain with several traders, grinders and chocolate producers. Almost all producers/grinders and processors are multinational companies based in Northern countries but operating globally. Cargill is a US-born multinational company, Barry Callebaut is the result of the merging of two leading companies from Belgium and France, and is now based in Switzerland but operates globally. Olam was founded in Nigeria, but its headquarters is in Singapore, Ecom is based in Switzerland and the list goes on. Barry Callebaut and Cargill account for 70% to 80% of cocoa processing worldwide, while a bunch of traders and grinders, including (besides Barry Callebaut and Cargill themselves) Olam, Ecom, Sucden, Touton, CEMOI, Cocoanect and Blommer account for some 60 to 80% of the global cocoa processing. The six largest chocolate manufacturers (Mondelez International, Nestle, Mars, Hershey's, Ferrero, Lindt und Sprüngli) transform 40% of chocolate products worldwide (Fountain and Huetz-Adams, 2018; Fountain and Huetz-Adams, 2015; ICCO, 2012) (Figure 6). Smallholder farmers produce cocoa beans. Acting as intermediaries between the smallholder producers and the confectionary industries are several traders and grinders. Cocoa beans are directly purchased by traders from producers and further sold to grinders

(processors) who process the beans into semi-finished products such as cocoa powder, liquor and butter. The second processors (confectionary industry) in the value chain convert semi-finished cocoa products into chocolate products, which are sold by several retailers/sellers (Figure 6).

Figure 6: Overview of actors in the cocoa supply chain

Image source: https://nancydrew4613.files.wordpress.com/2014/10/cocoavaluechaincsrasia-650x380.png

As a result of differences in roles and size of multiple actors involved in the coca supply/value chain, value sharing is unevenly distributed among players (players include farmers/producers, local buyers/government agencies, logistics, grinders/processors manufacturing/production costs, marketers and retailers/sellers. (Figure 7). With profit share increasing up the value/supply chain, the producers (farmers) have the least share of 3% whiles the retailers/sellers have the highest share of 43%.

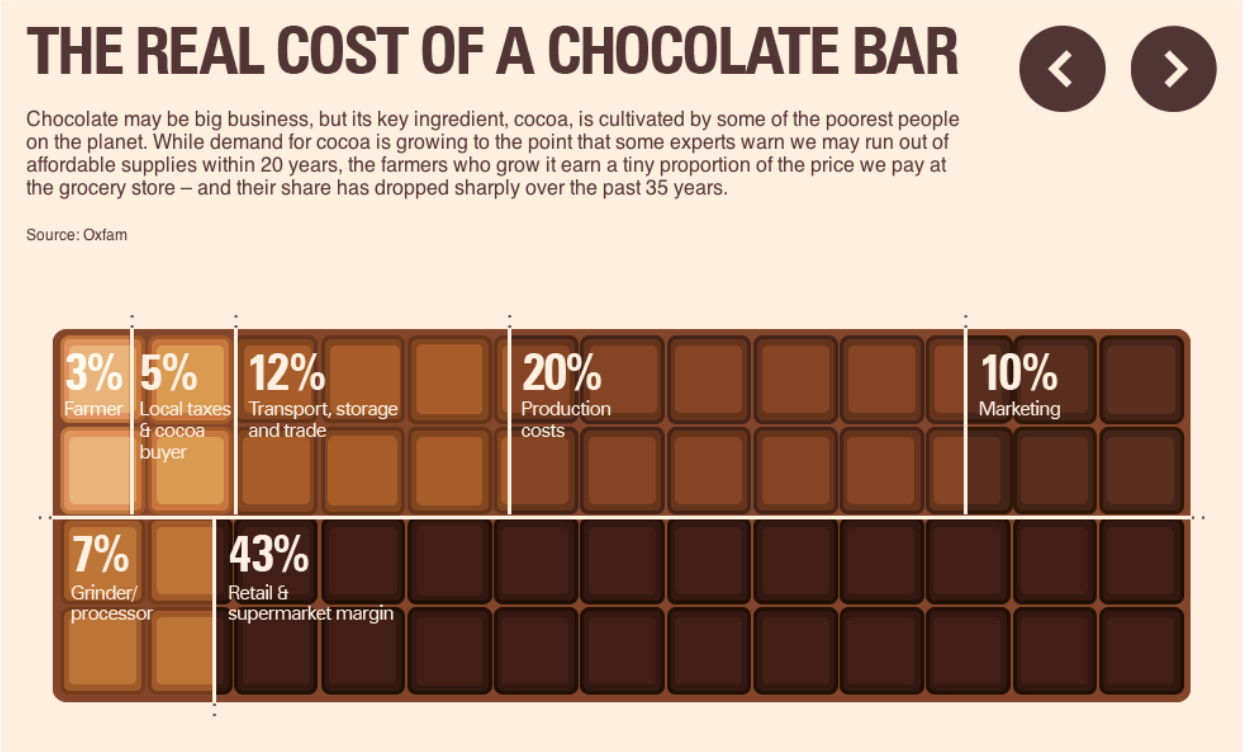

Figure 7: Percentage profit share of a bar of chocolate along the cocoa supply chain

Image source: https://nancydrew4613.files.wordpress.com/2014/10/screen-shot-2014-05-08-at-2-04-31-am.png

2.3 Structure of the cocoa market in West Africa and Ghana

The West African cocoa market was largely controlled by the government during the colonial era (Ould, 2004). Post-independence marketing boards operated with colonial structures (Abott, 2013). Ghana and Nigeria, both British colonies, used marketing boards created on the structures built by the British Government to control exports during the Second World War. In Côte d'Ivoire, the Caisse de Stabilisation et du Soutien des Prix des Produits Agricoles (Caistab) was created in 1964 following on from stabilization funds for cocoa and coffee established by the French in 1955 (Abott, 2013). In marketing board systems, government boards or its purchasing arm bought cocoa from farmers and then sold to international trade houses and domestic processors. On the contrary, Caisse system operated by stabilizing prices and costs for both farmers and exporters through a stabilization fund without taking over ownership of the products it controlled, with purchasing of cocoa left in the hand of Caisse licensed private agents. By their activities both bodies were able to effectively manage prices paid to farmers. Cameroonian structure prior to liberalization was best

described as an intermediate between the two (Ould, 2004). Advantages of the these systems include: reducing farmers' vulnerability to market fluctuations, raising government revenues through taxes on exports, all producers received the same price for the crops, inputs offered to farmers on credit and effective quality control etc. On the other hand, bureaucratic inefficiency and corruption tend to increase market costs, which subsequently could lead to low farm-gate prices for farmers (Ould, 2004).

Ghana is the only major cocoa producing country in the world without a fully liberalized marketing system (Kolavalli and Vigneri, 2011) with the Ghana Cocoa Board (COCOBOD) in charge of the regulation of all other stakeholders in the industry. Introduction of reforms by the Government of Ghana (GoG) in 1991 resulted in a partially liberalized internal marketing together with a privatization of the distribution of inputs and restructured extension services (World Bank, 2011). The liberalization of the internal cocoa marketing in 1993 allowed licensed buying companies (LBCs) to operate as intermediaries between the farm-gate level and the COCOBOD. COCOBOD has the sole mandate for the export and sales of the country's cocoa beans. The farm-gate price of cocoa is fixed by the board annually prior to the beginning of the cocoa season in October, in consultation with all key stakeholders including farmers' representatives. The price to offer farmers for the whole of the crop year is fixed by taking into account the world price. As a policy, the GoG is committed to offering farmers at least 70% Freight on Board[4] (FOB) price. For instance, farmers in Ghana received about 72% of FOB price in 2014/15 an amount of Ghanaian cedis[5] (GhC) 5,520 per ton as against GhC 3,392 per ton in 2013/14. COCOBOD continues to offer farmers with support through seedlings, subsidized inputs and extension services. Additionally, COCOBOD provides phyto-sanitary assistance to farmers, which has maintained high quality of bulk Ghanaian cocoa, attracting an international price premium between 7% and 10% higher than the price paid for other sources of West African bulk cocoa (COCOBOD, 2016). The centralized price fixing model and guaranteed price for the season practiced in Ghana tends to benefit farmers on the one hand, whiles burdening the COCOBOD incase world prices fall along the season. Per the COCOBOD's annual report of 2016, the 2015/2016 cocoa season marked 23 years of participation by the Licensed Buying Companies (LBCs) in the internal marketing of cocoa with

[4] FOB: The cost of movement of goods on board of ship is borne by the seller; all expenses thereafter to transport the goods to the buyer's premises are borne by the buyer

[5] 1 Euro is equivalent to 6.04 Ghanaian cedis as of 05/09/2019.

46 companies licensed at the beginning of the season. The Produce Buying Company Limited was the leading cocoa buyer with 31% share of the market. Armajaro Ghana Limited and Olam Ghana Limited followed in second and third places, with market shares of 13% and 12% respectively. Ten of the remaining LBCs with market share of between 1% and 10% accounted for about 40% of the market. The other twenty-seven companies together accounted for less than 4% of the market (COCOBOD, 2016). Since 1992-93 sales of Ghana's cocoa is made through the futures markets with prices being set more or less closely with some level of flexibility. The combined factors of flexibility and centralized fixing has rendered the pricing system a political tool for the two main political parties and farmers. An increase in prices at the local level is used to the advantage of ruling governments to canvass for votes, while cocoa farmers advocate for price increases especially during election year.

2.4 Developments and trends in the West African cocoa marketing structure

Structural adjustment programs pioneered by the International Monetary Fund (IMF) and the World Bank have led to reforms of the cocoa marketing institutions. Significant among them was the privatization of the government owned marketing boards deemed inefficient with high costs. These boards pursued ambitious developmental goals in addition to cocoa marketing. Employment rates for these boards exceeded those of private firms, which led to high costs in stabilizing prices anytime world prices of cocoa fell. In several instances, public funding and IMF loans were needed to avert bankruptcy of the boards. Reforms in Nigeria and Cameroon were more rapid than in Cote d'Ivoire or Ghana. Nigeria abandoned its board in 1981, with Cameroon commencing reforms in 1991, which was then completed in 1994. Privatization commitment was made by Cote d'Ivoire in 1999 but only gradual reforms were made in its monopolized export. This structure was already in place since private trading firms such as Cargill, Archer Daniels Midland Company and Barry Callebaut were handling exports. In 1991, Ghana's domestic marketing structure was partially reformed to permit the purchase of cocoa from farmers by private licensed buying companies but the monopoly on exports by the Ghana COCOBOD remained. During the reformation processes Ghana and Cote d'Ivoire have emerged as the leading global exporters with Nigeria and Cameroon declining in their production and market shares. The chocolate industry is supporting the export monopoly held by Ghana's COCOBOD due to the high quality cocoa beans it has maintained (Abott, 2013).

2.5 Impacts and problems associated with cocoa production

This section provides an overview of the main impacts and problems associated with cocoa production.

2.5.1 Driver of deforestation

Conventionally, cocoa has been a ‘‘slash-and-burn”[6] crop where rain forests are converted into cocoa farms (Cocoa Barometer, 2018). This has made cocoa production a major driver of global deforestation of tropical forests (Obiri *et al*., 2007) and the recent increase in awareness is seen in deforestation commitments across the cocoa supply chain by cocoa companies (Kroeger *et al*., 2017). The reasons accounting for this are that cocoa thrives in tropical climates and the establishment of cocoa plantation is easier and cheaper in forests (Clough *et al*., 2009). Establishing cocoa in converted forestlands has been reported to have short-term advantages economically than replanting of old farms because of the comparatively higher cost of inputs for replantation and the higher soil fertility, lower exposure to pests and diseases on converted forestlands (Kroeger *et al*., 2017; Ruf and Schroth, 2004). The farmer thus benefits from the temporary increase in profitability before moving into a new forest area to repeat the cycle (Ould, 2004). Changes in the production methods of cocoa has added implications on deforestation. Conventional approaches depended on semi-shaded conditions, which preserved primary forests, but there has been transition to the use of high yielding hybrid varieties that are grown in monoculture plantations with no shade (CNN, 2008), particularly in West Africa where the cultivation of full sun tolerant Amazon hybrid varieties keeps expanding (Wessel and Quist-Wessel, 2015). Smallholder farmers in West Africa are culprits in deforestation due to efforts to expand cultivation through the conversion of forests (Wessel and Quist-Wessel 2015). Recent increase in cocoa production by larger multinational agribusinesses, which employ monoculture plantation techniques have intensified pressures on forests (Bloomberg 2016; WRI, 2015). This trend is not just affecting West African forests, for example an increased trend of cocoa production has been observed over the past 30 years in Peru by large-scale agribusinesses at the expense of conversion of parts of the Peruvian Amazon forest: over 2,000 ha of forests have been lost to industrial cocoa cultivation (WRI, 2015). A global deficit in cocoa supply of 0.8 million tons by the year 2020 have been estimated (Amajaro, 2011; Fairtrade, 2011) and Europe and Asia reported

[6] A method of farming that involves clearing land by destroying and burning all the trees and plants on it, farming there for a short time, and then moving on to clear a new piece of land.

4% increase in demand each for the 2017/2018 (ICCO, 2017). There has been increased pressure on forest areas as the expansion of cocoa production continues to keep up with rising global demand. This results in spatial inequalities where the global demand and consumption drives local deforestation and other related environmental costs (Bunker and Ciccantell, 2005; Jorgenson *et al*., 2009).

2.5.2 An overview of cocoa-driven deforestation at the global, regional (West Africa) and country (Ghana) scales

At the global scale, information on the cocoa sector's role on forests is limited (Kroeger *et al*., 2017). Global and regional estimates of forest loss due to cocoa production is presented in Table 2.

Table 2: Global/regional estimates of cocoa-driven deforestation

Amount of forest cover loss	Year/Time span	Source
14-15 million hectares (global)	Past 50 years	Clough *et al*., 2009
2-3 million hectares (global)	1998-2008	European Commission, 2013
2,000 ha (Latin America, Peru)	Past 30 years	World Resources Institute, 2015
0.7 million hectares (South-East Asia, Indonesia)	1990-2008	FAOSTAT and European Commission, 2013

An estimated 90% of West Africa's original forests have been lost due to several factors, including conversion into farmland (Cocoa Barometer, 2018). Cocoa is often grown after forest clearing and farmers usually migrate to establish new cocoa farms in forest frontiers rather than replanting of aged farms (Ruf *et al*., 2015). As such cocoa plantation is the landuse system that has modified several parts of the forest landscape of West Africa (Gockowski and Sonwa, 2011), notably in countries like Ghana, Nigeria, Cameroon and Cote d'Ivoire (Wessel and Quist-Wessel, 2015). The African Guinea Rainforest spanning from Guinea to Cameroon has been designated as a biodiversity hotspot of global significance in the past 20 years (Myers 1990; Myers *et al*., 2000). Expansion of cultivated area by smallholder cocoa producers in the Guinea Rainforest (Cote d'Ivoire, Ghana, Nigeria and Cameroon) between 1988-2007 caused 2.3 million ha of forest loss (Gockowski and Sonwa, 2011). Cocoa production in Cameroon and the Democratic Republic of the Congo is currently putting virgin forests in the Congo Basin at risk and the situation becomes more alarming especially with projected growth in production for the two countries (Beule, 2014).

Over 60% of Ghana's forest cover was lost from 1950 to the turn of the last century (an estimate of 2.7 million hectares) (Owusu, 1999). Ghana's annual loss of forest cover is estimated at 2% (135,000 ha/year) and forest degradation is acknowledged to be more prevalent as compared to deforestation (MLNR, 2015). The expansion of cocoa production has been a major driver of the country's deforestation (Gockowski and Sonwa, 2011; MLNR, 2012). According to the Ghana Living Standards Survey (GLSS, 2014), cocoa production in Ghana spans across the six southern regions that fall within the forest zones (Figure 8). Spatially, the frontiers of cocoa production in Ghana has shifted westwards since the 2000s and the recent growth in national output has been at the expense of the conversion of forests to full sun productions systems in the Western region (Victor *et al*., 2010). The geographical location of Ghana's Western region is shown in Figure 8 (indicated by green color and labelled as rainforest). According to Dawoe *et al*., (2014), the Western region remains the last frontier for expanding the area under cocoa production hence the reduction rate of available virgin forests in the region has been drastic. Recent studies indicate that forest reserves in the region have been massively encroached (Benefoh *et al*., 2018). According to FAO (2017), the Western region accounted for 56% and 53% of the total domestic cocoa production in 2011 and 2002 respectively. With the gradual impossibility for expansion of land area under cultivation globally (WWF, 2006), due to the exhaustion of forests among other reasons, the only means to increase the output of cocoa is intensification by maximizing the output per unit area which is achievable at a higher cost than the simple conversion of forest lands into new cocoa farms. In view of this, studies have recommended intensification for meeting targets of sustainability (Kuwornu *et al*., 2011). According to Kuwornu *et al*. (2011) motivating farmers to adopt this route may not always be possible via increment in producer prices and hence strengthening government's campaigns for technology and subsidies for technology focusing on intensification has been suggested as having the ability to reduce deforestation in the long term. Kuwornu *et al*., (2011) report that leaving the adoption of intensification technologies to farmers' choice will result in deforestation since farmers will opt for the cheaper and easier alternative of land area expansion than the adoption of technology. Kuwornu *et al*., (2011) also indicated that technological innovations that have been rolled out by the GoG are seen to focus on raising cocoa output rather than conservation of forest reserves. The results have implications for the conservation of Ghana's rainforest because an increment in cocoa output according to the study translated into increased deforestation.

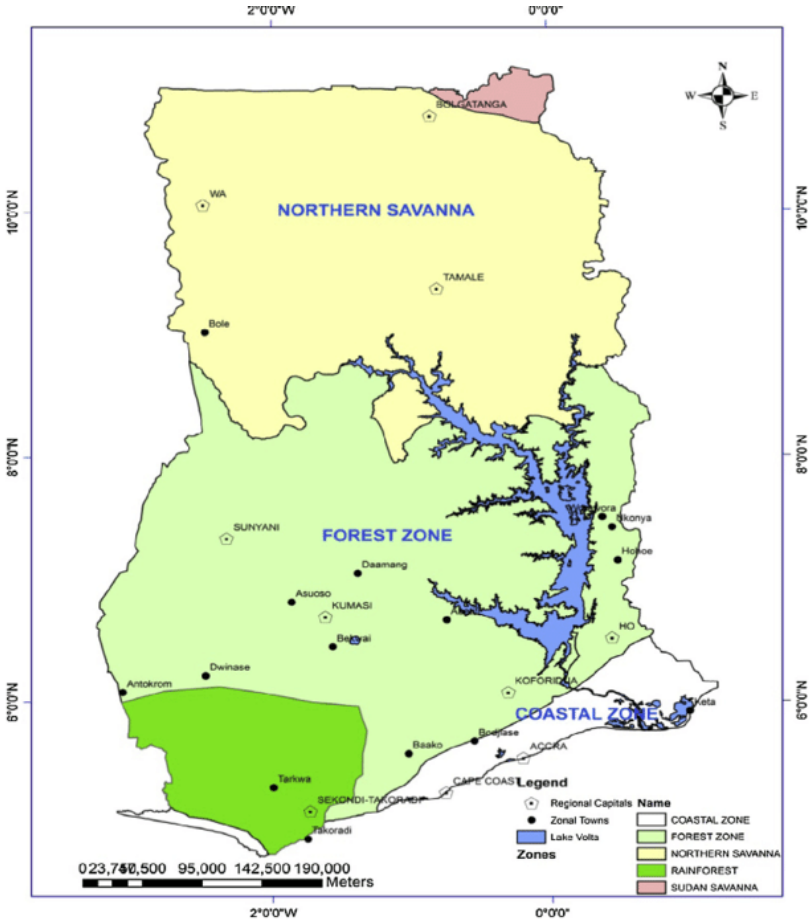

Figure 8: Map of Ghana's ecological zone

Source: Miezah *et al*., 2015.

2.6 Problems and challenges in cocoa production

The cocoa production sector is faced with serious and diversified challenges, such as changing weather and climatic conditions, decline in productivity, inadequate innovation, inadequate technology and knowledge transfer, declining soil fertility, pests and diseases, threatened supply due to competition from other cash crops and poverty (Netherlands Ministry of Foreign Affairs (CBI)[7], 2016). The main challenges are briefly presented and discussed in the following sub-sections.

[7] CBI is the Centre for the Promotion of Imports from Developing Countries of the Netherlands Enterprise Agency funded by the by the Netherlands Ministry of Foreign Affairs

In the cocoa sector, almost all risks are borne by the farmers. Unlike the companies in the supply chain that can hedge cocoa at the stock exchange to reduce risks, farmers are always the most disadvantaged in the supply chain. All risks of price volatility is borne by farmers though they have the weakest economic reserves in the whole supply chain (Cocoa Barometer, 2018). The vulnerability of the farmers in the supply chain makes most of the eminent challenges' producer based. Some of the producer related challenges are described in the following sections.

a. Tenure challenges and poor farmer organization

Many farmers do not hold any official land titles, most often rights to use land have been acquired through informal or traditional tenure systems. Absence of tenure security is a hindrance to a variety of sustainability measures. The lack of or unclear ownership of land can lead to lower investments as it serves as a barrier to access to credit for farm investment (Cocoa Barometer, 2018; Ogunniyi and Osuolale, 2015). Even if credit/resources can be obtained, there is uncertainty if the land remains theirs once farmers initiate the felling of cocoa trees intended to either rejuvenate the plantation or to diversify production. Removals of diseased trees or natural disasters that destroy trees can also result to loss of land rights, as can any move towards agroforestry (Cocoa Barometer, 2018) probably because it amounts to a violation of the tenure arrangements between farmers and landowners. In West Africa, particularly in Ghana, the prevalent customary land tenure regime discourages farm investments by farmers. Under customary land agreements common in Ghana's cocoa sector, the farmer has the responsibility of maintaining the farm and the farm is divided when the trees mature with the farmer holding perpetual right over his share on condition that the land remains in cocoa. Another variation is where the harvest is shared between the landowner and the farmer who is just a sharecropper[8] and the landowner retains the right over his land (Roth *et al*., 2017). According to a study conducted by Quaye *et al*. (2014) in four of Ghana's major cocoa growing regions (Eastern, Ashanti, Brong Ahafo and Western) 61.7% of farmers out of a total sample of 231 farmers cited land tenure arrangements as a factor that affects the adoption of sustainable cocoa farming practices, which has implications on low levels of yields (Ehiakpor, 2016). Almost all of the sector-wide efforts in cocoa reach only those farmers that are already (loosely) organized in cooperatives. The majority of cocoa farmers, however, are

[8] Sharecropping is a land tenure practice where tenant farmers (sharecroppers) maintain the farm leading a division of the farm between landowner and tenant farmer or leading to the division of the farm harvest at the end of every farming season

not organized and are not being reached. Concerted sector-wide strategies must be developed to reach these 'higher hanging' fruits (Cocoa Barometer, 2018).

b. Climate change, pests, diseases and low soil fertility

Major cocoa producing regions of the world in recent years have seen their production impacted negatively by adverse weather conditions. Harmattan (a dry wind that originates from the Sahara towards the Gulf of Guinea) has been lasting longer whiles affecting new areas (Climate Central, 2018). In West Africa, where countries like Ghana, Cote d'Ivoire and Burkina Faso together have lost over 70% of their natural forest cover over the last three decades, the impact of climate change has been aggravated. Research has shown that large parts of cocoa lands in West Africa will become less suitable for cocoa production in the coming decades due to climate change (Climate central, 2018).

About one-third of the global losses of cocoa crop annually is attributed to pests and diseases, which have implications for the livelihoods of smallholder farmers whose welfare and well-being is dependent on the vitality of their crops (Shapiro and Rosenquist, 2004). For instance in West Africa, particularly in Ghana, Nigeria and Togo, frequent outbreaks of the cocoa swollen shoot virus (CSSV) transmitted by mealybugs known for its rapid spread over an entire growing area have been reported (Matissek *et al*., 2012). There is also a reduction in soil fertility due to deforestation, which is driving a move towards agroforestry in countries like Ghana (Dawoe *et al*., 2014).

c. Aged cocoa trees/farms and ageing farmers

Majority of the world's cocoa trees are above their optimum pod production, which poses a great deal of challenge for cocoa farmers. Cocoa grown as a cash crop has an average life span of 25 years but in Africa is harvested up until 40 years, which could be attributed to the prevalent land tenure regimes that gives no room for rejuvenation of older farms (Cocoa Barometer, 2018). However, disincentives for rejuvenation of old cocoa farms is not only limited to tenure challenges. There are costs associated with the removal of cocoa trees, procurement of seedlings and replanting. In addition, post-planting activities costs and the time lag until the new trees start to produce have economic implications on the farmers. In West Africa as high as 35% of all cocoa trees are beyond 35 years which is far past their production peak (KPMG, 2013). As cocoa trees

age there is decline in yield and their vulnerability to diseases increases significantly making it one of the major challenges affecting producing areas especially in Africa (Matissek *et al*., 2012).

Most cocoa farmers are ageing but old age does not exempt farmers from engaging in the backbreaking labour of cocoa farming (Cocoa Barometer, 2018). For instance according to Barrientos *et al*., in 2008 the average age of cocoa farmers in Ghana stood at 52 years for males and 56 years females for women. This has implications for productivity since productivity is lower among older farmers because ageing small-scale farmers are less responsive to innovations and price movements and are neither able to expand production or increase their yields easily (Barrientos *et al*., 2008). The situation in Ghana is even direr because whiles there is ageing farmer profile there is also the outright exit of the youth from cocoa production (Barrientos and Asenso-Okyere, 2009; Ryan, 2012) to look for better opportunities in more promising activities.

In addition to the above-reported issues, additional socio-economic challenges shall be considered. The most relevant ones are presented below.

a. Low farmer income

Poverty among cocoa farmers is high and even the receipt of premium prices for certification does not directly translate into improvement in their condition of work (Ministry of Foreign Affairs, Netherlands (CBI), 2016). The high prevalence of poverty among cocoa farmers has been attributed to the volatility in cocoa prices and the great power wielded by multinationals in the cocoa supply chain among other things (Ministry of Foreign Affairs Netherlands (CBI), 2016). The poverty is even more rampant in major producing countries in West Africa. For instance, Fairtrade International calculated the actual national daily living income[9] for cocoa farmers in Cote d'Ivoire is $0.78 while the national daily living income is $2.51. This means that on the average, cocoa farmer households in rural Cote d'Ivoire earn only 37% of a living income (Cocoa Barometer, 2018). Similarly, a daily per capita income[10] of $0.42 has been reported for cocoa farmers in Ghana (Barrientos, 2013). Due to the decrease in economic returns, there is conversion

[9] Living income is the net income a household would need to earn to enable all members of the household to afford a decent standard of living.

[10] Per capita income (PCI) or average income measures the average income earned per person in a given area (city, region, country, etc.) in a specified year.

of cocoa farms into other land uses in some producing regions of Ghana (Asante-Poku and Angelucci, 2013).

b. Gender issues

According to the Cocoa Barometer (2018), on the average, women run a quarter of all cocoa plantations in West Africa. In spite of their contribution to the sector, they have limited access rights to land, extension services, credits and certification compared to their male counterparts (Cocoa Barometer, 2018). They also often have poor representation in farmers' organizations, public meetings and leadership roles in the communities. Although there are differences in the tasks performed by men, women are engaged in most of the steps in cocoa production from seedlings preparation to selling beans (Cocoa Barometer, 2018). According to ILO and IPEC (2013), there is a huge gendered disparity in terms of remuneration of male and female workers in the cocoa sector in Ghana. Generally, discrimination against women and favoritism for men in Ghana's labour market has created a wage gap that favors men (Baah-Boateng, 2012).

c. Child labour

According to Cocoa Barometer (2018), increases in cocoa production has led to an absolute increase of child laborers with over 2.1 million children in West Africa alone. In Ghana, available surveys conducted in four of Ghana's cocoa growing areas estimated that the number of children engaged in hazardous cocoa-related activities were around 186,307 which formed 10.1% of all households interviewed (ILO and IPEC, 2013). The same surveys also reported that above two-thirds of the children aged 5-17 years in the four surveyed districts are involved in cocoa agriculture and many of them perform hazardous activities. Up to 50% of the children used long and sharp knife as the major tool for cocoa agriculture and 42% performed the hazardous job of breaking cocoa pods with knives (ILO and IPEC, 2013). Other risky activities children undertook include use of knapsack sprayer, agrochemicals and fire explosives. Thus despite a widespread of awareness of the importance of child education, child-labour is still largely seen as an important component of the cocoa sector in Ghana. Third-party audited certification has been employed to address issues of child labour among others. Ghana has witnessed a regular competition in the sourcing of certified cocoa. According to KPMG (2012), the market grew twice as much from 3 percent to 6 percent in 2010. The production of cocoa under using third-party audited certification in Ghana had shot up to 16% by 2014 after multiple certification was corrected (Potts *et al*., 2014).

2.7 Addressing the impacts and problems in the cocoa sector

The issues in the cocoa sector are of concern to a broad spectrum of stakeholders: the chocolate industry seeks a sustained supply of raw materials, environmentalists interests lie in the conservation of forests and wildlife, developmental agencies have targets of improving rural incomes and governments seeks to support national agricultures (Shapiro and Rosenquist, 2004). Recent occurrences of malpractice along the supply chain management have rendered the world chocolate sector vulnerable in respect of how they handle social issues across the entire networks of the global supply chain (Lalwani *et al*., 2018). Accordingly, there are various programs that focus on improving farmers' living conditions increasing yields and securing cocoa supply (Ministry of Foreign Affairs, Netherlands (CBI), 2016) including managing and reducing deforestation risks along the cocoa supply chain. A non-exhaustive overview of some of the most significant initiatives is reported in Table 3. Landscape approach which views sustainability more holistically focusing on broader areas such as watersheds, ecosystems, transport systems, governments, communities and markets is been advocated (Kissinger *et al*., 2013).

Table 3: Summary of on-going initiatives to address the impacts and challenges in the cocoa sector, with a special focus on deforestation risks

ONGOING INITIAVES IN MULTIPLE COUNTRIES		
INITIATIVE	**ACTORS**	**BRIEF DESCRIPTION**
The Transboundary Tai-Sapo Corridor Project	GRASP/United Nations Environment Programme (UNEP) and the Wild Chimpanzee Foundation (WCF) then taken up by GIZ (German development agency) and KfW (German development bank) as a complement to the GRASPWCF initiative	The project aims to unite and protect forest fragments by promoting agroforestry for cocoa plantations as well as Payments for Environmental Services to encourage conservation and reforestation activities among local population
Greening the Cocoa Industry	Rainforest Alliance, Global Environment Facility and UNEP	It aims to change production practices in cocoa-producing countries and management procedures in cocoa and chocolate companies to give the industry a more active role in biodiversity conservation while also helping increase incomes for small producers to ensure the sustainable development of the cocoa industry
Quantity, Quality, Growth" (2QC)	Coffee and Cocoa Council	For the period 2014–2023, it aims to secure the revenue of all players in coffee and cocoa sectors and contribute, in particular, to promote the socioeconomic well-being of producers by improving farm

		productivity through sustainable intensification of the production system in compliance with social and environmental standards
The African Cocoa Initiative (ACI) Phase 2	Cocoa industry members, USAID and key government institutions in Cameroon, Côte d'Ivoire, Ghana and Nigeria	ACI 2 is the second phase of the African Cocoa Initiative which focused on public-private modals to improve sustainable cocoa production. ACI 2 aims at increasing production and use of quality cocoa planting materials, pesticides and fertilizers with focus on use of new techniques and technology and supporting regulatory bodies, and increasing the provision of financial services in support of cocoa value chain
Cocoa and Forests Initiative Cocoa Barometer, 2018	World Cocoa Foundation, the IDH Sustainable Trade Initiative, and the Prince of Wales	All actors pledged to bring a halt to deforestation in these two countries, coupled with individual country action plans Ghana, Cote d'Ivoire
ONGOING INITIAVES IN GHANA		
Full Sun to Shaded Cocoa Agro-forestry Systems	German Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety and SNV (Netherlands Development Organization)	A more balanced approach to cocoa production and forest protection, while supporting cocoa businesses to implement transparent deforestation-free supply chains in Ghana
Mainstreaming Climate-smart Agricultural practices in cocoa production in Ghana	Research Program on Climate Change, Agriculture and Food Security (CCAFS), International Centre for Tropical Agriculture and the International Institute of Tropical Agriculture, Rainforest Alliance, Root Capital and the Sustainable Food Lab	The project assesses the climate change exposure of cocoa systems in Ghana by using a transect approach to identify sites with high, medium, and low climate change impacts. Key actors from the Ghanaian cocoa sector are involved in developing locally relevant adaptation strategies, such as the adoption of climate-smart agriculture, through participation in multistakeholder platform
Climate Cocoa Partnership for REDD+ Preparation	Olam and the Rainforest Alliance	It is aimed to break the link between cocoa production and deforestation and build cocoa production areas mixed with forest lands to become more resilient to moisture and temperature changes due to climate change
Cocoa Life	Mondelēz International in partnership with United Nations Development Program (UNDP) Environmental Sustainability and Policy (ESP) project for Cocoa	create the national enabling environment necessary for their smallholders to be successful and sustainable by ensuring that the national REDD+ policies are based

	Production in Ghana, the Ghana Cocoa Board (COCOBOD), and cocoa traders	off and thereby beneficial for farm-level needs and realities. Restoring trees to the cocoa farmers' landscape to restore productivity and forest habitat

Source: Kroeger *et al*., 2017

2.8 The IDH Sustainable Trade Initiative on Verified Sourcing Areas (VSA)

The IDH Sustainable Trade Initiative on Verified Sourcing Areas (VSA) is a new approach that seeks to ensure the provision of large quantities of commodities that fulfill sustainability commitments at competitive scale and price, while improving the level of sustainability of the producing regions. It aims to validate the sustainability of a whole jurisdiction such as a municipality, district and subsequently, a province or state, thus making it irrelevant for verification to be done individually by a producer, mill or commodity. Through this approach, goals of sustainability such as forest and peat protection, labour safety, land tenure, governance and transparency is intended to become more ambitious both in scale and in impact (IDH-Factsheet, 2018). The VSA model therefore seeks to provide the mechanism for a more efficient engagement of producing areas and end buyers on issues of sustainability, ensuring that efforts at sustainability yield maximum results on the ground where they are most needed, while enabling governments to meet their role on issues of sustainability (IDH-Sustainable Landscapes Working Group, 2018).

A deal for the enhancement of sustainability in the producing areas referred to as Production, Protection and Inclusion (PPI) agreement called the Compact is reached between the private, public and civil society stakeholders at a jurisdictional level such as a municipality, district or province. The Compact outlines priority sustainability topics, targets and responsibilities that aims to ensure the best use of the strengths and abilities of each of the partners involved in the compact. There are compulsory key subjects referred to as the global VSA Performance Standard. These standards cover five main themes that are of global interest and concern: forest and peat protection, good governance, labor, land tenure and transparency. In the VSA model, any buyer, trader or third party with interest will have the ease of assessing the status and progress of the producing region in relation to the key sustainability goals. This allows end-buyers who are committed to sustainability to get an overview and better understanding of the products in their supply chain

while granting them the opportunity to give direct support for producing regions to improve sustainability (IDH-Factsheet, 2018). The advantage is that the VSA model offers a mainstream solution to sustainability and it makes it possible to connect a whole production area to the global markets. In these VSAs, the local actors become the drivers of sustainability and thus receive support and incentives by the global markets for doing so. VSAs that proof to be promising and successful will attract more byers and financiers by making it easier for products to be verified. The ultimate results is that, it leads to improved market conditions for the producers in the VSAs. The box below provides an overview of on-going VSA mechanism in Indonesia and Brazil.

SUSTAINABLE PALM OIL PRODUCTION IN ACEH PROVINCE, INDONESIA

- IDH brought together global market players (PEPSICO AND UNILEVER) in oil palm
- IDH and Aceh Provincial Government worked together to create enabling legal framework and green growth strategies at the state level
- IDH, Provincial Government, pam oil producers, CSOs and communities work together to develop a GPP (Green Growth Plan)
- The GPP sets out how to develop, implement and monitor participatory land-use management plan
- End results is positive impacts on community livelihoods, business performance, forest protection (with a focus on the Leuser ecosystem)

SUSTAINABLE CATTLE RANCHING AND SOY PRODUCTION IN MATO GROSO, BRAZIL

- IDH brought producers and traders interested in sustainable soy production, by employing a strategy that will finally achieve compliance with the Brazilian Forest Code and/or the European Feed Manufacturers' Federation (FEFAC)
- This strategy is then combined with cattle intensification program funded by private organizations
- Intensification prevents agricultural expansion at the expense of forest conversion
- IDH drives demand for sustainably produced soy and beef at the market end in Europe
- End result is enhanced livelihoods, business performance and forest protection

Adapted from https://www.idhsustainabletrade.com/verified-sourcing-areas/

3. RESEARCH METHODOLOGY

The sampling approach followed the four-staged procedure as outlined in Trochim (2006) also called the multistage sampling procedure for selection of respondents (Dhakal *et al*., 2015; Sood and Mitchell, 2011). For the purpose of this study, the target population identified as a first stage was the total population of cocoa farmers in the Prestea-Hunni Valley District, Ghana. The district was chosen for the study because it is a preconditioned area due to its status as one of the cocoa producing districts and falls within the tropical rainforest landscape with diverse land use and a possible high rate of cocoa expansion. This makes the district appropriate in answering the research questions raised for the study. The second stage consisted of selecting a sub-group of the total potential population and defining a sub-set of accessible population. The study population consisted of six randomly selected cocoa growing communities within the district. The third stage answered the question how to get access to the study population or the sample frame. The sample frame for this study was the cocoa farmers. Finally, as a fourth stage, the study sample was randomly selected among cocoa farmers in each of the six selected communities.

3.1 Research approach

A case study approach was adopted for the study. Rapid Rural Appraisal and Participatory Rural Appraisal tools, such as key informant interviews, structured and semi-structured surveys and field observations were employed to gather relevant information on key variables for addressing the research questions and objectives. The questionnaire was structured in order to cover the main thematic areas addressed by VSA, to preliminary check the gap between the study area and the VSA approach.

3.2 Study area

The study was conducted in six cocoa growing communities in the Prestea-Huni Valley district of Ghana (Figure 9). Prestea-Hunni Valley district lies within the Western Region of Ghana. The mainstay of the districts economy are farming, mining (Government of Ghana, 2013), trading and logging (Ehiakpor *et al*., 2016). The Western Region of Ghana remains the only frontier to increase the area under cocoa cultivation in Ghana because it hosts patches of reserved and non-reserved forests (Asare, 2005; Gockowski and Sonwa, 2008). This makes the district an appropriate one capable of meeting the focus of the study. Up to 75% of the region's vegetation is found within Ghana's high forest zone and 44 percent of the country's closed forest is accounted for by this region. It is the wettest part of the country and records an average annual rainfall (bi-modal rainfall

pattern) of 1,600 mm per annum (Victor *et al*., 2010). The district has a total land size of approximately 1,376 square-kilometers (Ehiakpor *et al*., 2016). The population of the district is estimated at 159,304 people comprising of 50.5% males and 49.5% females, with 65% of the overall population living in rural areas.

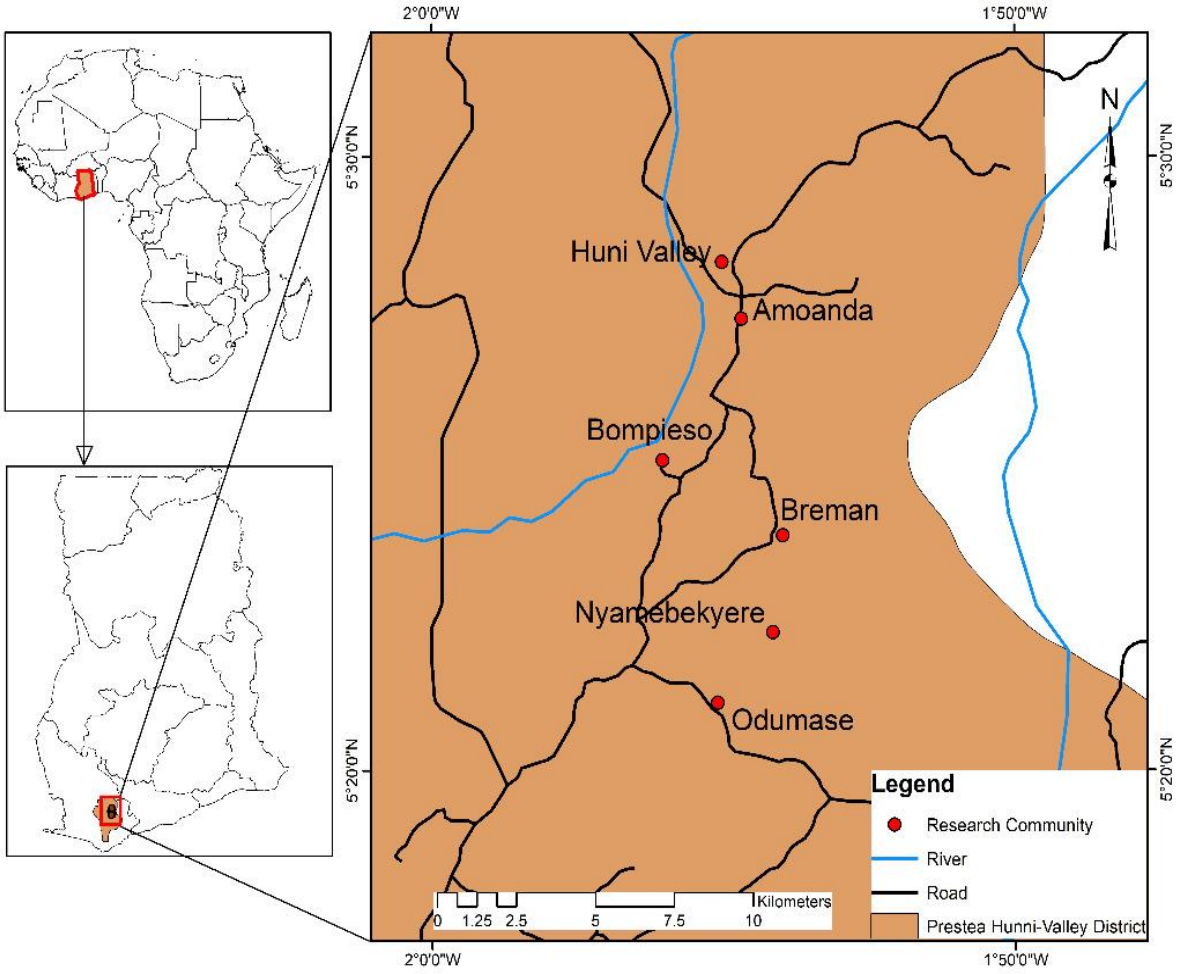

Figure 9: Map of the study area with the study communities

3.3 Data Collection

Face-to-face-interview method using structured and semi-structured questionnaires was used to collect both qualitative and quantitative data. Questionnaires were randomly administered to cocoa farmers in each of the selected communities. Key informant interviews using semi-structured questionnaire were performed with 8 key informants, including 4 cocoa purchasing clerks, 1 town

committee chairman, 1 chief/traditional ruler, 1 district sustainability manager and 1 general district manager. Purposive sampling technique was used to select the key informants that are in the position to provide information, according to the researcher's judgement, were relevant in answering the research questions and the objectives. The key informant interviews were conducted in order to obtain different views on the issues raised by the cocoa farmers. The consent for all respondents was sought prior to the interview and anonymity of participants in the interviews was duly protected where requested.

3.3.1 Questionnaire and interview guide

The structured questionnaire for farmers was divided into five sections (Annex 1). The first section was on farmers' profile and the second on farm characteristics, land use dynamics and tenure. The third section was on organization of cocoa farmers and the fourth part on trade mechanisms and market trends. The last section was on future developments and perspectives. The consent for all respondents were sought prior to the interview and anonymity of participants in the interviews was duly protected where necessary.

The key informant interview guide was divided into four sections (Annex 2). The first section covered land use dynamics, tenure and labour while the second section was on trade mechanisms and market trends. The third section focused on organization of cocoa farmers and the last section challenges/opportunities and future developments.

3.3.2 Reliability

The study aimed at obtaining quality data that is reliable to make informed decisions in relation to the VSA. In order to answer the research questions and to achieve the research objectives, a pre-testing of the questionnaires was performed. Thirty questionnaires were used for the pre-testing in Odumase and Hunni-Valley. Weaknesses and errors identified were corrected. A common theme for communicating the meaning of the questionnaires in the local Ghanaian language (Twi) was adopted for all farmers in order to reduce bias.

3.3.3 Sample

The sampling units for the study were six randomly selected cocoa growing communities in the Prestea-Hunni Valley District of Ghana. 200 cocoa farmers were interviewed using structured

questionnaires. To facilitate the selection of communities, a list of the cocoa growing communities in the Tarkwa Cocoa District was obtained from the district sustainability manager of Eliho-Touton (a multinational cocoa buying company). The six selected communities, their coordinates, farmers sampled are presented in Table 4. Coordinates were not available for all communities due to difficulty in accessing signals. Farmers interviewed per community was based on the extent of cocoa farming and the population of the community.

Table 4: Communities sampled and their sample proportions in relation to the total sample size for the study

COMMUNITY	COORDINATES	FARMERS INTERVIEWED	PROPORTION OF THE TOTAL SAMPLE (%)
Bompieso	5º24¹31.3¹¹N, 1º56¹02.5¹¹W	36	18%
Odumase	5º21¹03.7¹¹N, 1º55¹13.3¹¹.6W	70	35%
Hunni-Valley	Not available	40	20%
Nyamebekyere	Not available	20	10%
Breman	5º23¹49.6¹¹N, 1º53¹59.0¹¹W	14	7%
Amoanda	Not available	20	10%
Total		**200**	**100%**

3.4 Data analysis

Data was analyzed using both qualitative and quantitative methods. Parametric and non-parametric statistical tests were used. Friedman test (Zimmerman *et al*., 1993) was used to compare mean ranks between related groups and a post hoc test on the mean ranks using Wilcoxon signed rank test (Fowler *et al*., 2003; Zimmerman *et al*., 1993) was done. In performing the post hoc analysis for Wilcoxon signed rank test, the Bonferroni adjustment (Shi *et al*., 2012) was applied. This was necessary to avoid making Type 1 error (Fowler *et al*., 2003). One-way Analysis of Variance (ANOVA) was used to test variance in wages for daily hired labour and number of laborers for different age groups used for cocoa labor. Descriptive statistics and frequencies were employed to describe relevant variables. In addition, Pearson chi-square (Fowler *et al*., 2003) and cross tabulations of relevant variables were used where necessary to establish pattern, relationships and

statistical significance. Information from the key informant interviews was analyzed using key content analysis. Results were presented in tables and graphs. The Statistical Package for Social Sciences (SPSS) and Excel were used to process and analyze data.

4. RESULTS

Results of the surveys are presented within chapter 4.

4.1 Key informant interviews

On land use dynamics, tenure and labour, key informants were unanimous on the prevalence of sharecropping tenure arrangement in the study area. Majority reported sharecropping to be associated with cheating and abuse of sharecroppers' rights. There were conflicting views on cocoa rehabilitation, whiles majority indicated that rehabilitation of moribund cocoa farms were allowed only under new arrangements a few indicated that rejuvenation was permitted without any problem. Majority reported massive expansion of cocoa over the last 20 years at the expense of forests and more recently fallow lands due to limited forests, a trend characterized by use of sun tolerant hybrid varieties. Majority of informants indicated that hired labour were mostly employed and to some extent farmers and their families. It was reported that men are mostly preferred for hired labour especially young men around 30 years because they are deemed strong and hardworking. Access to land is limited for women. Similarly, labour accessibility is difficult for women except at harvesting when they are needed for carrying cocoa, breaking pods and fetching water for spraying. In terms of wages, men receive higher wages than women.

Regarding productivity and trade requirements, majority reported increased total cocoa production in the study area due to expansion and high tech-maintenance introduced by the government and LBCs, such as pollination. Beans dryness was the most important requirement by LBCs. Few also indicated that possession of passbook for verification of ownership and non-production in or near forest reserves were also important. On the part of farmers, many key informants reported that farmers are concerned by the scale of their buyers and require from them credit, inputs, equipment, premiums and bonuses.

Concerning organization of farmers, majority reported that farmers are organized and have a voice. Majority stated that concerns of farmers are mostly addressed at the group level and reach the district officers when no solution is offered at the group level. It was revealed that, a purchasing clerk was recently replaced at the request of farmers due to suspected scale adjustment. The sector minister visited the study area at the request of farmers to explain to farmers among others why cocoa price had not been increased for the past 4-5 years. A few indicated that, there are complaint forms that can be filled and summited to the district offices for action to be taken. There are frequent meetings between farmers and district officers where farmers are offered the opportunity

to deliberate with district officers. For majority of key informants, the challenge lies in farmers' co-operation when promises of inputs and other incentives are not met. LBCs do not give credit, but purchasing clerks of LBCs by their own initiative are sometimes able to assist farmers with credit facilities. There are instances where the group has helped members to access credits for school fees payment.

In relation to challenges and drivers, majority reported that there are challenges with sharecropping tenure arrangements that allow for no rejuvenation since landowners take back their lands when the cocoa is cut. Lack of inputs, pests, diseases, and equipment also remain very challenging. Majority of informants suggested consistent supply of inputs, affordable inputs and training as ways to address these challenges. Farmers are eligible to receiving help from the government and LBCs when they comply with high-tech maintenance practices enrolled out by the government. There are extension officers deployed for easy access by farmers. Farmers however oppose the 10 feet (ft) by 10ft planting distance that form part of the high-tech maintenance practices.

On future development, majority indicated that, the cocoa sector is expected to grow and expand. Major challenges will include lack of credits, high costs of inputs and lack of lands for expansion. There is also the problem of non-availability of quality inputs on the market. Majority asserted that, the impact of climate change is expected to be stronger. Conversion of cocoa plantations into rubber plantation due to the non-increment in cocoa prices poses a challenge. Though reported by few, a significant threat will also be the competition for cocoa lands with gold mining companies and illegal mining activities. Possible future drivers of cocoa growing/farming reported by majority of informants include; provision of credits, consistent supply of inputs, affordable inputs, provision of equipment and training offered through certification.

4.2 Demography of respondents

In total, 200 farmers from six communities were involved in the study. The age of participant farmers ranges from 18-60+ years old with majority of them (42%) between the age range of 31-45 years. Majority of respondents (71%) interviewed were males. Most of the respondents representing 62% were migrant farmers and 65% of farmers have been in cocoa farming up to fifteen years (Table 5).

Table 5: Summary of demographic information of respondents (percentage of respondents per commmunity)

	Bompieso [N. = 36]	Odumase [N. = 70]	Hunni-valley [N. = 40]	Nyamebekyere [N. = 20]	Breman [N. = 14]	Amoanda [N. = 20]	Overall [N. = 200]
Age range							
18-30	6	17	13	10	14	0	11.5
31-45	47	34	38	65	64	25	41.5
46-60	28	26	35	25	22	35	28.5
60+	19	23	14	0	0	40	18.5
Gender							
Male	67	52.9	82.5	100	71.4	85	70.5
Female	33	47.1	17.5	0	28.6	15	29.5
Residential status							
Native	27.8	55.7	15	0	35.7	80	38
Migrant	72.2	44.3	85	100	64.3	20	62
Years of farming							
0-15	61.1	58.6	62.5	80	78.6	70	64.5
16-30	36.1	24.3	17.5	20	21.4	30	25
31-45	2	10	15	0	0	0	7
46-60	0	7.1	5	0	0	0	3.5

4.3 Cocoa-driven landuse conversion

To understand the dynamics of land use conversion to cocoa plantations, as well as farmers reasons for expansion of cocoa cultivation, the percentage of farmers involved in the conversion of various land use to cocoa farmlands (in the past 20 years) was considered. In total, out of the 200 farmers interviewed, 29% have converted forests between 2000-2016. The relative increase in the conversion of forest between 2012-2015 and 2016-2019 was higher than any other observed. Similarly, forest conversion for 2004-2007 was much lower compared to the change observed for 2008-2011. Fallow land was the most converted landuse with majority (40%) of the sampled farmers. From Table 6, reported forest conversion was much prevalent in Nyamebekyere and Bompieso with 45% and 31% of respondents respectively. Amoanda had the least incidence of conversion of forest with 20% of respondents reporting it. Expansion to raise productivity was cited by majority of farmers (63%) as their reason for land use conversion.

Table 6: Cocoa driven-land use conversion and drivers (percentage of respondents per different converted land use, community and conversion driver)

Converted land uses							
Year of Establishment	Food cropland	Fallow area	Oil palm	Moribund cocoa farm	Forest	Coconut farm	Total
2000-2003	0	2	0	0	0	0	2
2004-2007	2	2	1	1	1.5	0	7.5
2008-2011	1	7.5	1.5	0.5	4	0	14.5
2012-2015	1.5	10.5	2.5	2	6	0.5	23
2016-2019	9	17.5	4.5	5	17	0	53
Total	13.5	39.5	9.5	8.5	28.5	0.5	100
Converted lands and drivers							
Converted land use	Bompieso	Odumase	Hunni-valley	Nyamebekyere	Breman	Amoanda	Overall
Forest	30.6	27.1	25	45	28.6	20	28.5
Fallow area	36.1	35.7	45	40	57.1	35	39.5
Food crop land	8.3	18.6	15	15	0	10	13.5
Oil pam	19.4	10	2.5	0	0	20	9.5
Moribund coca farm	2.8	8.6	12.5	0	14.3	15	8.5
Coconut farm	2.8	0	0	0	0	0	0.5
Drivers of land use conversion							
Expansion for raised productivity	36.1	60	67.5	80	85.7	75	62.5
Establishing improved variety	19.4	14.3	12.5	15	0	5	13
Rehabilitation of aged farm	19.4	8.6	10	0	14	10	10.5
Price increment	16.7	10	7.5	5	0	5	9
Infertile soil on previous farm	8.3	7.1	2.5	0	0	5	5

4.4 Projections for future expansion and landuse conversion

To have an overview of future landuse conversion, farmers' willingness for future cocoa expansion, land use preference for future expansion and the reason for the choice of preference was considered. Out of the total of 200 respondents, majority (84%) of farmers were willing to expand their cocoa farms. Willingness for cocoa expansion was high across all communities: at least 65% of farmers reported it across communities, with the higher percentage (95%) reported by farmers in Nyamebekyere. Men expressed higher willingness for expansion than women in all

communities interviewed. Majority (95.7%) of respondents aged 19-30 years, are willing to expand. The least willingness to expand was reported by respondents aged 60 and above with 62%. Majority (57) of farmers preferred forest for future expansion out of which 51% cited the reason for preference as fertile soil and high cocoa yield. The second most preferred land use was fallow areas representing 38% of respondents out of which 27% cited the same reason as given for preference for forest.

Table 7: Land use preference for future expansion and possible reasons (percentage of respondents)

Preferred land use and possible reasons							
Preferred landuse	Bompieso	Odumasi	Hunni-valley	Nyamebekyere	Breman	Amoanda	Total
Food cropland	8.8	8.5	0	0	0	7.7	5.4
Fallow areas	41.2	39	43.8	31.6	18	30.8	37.50
Oil palm	0	1.7	0	0	0	0	.6
Forest	50	50.8	56.3	68.4	82	61.5	56.5
Reason for preference	Bompieso	Odumasi	Hunni-valley	Nyamebekyere	Breman	Amoanda	Total
Easy access	5.9	15.3	3.1	0	9.1	15.4	8.9
Readily available	5.9	6.8	3.1	5.3	0	7.7	5.4
Fertile soil and high yield	82.4	74.6	81.2	84.2	82	69.2	78.6
Cheaper to establish	5.9	3.4	3.1	10.5	9.1	7.7	5.4
Easy to establish	0	0	9.4	0	0	0	1.8

One of the focus areas of the VSA mechanism is forest and peatland protection. Farmers' knowledge on the conversion of peatlands into cocoa land use in their communities was considered. Majority of respondents (57%) had knowledge on the conversion of peatlands in their communities. Respondents reported the highest (68%) knowledge on conversion of peatlands from Oduamsi, followed by Hunni-valley with 55% of respondents. Bompieso had the third highest (52%) knowledge on peatland conversion. The least (45%) was reported by Amoanda (Figure 10).

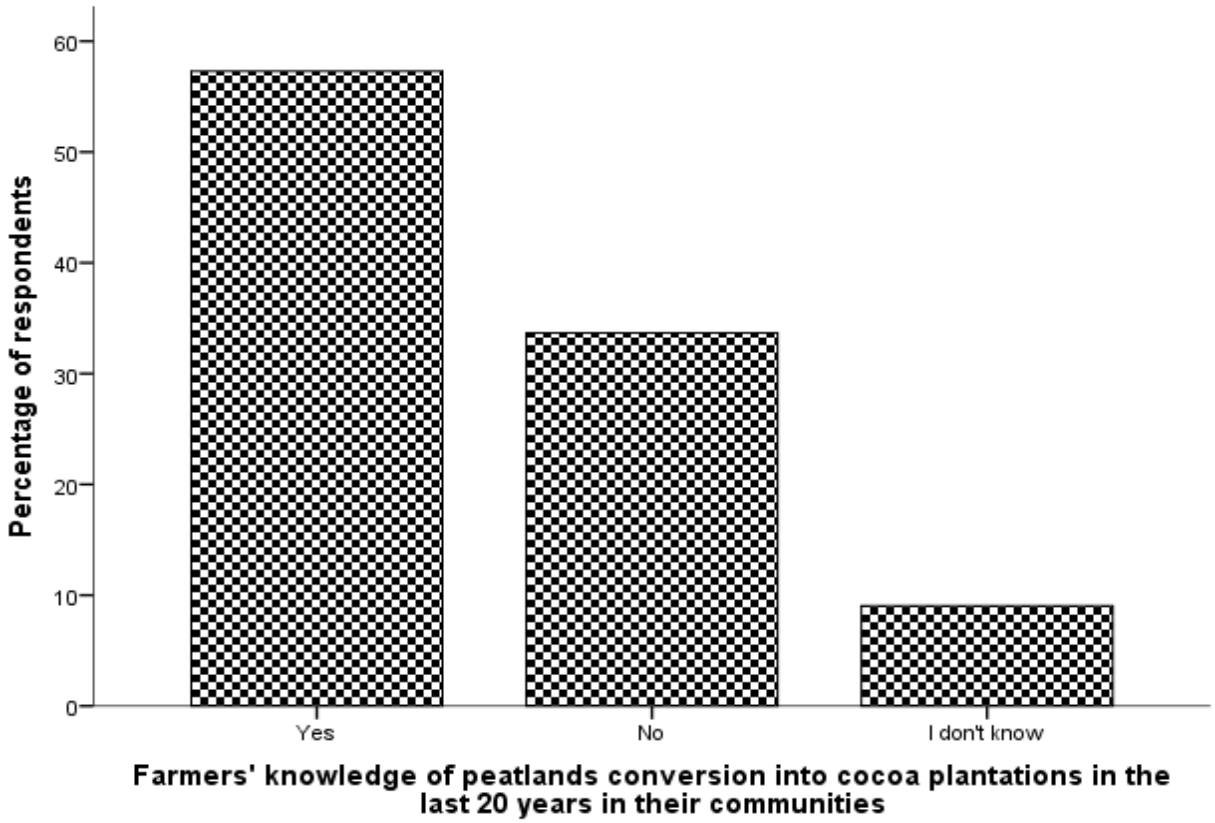

Figure 10: Farmers' awareness on peatland conversion in their communities

4.5 Land tenure arrangement and associated constraints

In total, majority of respondents (55%) had sharecropping tenure arrangement. This was followed by self-owned lands with 19%. Sharecropping was most prevalent among respondents in Nyamebekyere with 80% whiles self-owned land was most prevalent in Odumase with 23%. Similarly, family land tenure was also most prevalent in Odumase with 18.6% of respondents. The most common form of documentation for all terms of tenure were oral agreement and witnessed by chiefs and community leaders. In total, 43% of farmers had permanent terms of tenure, 39% of farmers had undecided terms of tenure whiles 19% of farmers had their tenure subject to termination by other party. Only 11% farmers had their tenure covered by court documents, 26% farmers had oral agreement, 30% witnessed by chiefs and community leaders and 34% farmers had no form of documentation. Permanent terms of tenure was most prevalent in Amoanda and

Oduamase. In total 80% of respondents had no form or restrictions imposed by their tenancy arrangement. The remaining 20% had one or more restrictions. Restriction on the use of agro-chemicals was more prevalent in Breman with 14% of respondents whiles restriction on the removal of diseased cocoa trees was more prevalent in Hunni-valley with 10% (Table 8).

Table 8: Summary of tenure characteristics of cocoa farmlands in the study communities (percentage of respondents per community)

Tenure types	Bompieso	Odumase	Huni-valley	Nyame bekyere	Breman	Amoanda	Overall
Sharecropping	55.5	41.4	75	80	71.4	25	55
Family land	16.7	18.6	10	0	0	10	12.5
Stool land	2.8	0.0	0	0	0	0	0.5
Purchased land	5.6	1.4	0	5	0	0	2
Gifted land	16.7	15.7	2.5	0	7.1	10	10.5
Borrowed land	0.0	0.0	2.5	0	0	0	0.5
Self-owned	2.8	22.9	10	15	21.4	55	19
Term of tenure							
Permanent	41.7	57.1	20	20	42.9	65	43
Non-permanent	44.4	27.1	47.5	75	28.6	20	38.5
Subject to termination	13.9	15.7	32.5	5	28.6	15	18.5
Tenure documentation							
Court documents	8.3	8.6	10	20	21.4	5	10
Oral agreement	30.6	17.1	35	40	21.4	15	25
Witnessed by community leaders	30.6	28.6	37.5	30	28.6	20	30
None	30.6	45.7	17.5	10.0	28.6	60	34
Restriction by tenure							
Rejuvenation	5.7	2.9	2.5	0	7.1	5	3.5
Removing diseases trees	5.7	5.7	10	5	0.0	0	5.5
Growing shade trees	5.7	5.7	2.5	0	0.0	0	3.5
Farm diversification	5.7	1.4	2.5	0.0	7.1	0	2.5
Use of agrochemicals	5.7	2.9	5	0	14	5	4.5
All mentioned activities	0.0	0.0	2.5	0.0	0.0	0.0	0.5
No restriction	71.4	81.4	75	95	71.4	90	79.9

4.6 Cocoa production: prevalent or perceived future challenges and involvement

4.6.1 Management cost and harvest

In Ghana, the COCOBOD defines a bag of cocoa as the gross weight of 64kg (COCOBOD, 2015). In total, 27.0% farmers harvest below 5 bags whiles 25% farmers harvest 5-10 bags. 10.5% farmers harvest between 11-15 bags, 9.5% farmers harvest between 16-20 bags and 28% farmers harvest above 20 bags. Farmers that spend beyond 1000 GhC and above tend to harvest more then 20 bags and farmers that spend below 500 GhC tend to harvest less than 5 bags (Table 9).

Table 9: Estimates of average annual harvest and production cost (GhC) per annually harvested product (n. of bags; 1 bag = 64kg)

Bags harvested	Bompieso	Odumasi	Hunni-valley	Nyamebekyere	Breman	Amoanda	Total
< 5 bags	19.4	37.1	20	25	7.1	35	27
5-10 bags	25	35.7	10	0	21.4	45	25
11-15 bags	11.1	10	10	30	0	0	10.5
16-20 bags	13.9	5.7	10	5	28.6	5	9.5
20+ bags	30.6	11.4	50	40	42.9	15	28
Production cost (GhC)	Bompieso	Odumasi	Hunni-valley	Nyamebekyere	Breman	Amoanda	Total
Below 500	44.4	37.1	30	5	28.6	40	33.5
500-1000	19.4	25.7	12.5	0	7.1	15	17
1000+	36.1	37.1	57.5	95	64.3	45	49.5

4.6.2 Trends for management cost and harvest

Out of the 200 farmers interviewed, 62% of farmers had seen an increasing trend for their cost of production whiles 8% had seen a decreasing trend over the last 5 years. Increasing production cost trend was most prevalent for farmers in Nyamebekyere, Breman and Amoanda respectively whiles increased harvesting trend was most prevalent for farmers in Nyamebekyere, Breman and Bompieso. Additionally, out of the 200 farmers interviewed, 43% experienced increased production trend over the last 5 years whiles 45% experienced a decreasing trend of harvest over the same period (Table 10).

Table 10: Farmers' perceived trend in cocoa production and harvest in the study communities (percentage of respondents per community)

Production cost	Bompieso	Odumase	Hunni-valley	Nyamebekyere	Breman	Amoanda	Overall
Increasing	52.8	58.6	60	90.0	64.3	60.0	61.5
Decreasing	11.1	7.1	5.0	10.0	14.3	0.0	7.5

Stable	33.3	30.0	35.0	0.0	21.4	40.0	29.0
Unkown	2.8	4.3	0.0	0.0	0.0	0.0	2.0
Harvest trend							
Increasing	47.2	31.4	35.0	65.0	64.3	55.0	43.0
Decreasing	47.2	52.9	52.5	30.0	21.4	30.0	45.0
Stable	5.6	14.3	7.5	5.0	14.3	15.0	10.5
Unknown	0.0	1.4	5.0	0.0	0.0	0.0	1.5

4.6.3 Prevalence of young cocoa farms in the study area

To understand cocoa production in the ensuing years to come, age of cocoa farms was considered. In total, majority (53%) of farms were aged less than 3 years (newly established) followed by 36% with farms between 3-8 years (young). This means that overall about 90% of total farms are less than 8 years. Only 2% of farmers had cocoa farms aged 16 years and above (old aged). Newly established farms were more prevalent in Nyamebekyere, Odumasi and Hunni-valley with 70%, 67% and 45% respectively (Table 11).

Table 11: Age categories of young cocoa farms in study communities (percentage of respondents per community)

Age of youngest cocoa farm	Bompieso	Odumasi	Hunni-valley	Nyamebekyere	Breman	Amoanda	Overall
< 3 years (newly established)	44.4	68.6	45.0	70.0	21.4	35.0	53.0
3-8 years (young)	47.2	22.9	35.0	25.0	64.3	55.0	36.0
9-16 years (medium aged)	8.3	4.3	17.5	5.0	14.3	10.0	9.0
>16 years (old aged)	0.0	4.3	2.5	0.0	0.0	0.0	2.0

4.6.4 Prevalence of young cocoa farms by gender of respondents

Female farmers had more newly established and young farms compared to their male counterparts. Majority of farmers (60%) aged 19-30 had newly established cocoa farms whiles 41% of farmers aged 60+ and above had young cocoa farms (Table 12).

Table 12: Age categories of young cocoa farms based on age and gender of respondents

	Percentage of respondents per gender		
Age of youngest cocoa farm	Males	Females	Overall
< 3 years (newly established)	51.1	57.6	53.0
3-8 years (young)	34.8	39.0	36.0
9-16 years (medium aged)	11.3	3.4	9.0
>16 years (old aged)	2.8	0.0	2.0

	Percentage of respondents per age				
Age of youngest cocoa farm	19-30	31-45	46-60	60+	Overall
< 3 years (newly established)	60.9	55.4	52.6	43.2	53.0
3-8 years (young)	39.1	37.3	29.8	40.5	36.0
9-16 years (medium aged)	0.0	7.2	15.8	8.1	9.0
>16 years (old aged)	0.0	0.0	1.8	8.1	2.0

4.6.5 Famers' views about future challenges and drivers in cocoa production

Farmers' perception on different challenges likely to affect future development in cocoa production was considered using a Likert scale ranking of 1-7 as presented in Table 13, where 1=Most important requirement, 2=More Important, 3=Important, 4=Moderately important, 5= Fairly Important, 6=Somehow important, 7=Least important.

The most important challenge perceived to affect future developments in cocoa production was the high costs of inputs. Lack of credit was also perceived as an important challenge followed by climate change. Inaccessibility to fertile lands for expansion and low productivity ranked as a moderately important challenges. Price fluctuations ranked as a fairly important challenge. Low income ranked as a somehow important factor. There was statistically significant difference of the different challenges perceived to affect future developments in cocoa production (X^2=621.246, df=6, $p<0.05$). Post hoc analysis with Wilcoxon signed-signed rank tests was conducted with a Bonferroni correction factor applied, resulting in a significance level set at 0.007. In Table 13, means of factors having the same alphabetical subscript are not statistically significant.

In addition, farmers' perception on different factors likely to drive future development in cocoa production was considered using a Likert scale ranking of 1-6 where 1=Most important requirement, 2=More Important, 3=Moderately important, 4= Fairly Important, 5=Important, 6=Somehow important. Farmers ranked timely supply of affordable inputs and price increment as an important driver of future developments in the cocoa production. This was followed by consistent input supply system as a moderately important driver. Certification and improved varieties were perceived to be fairly important. Emerging markets for cashew and rubber were ranked as being somehow important. There was statistically significant difference in the different perceived drivers of future developments (X^2=450.831, df=5, $p<0.05$). Post hoc analysis with Wilcoxon signed-signed rank tests was conducted with a Bonferroni correction factor applied, resulting in a significance level set at 0.008. From Table 13, means of factors having the same alphabetical subscript are not statistically significant.

Table 13: Ranked challenges and drivers of future developments in cocoa production as perceived by farmers

	Perceived challenges					
Factors	Minimum	Maximum	Mean ± SD	Chi-Square	df	p-value
Climate change	1	7	3.68 ± 1.66 a	621.246	6	0
Limited forest lands for expansion	1	7	4.47 ± 1.36 b			
Lack of credit	1	7	2.35 ± 1.34 c			
High costs of inputs	1	6	1.69 ± 0.99 b			
Low productivity	1	7	4.22 ± 1.40 d			
Price fluctuations	2	7	5.53 ± 1.49 e			
Low income	1	7	6.08 ± 1.16 f			
	Perceived drivers					
Factors	Minimum	Maximum	Mean ± SD	Chi-Square	df	p-value
Certification	1	7	4.06 ± 1.51 a	450.831	5	0

Consistent input supply system	1	6	2.90 ± 1.20 b
Timely supply of affordable inputs	1	6	2.26 ± 1.27 c
Improved varieties	1	6	3.80 ± 1.41 a
Per bag price increment	1	6	2.41 ± 1.44 c
Emerging markets for cashew and rubber	3	6	5.60 ± 0.58 d

4.7. Labour and related issues in cocoa production

Different aspects dealing with labour issues, including the prevalent sources of labour on cocoa farms, labour access by gender, wage disparity by gender and child labour were considered. The most common source of labour on cocoa farms were self (farmers) and hired labour. In total, out of the 200 farmers interviewed, 35% combined their own and hired labour, whiles 24% employed the services of hired labour only. Only 6% of farmers employed services from themselves and family members (household). The preference for mature and young workers were also considered by the study. By mature males and females, the study referred to people beyond 25 years whiles young men and women refer to 18-24 years. In general terms, mature workers are preferred to young ones and both for mature and young workers, men are preferred to women.

To understand the disparity in wages among mature males, females and children for services of hired labour, one-way ANOVA was performed on the wages received by mature males, females and children. Males received the highest mean wage of GhC 33.39±0.49 whiles females received GhC 25.06±0.34 for services of hired labour. Children received the least wage of GhC 21.45±1.40 Males received the highest wage. There was statistically significant difference between the mean wages for the different labour groups ($p<0.05$) (Figure 11).

Figure 11: Prevalent labour sources in cocoa production

To understand the use of child labour in cocoa production, one-way ANOVA was performed on the number of people for different age groups that farmers had engaged on their farms over the past one year. Children under the age of 18 were involved in cocoa production. The mean number of laborers engaged over the previous year for different age classes were 2 for below 10 years, 3 for 10-13 years, 3 for 14-17 years, 4 for 18-30 years and 3 for 31-40 years. However, there was no statistically significant difference between the mean numbers of laborers for the different age classes engaged by farmers over the past year (Figure 12).

Figure 12: Age groups of labour involved in cocoa production

4.8 Possible shifts by farmers from cocoa production

In order to have an overview of the prospects of cocoa farming in the study area in the next 5 years, future involvement of farmers in cocoa production was considered. Compared to other types of farming, cocoa production has the highest prospects of future involvement. In total, 47% of respondents interviewed showed preference to remain in cocoa farming with 22% of farmers showing interest to expand their farms over the next 5 years. 16% of the total respondents wish to shift into rubber farming. Preference for cocoa farming was higher among farmers in Bompieso and Nyamebekere, representing 56% and 55% respectively. 23% of farmers in Odumase prefer to shift to rubber farming. Cocoa expansion was more prevalent for farmers in Breman, Odumase and Hunni-valley.

Table 14: Future involvement of farmers in cocoa production (percentage of respondents per community)

Preferred occupation	Bompieso	Odumase	Hunni-valley	Nyamebekyere	Breman	Amoanda	Overall
Remain in cocoa farming	55.6	40.0	42.5	55.0	42.9	55.0	46.5
Cashew farming	2.8	2.9	5.0	5.0	7.1	0.0	3.5
Rubber farming	19.4	22.9	10.0	10.0	14.3	10.0	16.5
Oil palm farming	0.0	2.9	2.5	5.0	0.0	0.0	2
Cocoa expansion	16.7	22.9	22.5	20.0	35.7	20.0	22
Unknown	5.6	4.3	12.5	5.0	0.0	15.0	7
Other	0.0	4.3	5.0	0.0	0.0	0.0	2.5

4.9 Possible shifts by farmers from cocoa production by age and gender

Out of the 200 farmers interviewed, majority of female farmers have both preference to remain in cocoa farming and expansion, representing 48% and 31% respectively. With regard to age, majority of farmers within the age class of 19-30 and 31-45 have higher preference to remain in cocoa farming representing 52% and 49% respectively. Majority of farmers (22%) aged 60 years and above would prefer to go into rubber farming whiles the same age group showed the least (16%) preference for cocoa expansion (Table 15).

Table 15: Future involvement in cocoa production based on age and gender of respondents

	Percentage of respondents by gender		
Preferred occupation	Male	Female	Overall
Remain a cocoa farmer	46.1	47.5	46.5
Cashew farming	4.3	1.7	3.5
Rubber farming	19.9	8.5	16.5
Oil palm farming	2.1	1.7	2.0
Cocoa expansion	18.4	30.5	22.0
Unkown	5.7	10.2	7.0
Other	3.5	0.0	2.5

	Percentage of respondents by age classes				
Preferred occupation	19-30	31-45	46-60	60+	Overall

Remain a cocoa farmer	52.2	49.4	40.4	45.9	46.5
Cashew farming	4.3	2.4	7.0	0.0	3.5
Rubber farming	4.3	15.7	19.3	21.6	16.5
Oil palm farming	0.0	2.4	1.8	2.7	2.0
Cocoa expansion	21.7	27.7	17.5	16.2	22.0
Unkown	4.3	2.4	10.5	13.5	7.0
Other	13.0	0.0	3.5	0.0	2.5

4.10 Farmers' group membership: Prevailing reasons and cocoa trading requirements

Access to credits and inputs were two most important reasons for farmers membership of farmers' group. In terms of LBCs operating in the area, Eliho-Touton and Armajaro were the two most common LBCs involved in cocoa trading with the farmers. Out of the 200 farmers interviewed, majority (42%) of farmers trade with Eliho-Touton followed by Armajaro with 38%. Eliho-totuton was more prevalent among farmers in Amoanda, Bompieso and Odumase with 100%, 61% and 60% respectively. On the other hand, Armajaro was more prevalent in Hunni-valley, Nyamebekyere and Breman with 98%, 95% and 86% (Table 16).

Table 16: Prevailing reasons for farmers' involvement in farmers' group in the study communities (percentage of respondents per community)

Reason for membership	Bompieso	Odumase	Hunni-valley	Nyamebekere	Breman	Amoanda	Overall
Access to inputs	15.6	40.3	2.9	5.3	0.0	17.6	19.6
Access to credits	25	12.9	34.3	15.8	42.9	17.6	22.3
Access to training	6.3	19.4	11.4	31.6	14.3	5.9	15.1
Access to inputs and credits	9.4	3.2	8.6	5.3	7.1	11.8	6.7
Access to inputs and training	21.9	3.2	2.9	21.1	7.1	11.8	9.5
Access to training and credit	6.3	4.8	14.3	10.5	21.4	5.9	8.9
Access to inputs, credits and training	3.1	0.0	2.9	10.5	0.0	5.9	2.8
Buyers' requirement	3.1	4.8	11.4	0.0	7.1	17.6	6.7
To have a voice	0.0	0.0	5.7	0.0	0.0	0.0	1.1
Bonus/premiums	9.4	11.3	5.7	0.0	0.0	5.9	7.3

With respect to gender, majority of female farmers' membership was determined by access to inputs (31%) and to credit (27%), compared with their male counterparts (15% and 21% respectively). Access to training was more important for males than females representing 16.5%

and 12% respectively. Similarly, having a voice was a stronger determining factor for males with 9% whiles bonus/premiums were considered more important by females with 12%. Regarding age, access to credits and access to inputs were considered more important for farmers aged between 19-30 years with 32% and 26% respectively. Access to training, was more important for farmers aged between 31-45 with 18% (Table 17).

Table 17: Prevailing reasons for farmers' involvement in farmers' group based on age and gender

Reason for membership	Percentage of respondents by gender		
	Male	Female	Overall
Access to inputs	15	30.8	19.6
Access to credits	20.5	26.9	22.3
Access to training	16.5	11.5	15.1
Access to inputs and credits	8.7	1.9	6.7
Access to inputs and training	10.2	7.7	9.5
Access to training and credit	10.2	5.8	8.9
Access to inputs, credits and training	10.2	5.8	8.9
Buyers' requirement	3.1	1.9	2.8
To have a voice	8.7	1.9	6.7
Bonus/premiums	5.5	11.5	7.3

Reason for membership	Percentage of respondents by age				
	19-30	31-45	46-60	60+	Overall
Access to inputs	26.3	17.1	19.2	21.9	19.6
Access to credits	31.6	17.1	30.8	15.6	22.3
Access to training	15.8	18.4	9.6	15.6	15.1
Access to inputs and credits	5.3	3.9	5.8	15.6	6.7
Access to inputs and training	0.0	11.8	7.7	12.5	9.5
Access to training and credit	0,0	11.8	11.5	3.1	8.9
Access to inputs, credits and training	0.0	6.6	0.0	0.0	2.8
Buyers' requirement	15.8	5.3	5.8	6.3	6.7
To have a voice	0.0	0.0	3.8	0.0	1.1
Bonus/premiums	5.3	7.9	5.8	9.4	7.3

4.10.1 Farmers' and LBCs' expectations during cocoa trade

The requirements by buyers from farmers during cocoa trade was considered using a Likert scale ranking of 1-5 where 1=Most important requirement, 2=More Important, 3=Important, 4=Somehow important, 5=Least important (Table 18). Beans dryness and colour was identified as an important requirement by buyers during cocoa trading. The least important requirement was nature of beans ownership. There was statistically significant difference in buyers' requirements from farmers during cocoa purchase (X^2=35.5, df=4, $p<0.05$). Post hoc analysis with Wilcoxon signed rank tests was conducted with a Bonferroni correction factor applied, resulting in a significance level set at 0.01. Factors with same subscript are not statistically significant.

Similarly, requirements by farmers from buyers during cocoa trade was considered using a Likert scale ranking of 1-7 where 1=Most important requirement, 2=More Important, 3=Important, 4=Moderately important, 5= Fairly Important, 6=Somehow important, 7=Least important (Table 18). Weighing type or scale and input supply from buyers were ranked as the most important factors required by farmers from buyers during trade. Another important features were input supply from buyers and ready payment/no credit buying. The least important requirement was whether the buyer was a government LBC or a private licensed buying company. There was statistically significant difference in the different farmers' requirement from buyers during cocoa purchase (X^2=667.024, df=6, $p<0.05$). Post hoc analysis with Wilcoxon signed-signed rank tests was conducted with a Bonferroni correction factor applied, resulting in a significance level set at 0.007.

Table 18: Buyers' and farmers' requirements in the trading of cocoa

	LBCs' requirements					
Factors	Minimum	Maximum	Mean ± SD	Chi-Square	df	p-value
Registered and trained	1	5	2.20 ± 1.63 a	35.507	4	0
Uniformity in size	2	5	3.27 ± 0.96 b			
Beans dryness and colour	1	3	1.53 ± 0.74 c			
No production in reserve areas	2	4	3.33 ± 0.90 b			
Nature of beans ownership	2	5	4.67 ± 0.82 d			
	Farmers' requirements					

Factors	Minimum	Maximum	Mean ± SD	Chi-Square	df	p-value
Weighing type or scale	1	5	2.28 ± 1.33 a	667.024	6	0
Input supply from buyers	1	6	2.46 ± 1.33 ab			
No credit buying	1	7	2.61 ± 1.32 b			
Premiums/bonuses/promotions	1	7	3.87 ± 1.20 c			
Extension services/ training	1	7	4.78 ± 1.42 d			
Provision of credit	1	7	5.63 ± 1.66 e			
Private or government buyer	4	7	6.30 ± 0.90 f			

DISCUSSION

Chapter 5 reports discussion based on results presented within chapter 4.

5.1 Land use dynamics: applicability and implications for VSA

Smallholder farmers in West Africa are culprits in deforestation due to efforts to expand cultivation through the conversion of forests (Wessel and Quist-Wessel 2015). There has been the conversion of different land uses into cocoa plantations in the selected communities. The conversion of lands into cocoa production has progressed from the year 2000 to 2019 (Table 6). The number of farmers who have converted forest into cocoa was used as a proxy to estimate the total converted area from 2000-2019, given that in Ghana, the average size of smallholder cocoa farms has been estimated to be between one to four hectares (Barrientos, 2016; Wessel and Quist-Wessel, 2015). Therefore, it is estimated that, within selected communities, between 58-232 hectares of forest have been converted into cocoa farm during the last 20 years. Key informants revealed there has been a growing interest in cocoa production by natives of the targeted communities that have increased pressure on remnants of forested family lands and available fallow areas.

The relative increase in the conversion of forest between 2012-2015 and 2016-2019 was higher compared to any of the year intervals within the 20 years period. Contrary, forest conversion for 2004-2007 was much lower compared to the change observed for 2008-2011. Cocoa price was increased from GhC5,520.00 per ton to GhC6,720.00 per ton for the 2015/2016 cocoa season (COCOBOD, 2015). This 21.7% increment in producer prices and an expectation for similar adjustment from 2016-2019 could be responsible for the increased forest conversion over these two periods. Another reason could also be the increasing involvement of natives in cocoa production in the targeted communities. The reverse of these two reasons is probably responsible for the observed differences in forest conversions 2004-2007 and 2008-2011. The drift in interest to cocoa farming can be attributed to the reduction in illegal mining activities due to recent government control. Mining is one of the major economic activities in the study area which is mostly deemed lucrative by natives compared to cocoa farming. It confirms the findings of Victor *et al*. (2010) that recent growth in national output has been the use of full sun productions systems by converting forests in the Western region.

Forest conversion was prevalent in all the communities but was much prevalent in Nyamebekyere and Bompieso (Table 6). The high prevalence of forest conversion in these two communities can

be due to the numerous newly established cocoa farms in the two communities (Table 11). Odumase had the highest number of newly established farms (Table 11) but this expansion is more at the expense of fallow lands than forests (Table 6). According to key informants interviewed, cocoa production has expanded greatly over the past years at the expense of forests and, more recently, of fallow lands that were previously used for food production. They added that forests have diminished, and fallow areas are diminishing rapidly. This seems to be consistent with reports and studies indicating that cocoa plantation is a land use system that has modified several parts of the forest landscape of West Africa (Gockowski and Sonwa, 2011). It also confirms reports by Cocoa Barometer, 2018 and Obiri *et al*., 2007 according to which the production of cocoa is a major driver of global deforestation of tropical forests. According to Ruf, (2001) and Ruf and Schroth, (2004), the current deforestation in Ghana, especially in the Western Region of the country, is attributed to the continuous conversion of forestlands to cocoa farms.

5.1.1 Drivers of cocoa-driven land use conversion

Cocoa is often grown after forest clearing and farmers usually migrate to establish new cocoa farms in forest frontiers rather than replanting aged farms (Ruf *et al*., 2015). Different reasons were identified as drivers for the prevalent land use conversions. 63% of farmers converted lands into cocoa production with the aim of expanding their farms in order to increase productivity**.** According to Dawoe *et al*. (2014), the Western region of Ghana remains the last frontier for expanding the area under cocoa production hence the reduction rate of available virgin forests in the region has been drastic. Establishing of improved varieties was the second important driver for conversion of fallow areas and forestlands. 13% of farmers converted lands to establish improved variety. According to key informants interviewed, most farmers are shifting to the use of hybrid sun tolerant varieties as compared to past years. This confirms findings by Victor *et al*., (2010) that recent growth in national output has been at the expense of conversion of forests to full sun productions systems in the Western region of Ghana. Rehabilitation of moribund cocoa farms was reported by only 8.5% of farmers (Table 6). KPMG (2013) reported that in West Africa as high as 35% of all cocoa trees are beyond 35 years that is far past their peak. However, there was a lower reportage of this as a driver of land use conversion by farmers. From key informant interviews, once sharecroppers cut down their cocoa farms, the previous land use arrangement ends and farmers are expected to enter into new tenure arrangements with their landowners. Farmers are aware of this and are therefore reluctant in efforts to rehabilitate moribund

cocoa farms. Aside tenure, there are costs associated with the removal of cocoa trees, procurement of seedlings and replanting. In addition, post-planting activities cost and the time lag until the new trees starts to produce has economic implications on the farmer and cocoa rehabilitation.

According to a key informant, the government should pass a law that prohibits landowners to seize rejuvenated cocoa lands. This confirms reports by Cocoa Barometer (2018) that attempts to remove diseased trees or natural disasters that destroy trees can result to loss of land rights, as can any move towards agroforestry (Cocoa Barometer, 2018). The results also confirms reports by Quaye *et al*., (2014) in a study of four of Ghana's major cocoa growing regions where 62% (n=231) of farmers cited land tenure arrangements as a factor that affects the adoption of sustainable farming practices.

5.1.2 Cocoa driven land use conversion and peatlands

50% of farmers interviewed reported that there has been the conversion of peatlands into cocoa plantations in the last 20 years (Figure 10). Though the knowledge of peatland conversion was asked at the community level, most farmers interviewed added that they themselves had converted peatlands. Some of these peatlands were abandoned portions of their previous farms and new ones given out by landowners. They continued to indicate that to be able to use the peatlands for cocoa production, a canal to allow for efficient drainage was necessary and this came with additional labour requirements. Farmers indicated that peatlands were not conducive for cocoa production because the leaves turn red during the rainy season when there is excess water and these trees are able to bear fruits only in the dry season when the water level in the soil has reduced. The conversion of peatlands into cocoa plantations could be due to exhaustion of forests which is gradually making the expansion of land area under cultivation difficult (WWF, 2006). According to FAO (2017), the Western region accounted for 56% and 53% of the total national cocoa production in 2011 and 2012 respectively, which confirm possible pressures over peatlands. The high prevalence of peatlands in the study area is understood because, it falls within the wettest part of the country and records an average annual rainfall (bi-modal rainfall pattern) of 1,600 mm per annum (Victor *et al*., 2010). Another possible reason for the conversion of peatlands could also be due to lack of awareness by farmers on the importance of peatlands and the lack a framework to protect peatlands. The responsibility of both buyers and producers is not clear on protection of peatlands, because buyers seek to meet their target purchase for more cocoa beans whiles

producers seek to expand production in order to meet this demand. Moreover, the landowners have sole rights over the lands and solely decides on their usage especially in the absence of law that protects peatlands.

The study has highlighted the prevalent conversion of forests and peatlands and the drivers of these conversions in the study area. In addition to the prevalent forests and peatlands conversion, the overview of willingness for cocoa expansion and the preference of forest for these future expansions in the study area has implications for the VSA mechanism since the protection of forests and peatlands is one of the focus areas for it. Apparently, there is a huge gap on forest and peatland protection in the study area. This gap makes the focus on forests and peatlands protection relevant in the study area and offers the opportunity and the need to using the VSA mechanism to bridge the identified gap.

5.2 Key areas of the VSA initiative and gaps

Results as presented in Chapter 4 have been discussed also in the light of VSA requirements. Details are reported below.

5.2.1 Constraints associated with tenure arrangements

55% of farmers reported sharecropping arrangements as a formal framework for their land tenure rights, however 36% of farmers subject to sharecropping agreements have no form of restriction on their farms. On the contrary, 18% of sharecroppers have one or more activities that is prohibited or restricted under their tenancy arrangement. It could be observed that, restrictions or limitations was prevalent for tenancy for which official land titles are likely to be absent (stool land, gifted, sharecropping and borrowed lands) (Table 8). Under these tenancy arrangements especially sharecropping, the sharecropper is only responsible for farm maintenance with the landowner retaining the right over his land (Roth *et al.*, 2017). Under such form of arrangements, the decision on the dos and don'ts on the farm is made by the landowner with the sharecropper acting only as an executioner of such decisions. This according to Ehiakpor (2016) has implications on the level of yield because the farmer cannot adopt all combinations of relevant sustainable practices intended for optimum yield. Key informant interviews with other actors on what could be done to solve the issue of tenure security indicated that little could be done since the lands belong to the traditional rulers, stool lands and families. When the subject of pension schemes as means for takeover was suggested, it was refused by a traditional who indicated that, landowners prefer their

lands to be passed on to their family lineage rather than a government takeover. A town committee chairperson interviewed however, welcomed the idea citing that his age is failing and he can no longer work on the lands, as he ought to in order to make any meaningful economic gains.

The high prevalence of sharecropping arrangements is due to the fact that, majority of the farmers interviewed (62%) were migrant farmers (Table 5). As gathered from key informant interviews, cocoa production until recently was not attractive to natives because working in the mining companies or trading in the favorable trading economy created by the mining sector were deemed more lucrative. As such, family lands and stool lands were often given out to migrants for cocoa farming under sharecropping arrangements. This practice has been reported to be common in Ghana's cocoa sector (Roth *et al*., 2017). Under such customary land agreements, the farmer has the responsibility of maintaining the farm and the farm is divided when the trees mature with the farmer holding perpetual right over his share on condition that the land remains in cocoa production. A different form of this customary arrangement is where the harvest is shared between the landowner and farmer who acts only as a sharecropper with landowner retaining the right over his land (Cocoa Barometer, 2018). According to key informants, sharecropping was the most common tenure regime but was characterized by many disputes and cheating.

43% of farmers had permanent terms of tenure whiles 39% had non-permanent terms of tenure (Table 8). A sub-group of non-permanent tenure terms representing 19% of farmers had tenure terms that is subject to termination by landowners. Since young cocoa farms are the most common situation detected within the sample, the prevalence of permanent tenancy terms in the area could be due to lessons learnt by farmers in previous arrangements. Farmers perhaps are now in a better position to discuss terms of their tenure with their landowners at the beginning of the farming, which has traditionally not been the case. In spite of this, 58% (non-permanent and subject to termination by landowner) of farmers had no secured terms of tenure. Therefore, from the study permanent there is no prevalence of permanent tenancy in the targeted communities.

For documentation of terms of tenure, only 11% of farmers had their tenancy covered by legal/court documents. The rest were covered by informal arrangements such as oral agreements, witness by chiefs and or community leaders. A farmer reported an incidence where he was released of his sharecropping arrangement at the age of maturity when the farm was ready to be shared between him and the landowner. After several years of farming, he ended up with no portion of

the farm, as the owner would not head to the numerous pleadings he made. The study thus confirms report by Cocoa Barometer (2018) that many farmers do not hold any official land titles and that most often rights to use land have been acquired through informal or traditional tenure systems. This therefore highlights the difficulty for farmers to have official land titles. Tenure arrangements do have implication on the VSA approach. Large number of farmers have non-permanent tenure as well as non-official land titles. Coupled with this, many farmers work on lands whose tenure can be abrogated by the landowner at any point in time. Official documentation of tenure is almost non-existent with customary arrangements replacing legal security of tenure. The gaps identified renders tenure which is one of the focus areas of the VSA approach feasible and applicable to the VSA whiles highlighting the gap in the study area that can be improved with the VSA approach.

5.2.2 Labour in cocoa production

Cocoa production has traditionally been described as a household economic activity (Bangmarigu and Artan, 2018). From this premise, it was expected that farmers themselves and their families would be the major source of labour for cocoa production in the study area. However, the major source of labour on cocoa farms in the study area was self (farmers) and hired labour (Figure 11). Apparently, farmers highly employ the services of hired labour. The deviation from household cocoa farming could be due to the high awareness of child labour among farmers. Key informant interviews revealed that farmers in the area have been educated and sensitized on child labour. LBCs have included child labour under good social practices of their certification/verification schemes. There are child labour committees that track and report all incident of child labour to the LBCs with which the farmer trades. Since child labour constitutes a violation of both international and national labour laws, LBCs have incorporated in their terms of trade with farmers, and farmers stand to lose the premiums paid on their beans when compliance was met. In Odumase, the chief indicated that migrant farmers were often culprits in child labour and that he had personally reported households to the police for offences of child labour. To avert this, the chief reported that migrant farmers now often lie that the children they live with are not their own children, an assertion that is not a justification for child labour. This leaves questions on the understanding farmers have on the subject of child labour. However, the notion has traditional roots in the practice of adoption and rendering help to other people's children, where it is acceptable when certain responsibilities are not met.

Shared labour is when a group of farmers cooperates in turns to offer labour on their farms. This practice has been limitedly reported by respondents. The reason for this may be the high level of commitment it requires from all parties which is not easily achieved.

5.2.3 Labour access and remuneration for different groups

According to the Cocoa Barometer (2018), on average, women run a quarter of all cocoa plantations in West Africa. The cocoa sector has often been perceived as a male-dominated sector in several countries (Neilson, 2007). In spite of their contribution to the sector, women have limited access rights to land, extension services, credits and certification compared to their male counterparts (Cocoa Barometer, 2018). Mature men were ranked as the most preferred workers followed by mature women for both access to labour and payment of higher wages. Young men ranked third as the preferred labour group with young women ranked as the least preferred. Most farmers declared to prefer men when engaging services of high labour because men are stronger and able to work harder compared to their female counterparts. Key informants indicated that labour access for men around 30 years is easy because they are deemed strong and hardworking. Services of women are preferred during the harvesting season where they carry beans, spraying of cocoa farms when they are need to fetch water and removal of beans from pods that are broken by men because these activities are largely regarded as being more feminine. This implies that women stood the chance of having access to hired labour only in the absence of their male counterparts. In addition to that, farmers are willing to pay men higher wages compared to their female counterparts. An interesting reason given by some farmers for wanting to pay men higher than women was that men needed to take care and support their families. Others indicated that mature men have experience in cocoa farming. According to Barrientos (2013), women do not have the same opportunities as their male counterparts in the cocoa sector due to constraints imposed by gender. It also highlights the perception that production of cocoa is physically laborious and involves the use of machetes and other cutting instruments perceived to be difficult tasks for women. For farmers who preferred young men and women workers, the reason given was that these categories of labour groups could be rebuked easily compare to mature men and women.

5.2.4 Gender disparity in wage for services in hired labour

Males received GhC 8.33 per day more than their female counterpart whiles females received GhC 3.61 more than children under 18 years. The higher wage received by men is due to the traditional perception of cocoa as a sector that is dominated by men (Neilson, 2007). Again, it highlights the

perception that production of cocoa is physically laborious and that men are stronger and able to work harder to meet the high demands of labour that cocoa production requires compared to their female counterpart or children. Another reason may be because men have traditionally been seen as the breadwinner of their families and as such deserves to be paid more in order to be able to perform their responsibilities in that regard. This confirms earlier findings by ILO and IPEC (2013) that there is a huge disparity between the remuneration of males and females in Ghana's cocoa sector. According to Baah-Boateng (2012), favoritism for males and discrimination for females in the Ghanaian labour market has resulted in a large wage gap in favour of men.

5.2.5 Child labour in cocoa production

Child labour in cocoa production is both a symptom and a contributing factor for poverty as children give up formal education to work in cocoa plantations (Luckstead *et al*., 2019). Farmers were asked to state the number of people for different age categories whose services they have employed on their farms over the last one year. In spite of cocoa farming being a backbreaking labour (Cocoa Barometer, 2018), it appears children aged under 10 years and 18 years have equally been employed like their adult counterparts by farmers for services of hired labour on their farms. According to Cocoa Barometer (2018), increases in cocoa production has led to an absolute increase of child labourers. The use of children under 18 years can be attributed to the expansion of cocoa and the high reliance of hired labour in cocoa farming that is prevalent in the study area (Figure 11). The Minimum Age Convention of the International Labour Organization on child labour sets the minimum age for employment at 15 and the minimum age for hazardous work at 18 (ILO, 2019). Therefore, the active involvement of children (Figure 12) in cocoa farming violates the dictates of both international and national laws on child labour. Ghanaian law states that children under 18 years are prohibited from working on a farm for more than "three hours per day or more than 18 hours per week (for children on weekends, holidays, and/or children who have completed school)" or "more than 2 hours/day on a school day" (GoG, 1998). However, the prevalence of poverty in many cocoa households renders child labour a necessity for survival, hence current child labour laws are rarely enforced (Luckstead *et al*., 2019). The study thus confirms report by ILO and IPEC (2013) that regardless of the widespread awareness on the importance of child education, child labour remains an integral part of Ghana's cocoa sector. Indeed, as gathered from interaction with farmers, there seems to be great awareness on child labour among farmers because farmers reiterated Ghana government's clamp down on child

labour. By asking farmers their use of workers for different age groups over the past year, farmers had limited possibility to shy away from the fact that they engaged the services of children on their farms compared to when asked directly about the use of children on their farms. Field observations made during data collection seems to indicate that whiles farmers will not readily engage their own children on their cocoa farms, they are flexible when it comes to the use of other children on their farms. This brings to bear how messages and education on child labour are packaged for farmers. For instance, the Deputy Chief Executive of COCOBOD (Mr. Kwabena Asante Poku) in 2012 was quoted to have said "*as the regulator of the cocoa industry, (COCOBOD) had worked tirelessly with partners and other stakeholders to sensitize cocoa farmers to conduct their operations in a professional manner, and ensure that their children attend school during school hours without any hindrance*" (Luckstead *et al*., 2019 and Anane, 2012). The message should not just be limited to the use of one's own children but children in general.

From the study, it is apparent that there is a huge gap in the different aspects of labour and the VSA approach. The focus of VSA on labour is therefore feasible and applicable in the study area. This has implication for the VSA approach because there is the need for intensified efforts on eliminating all illegitimate issues of labour in the cocoa sector which can be achieved through the VSA approach.

5.2.6 Transparency and governance

As high as 73% of farmers indicated that there are meetings held between the farmers and district actors monthly. The frequent interactions between the two levels of actors could be due to the highly organized farmers' base that is made available by the efforts of the LBCs. This makes it easy to quickly mobilize farmers for meetings even in circumstances when they were not given notice in advance. Purchasing clerks are the organizers for the farmers their company trades with. Experience during field data collection revealed that farmers were efficiently and effectively mobilized once a message was sent through their purchasing clerks. There are chief farmers in communities that cooperate with district actors of LBCs and the district actors of the COCOBOD. There is cooperation among the different LBCs which allows joint meetings to be organized for farmers. These joint meetings are also used by the district actors of the COCBOD to reach out to farmers on a broader scale in the study area. Purchasing clerks interviewed as key informants however, added that getting farmers' cooperation depended on the level of trust between them and

the farmers. This trust is built when the clerks are able to meet the needs of farmers such as giving them credit facilities and equipment. Another factor is the timely delivery of inputs and fulfilment of promises given by LBCs. The meeting serves as a medium for the farmers to voice out and share their opinions on matters that bothers on cocoa production. Apart from being given a voice, farmers are also heard and have the power to push for their requests to be met. The power to push for their requests to be met has been demonstrated in the successful replacement of a purchasing clerk on suspicion of malpractice in dealings with farmers and farmers' meeting with Ghana's sector minister for food and agriculture for clarifications from government on why cocoa prices have remained stable for years.

With regard to governance and transparency, there seem to be limited gap in the study area and the VSA approach. It emerged that farmers have a voice and not only have a voice but their voice is heard and as such places them in a position that ensure their requests are granted. Nevertheless, the VSA approach can help strengthen transparency and governance by increasing the level of collaboration of all the relevant actors which will be brought on board during the signing of the VSA compact. Another implication for VSA is that, bringing the different actors together will not be so much task due to the level of cooperation that is already in existent in the study area.

5.3 Peculiarities of cocoa development: challenges, drivers, trade requirements and production trends

This sub-chapter discusses findings about cocoa farming development with regard to challenges, drivers, trade requirements and production trends.

5.3.1 Possible challenges in cocoa production

Farmers perceive rising costs of farm inputs to be the most important challenge to face the future of cocoa production (Table 13). Poverty among cocoa farmers is high and even the receipt of premium prices for certification does not directly translate into improvement in their condition of work (Ministry of Foreign Affairs, Netherlands (CBI), 2016). According to farmers, the cost of inputs keeps rising, which makes it difficult for them to afford the required inputs for their farms. The difficulty in meeting the cost of farm inputs could be the reason why farmers ranked lack of credit as another important challenge. Farmers reported that though the government does assist with inputs, it is inadequate for their farms and they have to wait for long hours at the district offices for their share. Farmers also perceive climate change as an important challenge to face the

future of cocoa production. Key informant interview confirmed the impact of climate change in the area. According to them, Tarkwa at 2 pm (an accolade for the daily prompt and punctual rains in the district at 2pm) have changed over the years in intensity, frequency and timeliness. The perception of climate change as an important challenge is in line with report by Climate Central (2018) that loss of 70% forest cover in the past decades in West Africa have aggravated climate change with prolonged droughts and less intensive rainfall and that large portions of the regions cocoa lands will be less suitable for the production of cocoa in the decades to come due to impact of climate change. Inaccessibility to fertile lands for expansion and low productivity is perceived as a moderately important challenge. The Western Region of Ghana remains the only frontier to increase the area under cocoa cultivation in Ghana because it hosts many patches of reserved and non-reserved forests (Asare, 2005; Dawoe *et al*., 2014; Gockowski and Sonwa, 2008). Farmers' awareness of this could be the reason for inaccessibility to fertile lands for expansion and low productivity perceived to be a moderate challenge for future cocoa expansion. It is worth noting that recent studies have indicated that forest reserves in the region have been massively encroached (Benefoh *et al*., 2018).

Price fluctuations was perceived as a fairly important challenge. In Ghana, cocoa price reductions are not passed on to the producer but absorbed by the government which has been the case for the past years. The COCOBOD is responsible for setting the farm gate cocoa price as a share of the net FOB price taking into account the world price (MOFEP, 2013). For instance, between 2010 to 2013, the farm gate price for Ghana was set at 77.81% of the net FOB price (MOFEP, 2013). As a policy, the GoG is committed to offering farmers at least 70% FOB price. This price setting regime enables COCOBOD to have working capital to stabilize the farm gate price and carry out its mandate (Luckstead *et al*., 2019). The price to offer farmers for the whole of the crop year is fixed by taking into account the world price. The centralized price fixing model and guaranteed price for the season practiced in Ghana tends to benefit farmers on one hand whiles burdening the COCOBOD in case world prices fall along the season. As such, farmers might have been shielded from the full impact of price fluctuations of cocoa. Low income ranked as a somehow important challenge. According to farmers, if they were supported with the right inputs to increase productivity, their economic conditions will be better off with cocoa production. The perception of rising costs of inputs as the most important challenge for the future development of cocoa production has implications for the VSA approach. It seems that farmers' inability to adopt

intensification results in forest conversion due to the need for expansion to increase production. Failure of the VSA approach to address farmers' challenges to adoption of intensification rather than expansion will likely result in a business as usual, where the conversion of forests and peatlands will continue unabated. Similarly, there should be measures to intensify agroforestry among other climate adaptation and mitigation practices in order to address the issues that are of primary concern to farmers. It is the necessary for the VSA to appear to solve farmers' challenges and concerns rather than doing something that is in isolation of the concerns of farmers.

5.3.2 Cocoa production: Key drivers of future developments in cocoa production

Farmers perceived timely supply of affordable inputs and price increment as a more important driver of future developments in cocoa production (Table 13). With cocoa prices having stagnated in Ghana the past years, farmers are expecting price increment from the government in the ensuing years. Key informant interview added that even for farmers that have the financial capacity to afford costs for farm inputs, quality farm inputs are not readily available on the market. Farmers therefore have no option than to purchase inferior farm inputs for their farms due to the fact that they cannot leave their crops without applying any inputs. Price increment was also perceived as an important driver. Price increment has been known to drive increases in cocoa production. For instance, price increment was an incentive to significantly raise the production of cocoa particularly for Ghana from 2004 to 2005, which was achieved by combining intensified labour and non-labour inputs coupled with increment in the cultivated area (Onumah *et al*., 2013). Consistent input supply system was perceived as a moderately important driver. As already reported, quality inputs are not readily available to farmers. Development and implementation of a consistent supply system for an all year-round accessibility to recommended inputs will greatly yield positive impacts in Ghana's cocoa sector. Certification and improved varieties were identified as fairly important drivers. Ghana has witnessed a regular competition in the sourcing of certified cocoa (KPMG, 2012). As at 2014 cocoa production under third-party audited certification in Ghana had reached 16% (Potts *et al*., 2014). With reported increasing climate, improved varieties that are able to withstand harsh impacts of climate are also expected to play an important role in future developments in the cocoa sector. In West Africa the cultivation of full sun tolerant Amazon hybrid varieties keeps expanding (Wessel and Quist-Wessel 2015). Though markets for rubber and cashew keeps evolving, farmers perceive it to be less of a challenge and was ranked as being somehow important. The implication on the VSA will be an increased

commitment by farmers to the course of achieving targets of sustainability set within the VSA approach, while providing buyers with a sustained flow of verified cocoa beans. On the farmers' expectation of price increment, even if actual prices of cocoa remain stable on the world market, benefits that the VSA approach may bring to farmers can offset farmers concern of price increment when the mechanism is well structured with farmers at the core of the system.

5.3.3 Cocoa trading: requirements and implications

Beans dryness and colour were ranked as the most important requirement by buyers when purchasing cocoa from farmers (Table 18). This was expected because buyers are keen on insisting that the beans were dry and had dark brown colour. LBCs suffer a loss when they buy under-dried beans because, after further drying, the weight at purchase decreases. In addition, high moisture content of beans leads to moldings and as such LBCs may not pass quality control checks that allows their beans to be exported to their clients by the COCOBOD. To achieve the required beans dryness and colour, farmers are trained and advised to brood the beans for 3 days and dry them for 6 days. However, purchasing clerks sometimes have to dry beans they buy from their farmers since farmers do not always comply. Another important requirement by buyers according to farmers was registration and training under buyers' training programs. It was gathered from key informant interview that LBCs have programs they run and they expect their farmers to be enrolled and to go through the training offered. The training covers sustainability issues in the areas of good environmental, agricultural and social practices. LBCs insist on this requirement for their farmers because of regular auditing by external auditors. Compliance to best-practices by farmers can result in premiums from their LBCs. It was indicated that clients of LBCs now employ sustainability officers who are responsible for ensuring that sustainability targets are met. Uniformity in size of cocoa beans and no production in reserve areas were the somehow important requirements by LBCs. According to key informants, processing companies incur extra cost during frying of cocoa beans when unequal sizes are mixed. When the smaller sized beans are burnt, companies incur additional costs of sugar in order to correct the bitter taste. To prevent forest conversion into cocoa plantations, farmers are not expected to produce in reserve or protected areas. However, this only form a lose part of LBCs requirements since there are no national laws that forbid the purchase of cocoa that is illegally produced in forest reserves or protected areas. There are emerging efforts by Ghana's Ministry of Lands and Natural Resources in collaboration with COCOBOD and the LBCs to curtail the purchase of cocoa beans produced from forest

reserves (GBN, 2019). Mr. Obed Owusu-Addai, who is the Managing Campaigner of the Joint Framework of Action Cocoa Ghana, is reported to have said that the aim is to discourage farmers from illegally converting forest reserves into cocoa plantations, a practice he acknowledges to have caused substantial destruction of Ghana's forest reserves (GBN, 2019). Nevertheless, it is still doubtful the impact of the initiative since it applies to only LBCs that sign on to the initiative. LBCs that have signed on to the initiative are expected to stop the purchase of such cocoa beans from December 31, 2019 (GBN, 2019). The least important requirement was nature of beans ownership. Only one purchasing clerk from the key informant interviews indicated that she only buys cocoa from farmers who present their passbook as an evidence of being a cocoa farmer.

On trade requirements by farmers from LBCs, weighing type or scale and input supply from buyers were indicated as the most important requirements by farmers (Table 18). Farmers prefer buyers whose scale is freer and is a standing scale rather than a hanging scale. Hanging scales are perceived to under weigh cocoa. Some purchasing clerks have been reported to adjust their scales to under weigh the beans thereby profiting from the bags of cocoa purchased. To verify the scale of their buyers, farmers divide their cocoa into two or more portions of approximate weight and then sell them to different clerks. According to a key informant interview, town committees have a weighing stone of a known weight that they use to test and verify the scales of purchasing clerks. In Bompieso, a purchasing clerk had been replaced due to complaints from farmers of suspected adjustment in scales. Since farmers have difficulty in terms of both affordability and accessibility to farm inputs, LBCs or a purchasing clerk that is able to facilitate assistance with farm inputs becomes a preferred trading partner. Ready payment/no credit buying is an important requirement by farmers. Farmers do not want to sell their cocoa beans on credit and as such, any LBC who becomes known for prompt payment is more likely to be preferred. Payment of premiums/bonuses/promotions are of moderate importance to farmers. In addition to premiums, LBCs can also pay bonuses on each bag of cocoa purchased. There are also cash or in kind promotions run by LBCs all aimed at luring farmers to trade with them. Extension services/training was ranked as a fairly important requirement. It appears farmers are interested in LBCs that offer training in best-practices in cocoa farming, but the adoption of these best-practices remains a challenge. In meeting this requirement, LBCs have extension services as an integral component of their programs. A key informant reported that both field and off field training sections are regularly held for farmers. Farmers somehow required provision of credit by buyers. Once farmers'

expectations were met by LBCs, they do not consider whether the company was a public or a private one.

The lack of a national framework on regulating illegally produced cocoa beans from forest reserves and protected areas leaves an important gap where VSA can fill in order to advance efforts of forest protection. It was expected that LBCs would have as part of their requirements a strong prohibition on the production of cocoa in protected or reserve forests, but this was not the case apart from those LBCs that signed the commitment to avoid this by 31.12.2019. However, it is still too early to see if the commitment will be enforced and put into practice. The absence of a national legal framework and the laxity on the part of LBCs creates incentive for farmers to convert such forests since it remains profitable and lucrative. With forest and peatland protection being one of the key areas of the VSA mechanism, meeting this requirement is necessary. There is the need for such illegally converted farms to be documented in order to prevent marketing of cocoa beans produced there.

The identification of beans dryness as a major requirement by LBCs also provides VSA with a clue to intensify education and training of farmers on how to meet this requirement since it is obvious that the buying partners in the VSA compact would want the same quality. VSA should also seek to create transparency in the aspect of cocoa weighing by making sure scales are not adjusted to put farmers at a disadvantage and, more in general, selling conditions and requirements are transparently set and fairly verified. Such an effort will create a mutual trust between the farmers and the VSA, which is a requirement for a successful adoption and implementation of sustainable practices that will be enrolled by the VSA.

5.3.4 Sustainable cocoa production: management cost and yield perspectives

It is observed that minority of farmers that have higher management cost (GhC1,000 and above) have higher harvests compared to farmers who spend less. More than half of farmers (52%) have an annual harvest of 5-10 bags (Table 9). The lower annual harvest reported by many farmers is due to the inability of farmers to purchase the right inputs in their right proportions for their farms. Farmers complained that inaccessibility to loans has made it difficult for them to maintain their farms and added that their bad performance on returning loans has contributed to the difficulty they are facing now. It was revealed that farmers do not adhere to trainings, a possible explanation for the low yields since higher management cost alone does not translate into improved yield unless

it is combined with other factors such as regular pruning, weeding and spraying of pests. A sustainability manager for a buying company interviewed added that, the problem of non-adherence to training by farmers results in misapplication of inputs either in amounts, frequency and time. The non-adoption of sustainable cocoa farming practices (Quaye *et al*., 2014) has implications for low levels of yield (Ehiakpor, 2016).

More or less half of the farmers are experiencing an increase in yields, while another half a decrease, while more than 60% farmers reported increasing production costs. 20% of farmers are facing decreasing yield despite increasing management costs (Table 10). Pests and diseases may account for the decreasing and stabilized trend of harvest even though the cost of production is rising for some farmers. When farmers were asked the possible cause of the decreasing trend of harvest, they were emphatic in attributing it to pests and diseases. According to Shapiro and Rosenquist (2004), about one-third of the global losses of cocoa crop annually is attributed to pests and diseases, which have implications for the livelihoods of smallholder farmers whose welfare and well-being is dependent on the vitality of their crops. This also explains the 45% of farmers that are reporting decrease in harvest coupled with non-adherence to proper farm maintenance techniques and application of farm inputs. Farmers added that their farms are young cocoa farms hence able to produce more. It has been reported that as cocoa trees age there is decline in yield and its vulnerability to diseases increases significantly making it one of the major challenges affecting producing areas especially in Africa (Matissek *et al*., 2012). The high vitality of cocoa farms reported by farmers in the study area seems to be inconsistent with report by KPMG (2013) according to which, in West Africa as high as 35% of all cocoa trees are beyond 35 years which is far past their peak (KPMG, 2013). According to key informant interviews conducted, the total production of cocoa in the study area has been increasing rapidly over the last 5-10 years due to expansion of the farming area, partly at the expense of forest resources.

As a mechanism, the VSA seeks to among others increase the economic gains of farmers. However, the prevalence of high cost of management and low yields by farmers presents a challenge to achieving this objective of VSA. There is therefore the need for measures to avert these trends in order to ensure that, optimum benefits from the program accrue to farmers in order to improve their economic and living standards.

5.4 VSA: PREVAILING CHALLENGES AND OPPORTUNITIES

Results as presented in Chapter 4 have also been discussed in the light of the possible challenges and opportunities for VSA. Details are reported below

5.4.1 Challenges

This sub-chapter discusses findings about the challenges for VSA in the targeted communities.

5.4.1.1 Prevalence of customary land tenure regimes

The system of landholding acquired through dynamic and complex related socio-political and economic conditions, norms of culture and the religious practices concerning the use of land as a natural resource, its usage, how it is managed and developed is described as land tenure (Quaye *et al*., 2014). In Ghana, all lands are by law vested in the state but customary regulation dominates statutory regulations (Ampadu, 2012). The government however has appropriation right over all lands in the country when developmental purposes or projects are to be executed, but the state must compensate the traditional owners for the appropriated land. Ghana's land tenure and management systems are diverse, but there are two common land administration forms where the applicable set of rules and laws is dependent on the type of authority governing the land. The two governing authorities are the statutory laws of the state and the customary laws borne out of the norms and practices of the locality. The dual system of land administration in the country have coexisted from the colonial era to the present (MFL, 1999), the rules governing the access and rights to land however are different for the two regimes. Under the customary regime, the management and allocation of land is executed by traditional leaders like chief, clan heads, heads of families just to mention a few as prescribed for by statutory framework of Ghana (Act 267 of the 1992 constitution). According to Kasanga and Kotey (2001:13) up to 78% of the total land mass of Ghana is customary with the rest of the 22% under the control and management of the state. The complexity of the legal framework surrounding land administration in Ghana will pose a great deal of challenge for the VSA approach. With most of the lands under customary administration, efforts to give cocoa farmers formal land titles is likely to be met with fierce resistance since traditional leaders, family heads among others will see it as an attempt to appropriate their lands. Inability to appropriately approach this will lead to a mass release of cocoa farmers from their already lose and undocumented tenure arrangements. Traditionally, land is seen as an asset that must not be sold or given out but is to be passed on to younger generations of a particular lineage as an inheritance, a practice that is firmly and deeply rooted in the fabrics of

Ghana's social and cultural life. For VSA to be successful on this focus area (tenure), it requires a high-level negotiation involving all the stakeholders particularly the customary and traditional authorities who exercise jurisdiction on most of these cocoa farmlands.

5.4.1.2 Low production trends

VSA intends to stimulate a sustained production of commodities in large quantities. In Ghana, the average national cocoa yield per hectare is 400 kg; this is relatively lower than other producing countries like Cote d'Ivoire and Malaysia (Aneani and Ofori-Frimpong, 2013). With an estimated national average size of two to four hectares for smallholder farms (Barrientos, 2016; Wessel and Quist-Wessel, 2015), it is apparent from the study that cocoa yields in the study area are relatively low with most of the farmers recording an estimated average annual harvest between <5-10 bags (64kg gross weight is equivalent to 1 bag) of cocoa (Table 10). Half of the farmers interviewed have an annual management cost of <500-1000 GhC. Achieving large production quantities and increasing farmers' economic status require high investments if the objective of VSA is to be achieved.

5.4.1.3 Lack of intensification and its impacts on expected future landuse dynamics

More than 80% of farmers are willing to expand their cocoa farms. An explanation for the majority of farmers opting to expand their farms is the notion that an increase in the area under cultivation is synonymous to increased productivity. Traditionally, cocoa has been a "slash-and-burn" crop where rain forests are converted into cocoa farms (Cocoa Barometer, 2018). 51% of farmers interviewed preferred forestlands for future expansion of cocoa. The main reasons for their preference was given as fertile soil, high yield and cheaper establishment. Farmers indicated that trees that are felled during land preparation decompose and enhance the soil fertility level. Again, farmers explained that their preference for forest is due to the less incidence of pests and weeds that compete with their crops especially in the early stages of establishment compared to other land use. These highlighted conditions reduce or totally prevent incurring cost in buying farm inputs such as fertilizers and pesticides thus, farmers benefit from the temporary increase in profitability before moving into new forests to repeat the cycle (Ould, 2004). Establishing cocoa in converted forestlands has been reported to have short-term economic advantages than replanting of old farms because of the comparatively higher cost of inputs for replantation and the higher soil fertility, lower exposure to pests and diseases on converted forestlands (Kroeger et al., 2017; Ruf and Schroth, 2004). 27% preferred fallow areas for expansion, citing reasons as easy access, ready

availability, fertile soil and high yield, cheaper to establish and easy to establish. The most cited reasons were high soil fertility and high yield and cheaper to establish (Table 7). The possible underlying causes of the choice of preference are same as already discussed. A possible reason for the easy access and ready availability of fallow areas could be the explanation given by key informants. They indicated that there has been a recent surge in cocoa expansion from indigenous persons of the targeted communities who previously had no interest in cocoa production. As such, available family lands that have been left to fallow have been converted into cocoa plantations. A key informant (traditional ruler) interviewed indicated that farmers prefer the lands to be passed onto their family lineage as an inheritance rather than it being given out to other people who are outside of their family lineage and that there was the need to utilize their remaining lands to avoid take over by other people. Intensification has been recommended for meeting targets of sustainability and to reduce deforestation (Kuwornu *et al*., 2010). However, farmers are unable to afford the cost that comes with intensification. These have implications for meeting forest and peatland conservation targets of the VSA. This calls for intensive public education for farmers and a well-structured framework with effective monitoring structures to ensure adherence to targets of non-conversion of forests and peatlands.

5.4.2 Opportunities

This sub-chapter discusses findings about the opportunities for VSA in the targeted communities.

5.4.2.1 Prevalence of active working labour in cocoa production

According to OECD (2019), working age population refers to people aged 15 to 64. 82% of farmers are aged 18-60 (Table 5). This implies that majority of farmers in the study area are within the active working age with more than half aged 18-45. The prevalent of active working labour in cocoa production in the study area has implications for the VSA approach since it also have implications on labour and productivity. Studies have reported lower productivity among older farmers because ageing small-scale farmers are less responsive to innovations and price movements, and are neither able to expand production or increase their yields easily (Barrientos *et al*., 2008). From this premise, VSA stands the chance of rapid response and adoption of innovations that will form part of implementation measures provided they are tailored to meet the needs of farmers and with the appropriate dissemination media, techniques and methods. Earlier reports by Barrientos *et al*., in 2008 pegged the average age of cocoa farmers in Ghana at 52 years

for males and 56 years females for women, but this study seems not to confirm this report at least with reference to targeted communities.

5.4.2.2 Large proportion of young and vital cocoa farms

Cocoa grown as a cash crop has a life span of 25 years (Cocoa Barometer, 2018). Using this a reference, the study categorized young farms into newly established (< 3 years), young (3-8 years), medium (9-16 years) and old (>16 years). Almost all (98%) young farms in the study area are aged <3-16 (Table 12). The high prevalence of young cocoa farms is an indirect evidence for the ongoing expansion of cocoa production in the study area. As cocoa trees age, there is decline in yield and its vulnerability to diseases increases significantly, a major challenge affecting producing areas especially in Africa (Matissek *et al*., 2012). Though Ghana and India have common production culture, yield per unit area in India is higher than Ghana and the deficit in yield has been attributed to ageing cocoa trees and diseases (Barrientos, 2013). The high presence of young and vibrant cocoa trees serves as an opportunity for the VSA approach in that production of cocoa can be sustainable and investments in pests and diseases management will be relatively lower due to the high vitality of the young cocoa trees.

5.4.2.3 Farmers' group organization

90% of farmers interviewed belong to farmers' group. Farmers' group formed by LBCs provide farmers with different forms of support that are designed as part of the package of services they render to farmers with which they trade. The three most important reason for farmers' membership were access to credits, access to inputs and access to training (Table 16). The citing of access to credits as the most important reason for membership of the farmers' based organization indirectly indicates the difficulties farmers have in accessing credit facilities from banks and financial institutions. A key informant (district manager for one of the LBCs) indicated that, it was obvious that no bank will give loans to farmers because of their inability to pay back. He also indicated that, granting of credit facilities is not an official component of their programs. The farmers' associations also do not assist members in accessing loans due to the high risk of non-payment by farmers. However, some purchasing clerks by their own informal initiatives are able to assist farmers with credit facilities. Purchasing clerks are financed by their respective LBCs to purchase cocoa on their behalf throughout the cocoa season. Purchasing clerks request for financing ahead of the peak season. They in turn use these funds they have received from their LBCs to provide interest free credit facilities to support farmers.

These loans are to be paid back during the peak season when farmers begin to sell their cocoa beans. The payment of the loan is not in cash, deductions are made in kilogram equivalents at a rate of 1 kilogram is to GhC 7.6. The purchasing clerks do this to support their farmers but more importantly, to maintain or attract more farmers to build a large famers' base from which purchasing can be done in large quantities. Once farmers take these loans, they are obliged to sell their cocoa beans to the purchasing clerk from whom a loan has been taken from. Purchasing clerks are more likely to be motivated by the financial benefit they get from such venture rather than the need to support farmers. On every bag of cocoa purchased, LBCs pay their purchasing clerks a commission of GhC 10. This means the more farmers a purchasing clerk is able to maintain the more the possibility of buying more cocoa and the higher the amount they receive as commission from the corresponding LBCs. Purchasing clerks bear some risk because farmers may default in the payment of loans. To circumvent payment, farmers sell their cocoa beans to different purchasing clerks in an effort to dodge deductions that would have been made to service their loans. Regardless of the risk purchasing clerks face, this informal transaction leaves a loop that is likely to play to the disadvantage of farmers. It is likely farmers become more vulnerable to cheating by purchasing clerks through scale adjustment resulting in the over payment of the expected amount. That is farmers may end up paying hidden interests on the loans without their knowledge. In addition, farmers are likely to be worse off economically throughout the cocoa season when all or most of his/her cocoa output is used to service these loans. This loop has the capacity of increasing the already poor economic conditions of many cocoa farmers.

LBCs in their program packages provide their farmers' base with inputs. Belonging to a LBC comes with no cost and farmers are often on the lookout for LBCs that offer packages and services that meet their needs such as input supply because they are unable to afford them and when they even have the money to buy inputs, availability is a challenge. Training is an equally important reason for farmers because the LBCs train farmers on a number of activities intended to ensure sustainable production. Farmers reported that, they are able to do better farming due to the training they receive. This presents LBCs and farmers a win-win situation because as farmers increase farm productivity by adhering to the training they are given, the LBCs are able to meet their sustainability targets that is incorporated in the training packages. To this extend, LBCs sometimes make it a requirement for farmers to be part of their training program in order to trade with them. Based on survey results, 64% of farmers are members of a farmer based organization because of

access to credits, inputs, training and bonus/premiums. Such an organization presents the opportunity to reach farmers with programs and initiatives designed around the above discussed factors that are of interest to farmers.

Notwithstanding the seemingly challenges in the mechanisms used by LBCs to organize farmers, the extent of organization of farmers in the study area presents the opportunity of the VSA to collaborate with the LBCs to reach out to the large number of farmers. This obviously will save a lot of economic resources and time needed to organize farmers from the scratch. It also presents an opportunity to learn from the strengths and weaknesses of LBCs in organizing farmers to inform areas that need improvement or modification.

4.2.4 Future involvement in cocoa farming

47% of farmers have preference for cocoa farming in the next five years, whiles 22% of farmers do not only want to remain in cocoa farming but wants to expand their cocoa farms. This implies that altogether, 69% of interviewed farmers are likely to remain in cocoa production (Table 15). A possible reason for the likely high future involvement in cocoa production by farmers is that the majority of the farmers are migrant farmers operating on sharecropping arrangements which give no room for rejuvenation of moribund cocoa farms let alone switching the land from the already agreed arrangements of cocoa production. Some famers indicated that they prefer to remain in the production of cocoa because that is where their experience lies. For them moving into either of the farming requires new skills and land which are not readily available. Farmers indicated that if the necessary support they needed particularly supply of fertilizers were met, their economic woes would have been better off with cocoa production. Some farmers indicated their desire to leave cocoa production, sounding very displeased about their inability to make economic gains from cocoa farming. They indicated that once rubber was established the cost of production was relatively cheaper compared to cocoa, thus making marginal revenues potentially higher. Some farmers reiterated their intentions to convert their cocoa farms into rubber plantations if the needed support from government and LBCs were not given them. The vision statement of the Ghana Rubber Estates Limited reads "*Economic empowerment through rubber cultivation for sustainable rural community development to alleviate poverty*" (GREL, 2019). Through out grower schemes, rubber plantations have been financed by the Agence Francaise de Developpement (AFD), International Development Agency (IDA)/World Bank and Government of Ghana with an amount

of 1.643 million euros from 1995 to 2015 (GREL, 2019). However, it is unclear how the purported conversions from cocoa to rubber plantations by farmers will be financed. Key informant interviews confirmed that, the issue of converting cocoa into rubber plantations have long been an issue and there are evidences of such conversion from cocoa plantations to rubber plantations occasionally. However, generally the study seems not to be consistent with report by Asante-Poku and Angelucci (2013) that stated that due to the decrease in economic returns, there is conversion of cocoa farms into other land use in some producing regions of Ghana (Asante-Poku and Angelucci, 2013). This presents an opportunity for VSA since it has implications on sustained production of cocoa in the study area.

5.5 Limitations and suggestions for future research

The study aimed at assessing ground level opportunities, challenges and issues of sustainability in relation to the key areas of the IDH Sustainable Trade Initiative's Verified Sourcing Areas (VSA) Mechanism, that includes forests and peatlands protection, as well as attention on labour, land tenure, governance and transparency. Forest conversion was calculated based on the number of farmers who reported to have converted forests and then with reference to documented average size of cocoa farms a final figure was obtained. Using GIS tools and satellite imagery in future research could give a more accurate picture of forest loss from cocoa production in the study area and, where needed, at a broader scale. Report on peatlands conversion was based on farmers' knowledge of conversion of such lands but not actual field observations. Though a lot of effort was made to explain clearly to farmers what a peatland is, there is still the likelihood that what some farmers referred to as a peatland may not necessarily be one or vice versa. Future research should aim at documenting the number and size of such converted peatlands. The study used structured and semi-structured questionnaires to obtain qualitative data from farmers and key informants. Farmers may have over-stated their concerns hoping to receive assistance that could introduce bias in the study as many farmers deem researchers to be government officials who is able to make their grievances heard by the top hierarchy of national authority. For instance, farmers were asked to give an estimate of their average annual production (in bags), their management cost and whether production levels and cost of management has been increasing or not. Future studies should employ quantitative data in order to provide accurate estimates. Farmers were asked to rank several factors, however this exercise might have turned fatiguing, at the extent that they may have lost track after the first few factors in the list. Bias from social desirability was however eliminated

since farmers were interviewed individually. The number of communities and sample size selected for the study is relatively small compared to the hundreds of cocoa farming communities and farmers in the district. Little could be done to increase the number of communities and sample size due to limited resources for the study. Future research should increase the sample size in order to provide a broader picture. How the identified challenges will be addressed and the impact the VSA will make lies beyond the scope of the study

Several challenges were encountered in accessibility to respondents and adjustments were made appropriately. Initially, the study intended to interview the chief of each of the selected communities for the study, however this was not possible because access to chiefs was difficult. Most of the chiefs do not live in the rural communities but in the major cities and towns. Access to them therefore involved cost as in the Ghanaian traditional setting, one does not summon the chief empty handed. Custom demands that drinks are delivered as a prior notification. Limited funds made this impossible. District officers of the Ghana COCOBOD were also to be interviewed but bureaucracy in accessing public officials did not make it possible due to time-constraints.

Finally, there was strong apathy among farmers that made them reluctant to participate in the study. The apathy was a consequence of unfulfilled promises by officials in the delivery of farm inputs. The right time farmers needed the inputs was fast elapsing and their frustration made them have no interest in collaborating with any researcher. Participation was achieved by close collaboration between the purchasing clerks of LBCs, the district sustainability manager for Eliho-Touton and the author. Service of three local residents who have interacted with farmers through working from time to time with LBCs were also employed to add to building trust and ensuring farmer participation.

CONCLUSIONS

Cocoa expansion is ongoing in the study area leading to loss of forests. This is largely due to farmers' inability to afford the cost that comes with intensification and hence resort to the cheaper alternative of expansion. Government and other stakeholders should roll out programs that can support farmers to offset costs of intensification. Opportunities presented by initiatives like the VSA can be of help when stakeholders are able to identify potential areas and compacts signed directly with major international companies willing to fulfill their corporate social responsibilities in the cocoa supply chain.

Illegally produced cocoa from protected forests do find their way into the market due to the non-existence of a legal binding instrument that prohibits LBCs to undertake such purchase. The GoG should develop a legal framework that do not only focus on the farmers who convert protected forests into cocoa, but also prevent the LBCs from purchasing such cocoa beans in order to render such illegal productions unattractive and unprofitable.

Men dominate cocoa production in the study area and enjoy many undue advantages over women in many aspects. Studies should be carried out in order to identify the limiting factors for women participation and involvement in the cocoa sector focusing on local/community specifics. This will make it possible to remove the barriers against women in the cocoa sector. Identified wage gaps against women can be overcome by creating awareness on gender equality and enactment of laws that prohibit such unfair wage gaps.

In spite of the seemingly high awareness on child labour, children are still involved in cocoa production in the study area. Innovative partnerships with the private sector, such as the VSA, can help raise the economic conditions of farmers thereby reducing poverty that is a major driver of child labour in the cocoa sector. There is the need for investigating into child labour at the family and communal levels in order to establish whether a reduction in child labour at the family level has resulted in increased child labour at the community level. There is also the need for studies to know whether progress in the fight against child labour in the cocoa sector has not resulted in an increase in child labour in other sectors of the local economies. The use of one's child in topics of child labour has created the impression that once a person does not engage his/her own children it doesn't amount to child labour. Awareness creation by both private and public stakeholders should

package the message of their campaigns such that it addresses child labour in totality, with no ambiguity left in the mind of farmers.

Farmers need for credit facilities has created a loop for purchasing clerks of LBCs to grant loans to farmers. Though farmers are made to understand that these loans come with no interest, studies must be done on whether the deductions by weight of cocoa beans for loan payment does not amount to indirect payment of interests by farmers. Non-availability of quality farm inputs forces farmers to resort to inferior farm inputs, which may have detrimental effects on cocoa trees and subsequently on production levels. The COCOBOD should create awareness on the prescribed inputs for farmers while establishing a distribution system that will give easy access to prescribed inputs by farmers. Existing distribution systems, that give room to politicization of inputs sharing where farmers' political party affiliation matters should cease. To promote efficiency and effectiveness, distribution of inputs should be given to private companies that can be put on critical monitoring and auditing.

In spite of the high-tech maintenance cocoa management rolled out by the government, many farmers in the study area are experiencing low or decreasing production with increasing management cost. This may be due to failure by farmers to adopt sustainable practices given out to them. Incentive packages such as awards and scholarships for farmers' children will go a long way in improving farmers' adoption of best practices. In addition, pests and diseases might be contributing to the low production but also increase management cost among farmers. For instance, farmers mentioned the emergence of a "climber weed" which even refuses to die when cut killing cocoa trees rapidly. Research should be done to identify the weed so the appropriate mechanism for eradication can be made known to farmers.

Cocoa production in the area is dominated by active working labour with a fair proportion of the youth and with little tendency for labour drain since majority of farmers prefer to remain in cocoa production. However, there is the need for studies to be conducted in order to document the dynamics of ageing labour in the area. Identifying the incentives and disincentives for the young people in cocoa production can allow decision makers to develop programs that will not only maintain but also attract more young persons into cocoa production.

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ANNEXES

Annex 1: Structured questionnaire for farmers

QUESTIONNAIRE

Dear respondent, I am a student of University of Padova, Italy. As part of my thesis work I would like to assess the state of cocoa production at the producer level to see how best sustainability initiative by IDH Sustainable Trade Initiative on verified sourcing areas can be applicable. The following questionnaire has been formulated to achieve this goal. You are kindly requested to answer the questionnaire. Thank you.

Name of community:

PROFILE OF FARMER

1. Sex 1. Male [ ] 2. Female [ ]
2. Age 1. < 18 [ ] 2. 18-30 [ ] 3. 31-45 [ ] 4. 46-60 [ ] 5. 60+ [ ]
3. Residential status 1. Native [ ] 2. Migrant [ ]
4. Years of farming 1. 0-15yrs [ ] 2. 16-30yrs [ ] 3. 31-45yrs [ ] 4. 46-60yrs [ ] 5. 60+yrs
5. Educational background 1. Primary school [ ] 2. MSLC [ ] 3. JHS [ ] 4. SHS [ ] 5. Tertiary [ ] 6. No formal education [ ]
6. Household size 1. <5 [ ] 2. 6-10 [ ] 3. 11-15 [ ] 4. >15 [ ]
7. Main sources of income from the most to the less.....

FARM CHARACTERISTICS, LANDUSE DYNAMICS AND TENURE

8. Total size of cocoa farm (s).....
9. Age and size of current cocoa farm Age..... Size.....
10. On a scale of 1-5, which of these bests describes the occurrence of forest trees on your current cocoa farm? 1. Occurs in high numbers [ ] 2. Occurs in moderate numbers [ ] 3. Few numbers [ ] 4. No trees/full sun [ ] 5. I don't know [ ]

11. Previous landuse before current cocoa landuse establishment 1. Food cropland [ ] 2. Fallow area [ ] 3. Oil palm [ ] 4. Old/aged cocoa farm [ ] 5. Forest [ ] 6. I don't know [ ] 7. Other, specify.....
12. Reasons for the establishment of the current cocoa landuse 1. Declined soil fertility on previous farm [ ] 2. For expansion [ ] 3. To increase productivity/rehabilitation of moribund cocoa farms [ ] 4. Take advantage of price increment [ ] 6. Establishing improved variety 7. Others specify..... 8. I don't know [ ]
13. Are you interested/willing to expand the farmland 1. No [ ] 2. Yes [ ] 3. I don't know [ ]
14. If Yes, when given the option for expansion, which of these landuse would you prefer most? 1. Food crops [ ] 2. Fallow areas [ ] 3. Oil palm [ ] 4. Forest [ ] 5. Other specify.....
15. Can you give a reason for your choice in question 14? 1. Easy access [ ] 2. Readily available [ ] 3. Fertile soil [ ] 4. High yield [ ] 5. Cheaper to establish [ ] 6. Other specify.....
16. To the best of your knowledge, has any peatlands been converted into cocoa plantations over the last 20 years within your community? 1.Yes [ ] 2. No [ ] 3. I don't know [ ]
17. What is the tenure arrangement of current cocoa farm(s) (if you have more than one farm indicate the land tenure for all the cocoa farms) 1. Family land [ ] 2. Stool land [ ] 3. Purchased land [ ] 4. Gifted land [ ] 5. Sharecropping [ ] 6. Borrowed land [ ] 7. Rented land [ ] 8. Self-owned [ ] 9. Other specify.....
18. What is the term of your tenure or use right? 1. Permanent [ ] 2. Undecided [ ] 3. Subject to termination by other party [ ] 3. Specify in years.....
19. What form of documentation covers your tenure arrangement? 1. Court documents [ ] 2. Oral agreement [ ] 3. Witnessed by chiefs and community leaders [ ] 4. No agreement [ ] 5. Other specify.....
20. Which of these activities is restricted or prohibited under your current land use arrangement for your cocoa farm? 1. Rejuvenation of cocoa farm [ ] 2. Cutting down diseased cocoa trees [ ] 3.Growing shade trees [ ] 4. Farm diversification [ ] 5. The use of agrochemicals [ ] 6. No restriction/prohibition [ ] 7. Other specify.....
21. Source of labour on your farm (**please you can tick more than one option**) 1. Self [ ] 2. Shared labour "Nnoboa" [ ] 3. Hired labour [ ] 4. Family members [ ] 5. Other.....

22. How much are the following people paid per day for hired labour in your community? 1. Men..... 2. Women..... 3. Children..... 4. I don't know [ ]
23. Rank the following based on your preference for higher payment for services of hired labour 1. Matured men [ ] 2. Matured women [ ] 3. Young men [ ] 4. Young women [ ]; Reason for ranking.....
24. If you have used labour on your farm, state the number for the following age groups for the past one year 1. Below 10yrs..... 2. 10-13yrs ..... 3. 14-17yrs..... 4. 18-30yrs..... 5. 31-40yrs..... 6. 40+ yrs.....
25. On a scale of 1-5, how would you describe the use of people between 5-17yrs in cocoa farming in your community? 1. Highly common [ ] 2. Moderately Common [ ] 3. Common [ ] 4. Uncommon [ ] 5. Very uncommon [ ]

ORGANIZATION OF COCOA FARMERS

26. How often are meetings organized between the local farmers and other actors (district cocoa officers and buyers) at the district level 1. Never [ ] 2. Once monthly 3. Once annually 4. Other specify..... 5. I don't know [ ]
27. On a scale of 1-5, how would you describe the organization of farmers in your community 1. Highly organized [ ] 2. Organized [ ] 3. Moderately organized [ ] 4. Poorly organized [ ] 5. No organization [ ]
28. Do you belong to any Cocoa Farmers' Organization/group? 1. Yes [ ] 2. No [ ] **If No, WHY**.....
29. **If yes**, state the number of years of membership 1. Below 5yrs [ ] 2. 5-10yrs [ ] 3. 11-15yrs [ ] 4. 16-20yrs [ ] 5. 20+ yrs [ ]
30. Reason for membership of the **cocoa farmers' based organization/group**? 1. Access to inputs [ ] 2. Access to credits [ ] 3. Access to training [ ] 4. Have a voice [ ] 5. Buyers' requirement [ ] 6. Other specify.....
31. Rank the following according to their contribution to organizing cocoa farmers in your community? 1. Ghana Cocoa Board [ ] 2. Licensed Buying Companies (LBCs) [ ] 3. Famers' Groups [ ] 4. I don't know [ ] 5. Other specify.....
32. On a scale of 1-5, how would you describe your satisfaction for the current level of organization 1. Highly satisfied [ ] 2. Satisfied [ ] 3. Moderately satisfied [ ] 4. Not satisfied [ ] 5. Highly unsatisfied [ ]

33. What should be changed/improved about the current organization.....

TRADE MECHANISMS AND MARKET TRENDS

34. Annual average harvest (bags per year;{1 bag= 64kg}) 1. <5 [ ] 2. 5-10 bags [ ] 3. 11-15 bags [ ] 4. 16-20 bags [ ] 5. 20+ bags [ ]
35. Harvest trend over the last 5 years 1. Increasing [ ] 2. Decreasing [ ] 3. Stable [ ] 4. I don't know [ ]
36. Average cost of production per year in cedis. 1. Below 500 cedis [ ] 2. 500-1000 cedis [ ] 3. 1000+ cedis [ ]
37. Trend for annual cost of production over the past 5 years 1. Increasing [ ] 2. Decreasing [ ] 3. Stable [ ] 4. I don't know [ ]
38. Average estimate for additional amount per bag sold over the last 5 years in cedis 1. Below 10 cedis [ ] 2. 10-20 cedis [ ] 3. 21-30 cedis [ ] 4. 30+ cedis [ ] 5. Nothing [ ] 6. I don't know [ ]
39. Have you ever had knowledge of the price of cocoa at the global market aside the price you receive from your local buyers 1.Yes [ ] 2. No [ ]
40. Which Licensed Buying Company do you sell your cocoa beans to? .....

    WHY.....
41. Rank the following features from **the most** to **the less important requirement** by cocoa buyers from farmers and add if not mentioned

Feature	**Rank**
Registered and trained under buyer's program	
Uniformity in size of cocoa beans	
Beans dryness and colour	
No production in reserve areas	
Nature of beans ownership	
Others (Please specify and rank together)	

42. Rank the following features from **the most to the less important requirement** by farmers from cocoa buyers and add if not mentioned

Feature	**Rank**
Weighing type or scale	
Input supply from buyers	
Ready payment/no credit buying	
Premiums/promotions/bonuses	
Extension services/training	

Provision of credit	
Private or government buyer	

FUTURE DEVELOPMENTS AND PERSPECTIVES

43. **Rank** the following **challenges** based on how you perceive they will drive future developments in cocoa farming in your community

Factors	**Rank**
Climate change	
Inaccessibility to fertile forest lands for expansion	
Lack of credit	
High costs of inputs	
Low productivity	
Price fluctuations	
Need to increase income	

44. **Rank** the following **drivers** based on how you perceive they will drive future developments in cocoa farming in your community

Drivers	**Rank**
Certification	
Consistent input supply system	
Timely supply of affordable inputs	
Improved varieties	
Per bag price increment	
Emerging markets for cashew and rubber	

45. In the next 5 years given the necessary resources, which of these would you want to do? 1. Remain a cocoa farmer [ ] 2. Cashew farming [ ] 3. Rubber farming [ ] 4. Oil palm farming 5. Acquire new lands for cocoa expansion [ ] 5. Other specify..... 6. I don't know [ ]

Annex 2: Key Informant Interview Guide

Dear respondent, I am a student of University of Padova, Italy. As part of my thesis work I would like to assess the state of cocoa production at the producer level to see how best sustainability initiative by IDH Sustainable Trade Initiative on verified sourcing areas can be applicable. The following questionnaire has been formulated to achieve this goal. You are kindly requested to answer the questionnaire. Thank you.

Name of community/Licensed Buying Company (LBC):

LANDUSE DYNAMICS, TENURE AND LABOUR

1. What is the most common tenure regime in the community, what challenges does it pose for farmers and cocoa buyers?
2. Has the area under cocoa cultivation expanded in the community over last 20 years? If yes, at the expense of which land use?
3. What are the main sources of labour in the community, how much is the wage for a hired labour and is the amount the same for men, women and children?
4. Do men and women have equal right to land access and hired labour?

TRADE MECHANISMS AND MARKET TRENDS

5. What are the trends in cocoa yield/quantities and prices over the past 5 to 10 years?
6. What are the features required by buyers from farmers and farmers from buyers?

ORGANIZATION OF COCOA FARMERS

7. How are cocoa farmers organized in the community and what are the challenges in organizing farmers and how can this be improved?
8. Do cocoa farmers in the community have a voice and what are the mechanisms for farmers' voices to be heard?

CHALLENGES/OPPORTUNITIES AND FUTURE DEVELOPMENTS

9. What are the main challenges associated with cocoa farming in your community and what do you think can be done going forward?
10. What are the main opportunities for farmers and cocoa buyers in the community?
11. How do you see the future of cocoa farming and what do you think will drive new developments of cocoa farming in the community?