Master thesis Sustainable Development

Towards sustainable cocoa production: a mixed method assessment of the influence of local governance modes on the farm level impact of private cocoa certification standards in Ghana

Cedric Steijn	Utrecht University
Student number: 5572940	Track course: Environmental Governance
Email: cedricsteijn@gmail.com	Supervisor: Dr. W. Vermeulen
Phone: +31 6 48 709 246	Second reader: Dr. F. Biermann
Address: Louwesweg 3A182, 1066 EA Amsterdam	Number of ECTS: 45

Internship: Royal Tropical Institute (KIT)

Address: Mauritskade 63, 1092AD Amsterdam

Contact person: Anna Laven (a.laven@kit.nl)

Universiteit Utrecht

Koninklijk Instituut voor de Tropen

Abstract

Cocoa is an agricultural good produced mostly in West Africa. The export of cocoa is paramount for the economies of Ghana and Côte d'Ivoire which are the two biggest producers. The cocoa supply chain, faces a lot of issues especially in producing countries at the farm level. Poverty, poor working conditions, and the use of child labour are just a few examples of the issues related to cocoa production. Furthermore, the hard working conditions and the low financial rewards lead to younger generations seeking other sources of income. This cocoa exodus leads to an increase in the mean age of cocoa farmers which jeopardises future cocoa supply. The problem is further exacerbated by increasing demands for cocoa on the world market. These issues have led to a call for improvements in the social, economic, and environmental aspects of cocoa farming in order to avert serious supply shortages of cocoa in the near future.

The dominant actors in sustainable production have traditionally been national governments or supra-national organisations. The increasing consumer demand for sustainable cocoa, along with the apparent failure of national governments in addressing the issues in cocoa production, have led to the rise of private certification standards. Private certification standards, a form of private governance, are usually the result of cooperation between civil society and market actors. The benefit of private governance is usually a marketing advantage for market actors (through a visible certificate on the products) and a means for civil society actors to pressure market actors into Corporate Social Responsibility (CSR). Cocoa is one of the supply chains that has undergone certification in recent decades. The benefits of becoming certified for a farmer relate to increasing yields, increasing profitability of cocoa farming, and improvements in farmer livelihoods.

The rise of private standards has led to two forms of regulation of the cocoa sectors in producing countries: public governance and private governance. The goal of this research is to verify what the influence of local public governance modes is on the uptake and impact of certification. The initial research plan entailed a comparative case study design where Ghana and Côte d'Ivoire would be compared. The cocoa sector in Ghana is heavily regulated by a government institute called COCOBOD. The cocoa sector in Côte d'Ivoire, however, has little regulation providing a useful contrasting case. Safety issues in Côte d'Ivoire have made this initial research plan impossible, leading to an intensive case study of the Ghana cocoa sector instead.

Mixed method analysis with both quantitative and qualitative data has been used during the research. The two data sources were further supplemented with desk research in order to triangulate the results. The qualitative data was collected through semi-structured interviews with major stakeholders in the Ghanaian cocoa sector. The data, along with desk research, provided insights on the functioning of COCOBOD and identified the policies that affect cocoa farmers and cocoa certification. The functioning of these policies were then verified through quantitative data collected from certified cocoa farmers. Descriptive and statistical analyses were used to verify the impact of COCOBOD policies and the uptake and impact of certification at the farm level.

The results of the analyses show which COCOBOD policies have an influence on the uptake and impact of certification, and whether this influence is likely to be positive or negative. Not all policy outcomes extracted from the qualitative data have been double checked with quantitative data

resulting in some uncertainty regarding their impact at the farm level. The policy impacts that have been verified show mixed results as to whether public policies are beneficial for certification or not. What has been concluded is that the policy regarding the distribution of inputs by Hi-Tech and CODAPEC is inefficient in its current state. Furthermore, the price fixing policy in relation to the input distribution leads to inequities as all farmers pay indirectly for the inputs, but not all farmers receive them or receive them to the same extent. However, extension services of the Cocoa Health and Extension Division of COCOBOD appear to be beneficial both for the uptake and impact of certification standards.

The final conclusion of the research is that public and private governance mechanisms in the Ghanaian cocoa sector have the same goals and apply roughly the same methods. Heavy regulation in the form of public governance from COCOBOD is therefore likely to be positive for the uptake and impact of certification standards. However, COCOBOD lacks the capacity to effectively address the current issues in the Ghanaian cocoa sector. Therefore, increased cooperation to harmonise the efforts of the NGOs, cooperatives, Licensed Buying Companies, COCOBOD, and private certification standards is needed to effectively address the current issues related to cocoa production. Public Private Partnerships through the Ghana Cocoa Platform are likely to improve sustainable cocoa production in Ghana and secure a sustainable cocoa supply in the future.

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1. Introduction

1.1 Background of cocoa production

Cocoa (*Theobroma cacao*) production is a relatively small sector in agriculture with a global production that averages 4.5 million tonnes a year (Ecobank, 2014). The cocoa industry is paramount for the economies of many West-African nations, where about 80% of the world cocoa is produced and millions of smallholder farmers produce the crop as a means to sustain their livelihoods (Fairtrade Foundation, 2011). However, future cocoa production is in peril. This is due to a variety of factors including price instabilities relating to supply deficits or supply surpluses (Pipitone, 2015: Thornton, 2015) or problems related to production itself, such as soil erosion or fungal diseases (Rice & Greenberg, 2000), or a combination of old cocoa trees, poverty (low income), and an aging population of cocoa farmers (Vellema et al. 2015). These factors lead to low yields, especially in West Africa where the yield gap is significant (Wessel & Quint-Wessel, 2015). Contemporary cocoa production needs to be move to a more sustainable production system in order to ascertain future production is possible. One way achieving a more sustainable cocoa production is through private governance.

1.2 Private governance

Governance aimed at sustainability is traditionally undertaken by national governments or intra-governmental organisations (Ruggie, 2004). Private governance, however, is a governance intervention implemented by non-state actors (Smith & Fischlein, 2010). An example of private governance is that of certification. Certification is usually the result of a partnership between market actors (e.g. corporations) and civil society actors (e.g. NGOs) (Glasbergen, 2011). Certification of a product can be used to combat social injustices (e.g. unfair prices, use of child labour) or to make production of a good more ecologically sustainable (e.g. introduce new farming practices) (Ruggie, 2004). Certification has been applied to the cocoa supply chain in an attempt to make production more sustainable. Private certification standards, such as UTZ Certified, Rainforest Alliance, and Fairtrade, introduced production standards for sustainable production. If cocoa farmers meet these standards, they receive benefits such as a higher price for their produce, better market access, and access to trainings on good agricultural practices to be able to increase their yields, which should increase incomes and savings while simultaneously addressing other issues such as poor housing, sanitation, and the occurrence of child labour (UTZ Certified, 2014a).

1.3 The Ghanaian cocoa industry

Ghana is the second largest cocoa producing country in terms of output (Ecobank, 2014). Cocoa production in Ghana reached 896,229 tonnes in the 2013/2014 season and showed an increase compared to previous years (Ghana Cocoa Board, 2014). Large certification schemes as the ones mentioned above have stepped in in an attempt to make Ghanaian cocoa production more sustainable (Potts et al. 2014). However, governance in the form of certification is not the only mode of governance affecting cocoa farmers. State governance also forms an important factor in how cocoa is produced and traded (Vellema et al. 2015). The cocoa industry in Ghana is heavily regulated by the Ghana Cocoa Board (also known as COCOBOD), a government institute which sets the annual price for cocoa, determines who is allowed to purchase cocoa on the domestic market, organises quality inspections, and provides inputs to farmers (Grossman-Green & Bayer, 2009: Capelle, 2008). Both COCOBOD in Ghana and private certification standards attempt to improve sustainable cocoa

production (Vellema et al. 2015), but one can question whether a heavily regulated cocoa market is beneficial for the uptake of certification. This leads me to the formulation of the following research question:

"Through what mechanisms and to what extent do public policies from the Ghana Cocoa Board affect the uptake and impact of private certification standards at the farm level?"

1.3 Measuring impact of certification standards

Private certification standards, of which Fairtrade, UTZ Certified and Rainforest Alliance are the most important, attempt to improve sustainability in agricultural supply chains by formulating standards which, if conformed to, should improve the social and financial situation of farmers while simultaneously addressing ecological issues during production (Potts et al. 2014). Since the inception of these private standards, numerous reports have been written that assess the impact of these standards at the farm level. These reports indicate that conforming to the standards has a positive impact on productivity, income and labour conditions (Potts et al. 2014: Podhorsky, 2015: UTZ Certified, 2014a). It is, however, not known how public policies and regulations in producing countries affect the uptake and impact of these standards at the farm level. This research aims to assess the extent to which public policies affect the uptake and impact of private standards on farmers in the case of the Ghanaian cocoa industry. The research will contribute to the debate of private versus public governance and how these can be mutual beneficial. In order to achieve this, both qualitative and quantitative research methods have been employed to first give a broad understanding of the institutional framework of COCOBOD and their policies, and then to give an overview of how these policies, and the private standards, work out at the farm level.

1.4 Outline of the thesis

The thesis will be structured as follows: chapter two, the regional framework, will give an overview of the Ghanaian cocoa market with an historical background and a short overview of contemporary issues affecting cocoa production. The third chapter will discuss the theoretical framework where the various concepts used in this thesis will be introduced. The employed methodology, along with the strengths and weaknesses of the methods, will be introduced in chapter four. In chapter five the qualitative data from stakeholders in the Ghanaian cocoa supply chain will be analysed, which provides the institutional analysis of COCOBOD and how their policies work out according to the stakeholders. Furthermore, chapter five also investigates the roles of the other stakeholders in the Ghanaian cocoa supply chain. The sixth chapter provides the quantitative analysis which investigates the role of COCOBOD policies at the farm level, and the uptake and impact of certification standards. Chapter six also provides an analysis of the quantitative data in order to find the causes behind the results. Chapter seven provides the conclusion of the research and therewith the answer to the research question. Chapter eight provides a discussion on the results and the validity of the research. Finally, chapter nine will provide some policy recommendations for both public governance as well as private actors in the Ghanaian cocoa sector.

2. Cocoa production in Ghana

2.1 A brief history of cocoa production in Ghana

Cocoa is a crop that was originally found in Middle America, where it was enjoyed the Aztecs who used the crop to produce drinks and was even used as currency (Grossman-Greene & Bayer, 2009). The introduction of cocoa to Ghana took place in 1857 by missionaries employed by the Danish government. Seedlings from Surinam were planted, but the young trees died shortly after. The second attempt yielded one surviving tree, the rest had been destroyed by insects, and pods from the one surviving tree were spread among other mission stations in Ghana. The first successful maturing of cocoa trees took place in the Eastern Region in 1879 and the crop from then on prospered in Ghana, which became the leading exporting country in the early 20th century (Grossman-Greene & Bayer, 2009). Cocoa remains the most important agricultural export product of Ghana today (Barrientos & Asenso-Okyere, 2012).

2.2 The Ghanaian cocoa supply chain

West Africa is the leading region when it comes to cocoa production. About 70% of the world's cocoa output comes from 6 million hectares of cocoa farms in West Africa, where Côte d'Ivoire, Ghana, Nigeria and Cameroon are the leading producers (Wessel & Quint-Wessel, 2015). In Ghana the crop is produced by about 800,000 (smallholder) farmers who produce the crop on relatively small farms as the average farm size is only around 2,24 hectares (Hainmüller et al. 2011). COCOBOD, the regulating government institute for cocoa, coffee and sheanut, has divided the cocoa producing regions in Ghana into 7 so called "cocoa regions". These 7 regions are subdivided into 67 cocoa districts for the sake of convenience of COCOBOD operations (distribution of inputs and provision of trainings) more than for economic reasons. Confusingly, the cocoa districts and regions do not necessarily coincide with the national administrative regions and districts (Barrientos & Asenso-Okyere, 2012). The cocoa producing regions are the southern regions of Ghana, namely Ashanti, Bhong-Afo, Greater Accra, Volta, Western and Eastern region (Barrientos & Asenso-Okyere, 2012). These are the most suited areas for cocoa farming due to their favourable tropical climate (Olesen et al. 2013).

There are a variety of issues that affect the Ghanaian cocoa sector. Especially financial (poverty), ecological (pests and diseases) and social issues (child labour) are widespread (Hütz-Adams & Fountain, 2015: Wessel & Quint-Wessel, 2015). These issues are often mutually reinforcing and are a major problem for future cocoa supply. The issues will be discussed in more detail in section 5.5.

As mentioned before, Ghana's internal cocoa market is heavily regulated by COCOBOD. One example of this is that the internal cocoa market is only partly liberalised, as opposed to other West African nations (Vellema et al. 2015). Licensed Buying Companies (LBCs) are privately owned companies that are allowed to purchase cocoa from farmers as long as they operate within the rules set by COCOBOD. This includes a fixed farm-gate price for cocoa and that all the purchased cocoa must be sold to the COCOBOD subsidiary Cocoa Marketing Company (CMC) which retains the monopoly of selling to the international market (Kolavelli et al. 2012). Figure 2.1 gives an overview of the Ghanaian cocoa supply chain which has a typical hourglass shape with 800,000 smallholder farmers at the base, the CMC and a few large corporations in the middle, like Cargill, Barry Callebaut, Mars and Mondelez. At the end of the supply chain are the millions of chocolate consumers who can predominantly be found in Europe and North America (Fairtrade foundation, 2011).

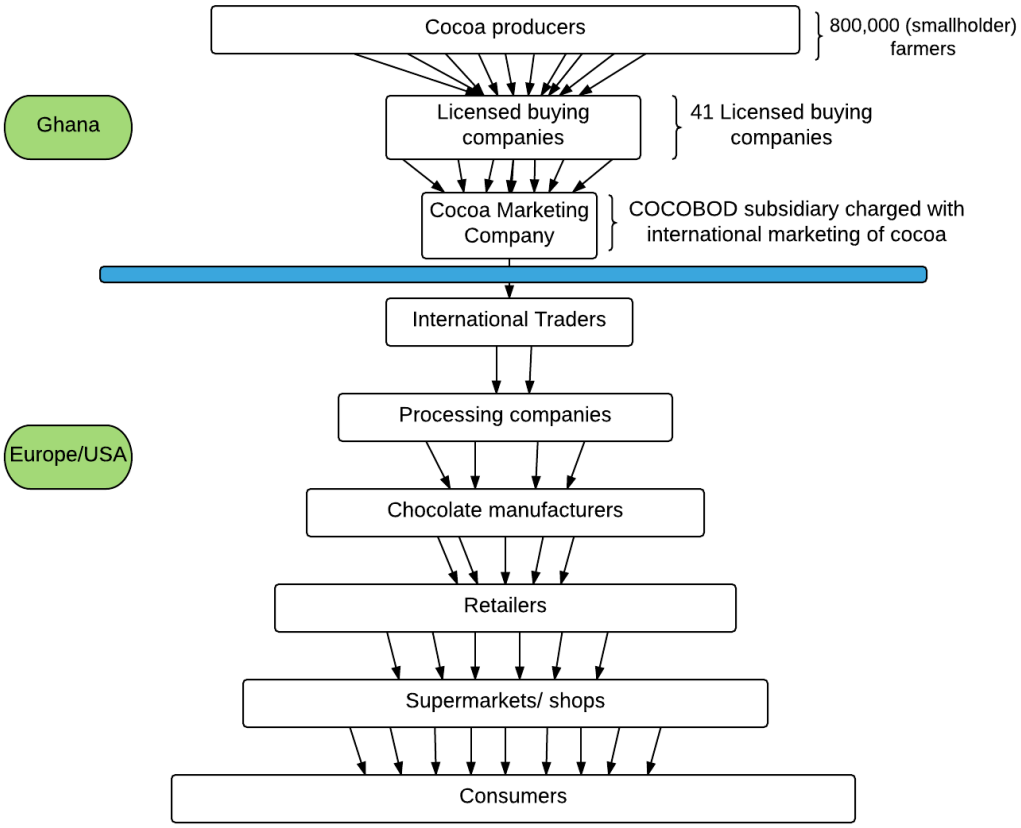


Figure 2.1: The Ghanaian cocoa supply chain

2.3 Historical institutional background of COCOBOD

Ghana is often referred to as a success story of the African continent, especially due to its cocoa industry, which is the most important (employment) sector in the country and has therefore been central to policies regarding development and poverty alleviation (Kolavalli & Vigneri, 2011). The importance of the cocoa sector led the Ghanaian colonial government to establish the Cocoa Marketing Board (CMB) in 1947. The establishment of the CMB was aimed at resolving problems in the industry related to market sharing, price fixing, and unstable domestic prices. CMB, which was renamed to COCOBOD in 1984, became responsible for every facet of the Ghanaian cocoa market, and was the single biggest employer in Ghana in the early 1980s, counting over 100,000 employees (Kolavalli et al. 2012). In later years, however, the Ghanaian government gradually reformed the cocoa market to reduce costs of inefficient marketing and pricing systems. Certain tasks were (partially) privatised, such as the internal marketing. The partial liberalisation of the internal cocoa marketing started in 1992 when COCOBOD granted licenses to private companies to buy cocoa from producers for the fixed minimum price and then deliver them to the CMC as long as they adhered to the quality controls performed by the COCOBOD subsidiary Quality Control Company (QCC) (Kolavalli et al. 2012). Before this partial reform a COCOBOD subsidiary called PBC was the sole purchaser of cocoa on the market. PBC remains the largest LBC to date with 297,131 tonnes purchased in 2014, accounting for 33% of the total internally sold cocoa in Ghana (Ghana Cocoa Board, 2014). Besides the partial liberalisation of the internal market, other COCOBOD tasks were moved to different public institutes, such as the building of roads (Vellema et al. 2015: Kolavalli et al. 2012). Subsequently, the amount of employees of COCOBOD was decreased to about 5500 in 2006. The decreasing role of COCOBOD is gradually leading to private actors filling the gap. Private actors and NGOs have

expanded their activities in Ghana, primarily in partnerships. The main drivers for this expansion were the risk of supplier failure due to low productivity levels, and the increasing demand for certified cocoa (Vellema et al. 2015). Even though the Ghanaian cocoa market has become more liberalised, with increasing private actor involvement, COCOBOD is still the dominant actor in the sector as it regulates everything from price fixing to input provision to farmers to quality control (Kolavalli et al. 2012: Grossman-Green & Bayer, 2009: Victor et al. 2010). The functioning of COCOBOD and its boards, subsidiaries and policies will be discussed in depth in chapter five.

3. Theoretical framework

This thesis has a dual focus: private certification standards and public policies from the Ghanaian government. This chapter will discuss the development context of Sub Sahara Africa and the dominant development theories that have been applied to the region since independence. National governments have traditionally been the dominant actors in development (Kingsbury et al. 2012). It is therefore important to provide a historical background on how African nations (Ghana in particular) have developed in the post-colonial era, what the influence of organisations such as the World Bank and IMF has been on development, and why private governance has stepped in to address development issues. The emergence of private governance and its role in development will also be addressed in this chapter.

3.1 Development context: Post-Colonial Sub-Sahara Africa

The continent of Africa was almost completely colonised by European countries prior to World War II. In the decades after World War II, the African countries began to strive for independence. Decolonisation of the Sub-Saharan region happened rather quickly and peacefully. This was mainly due to colonial powers, such as France and the United Kingdom, deciding that they no longer had the means to maintain their colonies and began to withdraw in the late 1950s. The process of decolonisation, once started, moved rapidly during the 1960s. By 1970, virtually every country in the region had gained its independence peacefully. Only Angola and Mozambique needed armed resistance against the Portuguese in order to gain independence (Rowntree et al. 2009). The long years of colonisation have left the 'new' African nations underdeveloped compared to their former colonisers.

3.1.1 Development theories

Development in general is concerned with how countries can improve the living standards of their citizens, as well as how to construct a political and social environment where such material benefit can take place (Kingsbury et al. 2012). Several theories have been developed in order to address the problem of underdevelopment. The development theories focus on the policies that national governments should formulate and implement and how the domestic markets should be regulated in order to facilitate development. The nation-state is usually seen as the key actor in development theories as sovereign states were the only recognised authority within a nation's borders, and the only entity that is able to pass laws and initiate policy (Kingsbury et al. 2012). Three schools of development theory have dominated since the late 1950s: modernisation theory, dependency theory (applied to Latin America and Ghana), and neoliberalism. Modernisation- and dependency theory focused on the key roles of governments, while neoliberalism focused on the power of markets to deliver benefits of development more effectively than governments (Kingsbury et al. 2012).

Modernisation theory

Modernisation theory is the classical development theory that emerged in the 1960s. The central tangent of this theory is that 'all nations however poor are able, with the implementation of correct policies, to achieve a modern standard of living by following exactly the same growth path as that pioneered by Western nations' (Kingsbury et al. 2012, p.59). What was needed to achieve the modern standard of living was domestic savings, supported by foreign investment, which would fuel the local economy. The government's role would be to create the organisational mechanisms and

political will to achieve sustained increases in savings and productive investments. The productive investments in the domestic economy should lead to a more efficient economy through mechanisations of, for instance, ports, and create the possibility to invest in human capital through the development of a well-functioning educational system (Kingsbury et al. 2012).

Modernisation theory embraced earlier classical economic theories that labour would migrate from low-wage areas to areas where rewards were higher. On the other hand, capital would move in the opposite direction as returns on investments would be higher in underdeveloped areas as investment potential was high in these areas (higher growth potential). Two kinds of forces would be at work: spread effects would serve to distribute growth from richer to poorer areas, while backwash effects would tend to increase the existing inequalities between the global north and the global south. The relative strength of these two forces would depend on the circumstances in countries created by policy frameworks developed by local governments (Kingsbury et al. 2012). In the end, backwash effects proved much more powerful than the spread effects, thus only further exacerbating existing inequalities. There was need for new development theories.

Dependency theory

During the 1960s it became apparent that the classical economic theory did not reduce inequalities as predicted. Instead, countries seemed to move in the opposite directions: the division between the poor 'peripheral countries' and the rich 'core' seemed only to increase. This was particularly the case in Latin America, where a new development theory, known as development theory, was developed. It was theorised that global commerce took place between rich and powerful developed countries and weaker peripheral countries. In this context, the rules of trading system were systematically manipulated to always be in favour of rich western-based corporations, ultimately benefiting the already rich countries (Kingsbury et al. 2012). Modernisation theory was discredited as it was argued that rich countries achieved their growth by systematically exploiting their colonies, a process that continued after independence. The backwash effects were therefore much stronger than the spread effects.

To counter the negative backwash effects dependency theory called for a complete reform of institutional arrangements and relationships with the outside world. It was argued that late industrialisers, such as Germany and Japan, had gone through earlier stages of industrialisation by hiding behind tariff walls until they felt competitive enough to enter the global market. The focus should therefore be more on the internal market and reducing the dependency on expensive imports from rich countries. In other words: new technologies should be developed and implemented internally. In this case the local government is the catalyst of development through the issuing of policy frameworks. The reduced dependency on foreign imports should reduce the backwash effects (Kingsbury et al. 2012).

Neoliberalism

Neoliberalist development theory was popular in the 1980s and resembled modernisation theory as they share the believe that all good comes from external sources (i.e. foreign investment) and both underline the importance of domestics saving rates. The major difference between modernisation theory and neoliberalism is that neoliberalism dismisses the role of the government. In neoliberalism, politicians are portrayed as villains who are only looking after their own interest instead of the

interest of society as a whole (Kingsbury et al. 2012). Instead of national governments, markets are seen as the catalyst of development. The role of the government must be reduced as government interference leads to market failures, which negatively impacts development. This means that spending on government services such as health and education must be reduced in order to balance the national budget and to create an environment more favourable for foreign investment. Furthermore, foreign exchange rates must be actively managed and devalued in order to increase export competitiveness. According to neoliberalist development theory, world trade is the panacea to all development woes. Neoliberalist thinking has been central to policy development in financial institutions such as the International Monetary Fund (IMF) and World Bank (Kingsbury et al. 2012).

The IMF and World Bank have been very influential in development since the 1980s. Countries that applied for loans were required to implement Structural Adjustment Programmes (SAPs). SAPs required countries to liberalise and deregulate their economies for the sake of free trade. Countries that implemented the SAPs did see an increase in exports, but on the other hand saw massive deterioration in investments and a rapid increase in poverty. Another negative consequence was that many developing countries became vulnerable to the negative influence of the world market, especially price fluctuations and the price competitive nature led to a so called "race to the bottom" to produce ever cheaper goods for the sake of increasing exports, severely reducing income for producers of raw material (e.g. agricultural goods) in developing countries (Kingsbury et al. 2012).

3.1.2 Contrasting development approaches in post-colonial Sub-Saharan Africa and Ghana

Of the theories mentioned above, neoliberalism has been most influential in the development context of Sub-Sahara Africa. Especially the SAPs, imposed by the IMF and the World Bank, have been very influential on how African countries regulate their domestic markets (Riddel, 1992). Côte d'Ivoire will serve as an example of the influence of neoliberalism on Sub-Saharan Africa. Côte d'Ivoire is the world's leading producer of cocoa and implemented SAPs under pressure of the IMF in the 1980's and fully deregulated its cocoa sector (Kingston et al. 2011). The government of Ghana, on the other hand, maintained a strong regulating position in its cocoa sector (see section 2.3) and adhered more to the dependency theory (Vellema et al. 2015: Ahiakpor, 1985). The two countries form an interesting comparison as they are located in the same region (West Africa) and are both major producers of cocoa.

Development in post-colonial Sub-Saharan Africa

Debt crises were rampant all through Sub-Saharan Africa in the early years of independence, much like ever increasing rates of unemployment and a lack of food and fuel, furthermore living standards plummeted. Other issues, such as rapid population growth, overurbanisation, environmental deterioration, political instability and AIDS only further exacerbated the already problematic situation (Riddel, 1992) In order to curb these negative development trajectories, the dominant development approach that has been applied to the region is that of neoliberalism, introduced through the Structural Adjustment Programmes of the IMF (and later the World Bank)(Kingston et al. 2011: Riddel, 1992).

Structural Adjustment Programmes in practice: the case of Côte d'Ivoire

Côte d'Ivoire is a former colony of France and gained its independence in 1960 (Rowntree et al. 2009). Much like other African nations after independence, Côte d'Ivoire was vastly underdevelopment compared to their former coloniser and faced many of the problems mentioned

above. The implementing of the SAPs by the Ivorian government has led to the deregulation of the cocoa sector and cuts in government spending on health and education to balance the national budget. The liberalisation of the Ivorian cocoa sector has led to a doubling of the incidence and intensity of poverty from 17,8% to 37% of the population. The export of cocoa, however, increased from 3 billion USD to 5 billion USD. On the other hand, the Ivorian GDP remained stagnant at 10 billion USD (Kingston et al. 2011). Furthermore, the strain on the economy forced farmers to produce more cocoa in order to sustain their livelihoods, which led to an increase in the reliance on child labour.

The cuts in government spending on health and education were equally problematic. User fees were introduced to the national health system, seriously impairing the accessibility of health care for the poorer Ivorian citizens. The reduction of wages for teachers in both primary and secondary education led to a serious decline in the quality of education and to an exodus of highly skilled workers to countries with better employment (Kingston et al. 2011).

The implementation of SAPs has had a severe negative impact on Côte d'Ivoire. The external debt increased from 7.4 billion USD to 17.7 billion USD between 1980 and 1990. This turned Côte d'Ivoire in one of the most indebted countries in the world. The devaluation of the Ivorian currency in favour of exports further exacerbated the situation of the already poor Ivorian citizens as both savings and purchasing power declined (Kingston et al. 2011). The neoliberalist approach of focusing on increasing exports through deregulation was clearly ineffective, even counterproductive, in the development process of Côte d'Ivoire. Similarly, other sub-Saharan countries have shown similar development trajectories after implementing SAPs (Kingston et al. 2011: Riddel, 1992).

Ghana

Ghana is an interesting case in the development context of sub-Sahara Africa. Ghana faced many of the same problems that other countries in region faced. Especially food production was lacking and budget deficits kept increasing in the early 1970s (Ahiakpor, 1985). The SAPs imposed by the IMF and the World Bank were implemented to some extent as foreign exchange was needed, however the dominant development theory applied to Ghana is the Dependency Theory (Riddel, 1992: Ahiakpor, 1985).

Dependency Theory was popular mostly with scholars and students from the law and political science faculties of the University of Ghana. It was these scholars and students that persuaded President Rawlings in the end of 1970s to change the institutional arrangements of Ghanaian society in order to promote justice, economic growth, and development according to interpretations of development in line with the dependency theory (Ahiakpor, 1985). The shift to dependency thinking led to the implementation of the Policy Guidelines of the Provisional National Defence Council (PNDC), which stated that 'retention of structures of colonialism assured the continuing domination of the Ghanaian economy by foreign financial interests' (Ahiakpor, 1985: p.542). Furthermore, a fundamental break from existing neo-colonial relations was needed in order to achieve total economic independence.

The policy guidelines were aimed at reducing the power of international corporations by renegotiating agreements made with previous governments. Most importantly, the importing of goods for which the government was responsible for allocating foreign exchange was made a state monopoly as foreign owned commercial enterprises were excluded. Foreign controlled banks were also banned from retail banking and the Ghanaian government increased its share in foreign banks

and insurance companies in order to increase its influence on these institutions (Ahiakpor, 1985). Furthermore, foreign ownership in the Ghanaian economy was drastically reduced through nationalisation or even total exclusion.

The complete overhaul of the Ghanaian economy yielded some positive results, namely the decrease in prices and rates announced by landlords, market women, spare-part dealers, and lorry- and taxi drivers. The decrease in prices led to an increase in the purchasing power of Ghanaians. Government revenues also increased through better collection of taxes and penalties. The increased government revenue decreased the dependency on the Central Bank of Ghana for credit (Ahiakpor, 1985).

The various actions of the Ghanaian government ultimately did not reduce the dependency of the Ghanaian economy. Even more worrisome is the fact that the dependency theory strategy increased the level of poverty and subsequently increased the dependence on foreign aid and charity. The increase in poverty stemmed mainly from the severe reductions in the stocks and flows of consumer and producer goods, reductions in production capacity resulting in increasing unemployment, and increasing social tensions resulting in violence (Ahiakpor, 1985). Another outcome of the dependency theory, which is not necessarily negative, is still noticeable in the contemporary Ghanaian cocoa sector, namely that the internal cocoa sector has only been partly liberalised (see section 2.3). Other cocoa producing countries, such as Côte d'Ivoire and Cameroon, have fully liberalised cocoa sectors as a result of the implementation of SAPs (Vellema et al. 2015).

Today Ghana is referred to as a success story of the African continent as it will be the first country to reach the first Millennium Development Goal (MDG): halving its national poverty rate against its 1990 level. Furthermore, Ghana's political stability with regular elections resulting in changes in governments is also quite an accomplishment compared to the political unrest in other sub-Saharan countries (Wiggins & Leturque, 2011). However, it must be noted that Ghana is still ranked as a low middle income country and faces many economic issues that still need to be addressed (Worldbank, 2016a).

Development outcome in sub-Saharan Africa

In the end both the implementing of the neoliberalist approach in most sub-Saharan Africa countries and the introduction of the policy prescriptions in line with the dependency theory in Ghana appeared to be ineffective in combatting inequality and poverty. National governments proved ineffective in fostering development, either through regulation or deregulation of the local economy (Kingsbury et al. 2012). There was a need for a shift to other mechanisms in which the private sector and civil society would be the dominant regulators and catalysts of development. This shift away from the national governments as dominant actors in development is known as private governance (Bartley, 2006).

3.2 Private governance and sustainable supply chains

As previously mentioned, national governments and intergovernmental organisations have traditionally been the key actors in the sustainable development arena where organisations such as the European Union were the dominant regulating actors (Ruggie, 2004). However, in recent years, a new form of governance has surfaced in which market and civil society actors have become the important initiators of regulations related to sustainability (Bartley, 2006: Bartley, 2010). This new form of governance is called private governance and is novel in the sense that governments have no decision power, but a mere consultative and facilitating role (Glasbergen, 2011). The shift from public

to private governance was primarily due to the fact that supply chains have become increasingly complex and stretch over an increasing number of countries involving increasing amounts of people and the fact that public governance institutions lacked the capacity to effectively regulate international markets (see previous section on development) (Bartley, 2006).

One of the forms private governance, or sustainable supply chain governance (SSCG), is certification. SSCG systems can be defined as "forms of cooperation of market actors in (international) supply chains (possibly together with non-market actors) in improving the environmental and social conditions of production operations in developing countries" (Vermeulen & Metselaar, 2015: p227). Certification of a commodity, such as cocoa, is usually the result of a partnership between NGOs (non-market actors) and businesses (market actors) aimed at creating a more equitable or more sustainable supply chain (Glasbergen, 2011). Certification has many virtues to resolve problems related to production and has the ability to serve business actors as well as NGOs, civil society actors, and other stakeholders in a supply chain, such as producers of crops in developing countries (Glasbergen, 2011). Undergoing certification is voluntary for businesses and yields some benefits, mainly related to marketing, as certification shows a commitment to resolve issues within a supply chain (e.g. child labour) (Bartley, 2010). Various scholars question whether private governance can be effective to the extent that they can replace public governance modes (Bitzer & Glasbergen, 2015: Smith & Fischlein, 2010). The major downside of private governance is that if often lacks legitimacy due to its undemocratic nature (Glasbergen, 2011) and the lack of stakeholder involvement (ICCO, 2010).

3.3 Certification of the cocoa supply chain

One complex supply chain that is undergoing certification is that of cocoa. A supply chain is an input/output structure of value-adding activities, beginning with raw material and ending with the finished product (Gereffi et al. 2001). Cocoa certification is aimed at improving the cocoa supply chain in terms of ecological sustainability (e.g. improving farming practices), but also aims to improve social (e.g. eradicating child labour), and financial conditions (e.g. fair prices) at the bottom of the supply chain (i.e. targeting the farmers in producing countries) (UTZ certified, 2014a: Ingram et al. 2014: Rainforest Alliance, 2012). The three largest certification schemes in cocoa are: UTZ Certified, Rainforest Alliance, and Fairtrade. These three schemes have set up standards that, if implemented correctly by farmers, should improve the conditions mentioned above. The impact of these three schemes is assessed by third parties such as universities, research institutes, consultancy firms, and government institutes. These third parties are often commissioned by the certification schemes to do impact assessments to assess the effectiveness of certification (Waarts et al. 2013).

3.4 Sustainable development: People, Planet, Prosperity

As previously mentioned, development is a key issue in the world, especially in Africa after independence. The idea of development has been central to the processes by which poorer countries organise themselves. The process of development focused on how countries can facilitate development, the role of other actors (i.e. market actors, civil society) in the process was not addressed (Kingsbury et al. 2012).

In later years the concept of sustainable development has gained prominence. Growing concerns about the human impact on the environment started to arise in the early 70's with the publishing of a report called 'Limits to Growth'. This report highlighted the impact of exponential growth in both

population and economic development on the finite resources of the planet (Goudie, 2006). Concerns about the environment culminated into the influential Brundtland report, published in 1987, where sustainable development was defined as: 'meeting the needs of the present without compromising the ability of future generations to meet their own needs' (United Nations, 1987). Similar to development in general, the concept sustainable development was predominantly concerned with the task of governmental institutions.

The concept of sustainable development gained increasing attention in the decades following the publication of the Brundtland report. However, attention increasingly shifted from the role of governments to the pivotal role that corporations have in sustainable development. The new role of corporations meant that the focus should no longer be solely on making profit, but that corporations also have a duty to address social and environmental issues in their respective supply chains. The increasing responsibility attributed to corporations became known as corporate social responsibility (CSR). A new concept, known as People Planet Prosperity (PPP), was introduced in order to address the various social and sustainability issues related to the negative internal and external effects of corporate production- and consumption systems. The three P's, all roughly equally important, stand for ecological threats (Planet), obstructed development potentials for individuals in supply chains (People), and the development goal, namely creating shared value and prosperity in the communities linked in a supply chain (Prosperity) (Vermeulen & Witjes, 2016).

As mentioned in section 3.2, certification of products is a means by which corporations are able to show their commitment to CSR. Consumer concerns about unsustainable or unequitable production systems can be addressed by implementing production standards that, if implemented correctly, should address PPP. This would result in a marketing advantage for corporations and increased development potential for, for instance, cocoa farmers at the bottom of the supply chain (Bartley, 2010: Glasbergen, 2011). UTZ Certified is an example of a certification standard that enables corporations to display their corporate social responsibility while simultaneously addressing development issues related to People, Planet, Prosperity.

3.5 UTZ Certified and the UTZ Theory of Change

Of the three major certifiers, UTZ certified is the biggest in terms of amount of certified cocoa. Besides cocoa, UTZ also certifies sustainable coffee and tea and reaches around 900,000 people in 34 different countries. The name of UTZ certified is also the most visible label as it appears on 10,000 different products that are sold in 116 different countries (UTZ certified, 2014a). The global reach of UTZ, and especially its comprehensive Theory of Change (ToC), make it a perfect example to describe the methods and goals of private certifications standards.

The UTZ Theory of Change forms the basis for monitoring and evaluation of UTZ standard. The ToC has three main focuses: People, Planet, and Prosperity. Figure 3.1 on the next page shows a simplified version of the ToC with its requirements ultimately leading to the desired impact. The ToC is a relatively mechanic theory that assumes that if farmers adhere to the requirements (strategies) to the left of the model it should lead to the direct outcomes, which already constitute improvements to farmers, leading to the expected outcomes before ultimately leading to the desired impacts. The desired impacts is where we find People (better life), Planet (better environment), and Prosperity (better crop and better income) (UTZ certified, 2014a).

The UTZ ToC is a useful tool to measure the impact of private standards on the farm level. Therefore, the theory will be used as a basis for the measuring of the impact of standards on People, Planet, Prosperity at the farm level in Ghana in this research. Subsequently, the various requirements, direct outputs and expected outcomes will be operationalised in the next chapter discussing the employed methodology. For this, the UTZ Code of Conduct will be used in addition to the UTZ Theory of Change. The UTZ Code of Conduct describes the requirements farmers have to meet before becoming certified a long with how the implementation of the requirements should be monitored (UTZ Certified, 2014b).

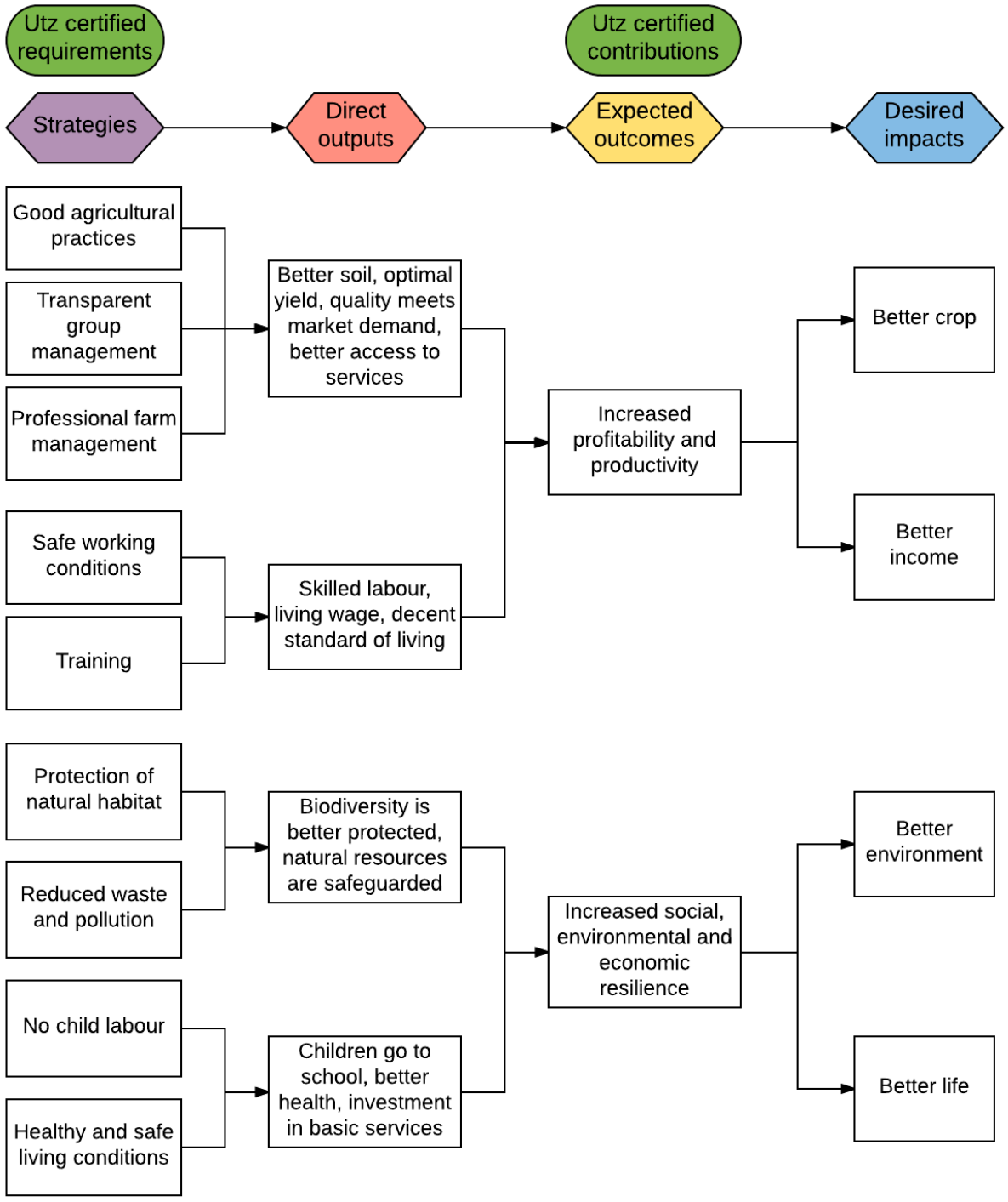


Figure 3.1: Simplified UTZ Theory of Change (UTZ Certified, 2014a).

3.6 Main research question and sub questions

This research has a dual focus: public governance from the Ghanaian government (i.e. COCOBOD) and private governance from certification standards. Both types of governance affect cocoa production in Ghana, and rural development of cocoa farming communities in particular. The main focus of this research is to verify what the effect is of the public policies from COCOBOD on the uptake and effectiveness of certification standards at the farm level in Ghana. To this end, the following research question and sub questions have been formulated:

"Through what mechanisms and to what extent do public policies from the Ghana Cocoa Board affect the impact and uptake of private certification standards at the farm level".

Sub questions:

- How can the uptake and impact of certification standards be assessed?
- How are policies formulated by the Ghana Cocoa Board, who are involved in the decision making process, and how are the policies implemented?
- How do the policies of the Ghana Cocoa Board affect cocoa farmers?
- How do the policies of the Ghana Coco Board affect the uptake and impact of private certification standards?

4. Methodology

4.1 The original research plan

Fieldwork, especially in Africa, can be very difficult. Unforeseen events can make data collection either difficult or even impossible. This is also the case for this research. The original research plan was to do a comparative case study comparing the internal cocoa markets of Ghana and Côte d'Ivoire. The cocoa sectors in both countries differ in the extent to which the government regulates the market. Ghana has a strong involvement through COCOBOD, which regulates every aspect of the internal market, whereas Côte d'Ivoire has little regulation besides a fixed farm gate price. A comparative research design was chosen to investigate the effect of different regulatory systems on the effectiveness of private certification standards in both countries.

After completion of the data collection in Ghana, I was supposed to fly to Abidjan on the 14th of March. On the 13th of March, however, a terrorist group attacked a hotel in Grand Bassam, near Abidjan, killing 22 persons. After discussing options with the Utrecht University and my internship, the Royal Tropical Institute, I first decided to postpone my fieldwork in Côte d'Ivoire to first assess the safety in the country. Various emails with the French embassy in Abidjan and the Dutch embassy for West Africa in Accra made it clear that, besides the terrorist threat, the inlands of Côte d'Ivoire were unsafe especially in cocoa producing areas where armed robberies are common due to the fact that a lot of cash is involved in the cocoa trade. I was told I could travel to Côte d'Ivoire, but only if I wouldn't travel alone or at night. Since I was not sure if an organisation could move me around the country for a month, I decided to cancel my trip to Côte d'Ivoire as I had no guarantee I would be able to gather my data in those circumstances.

The original research plan also involved comparing certified with uncertified farmers to assess the impact of certification on farmers. Being able to interview farmers is a long process as you can't go to communities on your own without permission from local chiefs or farming organisations. It became clear that the only way to be able to get in touch with cocoa farmers was through farmers associations. However, all farmers that are member of such a cooperative are certified and the one month I would originally have stayed in Ghana was not enough to make contact with uncertified farmers as even finding a cooperative for certified farmers took about 3 weeks. I therefore had to adjust my research plan and my questionnaire to involve only certification and assess the impact by comparing the time before certification with after certification.

Further changes to the questionnaire were made after discussing the questions with local stakeholders involved in the farmers' association Kuapa Kokoo. Farmers would not be able to answer certain questions in detail regarding the exact changes between before and after certification as some of the farmers have been certified for over 10 years. I therefore changed questions to see whether if something changed instead of the extent to which, for instance income or productivity, have changed in order to reduce non response. The degree of detail in the quantitative data is therefore severely reduced as I can only verify whether there was a positive or negative change, and not the extent to which the situation has changed. This could also pose problems in the analysis as nominal variables are less suitable for calculating correlations.

Access to respondents was also an issue for the qualitative data collection. Diversification of the respondents provides a more complete story of the Ghanaian cocoa sector as multiple angles and

interests are taken in to account. Access to government officials was particularly difficult. Attempts by email and phone calls to arrange interviews with representatives of the Ministry of Finance and the Ministry of Food and Agriculture were fruitless. Another important stakeholder, the Ghana Cocoa Coffee Sheanut Farmers Association, was equally non responsive to emails and phone calls. The reduced diversity in group of respondents could lead to missing information, especially on government functioning in Ghana.

4.2 Methodological approach

The selected methodology relies on three key strategies: desk research and qualitative and quantitative data analysis (mixed methods). Desk research is needed for several reasons: first of all, there is need for general theory on how certification (and private governance) works. Secondly, the role of governmental institutions in development in post-colonial Africa needs to be investigated for a clear picture of the development context (see section 3.1). Thirdly, policy and literature review is needed to fully understand how the Ghanaian cocoa sector is organised. This requires policy documents from the Ghanaian government, as well as scientific literature on government functioning in Ghana. Finally, literature review is required to select indicators on how to measure the effectiveness of the certification scheme, and which other factors might have influence besides government regulations. Figure 4.1 shows the research framework including all the steps required to answer the main research question.

To further complement the desk research qualitative data will be collected in the field using semi structured interviews with COCOBOD officials and other major stakeholders in the Ghanaian cocoa market (i.e. market actors and NGOs). The interviews with COCOBOD officials serve to gather detailed data on how COCOBOD as an institution is organised, how policies are formulated, who are involved in the policy formulating process, how policies are introduced in the system and how the policies affect cocoa farmers and cocoa production according to the interviewed stakholders. The interviews with other stakeholders, such as UTZ Certified, Solidaridad and Kuapa Kokoo serve to provide insights on how certification works in practice, how it is implemented, what actors are involved in the implementation, what the impact of certification is, and what factors affect this impact. The combination desk research with the qualitative data collection should result in hypotheses on how institutional arrangements affect the functioning of private certification standards.

The final step is to collect quantitative data through structured interviews at the farm level. The questionnaire (see Annex IV) will be developed based on the collected qualitative data and the desk research. The goal of the quantitative data is to verify what the exact impact is of policies from the COCOBOD on cocoa farmers and the extent to which farmers implement the certification standards and the extent to which the implementation of these standards leads to improvements in People, Planet and Prosperity at the farm level. The combination of the three research methods leads to the answer to the research question as well as policy recommendations for both COCOBOD and certification schemes. Figure 4.1 shows the research framework with the various research methods ultimately leading to the answer to the research question.

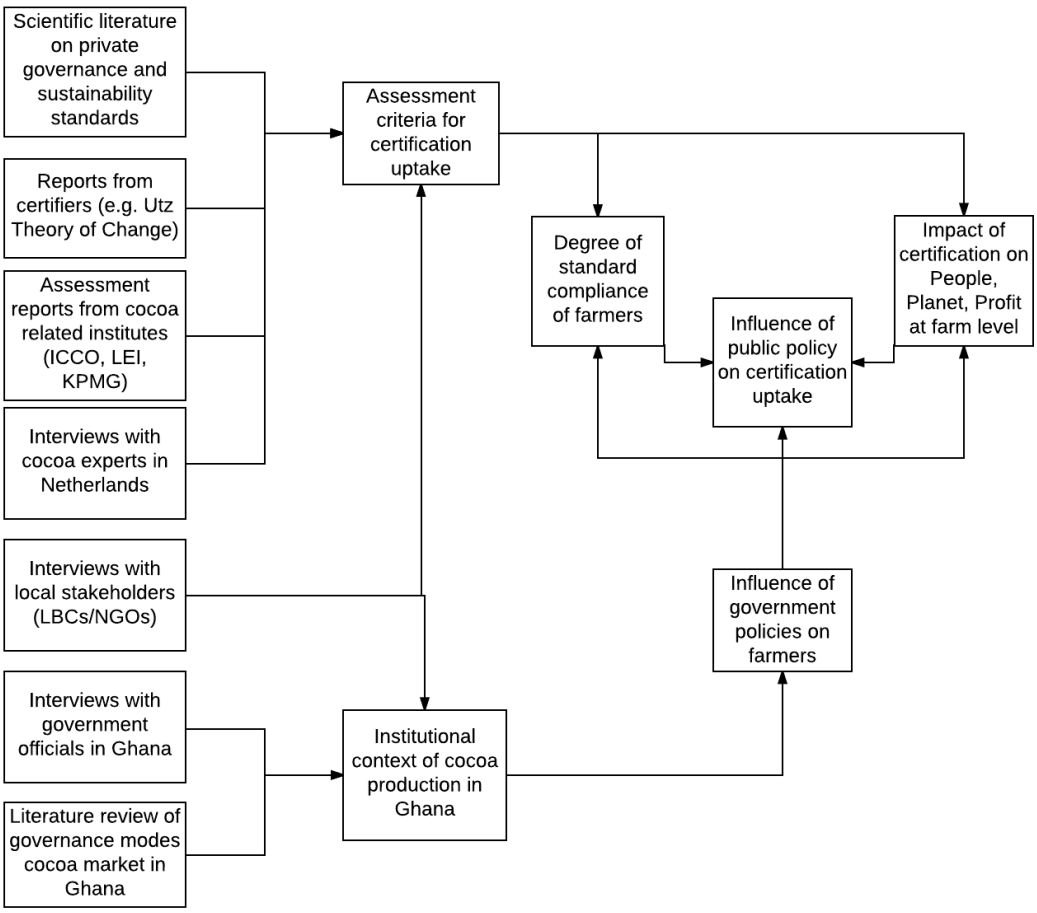


Figure 4.1: Research framework detailing research process leading to answering the main research question

4.3 Research design and research methods

The research design employed for this research is the case study design. Yin (2009) defines a case study as "*an empirical inquiry that investigates a contemporary phenomenon in depth and within it's real life context"* (Yin, 2009, p.18).This definition shows the suitability of the case study for this research as it investigates contemporary phenomena (private standards and public policies) within it's real life context (the cocoa sector in Ghana). One of the benefits of using the case study design is its high internal validity. However, the external validity is low. This means that the results are valid for Ghana alone, and are not applicable for other cocoa producing country.

The research method used during this research is called mixed methods in which both quantitative and qualitative research methods. The main benefit of mixed methods research is that it allows for very broad analysis (Bryman, 2008), which makes this method very useful as a broad understanding of the cocoa supply chain is needed.

4.4 Research locations

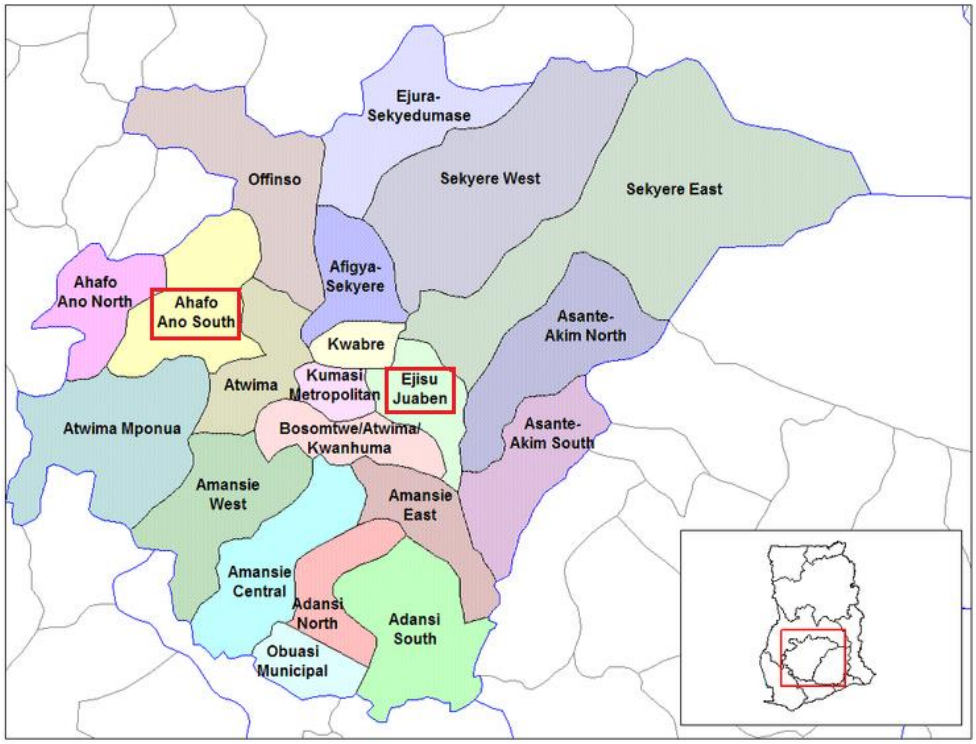
The fieldwork during which the quantitative data with farmers was gathered was spread out over two periods. It was anticipated to only go into the field once in Ghana, but due to reasons mentioned earlier it was decided to gather extra data in Ghana in April. The fieldwork was conducted with the aid of two farmers' cooperatives: Kuapa Kokoo and Kokoo Pa. The regional offices of these organisations can be found in Kumasi in the Ashanti region. The communities to be visited were

selected in consultation with the regional managers, district managers and lead farmers to see when and where farmers would be available to respond to the questionnaire. The locations were chosen based on the days I was in the area and on the days on which translators, transportation, and the farmers were available. For the sake of comparability, all the communities to be selected are from the Ashanti region in order to have similar background characteristics (amount of rainfall, soil structure etc.). With these criteria in mind, the following six communities were selected: New Koforidua and Nobewam for Kuapa Kokoo, and Biemso II, Fedeyaya, Kunsu Camp and Kunsu Kumawu for Kokoo Pa. The characteristics of the villages can be found in table 4.1.

Table 4.1: The selected research locations

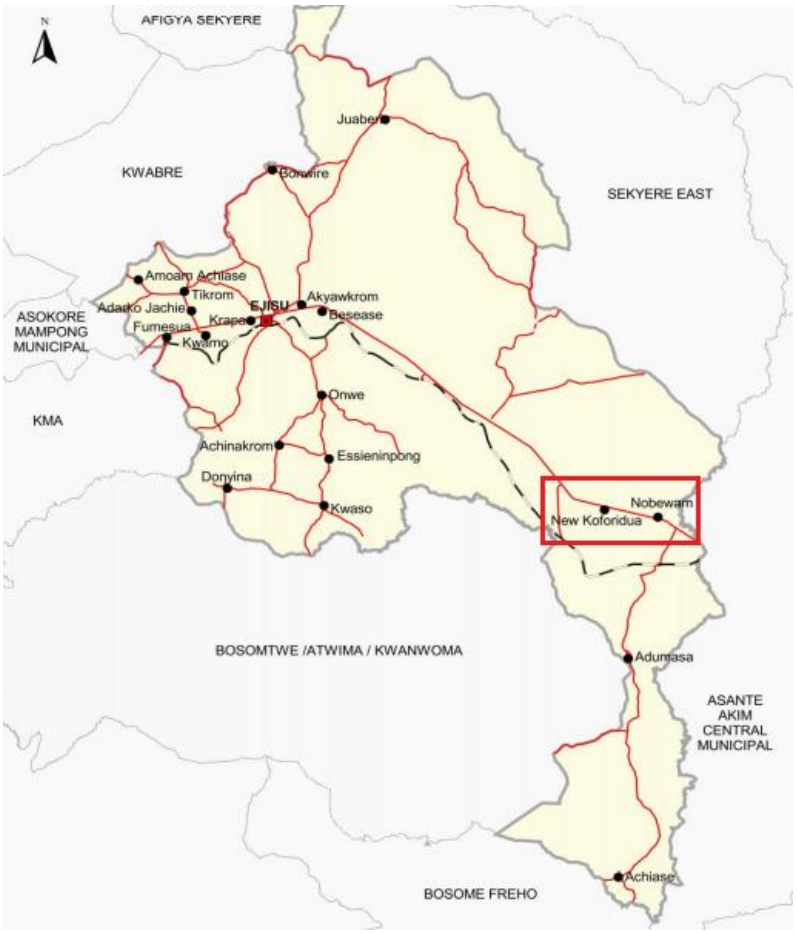
	Fieldwork March	Fieldwork April
Region	Ashanti	Ashanti
District	Ejisu-Juaben	Ahafo-Ano South
Communities:	New Koforidua Nobewam	Biemso II Fedeyaya Kunsu Camp Kunsu Kumawu
Certification standard	Fairtrade, UTZ Certified	UTZ Certified
Certifying organisation	Kuapa Kokoo Farmers Union	Kokoo Pa

Map 4.1 shows the Ashanti region with the two districts highlighted in red. The Ashanti region is located in the middle-south part of Ghana and consists of 18 districts. The capital of the region is Kumasi, which is the second largest city in Ghana with around 1.5 million inhabitants in 2005. Ashanti is most famous for its gold and cocoa production (Government of Ghana, 2016a). Hainmueller et al. (2011) reported that this region has relatively large farm sizes compared to other regions (4 acres in Ashanti versus 2.51 acres on average for all cocoa regions) and a relatively high usage of fertiliser.



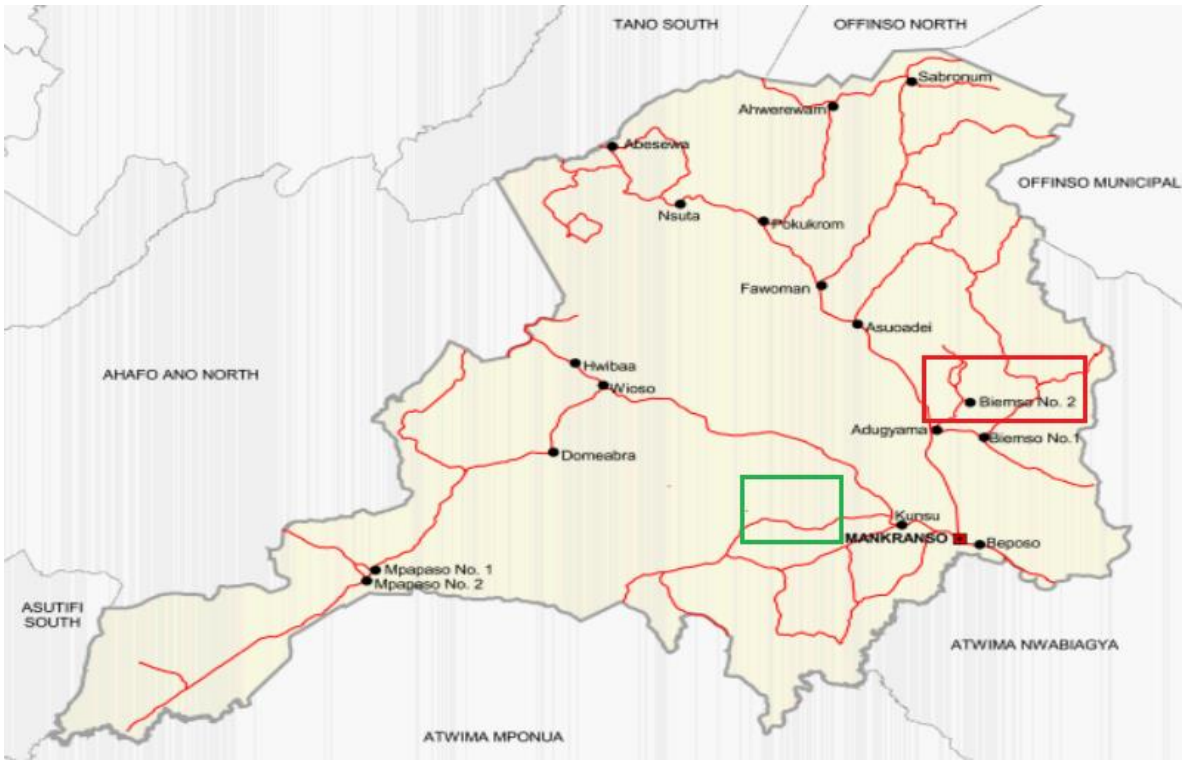
Map 4.1: The Ashanti region with the two visited districts in red. Bottom right shows the location of the Ashanti region within Ghana (enhancedwiki.altervista.org, 2016).

During the first field trip with Kuapa Kokoo in March the communities of New Koforidua and Nobewam were visited (see map 4.2). These communities are located east of Kumasi (see map 4.1). The communities are well connected as they are positioned on the N6 highway connecting Kumasi to Accra. The communities are located in the Ejisu Juabendistrict of which Ejisu is the capital. The distance and accessibility of the district capital could be a factor influencing the efficiency of COCOBOD's input delivery as all inputs are first shipped to the district capital before distributed among the communities. However, it should be noted here that farmers from New Koforidua and Nobewam get their inputs from Konongo, the capital of the neighbouring Asanta Akim North district as it is closer (F. Frimpong, personal communication, 24/07/2016).



Map 4.2: The Ejisu JuabenDistrict with New Koforidua and Nobewam in the East (Ghana Statistical Service, 2014a).

The second round of data collection in the field took place in April with the cooperation of Kokoo Pa. Four communities were visited in two days to administer 56 questionnaires. Map 4.3 shows the locations of Biemso II, Fedeyaya, Kunsu Camp and Kunsu Kumawu. These four communities are located in the Ahafo Ano South district to the north-west of Kumasi (see map 4.1). Mankranso is the district capital and lies in close proximity to the four communities. However, the communities are connected to the (concrete) main road by dirt roads that can become impassable during the rainy season. The quality of the roads may affect the delivery of inputs by COCOBOD.



Map 4.3: The Ahafo Ano South with the locations of Biemso 2 and Fedeyaya (red square) and Kunsu Camp and Kunsu Kumawu (green square)(Ghana Statistical Service, 2014b).

4.5 Structured interviews with cocoa farmers

Structured interviews with cocoa farmers are used to measure to the extent to which good farming practices are adopted by farmers and to investigate the impact of standard compliance on productivity, income and other indicators. Another use for the structured interviews is to check the role of COCOBOD at the farm level and what the influence is of certain policies on farmer livelihoods. The questionnaire that has been used can be found in Annex IV.

4.5.1 Sampling strategy

As mentioned before, the quantitative data collection can be divided into two different trips to the field. The farmers were selected on two criteria, 1: the farmer must be certified, and 2: availability. The farmers were randomly selected from the Kuapa Kokoo or Kokoo Pa member list by either the lead farmer at the community level or the local extension officer. As mentioned in section 4.4 the days of the field work was also a factor for availability as cocoa farmers have a so called 'Taboo day' (one day in the week when the farmers do not work) every week. The research locations, and therefore also the farmers, were therefore selected based on the days I was in the field.

A total of 106 questionnaires were administered in 6 different communities, 50 respondents are member of Kuapa Kokoo and 56 of Kokoo Pa. The main characteristics of the selected farmers can be found in the table below.

Table 4.2: Main characteristics of the research population in the visited communities

District	Ejisu-Juaben		Ahafo Ano South			
Village	New Koforidua	Nobewam	Biemso II	Fedeyaya	Kunsu Camp	Kunsu Kumawu
Farmer total	198	262	380	60	250	180
Research population	n=27	n=23	n=22	n=12	n=11	n=11
Mean age	56,5	57,7	60,9	46	50,2	56,1
Max age	73	82	85	72	75	69
Min age	26	37	38	28	25	42
Sex	M:19 F:8	M:15 F:8	M:13 F:9	M:7 F:5	M:7 F:4	M:5 F:6

4.5.2 Data collection procedure

Data collection in the field faced a variety of difficulties. Firstly, the questionnaire is 88 questions long making the answering of the questions time consuming (each questionnaire would take about 60-80 minutes). Secondly, most of the farmers do not speak or read English; therefore translators were required to be able to administer the questionnaire. Thirdly, a problem of logistics: both Kuapa Kokoo and Kokoo Pa were only able to gather all farmers at the same time, which meant that 10 to 20 farmers would be grouped together once. The three difficulties combined meant that it was impossible for me to administer the questionnaire one farmer at the time because that would be too time consuming. To be able to speed things up, an extra translator was hired and all translators were briefed administering the questionnaire for them to be able to administer the questionnaire themselves. This enabled doing two questionnaires at the time, which was still too slow as I could not keep farmers waiting for more than 5 hours. I was therefore forced to have my translators administer the questionnaire to 3 or 4 farmers at the same, significantly increasing the potential for biased answers as will be discussed in the next subsection. A solution would have been to spread the data collection out over more days, but availability of transportation, farmers and translators made this impossible.

4.5.3 Potential biases during the quantitative data collection

The way the questionnaire was administered is a significant source for bias. The administering of multiple questionnaires at the same time by one translator could also lead to farmers basing their answer on what they heard the other farmers say, reducing variety in answers. Another potential bias is the translators themselves; the translators were themselves employed by either Kuapa Kokoo or Kokoo Pa and could potentially alter certain answers, especially as I could not understand the answer provided by the farmer in Twi. The translators could also ask questions in different ways, which could influence answers causing an inter-interviewer bias resulting in different interpretations of questions by the farmers.

Several measures were taken in order to reduce the sources of bias. The translators were always briefed the morning of the fieldwork to reduce variability in interpretation of questions from the part of the translators and to discuss logical answers to questions or what the meaning was of certain questions. I supervised the translators as they administered the questionnaire to make sure all the farmers were asked the same questions and to make sure all questions were filled out. After finishing the fieldwork, the preliminary results and anomalies would be discussed with the local district officer to check whether answers were indeed logical or that mistakes were made.

Nonetheless, some bias and non-response still occurred. Bias occurred in the sense that questionnaires that were administered simultaneously by the same translator yielded similar answers for the open questions. Non-response occurred mostly for question 86 on record keeping. The question was answered with 'Not applicable' (N/A) by most farmers, which is impossible as record keeping is mandatory for certified farmers (F. Amponsah, personal communication, 16/06/2016).

4.6 Semi structured interviews with stakeholders and COCOBOD officials

The semi structured interviews form the qualitative part of the research. The interviews provide an overview of the major challenges and development in the Ghanaian cocoa sector. The respondents come from a variety of organisations that are active in cocoa. The goal was to have at least one type of actor from each sector. The organisations can be categorised as follows: NGOs, COCOBOD, market actors and other.

The interviews with COCOBOD officials were predominantly aimed at investigating the institutional arrangements within COCOBOD, how policies are formulated and by whom, and how policies are implemented. To this cause, three officials have been interviewed from three different sections COCOBOD: research monitoring and operations, Cocoa Health and Extension Division (CHED) and the Cocoa Research Institute Ghana (CRIG). The goal was to also have respondents from other ministries, namely the Ministry of Food and Agriculture and the Ministry of Lands and Natural Resources. These ministries were, however, non-responsive to both emails and phone calls.

The interviews with Solidaridad and UTZ Certified were conducted in order to fully understand the goals, implementation procedures and functioning of private standards, and to see which actors are involved in developing the standards and training manuals.

Market actors were included to see how COCOBOD policies and certification standards affect the cocoa trade. Kuapa Kokoo Limited, an LBC, is an internal market player that buys cocoa from farmers and sells to COCOBOD (CMC), while Cargill is an international market player that buys from the CMC and processes chocolate into semi-finished products such as cocoa butter and cocoa liquor before selling to chocolate manufacturers.

Organisations such as the World Cocoa Foundation, IDH and the Dutch embassy in Accra were included in the research to develop a broad overview of the issues and challenges in the Ghanaian cocoa sector. These organisations are directly involved in sustainability programs or work together with other stakeholders in the cocoa sector.

Table 4.3: Semi structured interviews with stakeholders in the Ghanaian cocoa sector

Non-governmental organisations	COCOBOD officials	Market actors	Other
Solidaridad	Research, monitoring and operations	Kuapa Kokoo Limited	IDH
World Cocoa Foundation	Cocoa Health and Extension Division	Cargill	Dutch Embassy in Accra
UTZ Certified	Cocoa Research Institute Ghana		

4.7 Operationalisation of variables

Operationalisation of the variables is required to be able to measure them. This research includes a variety of variables related to farmer characteristics, contextual characteristics, the uptake and impact of certification, the role of COCOBOD and a variety of other variables that could be relevant for this research. The variables that are used to measure the uptake of certification and impact of certification are taken from the UTZ Theory of Change, UTZ Code of Conduct and a previous research into UTZ Certification standards by Dengerink (2013). The variables are operationalised in order to compare the pre-certification period with the situation in the last 12 months. The categories in which the variables are grouped are as follows: farmer characteristics, contextual characteristics, COCOBOD operations, changes in farming practices, certification outcomes, certification impacts and 'other' variables. The tables in Annex III give an overview of how the variables have been operationalised and to which question in the questionnaire they correspond. The questionnaire can be found in Annex IV.

4.8 Quantitative analysis

The quantitative data collected through the questionnaires will first be summarised through descriptive analysis (i.e. frequencies and percentages). The descriptive results will be provided in section 6.1. Then, in section 6.2, statistical analysis of the variables is provided in order to find explanations for the results found for both the descriptive results of the quantitative data, as well as the results from the qualitative data. The results will provide insights as to which variables are the most important determinants for certification uptake and impact, and how the effects of COCOBOD policies affect this at the farm level. The analysis will make use a variety of statistical tests to find significant difference and correlations between variables. The tests that are used depend on what type of variables the dependent and independent variables are (nominal, ordinal or scale).

4.8.1 Differences between variables

Differences between variables are calculated when the independent variable is nominal. An example of a nominal independent variable is the community in which a farmer lives. There are four statistical tests suitable to measure differences between nominal variables depending on the variable type: Chi-square, the T-Test, the Mann-Whitney U Test, and the Kruskall-Wallis H Test. Table 4.4 provides information as to when a specific statistical test is suitable (Field, 2013). The T-Test will not be used in this research as none of the scale variables have a normal distribution.

Table 4.4: Suitability of statistical tests for calculating differences between variables.

Statistical test	Applicable when:	Determines:
Chi-square	Both the dependent and independent variable are nominal variables	Whether there is a relationship between nominal variables (the higher the Chi-square score the
T-Test	The independent variable is nominal and the dependent variable is a scale variable with a normal distribution	Whether there is a difference between two independent groups by comparing mean scores
Mann-Whitney U	The independent variable is nominal and the dependent variable is either ordinal or scale with no normal distribution (compares two independent groups)	Whether there is a difference between two independent variables by comparing mean scores
Kruskall-Wallis H	Similar to the Mann-Whitney U test except it allows for the comparison for more than two independent groups	Whether there is a difference between multiple independent variables by comparing mean scores

4.8.2 Correlations between variables

Correlations between variables are calculated when the independent variable is either an ordinal variable or a scale variable. An example of an ordinal variable is the change in productivity (deteriorated, no change or improved). The scores can be ranked in an ordinal order as an improvement is better than no change and no change is better than a deterioration. An example of a scale variable is the frequency of trainings a farmer received during the year. Scale variables are continuous positive measurements on a nonlinear scale (Field, 2013). There are two statistical tests that can be used to calculate correlations: Pearson's R and Spearman's R. Table 4.5 provides information as to when a statistical test is suitable or not. As mentioned before, none of the scale variables in this research have a normal distribution. Therefore, Spearman's R will be used to calculate correlations.

The major limitation of calculating correlations and differences is that the analyses do not incorporate differences and correlations among independent variables. A significant correlation between two variables may therefore be caused by the influence of a third variable. A more suitable analysis may therefore be an ordinal logistic regression. However, attempts to calculate ordinal logistic regression proved to be unreliable (missing significance values). This is likely due to the type of data (mostly ordinal and nominal) and the low amount of observations (106).

Table 4.5: Suitability of statistical tests for calculating correlations between variables.

Statistical test	Applicable when:	Determines:
Pearson's R	Both the independent and the dependent variable are scale variables and the dependent variable shows a normal distribution	Whether two variables show a positive or negative correlation and how strong the correlation is (-1= perfect negative correlation, 0= no correlation, 1= perfect positive correlation)
Spearman's R	At least the independent or the dependent variable is an ordinal variable (or both) or the dependent is a scale variable with no normal distribution	Whether two variables show a positive or negative correlation and how strong the correlation is (-1= perfect negative correlation, 0= no correlation, 1= perfect positive correlation)

4.8.3 Significance of differences and correlation

The statistical tests in tables 4.4 and 4.5 show whether variables are related, different or correlated, but the relationship, difference or correlation may not be significant. A hypothesis and a null-hypothesis are formulated before calculating the statistical test. The null-hypothesis will always be that there is no relationship (or no difference/correlation); while the alternative hypothesis will be that there is either a positive or negative relationship or that there is a difference between nominal variables. A significance test is needed to verify whether the alternative hypothesis can be accepted or needs to be rejected. In this research, a hypothesis will be accepted when the significance value (p-value) is either <0,01, <0,05 or <0,1. Subsequently, the null-hypothesis is accepted when the p-value is greater than 0,1 (i.e. no significant relationship, correlation or difference) (Field, 2013).

5. Institutional arrangements in the Ghanaian cocoa sector

5.1 Chapter outline

A total of 10 semi structured interviews have been conducted with different stakeholders active in the cocoa sector. This chapter discusses the results from those interviews related to governance modes in the Ghanaian cocoa sector, as well as the problems that affect the Ghanaian cocoa sector. The results of the interviews, supplemented with desk research, will provide what roles internal and international actors fulfil in relation to public and private governance in the Ghanaian cocoa sector. Especially the functioning of COCOBOD and private certification standards will be discussed in depth. Section 5.2 will discuss how COCOBOD functions. This entails three interviews with different COCOBOD officials to identify the process of policy formulation, what stakeholders are involved, and how these policies are implemented. The interviews will be supplemented with policy documents for a complete overview of boards and functions within COCOBOD. Furthermore, the impact of the policies will also be highlighted. The advantages and disadvantages of these policies will be discussed in section 5.5. Section 5.3 will discuss the role of internal actors in the Ghanaian cocoa sector. The internal actors included in this research are farmers cooperatives and Licensed Buying Companies. The role of international actors, NGOs and market actors, will be discussed in section 5.4. The roles of cooperatives, LBCs, and NGOs are important for the implementation and functioning of certification standards. The role and functioning of certification standards are discussed in section 5.6. Section 5.5 discusses the various issues related to cocoa production in Ghana as identified in scientific literature and by the stakeholders themselves. The chapter will conclude with a summary where the expected influence of COCOBOD policies on private certification standards will be highlighted.

5.2 Government activities related to cocoa

5.2.1 The Ghanaian government

Ghana, a former British Colony, gained its independence in 1957 and was declared a republic with a one party system in 1960. The period between 1960 and 1992 was marked by a series of military coups overthrowing the (often military) government. In 1992 J. Rawlings was the first democratically elected president and Ghana has been a democratic republic ever since (Government of Ghana, 2016b). There are two major political parties and Ghana that compete for the presidency: the New Patriotic Party (NPP) and the National Democratic Congress (NDC). The current president, John Mahama, is from the NDC. The Ghanaian national government counts 23 ministries. Three of these ministries are relevant for the cocoa industry, namely the Ministry of Finance, the Ministry of Lands and Natural Resources, and the Ministry of Food and Agriculture (UNDP, 2012b). The trade of cocoa is regulated by the Ghana Cocoa Board (COCOBOD), which falls under the Ministry of Finance.

The Ghana Cocoa Board

COCOBOD is the regulating institution for cocoa, coffee and sheanut in Ghana. Of these crops, cocoa is the biggest in terms of volume and therefore central to the policies. The results of the analysis of the qualitative data related to COCOBOD will be summarised in three different sections. The first section discusses the institutional arrangements of COCOBOD: how policies are formulated, which committees decide on which matters and how committee members are selected. The second section focuses on the tasks of the various COCOBOD subsidiaries and how the policies (should) impact farmers.

Institutional embedding within the Ghanaian government

COCOBOD is a partly independent government institute, where the ministerial control is done by the Ministry of Finance. It is uncommon that a government institution for agricultural goods is related to the Ministry of Finance; usually it falls under either Trade or Agriculture. The reason why COCOBOD is linked to the Department of Finance is because cocoa has always been one of the biggest export products of Ghana and is therefore paramount for both the country's import/export balance and the national budget (E. Quartey, personal communication, 4/04/2016). Ministerial control in this case means that COCOBODs' budget needs to be approved by the Ministry of Finance and that the chief executive and deputy executive in the board of directors are appointed by the Minister of Finance. In other words, COCOBOD is free to decide how to spend their budget once it is approved by the Minister of Finance. However, the people who hold most of the power in COCOBOD are appointed by the Ministry of Finance.

5.2.2 Institutional arrangements within COCOBOD

COCOBOD has a hierarchical management system, in which the Board of Directors has the highest authority and is the board that formulates new policies. The COCOBOD management is the body that supports the activities of the board directors and implements new policies. Under the COCOBOD management are the divisions and subsidiaries of COCOBOD: the Cocoa Marketing Company, Cocoa Health and Extension Division, Quality Control Company, Seed Production Unit, and the Cocoa Research Institute Ghana. The divisions and subsidiaries are responsible for carrying out the policies formulated by the Board of Directors. Next to these management layers, there is another important committee: the Producer Price Review Committee (PPRC). This committee is charged with setting the annual price for cocoa.

Board of directors

The Board of Directors holds monthly meetings and consists of ten members headed by the board chairman. The board members are inaugurated by the Minister of Finance under the directives of the President of Ghana in accordance with the Ghana Cocoa Board Act of 1984 (PNDC 81). This law gives directions to the board of directors in terms of objectives, functions and how board members are to be selected. PNDC 81 states that the board members must be selected based upon their knowledge of and competence in economics, agricultural economics, financial management, policy analysis, international marketing, external trade or cocoa farming experience. PNDC 81 also gives direction as to the position and rank the board members must occupy (e.g. not below director) (Provisional National Defence Council, 1991). Table 5.1 gives an overview of the current board members and their affiliation.

Table 5.1: Overview of the Board of Director of COCOBOD (Provisional National Defence Council, 1991).

Function	Affiliation
Board Chairman	Government nominee
Chief Executive	COCOBOD
Farmers representative	Cocoa Coffee Sheanut Farmers association
Farmers representative	Cocoa Coffee Sheanut Farmers association
Workers representative	Director Audit COCOBOD
Member	Ministry of Trade and Industry
Member	Governor Bank of Ghana
Member	Government nominee
Member	Government nominee
Member	Ministry of Finance

The board of directors is charged with formulating the policies by which the cocoa sector is regulated. Examples of policies that are formulated regard the regulating the internal and external marketing by establishing purchasing and marketing organisations and the regulating of the mode of operation of these organisations, and the provision of seedlings, credit, inputs and other facilities to cocoa farmers. These policies target certain objectives of which encouraging cocoa production, initiating programs aimed at controlling pests and diseases, encouraging scientific research and the regulation of the marketing and export of cocoa are most important (Provisional National Defence Council, 1991).

COCOBOD management

The COCOBOD management is the body supporting the board of directors. The COCOBOD management is headed by the chief executive who is assisted by three deputy chief executives in charge of Operations, Agronomy and Quality control, and Finance and Administration. The rest of the management body consists of other directors of various departments within COCOBOD (Provisional National Defence Council, 1991). The current COCOBOD management body has 17 members. Their affiliations can be found in table 5.2.

Table 5.2: Members of COCOBOD management (Ghana Cocoa Board, 2014).

Chief executive	Deputy Executive (Operations)
Deputy Executive (Agronomy and Quality Control)	Deputy Executive (Finance and Administration)
Director Finance	Director General Services
Director Audit	Director Human Resources
Director Research, Monitoring and Operations	Director Scholarship Unit
Director Health	Director Legal Services
Director Special Services	Deputy director CODAPEC/HI-Tech
Deputy director Research & Development	Deputy director Audit
Deputy director Finance	

The functions of the management relate to the management of the property, business, operations and finances of COCOBOD. Management is also charged with the implementing of new policies which are subsequently carried out by divisions and subsidiaries. Auditing, research, legal services are other functions performed by the management board to support and improve COCOBOD operations.

COCOBOD subsidiaries and divisions

The subsidiaries and divisions are charged with the carrying out of the policy decisions from the Board of Directors. The difference between a subsidiary and a division is that the management board of subsidiaries are not appointed by COCOBOD, but directly by the government. The subsidiaries are therefore independent from COCOBOD, apart from the budgetary allocation. Divisions do have boards appointed by COCOBOD and are therefore fully dependent on COCOBOD management through the appointment of board members. COCOBOD has two subsidiaries; the Cocoa Marketing Company (CMC) and the Quality Control Company (QCC), and three divisions; Cocoa Health and Extension Division (CHED), Seed Production Division (SPD) and the Cocoa Research Institute Ghana (CRIG).

The Cocoa Marketing Company is the subsidiary that purchases all the cocoa from the LBCs at the ports of Tema and Takoradi before exporting beans and semi-finished products in the form of cocoa liquor and cocoa butter to overseas destinations of which the EU is the biggest export market.

The mission of the Quality Control Company is to ensure the quality of cocoa in Ghana by developing and implementing control strategies. The quality of Ghanaian cocoa is one of prides of Ghana and is an important issue for COCOBOD. Therefore, the quality control in Ghana is stringent and covers everything from pre-harvest (through extension services on when to harvest) to the post-harvest (the breaking of the pod and the drying and fermenting of the beans). The beans are categorised into 7 grades based on the amount of beans per 100 gram (the less beans per 100 gram, the better the quality). The Quality Control Company also implements regulations to ensure quality during transportation by not allowing mixing of different grades of beans or mixing of cocoa with other crops during transportation.

The operations of the Cocoa Health and Extension Division (CHED) can be divided into trainings and the distribution of fungicides, pesticides and fertiliser through Cocoa Disease And Pest Control (CODAPEC) and Hi-Tech. The provision of extension services to cocoa farmers was first under the care of the Ministry of Food and Agriculture (MOFA). However, MOFA lacked the resources to effectively reached farmers. Extension was therefore transferred to CHED (Baah & Anchirinah, 2010). CHED currently employs around 400 extension officers who provide the trainings. The trainings are mostly aimed at good agricultural practices and safe working conditions for chemical application on the farm. Furthermore, CHED also provides trainings to LBC and farmer cooperative staff. The LBC and cooperative staff will then be able to provide trainings to farmers themselves (E. Quartey, personal communication, 04/04/2016). CHED uses a training manual that is revised every few years in cooperation with organisations like the World Cocoa Foundation in order to help farmers achieve higher yields per hectare. The trainings also include developing alternative livelihoods so farmers are not fully dependent on one source of income. This usually translates into farmers planting food crops or other cash crops such as rice, palm oil or plantain. Furthermore, the trainings address social issues like safe working conditions and the use of child labour (W. Wiafe, personal communication, 17/02/2016).

CODAPEC is the branch of CHED that supplies cocoa farmers with pesticides and fungicides through mass spraying schemes. CHED officials move around Ghana to search for outbreaks of CSSVD in order to be able to stop the outbreak as soon as possible. When infected trees have been found the trees are uprooted and the adjacent cocoa farms are sprayed by so called spraying gangs to stop the virus from spreading. In theory, all farms should be sprayed regularly as a pre-emptive measure to prevent infections. Hi-tech supplies the farmers with fertiliser as an attempt to increase the fertiliser usage of farmers. Input access is seen as one of the major issues in the Ghanaian cocoa sector, as described in, which is the reason why COCOBOD decided to take up the input provision as an attempt to make inputs better accessible for farmers (E. Quartey, personal communication, 04/04/2016). It should be noted that the mission of CODAPEC and Hi-tech is to supply farmers with part of the supplies they require. All additional inputs need to be bought from the open market by the farmers. Inputs usually arrive at the large seaports of Tema and Takoradi and are then transported to the district capitals. The lead farmer of every cocoa producing community in a district then gets a message that the inputs have arrived and can be picked up at the depot.

The Seed Production Division (SPD) is the division that multiplies and distributes seedlings for farmers. Seedlings are highly demanded in Ghana due to the removing of trees that are either too old or have been infected with CSSVD. COCOBOD has implemented a large rehabilitation scheme in order to replant cocoa trees. Farmers that register at COCOBOD have access to the seeds which are freely available. The SPD also ensures quality of cocoa by only supplying farmers with high quality seedlings.

The Cocoa Research Institute Ghana (CRIG) is the research institute researching inputs for their use on cocoa farms. Before a product is allowed to be used in Ghana it is tested by the CRIG as pesticides are often developed in Europe or North America where other pests and diseases occur. By means of trials the efficacy, the amount of left over residue on the plant, the effect on non-target organisms and the effect on the cocoa beans are checked. That way the CRIG ensures that the quality of the bean is not affected and there are no negative impacts on both the ecosystem and humans. Next to the testing of chemicals and fertilisers, CRIG also develops training manuals, hybrid (pest resistant) seedlings and other cost-effective technologies related to cocoa farming.

The Producer Price Review Committee

Perhaps the most important committee that affects farmers is the Producer Price Review Committee. The Producer Price Review Committee meets once a year and sets a fixed producer price for cocoa at the beginning of the production season in October. The committee consists of a variety of actors with a stake in the internal cocoa marketing system (Ghana Cocoa Board, 2011). The committee is headed by the Minister of Finance. The other members can be found in table 5.3.

Table 5.3: Producer Price Review Committee members

Minister of Finance	COCOBOD Chief Executive
Governor of the Bank of Ghana	Managing Director Quality Control Company
Managing Director Cocoa Marketing Company	Managing Director of LBCs
President of Cocoa Hauliers Association	Chief farmer of Ghana Cocoa Coffee Sheanut Farmers Association

The annual price for cocoa is based on three parameters: the projected crop size (based on estimates from 200 cocoa sites), the international cocoa price, and the exchange rate of Ghana Cedi to US Dollar (E. Quartey, personal communication, 04/04/2016). These three parameters set the gross FOB price. The FOB price is the Free On Board price, which is the price of cocoa when it is ready to be exported. The net FOB price is calculated by deducting the costs of the operations of CODAPEC and Hi-Tech, as well as cost of social projects and fixed costs such as the jute sacks used for transportation. For the 2011/2012 season, the cost for inputs was around 200 million GHC making it the biggest expense deducted from the producer price (Ghana Cocoa Board, 2011). For the 2015/2016 73% of the net FOB price went to the farmer as the producer price. The other 27% of the net FOB price goes to operational costs of COCOBOD (e.g. wages), the LBC price margin, the CMC shipping costs and the hauliers costs (transportation of cocoa to the ports)(Government of Ghana, 2015). Figure 5.1 shows a simplified overview of how the producer price is determined.

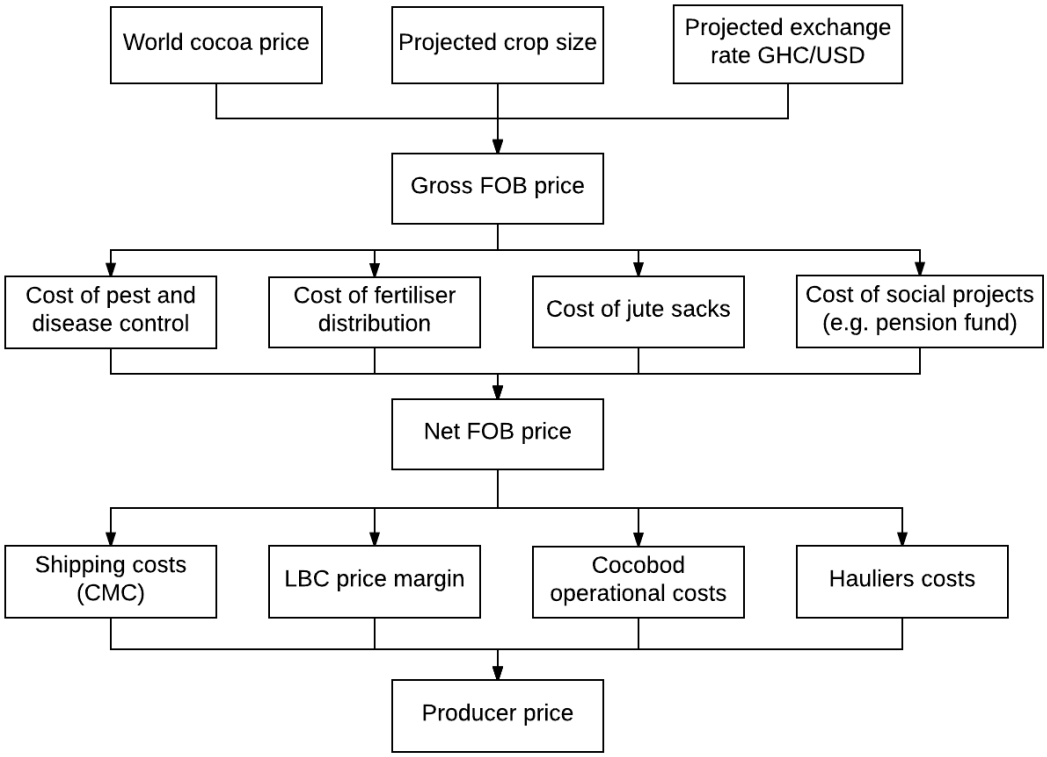


Figure 5.1: Producer price setting process (Ghana Cocoa Board, 2011)

The producer price for the 2015/2016 growing season is set at 420 GHC per bag of 64 kg (6720,- GHC per tonne), which is a 21% increase compared to the previous season. Other stakeholders, such as the LBCs and hauliers, also received a higher price compared to the last season to ensure profitability of their operations (Government of Ghana, 2016c). Table 5.4 shows the changes over the past 5 years for the world cocoa price, the exchange rate (US Dollar to Ghana Cedi) the net FOB price, and the producer price. Unfortunately, there is no data available for the gross FOB price and the projected crop size. The world prices as well as the exchanged rate as mentioned in the table are the prices and exchange rates for mid-October, which is the start of the growing season and the moment the fixed price is set. However, the table does not show volatility of the world cocoa price or of the exchange rate. Figure 5.2 shows the trend of world cocoa price for the past 5 years, while figure 5.3 shows the trend of the exchange rate for the past 5 years. The world price is in US Dollars, while the net FOB price and producer price are in Ghana Cedi's. The world price fluctuated around 3000,- USD during the last two growing seasons, which therefore does not explain the sudden price increase in Ghana Cedi's in 2014 to 2016. What does explain the sudden price increase is the exchange rate of the US Dollar to the Ghana Cedi. Figure 5.3 shows the trend of the USD to GHC exchange rate over the last 5 years. The increases in the net FOB price and the producer price therefore seem to be caused by inflation rather than increasing world cocoa prices. Furthermore, the increase in producer price does not necessarily lead to better livelihoods for farmers as their cost of living likely increased due to inflation.

Table 5.4: World price, net FOB price, and producer price of cocoa for the last six growing seasons (Ministry of Finance, 2011, 2014: Ghana Business News, 2012, 2013: Government of Ghana, 2015: www.tradingeconimics.com, 2016: www.xe.com, 2016).

Season:	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
World price per tonne (USD)	2908,-	2667,-	2407,-	2802,-	3103,-	3074,-
Exchange rate (USD to GHC)	1,43	1,63	1,89	2,18	3,20	3,83
Net FOB price per tonne (GHC)	Unknown	4131,-	4325,-	4284,-	7263,-	9081,-
% of net FOB given as producer price	Unknown	76,04%	78,42%	79,17%	76%	74%
Producer price per tonne (GHC)	3125,-	3280,-	3392,-	3392,-	5520,-	6720,-

Figure 5.2: Price volatility of cocoa (2011-2016) in USD (current price in red) (source: www.tradingeconomic.com, 2016)

Figure 5.3: Exchange rate of US Dollar to Ghana Cedi in the past 5 years (www.xe.com, 2016)

The fixed price setting at the start of every growing season has downsides as the price fluctuates throughout the year. The Producer Price Committee meets only once a year makes it impossible for the fixed price to be adjusted during the season. However, the fixed price protects farmers from sudden price collapses. The advantages and disadvantages of the price setting policy will be discussed in section 5.5.5.

COCOBOD and Public Private Partnerships

COCOBOD has not always been keen on cooperating with private certification standards, claiming they did not need aid in making the Ghanaian cocoa sector sustainable. In recent years, however, COCOBOD has welcomed all initiatives that would aid farmers to increase yields. This is embodied by the establishment of the Ghana Cocoa Platform, which is an initiative is aimed at enhancing Public-Private dialogue and joint action planning to scale up sustainable cocoa production. This way, COCOBOD and other stakeholders can harmonize programs and better coordinate their efforts (UNDP, 2012b). The platform provides opportunities for a wider inclusion of stakeholders through plenary sessions on how to address the different issues in the Ghanaian cocoa sector. The platform is led by COCOBOD with technical support from the United Nations Development Program (UNDP). The governance structure should allow all active stakeholders to voice their opinion in the Ghana Cocoa Platform. The Platform has only been implemented recently (2012) so the impact of the initiative is uncertain as the impact of the projects are yet to be assessed. The governance structure can be found in figure 5.2.

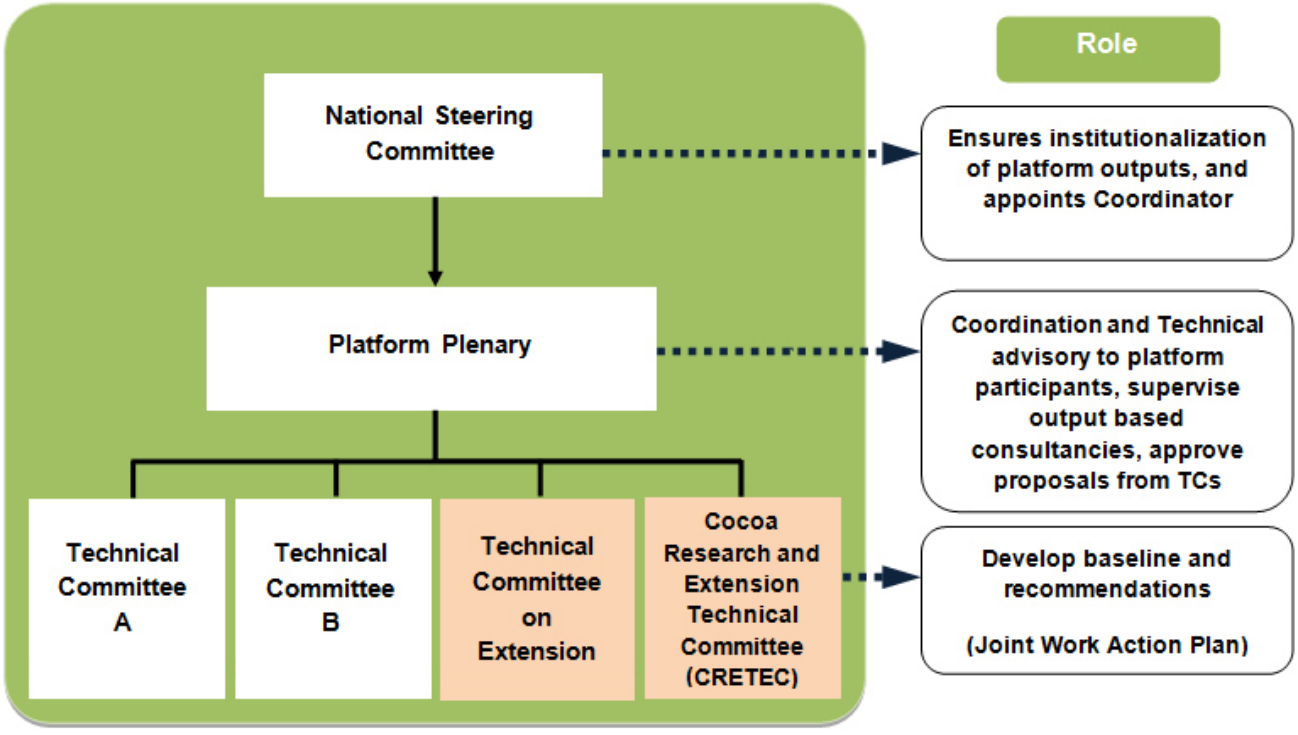


Figure 5.2: Governance structure of the Ghana Cocoa Platform (UNDP, 2012b)

A variety of issues have been highlighted at the inception of the platform. Even though progress has been in recent years, issues such as poverty, child labour and deforestation still remain. There are a variety of barriers that limit the impact of efforts thus far. The Platform aims to reduce or remove these barriers in order to have a positive impact for cocoa farmers (UNDP, 2012b). The barriers

identified at the inception of the platform can be grouped on three different levels and can be found in table 5.4. The overcoming of these barriers needs a holistic approach where all stakeholders are involved. Agreement on a common strategy through dialogues, implementation of actions aimed at common goals, and the monitoring of the effect of the efforts should help overcome the barriers. The Ghana Cocoa Platform should provide the opportunity for dialogue and cooperation between stakeholders needed to overcome the barriers (UNDP,2012b).

Tabel 5.4: Barriers identified by the Platform (UNDP,2012).

Level	Barrier
Policy level	Insufficient integration of all policies and instruments impacting the cocoa sector
	Limited policies and incentives to encourage farmers to adopt sustainable farming practices
	Unfavourable land tenure systems and lack of harmonization among them
	Limited financial mechanisms to boost farmer's investment
	Unfavourable international-level policy and terms of trade in the cocoa sector
Institutional level	Weak institutions, especially in the financial sector and at local and district levels
	Limited institutional coordination
Stakeholder level	Lack of an agreed common vision by all stakeholders for the development of the sector
	Insufficient sustained dialogue among all stakeholders
	Limited public participation at all levels of the decision making process in the cocoa sector
	Limited coordination among existing sustainable initiatives in the sector

The stakeholders involved in the Platform range from government institutions to NGOs to private companies. Each stakeholder has a different role depending on the committee they are involved in. The composition and roles of the various committees can be found in tables 5.4.

Tabel 5.5: Members and roles of the different committees of the Ghana Cocoa Platform

Committee	**Members**	**Role**
National Steering Committee	COCOBOD, UNDP, Ministry of Lands and Natural Resources, Cocoa Coffee Sheanut Farmers Association, LBCs of Ghana, Project coordinator	Ensuring institutionalisation of platform outputs, appointing coordinator
Platform Plenary	Government representatives, NGOs, Certifiers, donors (e.g. Mondelez, IDH), research institutions	Coordinating and technical advising of the platform participants, supervise outputs based on consultancies and approve proposals from TCS
Technical Committees	Cocoa Platform members	Addressing the priorities and deliverables set by the Steering Committee, project documenting, defining problems related to deliverables
Platform Coordination	Platform coordinators, facilitators,	Providing technical advisory services

Unit	administrative assistant	to support organization and facilitation of platform operations, partnership building, conflict resolution, supervision of technical studies and communications

COCOBOD also works closely together with other private partners in the cocoa sector. Even though COCOBOD regulates everything in the market, it still relies on private companies for part of their operations. Transportation of cocoa and fertiliser is done by private hauliers, while the internal buying and selling of cocoa is handled by privately owned LBCs (E. Quartey, personal communication, 04/04/2016). The LBCs are, however, restricted in their operations as they can only operate within the rules set by COCOBOD and some rely on COCOBOD for their loans. Furthermore, the hauliers rely on COCOBOD for their contracts. Both LBCs and hauliers are represented in the PPRC and thus have a voice in the setting of the price margin for LBCs and the operation costs for the hauliers.

5.3 The role of internal actors in the Ghanaian cocoa sector

There are two important types of actors in the Ghanaian cocoa sector: Licensed Buying Companies (LBCs) and farmers cooperatives. LBCs are the private owned companies that buy cocoa from the farmers and sell it to the Cocoa Marketing Company at the ports of Tema and Takoradi. Farmers cooperatives are organisations that allow farmers to mobilise themselves in order to be able to assert more power in the supply chain. Both LBCs and cooperatives play an important role in the process of certification.

5.3.1 Licensed Buying Companies

As mentioned before, the role of the LBCs in the Ghanaian sector is important as they are the only organisations that are allowed to buy cocoa on the internal cocoa market. LBCs buy the cocoa directly from farmers and then transport the beans to the seaports of Tema and Takoradi where the cocoa is sold to the Cocoa Marketing Company (CMC). The price at which cocoa is bought from the farmer, and at which it is sold to the CMC are both fixed by the Producer Price Review Committee (Ghana Cocoa Board, 2011). The effect of the fixed price margin has been discussed in the section about the Producer Price Review committee. In 2014 there were 41 LBCs of which 32 were active in buying cocoa (Ghana Cocoa Board, 2014). The largest LBC is the Produce Buying Company (PBC), which accounted for 33% 297.131 tonnes) of the total purchases of cocoa in 2014.

LBCs also have other roles besides the buying and selling of cocoa. For instance, UTZ Certified makes use of LBCs to certify farmers. UTZ Certified has two distinct types of models that are used to guide and train farmers: the LBC model and the Producer Group model. In the case of the former, LBCs are the certificate holders and they manage the Internal Control System (ICS). The LBC model also allows LBCs to organise, link, guide, and train cocoa farmers. The training of the staff of the LBCs is done by an international NGO, in the case of Ghana often Solidaridad, which also further assists the LBC in other certification related operations. There is one important difference between the two models of certification implementation: in the LBC model, the LBC is the certificate holder and the certified farmer is only allowed to sell cocoa to that particular LBC. In the cooperative model, however, the cooperative is the certification holder, but farmers are free to sell to every LBC (Waarts et al. 2013). Fairtrade certification also makes use of the cooperative model and included criteria for cooperatives in its standards (Fairtrade International, 2011). The model relevant in this research is the cooperative

model as in both cases the certification holder is a cooperative (i.e. Kuapa Kokoo or Kokoo Pa). Furthermore, LBCs are also used for the operations of the Cocoa Health and Extension Division (CHED). In other words: extension services from CHED, including trainings, are often provided through LBCs. In this case CHED trains LBC staff so that they are able to provide the trainings for farmers (E. Quartey, personal communication, 18/07/2016).

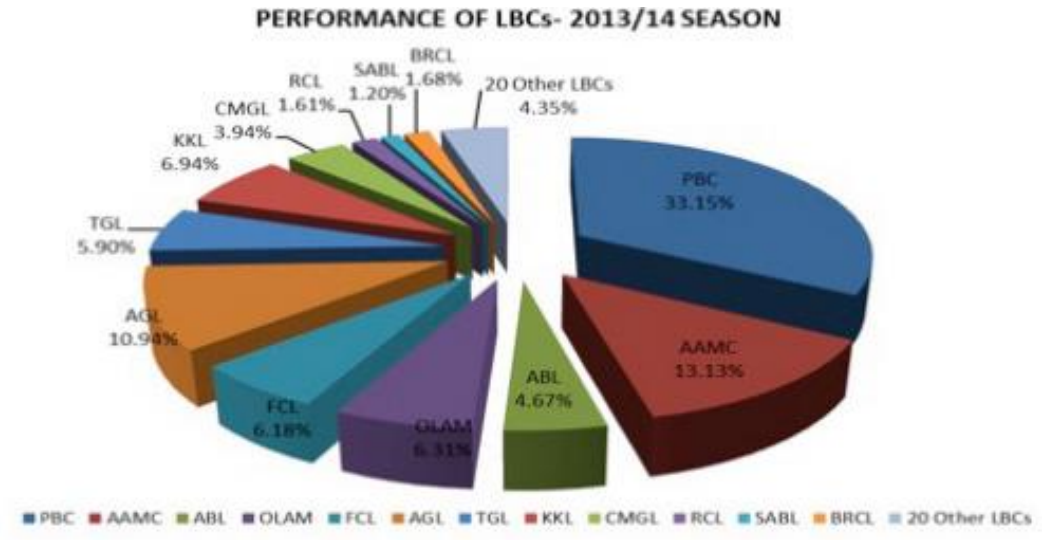


Figure 5.3: Percentage of cocoa sold to the CMC per LBC (Ghana Cocoa Board, 2014).

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5.3.2 Farmers Cooperatives

Cooperatives are business minded organisations that have democratic structures by which farmers can choose representatives, who are cocoa farmers themselves, to lead the organisation (Comic Relief, 2011). Two cooperatives have been included in this research: Kuapa Kokoo Farmers Union and Kokoo Pa (formerly Ahansocofa). Both cooperatives have been used to increase the number of certified farmers. Table 5.7 shows the characteristics of the two cooperatives. The most important difference is that Kuapa Kokoo is much larger in terms of members and communities reached. The next sub-section will focus on Kuapo Kokoo more in depth to provide an example of how farmer cooperatives operate in Ghana.

Table 5.7: Differences between Kuapa Kokoo and Kokoo Pa (F. Frimpong, personal communication, 27/07/2016: Kokoopa.org, 2016).

	Kuapa Kokoo	**Kokoo Pa**
Year of foundation	1993	2009
Initiators	Local farmers	Solidaridad
Stakeholders involved at start	Local farmers, TWIN Trading Company (UK)	Solidaridad, UTZ Certified
Stakeholders involved now	Local farmers, Fairtrade, UTZ Certified, Comic Relief, Divine Chocolate	Solidaridad, UTZ Certified, FEDCO, World Cocoa Foundation, Ferrero, Transmar Group
Democratic structure	Yes	Yes

Members	123.000 (2016)	8600 (2015)
Number of communities	1.224	218
Certification	Fairtrade, UTZ Certified (recently)	UTZ Certified
LBC	Has its own LBC: Kuapa Kokoo Limited	Cooperation with FEDCO
Premiums used for:	Bonus for farmers, trainings and social projects (e.g. boreholes, schools)	Bonus for farmers, trainings and Spay Service Providers

Farmer benefits of cooperatives

Calkins & Ngo (2005) found that members of cooperatives were better off than unorganised farmers. The research investigated the difference between organised farmers (cooperative members), and unorganised farmers in Ghana and Côte d'Ivoire. The results have been summarised in table 5.8.

Table 5.8: Benefits of cooperative membership for farmers (Calkins & Ngo, 2005)

Cooperative activity	Outcome	Impact
Access to inputs	Increased use of fertiliser, pesticides and mechanical implements	Higher yields
Cocoa marketing	Better evaluation of cocoa bean quality, better market access	Higher revenues
Farmer training	Specialised cocoa farmers	Higher revenues
Access to collective transportation	Better healthcare, market access (transportation of patients to clinics and cocoa beans)	Better healthcare, higher revenues
Community projects	Improved community development	Better access to clean drinking water, schools, healthcare
Household reorganisation	Allows women to spend more time outside income generating- and household activities	Increased gender equality
Service provision	Increased access to loans	Higher farm investments
Farm management training	Better financial management of farms	Improved allocation of financial means

Kuapa Kokoo

Kuapa Kokoo is the largest cooperative in Ghana with around 123.000 members in 2016 (F. Frimpong, personal communication, 27/07/2016). Farmers of Kuapa Kokoo are Fairtrade certified and receive both individual, as well as community benefits from their membership in return for a small yearly membership fee (Comic Relief, 2011). Kuapa Kokoo can be divided into two separate entities: Kuapa Kokoo Farmers Union (KKFU) and Kuapa Kokoo Limited (KKL). KKFU is the cooperative part of Kuapa Kokoo, while KKL is an LBC. The governance structure of KKFU is divided into three levels: the national level, the district level, and the community level. The national executive committee is the highest governing body within Kuapa Kokoo and is made up of member of the KKFU. The members of the national executive committee are elected by the entire nationwide KKFU membership and decide on the general matters such as how the Fairtrade premium should be used, how much of it should go to farmers and how much of it should go into social amenities. Besides the usage of the premium, the national committee also decides on the distribution of inputs and trainings. The same voting process is used for the district level, where all KKFU members registered in a particular district can vote for the members of district committee. The district committee decided

on the allocation of premium at the district level and receives budgetary allocations from the national executive committee. Finally, the community level has the same democratic structure and decides on matters at the community level. Kuapa Kokoo is financed by the income generated from the LBC, premiums from Fairtrade, and a small yearly membership fee (S. Apent, personal communication, 10/03/2016). Other cooperatives, such as Kokoo Pa, have similar democratic governance structures. However, other cooperatives do not own their own LBC as is the case for Kuapa Kokoo.

Kuapa Kokoo provides a variety of services for its farmers (see table 5.7) of which trainings are most important. Kuapa Kokoo members are Fairtrade certified and therefore receive training in correspondence with the Fairtrade standard. The trainings are provided through the Kuapa Kokoo Internal Control System (KKICS). Trainings that Kuapa Kokoo farmers receive are mostly provided by Kuapa Kokoo's own extension staff or by other recognised training providers (e.g. Cocoa Health and Extension Division) (F. Frimpong, personal communication, 08/06/2016). As mentioned before, trainings in good agricultural practices lead to higher yields. Other benefits relate to market access. Farmers are free to sell their cocoa to any LBC they want, but most often sell to Kuapa Kokoo Limited (kKL). KKL has sufficient funds to do timely payments for the cocoa and farmers also receive bonus as part of the Fairtrade premium. Other benefits relate to social projects such as the building of schools, boreholes, and mobile health clinics (kuapakokoo.com, 2016). Besides the benefits for farmers, cooperatives are an important factor affecting the uptake of certification as UTZ Certified makes use of cooperatives as certificate holders. Furthermore, the trainings through cooperatives make it possible for a farmer to become certified.

5.4 The role of international actors in the Ghanaian cocoa sector

There are a variety of international actors that also play a role in the Ghanaian cocoa sector related to the uptake of certification standards. The most two most important type of international actors are NGOs and corporations (i.e. market actors). NGOs provide support for certification implementation. An example is the program of UTZ Certified and Solidaridad to increase the uptake of certification amongst cocoa farmers in Ghana (Waarts et al. 2013). International market actors provide demand for certified cocoa and participate in sustainable cocoa programmes that are implemented by, among others, the World Cocoa Foundation (WCF).

5.4.1 The role of NGOs

The two NGOs included in the interview are Solidaridad and the World Cocoa Foundation (WCF). These two NGOs have projects in Ghana aimed at increasing productivity, improved access to inputs, and the reduction of food security issues and gender inequality. Both NGOs cooperate with COCOBOD in Ghana through programs such the WCF Cocoa Livelihoods Program. Both Solidaridad and WCF provide farmers with trainings on farm management and good agricultural practices (V. Manu, personal communication, 23/03/2016). WCF and Solidaridad are also involved in the development of new training manuals in cooperation with COCOBOD and other institutes such as GIZ and IITA. The activities of NGOs are financed by member organisations, such as companies, countries and charity foundations. An example of the role of NGOs in Ghana is the Cocoa Livelihood program from the WCF.

The goal of the Cocoa Livelihood Program is to increase farmer income and strengthen communities by improving productivity to 1000 kg/ha, improving service delivery, and improving farmer resilience

by focusing on food crop production (worldcocoafoundation.org, 2016). In order to achieve this, WCF identifies the service providers in a country, for instance the Cocoa Health and Extension Division (CHED) in Ghana. Then WCF collaborates with CHED through another program, called the Africa Cocoa Initiative, in order to further build the institutional capacity. The goal of this capacity building is to provide a way for CHED to increase their number of extension officers while simultaneously improving their skills and knowledge. This will ultimately lead to better quality extension service delivery to farmers and an ability to reach more farmers. Besides better extension services, the program also aims to improve delivery systems for inputs and financial services. WCF builds capacity and the mechanisms of input delivery systems by harmonising the involved stakeholders for a more efficient delivery system (V. Manu, personal communication, 23/03/2016).

Another example of the role of NGOs is the cooperation between Solidaridad and UTZ Certified. The goal of program of Solidaridad and UTZ Certified is to improve sustainability in the cocoa supply chain by providing support to cocoa farmers to implement farming and managing practices in line with the UTZ Code of Conduct. Furthermore, Solidaridad trains extension staff from LBCs and cooperatives in certification standards to better provide trainings and facilitate certification standard implementation at the farm level. This should increase the amount of farmers that can become certified (Waarts et al. 2013).

The role of NGOs is important for both the functioning of certification and the functioning of the Cocoa Health and Extension division. The improved quality of extension services would likely be beneficial for farmers, but also to the functioning of certification on the ground. More and better skilled extension officers would make it possible to reach more farmers with better quality training. NGO support therefore plays a pivotal role in the uptake of certification, both in terms of the amount of farmers that can become certified as in the implementation of the standards at the farm level (I. Gyamfi, personal communication, 31/03/2016).

5.4.2 The role of international market actors

Only one among many international market actors has been included in this research by means of an interview. Cargill will therefore provide an example of how international market actors operate in relation to sustainability in the Ghanaian cocoa sector. Other big cocoa and chocolate companies, such as Mondelez, Nestlé, and Cadbury have similar projects.

The primary role of the international market actors is to buy cocoa or semi-finished cocoa products to either sell again to chocolate producers or to produce and sell chocolate themselves. Changes in consumer preferences have led to an increase in the demand for sustainably produced chocolate. The changes in demand prompted big cocoa companies to seek sustainably produced cocoa either through private certification such as UTZ Certified and Fairtrade, or through projects set up and financed by the private sector in cooperation with local governments and NGOs (A. Kadja, personal communication, 22/04/2016). An example of a company that chose to use certified cocoa for their products is Mars, which is UTZ Certified. Mondelez, on the other hand, has started sustainable cocoa projects in Ghana (e.g. Cocoa Life Program) in cooperation with COCOBOD, UNDP, and local farmers cooperatives. The role of Mondelez in the project is the financing (Asante et al. 2014). A third large chocolate company, Nestlé, runs a similar project, called The Nestlé Cocoa Plan (Nestlé, 2012).

The market actor that serves as an example in this research is Cargill. Cargill is one of the major international market actor that buys cocoa from the Cocoa Marketing Company (CMC) in Ghana. The

cocoa bought by Cargill (both certified and uncertified cocoa) is processed into semi-finished products (i.e. cocoa liquor or cocoa butter) before it is sold to chocolate manufacturers (see figure 2.1) (A. Kadja, personal communication, 22/04/2016). Cargill organises and funds sustainable cocoa projects in Ghana: the Cargill Cocoa Promise (as the organisation in charge) and the Cocoa Rehabilitation and Intensification Project (CORIP) (as one of the funding companies) (Asante et al. 2014). Both projects are the product of cooperation between different stakeholders in the Ghanaian cocoa sector, such as COCOBOD (CHED), the Ministry of Food and Agriculture (MOFA), Solidaridad, IDH, and the Dutch Embassy. The Cargill Cocoa Promise focuses on three key areas: farmer training, community support, and farm development. The outcome of the project should be an improvement of the livelihood of farmers and their communities which should secure a long term supply of cocoa (Cargill, 2014).

5.5 Problem perceptions of stakeholders in the Ghanaian cocoa sector

Most of the major challenges in the cocoa sector in general, and Ghana in particular, have already been identified in scientific literature or other studies. Therefore, general issues in the Ghanaian cocoa sector derived from scientific literature will be included in this section alongside with the problem perceptions by major stakeholders in order to have a complete overview. The identified issues have been grouped in four different categories: ecological, financial, social, and land tenure-ship. The problems mentioned in literature and those from the interviews overlap to a great extent. To avoid mentioning problems multiple times, every subsection will first provide an overview of issues mentioned in both literature and in the interviews. All problems mentioned specifically by stakeholders will be mentioned in the last part of the subsection. Furthermore, the respondents were asked for their views on the functioning of COCOBOD as a regulating institute. The respondents provided information on how the COCOBOD policies play out in practice, and what the advantages and disadvantages of these policies are.

5.5.1 Ecological issues

There is a great overlap between ecological issues mentioned in literature and those mentioned in the interviews. The biggest issue appears to be low yields. Yields in Ghana lie around 420 kg/ha (Hütz-Adams & Fountain, 2015), whereas yields in Asia and Latin America range between 500 and 600 kg/ha (World Cocoa Foundation, 2014). The low yields are predominantly caused by the high incidence of pests and diseases. Especially Cocoa Swollen Shoot Virus Disease (CSSVD) was rampant in the past, especially in Ghana where the disease has led to the removal of millions of infected trees. Another major disease affecting cocoa is Phytophthora Pod Rot (PPR), better known as black pod disease. Black pod disease is thought to have caused a loss of 40% of pod loss in Ghana and Côte d'Ivoire and can be combatted through regular spraying of farms with fungicides, but access to these chemicals is a major problem (Wessel & Quint-Wessel, 2015).

Other ecological issues arise from the way the crop is produced. Ghanaian cocoa farmers often switch to monoculture farms to increase the amount of trees per hectare, which increases short term productivity (UNDP, 2012a). Monoculture cocoa farming, however, has an adverse effect on productivity as it leads to the loss of soil nutrients, while also causing a loss in biodiversity (Rice & Greenberg, 2000). Furthermore, the impossibility of increasing yield per hectare due to reasons mentioned in the previous section leads to cocoa farmers expanding their farms as a means to increase their overall productivity, subsequently leading to deforestation and more biodiversity loss (UNDP, 2012a). A solution to this problem would be introducing agroforestry as a means to grow the

crop (Utomo et al. 2014). Another reason for low yields is the age of cocoa trees. A cocoa tree starts producing pods at the age of three and has an economic lifetime of 30-40 years after which productivity decreases significantly (Wessel & Quin-Wessel, 2015). Another problem, likely to become bigger in the future, is that of climate change, which reduces the amount of land suitable for cocoa production (UNDP, 2012a).

The problem that seems to worry the interviewed stakeholders most is the availability of land. The land available for cocoa is decreasing for a variety of reasons of which climate change is the most significant. Changes in weather patterns and the increasing frequency of droughts make certain areas unusable for the rain fed cocoa agriculture. In areas where climate change is less evident, cocoa will likely expand to compensate for lost lands in other areas ultimately leading to deforestation. Another factor in decreasing land availability is gold mining. If gold is found in a certain area, cocoa farmers or the land owners often sell their land or give it to mining companies as a concession for a short term influx of cash. The mining company then removes all trees from the farm to take out the gold and the land is rendered useless for cocoa farming afterwards when the farmer may get his land back. The issue with gold mining also relates to land tenure-ship, as will be described later (R. Edu-Acheampong, 19/02/2016).

The productivity of aging trees also remains an important problem. The productivity of the trees decreases resulting in a need for new trees. COCOBOD, through the Seed Production Unit, has started a large rehabilitation scheme to provide farmers with seedlings and seed pods to counter this issue. A problem with planting new trees is that the old tree needs to be cut down and a new tree only starts to produce pods after three years resulting in a reduced income for farmers over a certain period. In order to address this issue farmers are encouraged to plant short term crops such as maize and cassava for additional income (W. Wiafe, personal communication, 17/02/2016).

5.5.2 Financial issues

A countries' economic development is often measured in GDP per capita. Ghana's GDP per capita is 1,441 USD, while 24,2% lives under the national poverty line. The World Bank therefore ranks Ghana as a lower middle income country (worldbank.org, 2016a). On other indicators, aggregated into the Human Development Index (HDI), Ghana ranks 138th and is classed as having "medium human development' (UNDP.org, 2014). Poverty is a big issue in Ghana and is also rampant in the cocoa sector. Low rates of income for cocoa farmers are often due to low cocoa prices, small farm sizes, low yields per hectare and a lack of market access. The poverty resulting from these factors in turn lead to the use of child labour, malnutrition due to food insecurity, illiteracy and young generation of farmers leaving the cocoa sector as it does not provide a living income (Hütz-Adams & Fountain, 2015). Low yields are both a cause and an outcome of poverty, as is shown in figure 5.4. Improving yields would improve the situation for cocoa farmers, but a lack of access to inputs and loans and bad farming practices make achieving this a tough challenge (Wessel & Quint-Wessel, 2015).

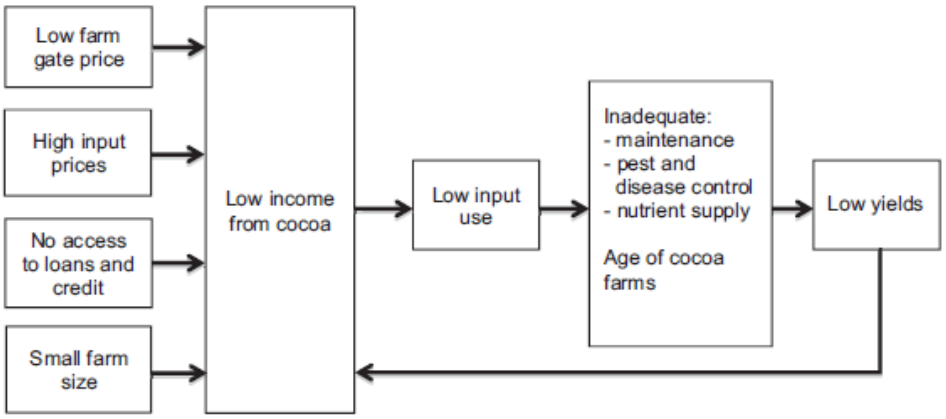

Figure 5.4: Causes for low yields in West-Africa (Wessel & Quint-Wessel, 2015)

The interviewed stakeholders hold financial issues as the biggest constraint in the Ghanaian cocoa sector. In addition to the problems mentioned above, the respondents also highlighted other issues. One of the issues is the lack of financial investments is caused by poor financial management of farms. Farmers often receive the returns from their farms in a short period and spend it instead of saving it to invest back in the farm later (I. Gyamfi, personal communication, 31/03/2016). Furthermore, agriculture is a very risk inherent business; investments need to be made upfront and the proceeds can only be obtained after harvest. A variety of factors (see 'ecological issues' above) can cause low returns on investments due to low yields making investments risky.

Access to financial means can be improved through the provision of microcredit. Because of the inherent risks of agriculture, banks and other credit loaners often do not want to loan money to farmers as there is a high chance of them not being able to pay it back, besides the fact that farmer often do have the bookkeeping required to have access to bank loans. Small scale private money lenders within communities are more likely to give out loans as they know the farmer and can inspect the cocoa farm to assess the return rate of the investment. Access to loans is further impaired by the high interest rates in Ghana at the moment. Especially interest rates of micro financers are high: monthly interest rates of 3-5% are not uncommon making microcredit a huge financial risk for farmers. Interest rates of larger banks are often lower, but usually still amounts to a monthly interest rate of around 2,5% (A. Kadja, personal communication, 22,04/2016).

A potential solution to improve access to credit is through certification itself. A key part of certification standards is farm management, which involves recordkeeping on the farm. Farmers are far more likely to get a loan from a bank if they can show extensive records on how much is produced over the years, what their yearly income is, and what they invest in. Recordkeeping can therefore help improve access to credit from banks, but cannot provide a solution to the high interest rates in Ghana (J. Steijn, personal communication, 16/07/2016).

5.5.3 Social issues

Social issues often arise from the impoverished situation most cocoa farmers live in. Cocoa farmers often lack the income to be able to hire the additional labour they require on their farms, especially during harvest. This inability to pay labourers leads to forced labour, often of family members, and poor working conditions (Anang et al. 2011). The poor working conditions often cause health problems due to hard work or poor handling of chemicals. Child labour, an important issue especially

in the eyes of the chocolate consumer, is also widespread in West Africa. Children growing up in poor areas often start working on their parent's farm at an early age. Child labour often robs a child of the opportunity of an education leading to low education levels of (future) farmers and illiteracy (Hütz-Adams & Fountain, 2015). Other issues relate to discrimination of workers who are not capable to associate with workers' union and are unable to set criteria for wages (Asante-poku & Angelucci, 2013).

Gender inequality in the cocoa sector is also a major problem where women are expected to work on the farm, but also run the household as in doing the cleaning, cooking, taking care of the children and the gathering of firewood. Women in cocoa therefore often have a much heavier workload than men. Furthermore women are often not the owners of land, which is a precondition to join farmers organisation or to apply for a bank loan (land is used as collateral). The result of this is that women are often bypassed in decision making processes and are less informed about market developments and effective farm management compared to men (Laven, 2010).

The social issue mentioned most often in the interviews is that of the aging of the farmers. A variety of explanations are provided as to why younger generations are unwilling to become cocoa farmers. The most important reason is that of the low income associated with the heavy work on cocoa farms. Younger generation often migrate to cities and towns in order to find work that provides better opportunities to improve one's livelihood (E. Quartey, personal communication, 04/04/2016). The availability of labour therefore decreases, which is mainly a problem for farmers whom are too old to work the land themselves and rely on additional labour for their income. Furthermore, the share of agriculture in general in Ghana's GDP is declining from 26% in 2011 to 22,4% in 2014 (Worldbank.org, 2016b). This is likely a result of government policy favouring the service sector. The decreasing amount of land available is also a disincentive as young farmers often want to be land owners instead of sharecroppers or labourers (I. Gyamfi, personal communication, 31/03/2016).

5.5.4 Land tenure-ship

The way in which land is divided is a major issue in cocoa farming in Ghana. The issue of land tenure-ship can be divided into property right issues and inheritance issues, both of which have a negative impact on productivity of cocoa farms.

The problem with property rights relates to who owns the land. A cocoa farmer who works the land is often not the owner of the land. Ghana has a very traditional system when it comes to land ownership and the system differs from region to region. Usually, the land is often either owned by the local chief or by a family. The local chief can give land for a farmer to use in return for a certain percentage of the profit made from the land. The same arrangements can be made with land owners who are not necessarily the local chief. The problem that arises here is that a landowner or chief can sell the land without consultation with the farmer. This means that when, for instance, a mining company buys land from the local chief to extract the gold, the farmer would lose his farm and his livelihood. It also happens that a land owner moves out of the region to work and live in the city. The farm would then remain unused because the owner does not use and does not allow anyone else to use it, which further exacerbates the land availability issue described above (E. Quartey, personal communication, 04/04/2016).

The other issue relates more to family owned land and the way inheritance is arranged in the traditional farming systems. It is the case in many of the land tenure arrangements that a cocoa farm

is passed on to the farmers' sons when he passes away. The cocoa farm is subsequently divided amongst the sons meaning that a farm could be divided into four smaller farms. The fragmentation of farm land caused by this inheritance system leads to decreasing yields as small farms are a disincentive for investments besides the fact that the income generated from the farm is low (E. Quartey, personal communication, 04/04/2016). This results in a lesser usage of fertiliser and a higher incidence of pests and diseases due to a lack of pesticide spraying. The system is seen as a cultural heritage, so even though it is not profitable, farmers refuse to abandon the system.

5.5.5 Advantages and disadvantages of COCOBOD policies

Cocoa Research institute Ghana

The major benefit of the CRIG is that, through the testing of inputs, pesticides, fungicides and fertiliser available on the Ghanaian market and through COCOBOD are often of very good quality. The testing also prevents to a great extent the amount of environmentally harmful products that enter the market. Nevertheless, counterfeit or low quality products can still find their way on the market, especially through private companies (R. Edu-Acheampong, personal communication, 19/02/2016). CRIG research also helps protecting both humans and the environment from negative effects of pesticide spraying by providing manuals on how it should be applied. Furthermore, the CRIG develops training manuals that are revised every few years and are aimed at teaching farmers good agricultural practices that can increase yields. CRIG studies also show how cocoa trees and shade trees should be arranged on a plantation in order to increase productivity.

Seed Production Division

The task of SPD is important as high incidences of CSSVD and aged trees lead to high demand of seedlings. The SPD harvested over 6 million hybrid seed pods and over 9 million seedlings in the 2013/2014 season. 93% of these seedlings and hybrid seed pods were distributed to farmers to rehabilitate their farms. The actions of the SPD are a significant contribution for farmers to be able to continue growing cocoa after CSSVD epidemics and after the removing of old trees.

Quality Control Company

The QCC ensures that the quality of the cocoa reaches a certain standard. By imposing stringent quality controls, farmers are incentivised to produce better quality cocoa, which reduces the risk of produce being deducted from the bag when sold to LBCs. Better quality cocoa can therefore be beneficial for the income of a farmer. In order to sell good quality cocoa farmers are trained on harvesting techniques and the post-harvest treatment of the beans. Better quality cocoa can fetch a higher price and is also one of the desired impacts of the UTZ Theory of Change and can therefore also be beneficial for certification. Another benefit of the quality control is that it makes cocoa traceable. A seal on the bag after quality control marks the origin of the contents making it traceable to the purchasing clerk that bought it (but not to the farmer who produced it).

Cocoa Health and Extension Division

Extension services are important in order to achieve sustainable cocoa production. The trainings from CHED focus on good agricultural practices and income diversification. The good agricultural practices can increase a farms yield if done well and regularly. The COCOBOD extension staff is the biggest provider of trainings in Ghana. Trainings through LBCs, cooperatives and other organisations are often performed by CHED extension officers. This is also important for certification as the trainings and the good agricultural practices are a core feature of certification. CHED staff can

therefore do the initial training in good agricultural practices so certifiers only need to do the top up to include the specific certification standard. The training manual as used by COCOBOD also forms the basis for the manuals used by UTZ Certified, Fairtrade, and Rainforest Alliance. Organisations such as Solidaridad provide trainings for CHED staff on certification standards so certifiers can also make use CHED staff to train farmers in order to certify them (F. Amponsah, personal communication, 16/06/2016). The extension services provided by COCOBOD are therefore likely beneficial for both farmers and certifiers. Certifiers, however, might find it a hindrance that they have to rely on CHED for their extension staff.

CODAPEC and Hi-Tech

CODAPEC and Hi-Tech are the branches of CHED in charge of the distribution of inputs such as fertiliser and the spraying of farms with pesticides. The farmers that receive inputs can attain higher yields, which should result in an increase in income. CODAPEC and Hi-Tech have been successful in distributing around 200,000 cartons of fungicides/pesticides and around 1,8 million bags of fertiliser (Ghana Cocoa Board, 2014). However, the distribution of inputs creates issues for farmers and is not solely beneficial for the industry.

The operations of CODAPEC and Hi-Tech are subject to most the criticism towards the role of COCOBOD. The farmers do not have to pay for the inputs as they arrive, however, as can be seen in figure 5.1, the costs of the inputs are deducted from the gross FOB price to come to the net FOB price. In other words: all farmers indirectly pay for the inputs. This would not necessarily be a problem if all farmers get an equal share of the inputs they have paid for.

However, the input distribution has been criticised for being unequitable as all farmers pay for the inputs, but not all farmers receive them (or to the same extent). Another issue is that the farmers that do get the inputs often do not get enough for their lands. It should be noted here that it is not the goal of CODAPEC and Hi-Tech to provide farmers with all their required inputs. Farmers receive inputs for part of their farm and should purchase the rest of their inputs themselves (W. Wiafe, personal communication, 17/02/2016). A database could provide insights on how much which farmer needs to apply on their farms. This database, however, is lacking as it does not include all farmers resulting in farmers often receiving the same amount of fertilisers even though one farmer may have a 5 acre farm, while the other has a 40 acre farm. The farmer with the 40 acre farm pays more (indirectly through his cocoa output), but does not receive more inputs. COCOBOD at the moment lacks the capacity to distribute the inputs fairly, leading to other problems as well (E. Quartey, personal communication, 04/04/2016). Another possible explanation for the unequal distribution of inputs is the political nature of COCOBOD. Various stakeholders mentioned that districts that did not vote for the current president are less likely to receive public services such as the repairing of roads and the delivery of inputs for cocoa production. This is, however, highly speculative and hard to investigate.

It is very important for farmers to receive their inputs on time. Fertiliser, for instance, should be applied before the rainy season so the nutrients are absorbed better by the soil. If a farmer receives the fertiliser too late, applying it would have very little effect for cocoa trees. This leads to farmers applying it on other crops such as maize or selling it back to the market in order to generate some income (E. Quartey, personal communication, 04/04/2016). The input distribution is very costly, but does not lead to a higher yield if an effective distribution system is lacking.

Another issue with the distribution system is that it has created a certain mentality in farmers whom would sit around and wait for COCOBOD to provide them with inputs instead of investing in- and applying their own from the open market. The input distribution from COCOBOD is a disincentive for farmers to invest in their farms and could even be harmful for yields as farmers that do not receive inputs, or received them late, have not invested in their own leading to farms being unfertilised and more vulnerable to disease and pests. However, business minded cocoa farmers would always buy his own inputs as he knows the benefits of timely fertiliser application (E. Quartey, personal communication, 04/04/2016).

The almost complete monopoly of COCOBOD on input distribution is also a disincentive for private companies to step in. Companies can't compete with COCOBOD on price and therefore need other ways to be cost-effective. The quality of products on the open market suffers as counterfeit pesticides or low quality fertilisers are ways for companies to be able to compete with COCOBOD (T. van der Helden, personal communication, 15/02/2016). Low quality products negatively impact yields as they are less effective. The input distribution by COCOBOD is preventing a major input sector from operating, which also leads to farmers being unable to get inputs from anywhere but COCOBOD as companies are less inclined to enter the sector. So if a farmer does not receive inputs or the inputs arrive late, there might not be a private input company in his district as COCOBOD disturbs the market (E. Quartey, personal communication, 04/04/2016).

Furthermore, the way the distribution of the inputs is handled creates avenues for rent seeking. Hauliers get contracts to move a certain amount of fertiliser from the port to a district. The person that is awarded the contract may not have a truck to move the fertiliser and would sell the contract to someone that does for profit. Rent seeking is common in Ghana and leads to inefficiencies in the distribution system causing inputs to arrive late (E. Quartey, personal communication, 04/04/2016).

Producer price fixing

It is important to note that 70% of the projected crop size is sold forward ensuring the fixed price to a great extent. The fixed price policy in Ghana has been praised as it protects farmers from price fluctuations on the world market. Regardless of fluctuations on the world market, the price for farmers remains the same throughout the season even if the international price drops. Farmers may even get an additional bonus on their produce if the world price increases as the surplus is shared between the government (as export duties) and farmers. The fixed producer price thus ensures a steady income for farmers (E. Quartey, personal communication, 04/04/2016).

The fixing of the producers does have some inherent problems. This is especially due to the fact that the committee only meets once a year at the beginning of the season and therefore cannot quickly respond to price fluctuations on the world market. One significant consequence of this is, is that if the world cocoa price would drop; international cocoa traders would sooner buy cocoa from other countries as the price would be lower there. Furthermore, depreciation of the Ghana Cedi can erode the fixed price paid to farmers rendering it uncompetitive compared to neighbouring countries. Farmers would be able to get a better price for their cocoa elsewhere leading to the smuggling of cocoa to Côte d'Ivoire or Togo (Ghana Cocoa Board, 2014).

The fixed price for cocoa farmers is based on a variety of factors (see figure 5.1). The producer price is significantly reduced by the financing of the input provision through CODAPEC and Hi-Tech. Money that could be paid for farmers is thus withheld to pay for inputs that do not reach all farmers. Low

income and poverty are significant problems for farmers and since the input provision is unequitable, abandoning the input distribution would ensure a higher price for farmers (E. Quartey, personal communication, 04/04/2016). Alternatives to the input distribution by COCOBOD will be discussed in chapter 9.

The producer price review committee also decides on the price margin for the LBCs. As explained earlier, the fixed price margin leads to competition between LBCs to buy as much cocoa as possible as it is the only way for them to increase their profits. This competition leads to LBCs trying to motivate farmers to sell their cocoa to them. Farmers would therefore often receive additional benefits next to the fixed price if they sell to a particular LBC. There are a variety of reasons to choose to sell to a certain LBC. The direct availability of cash for cocoa is a big incentive as not all LBCs would have the financial means to buy cocoa at that time. Farmers who would have a trading with a certain LBC might therefore move to another LBC if they need quick cash at a certain time. LBCs also provide certain services to farmers such as providing them with loans or fertiliser on credit. These services could create a sense of responsibility of a farmer towards a certain LBC. Other benefits farmers would receive from farmers are exercise books, machetes, and access to spraying machines or other goods such as soaps or clothing. The way the internal market is organised thus leads to additional benefits for farmers (S. Apent, personal communication, 10/03/2016).

The Ghana Cocoa Platform

As explained earlier, the Ghana Cocoa Platform is an attempt to harmonise programs aimed at sustainable cocoa production. The Platform Plenary consists of a variety of stakeholders to discuss how to best aid farmers in regards to the issues affecting the sector. The Platform has only been implemented recently and the effects of the programs initiated through the platform have yet to be assessed, however increased cooperation and harmonisation of efforts in the Ghanaian cocoa sector can only be beneficial for farmers as mechanisms can be put in place for improved extension services and improved access to inputs. This is especially likely because both COCOBOD and other actors have the same goals and apply roughly the same methods (e.g. extension services). The improvement in extension services and access to inputs would likely translate into higher yields and a higher income for farmers over time. Increased cooperation between COCOBOD and certifiers would also likely improve the uptake of certification as mechanisms for extension services improve the amount of farmers that can be reached.

5.6 Private certification standards

This section focuses on how private standards are formulated, who is involved in the development process, how the implementation works and what the impact is of certification according to the interviewed stakeholders. The quantitative data serves as a means to check what the exact impact is at the farm level. Even though roughly half of the farmers are certified under the Fairtrade standard, this research focuses on the UTZ Certified standard. This is mainly because the UTZ Theory of Change and the UTZ Code of Conduct form the basis for the certification uptake and impact assessment. A rough comparison between the two standards showed that most of the criteria for the two standards are roughly the same, at least for those used in this research (UTZ Certified, 2014b: Fairtrade International, 2011).

5.6.1 Certification standard development process

The core of the UTZ Certified certification program is the code of conduct. The code of conduct sets out the requirements for farmers to become certified. The requirements include farming practices and working conditions as described in the theoretical framework. The code of conduct can be found in the UTZ Theory of Change on the left side under requirements (see figure 3.1). The UTZ Theory of Change is a simplified version of the code of conduct as it only mentions, for instance, good agricultural practices, but not what those practices exactly entail. Good agricultural practices are made up of a set of criteria ranging from the amount of shade trees per acre to the type of pesticide applied (UTZ Certified, 2014b). The criteria also serve as indicators for the monitoring and auditing of UTZ Certification projects at the farm level.

The code of conduct is developed in collaboration with other stakeholders and also includes public consultation. The code of conduct is based on conventions of the International Labour Organisation (ILO) in order to develop internationally recognised criteria for sustainable farming. The development process ascertains that the criteria reflect the latest agreements, research and expertise. Furthermore, the development and revision process are in with the requirements line with the ISEAL alliance (UTZ certified, 2014b). UTZ Certified has a code development procedure in which the various stakeholders are involved. The stakeholders are included in the various boards and committees that set up the code of conduct.

The development of the Code of Conduct culminates in criteria that are divided into four blocks: management, farming practices, working conditions and environment. These four blocks represent the four pillars of sustainable agriculture embodied in the UTZ Theory of Change (see figure 3.1) (UTZ Certified, 2014b). Figure 5.3 shows an example of two criteria included in the code of conduct under farming practices. The first column (CP#) indicates the block and number of the control point, the second column (control point) is the requirement that needs to be met, columns three through six (years) shows the year in which the control point must be met, and the seventh column (clarification for compliance) provides clarification for implementation and how to assess compliance (UTZ Certified, 2014b). The UTZ code of conduct is made up of a total of 122 criteria that each have different amounts of mandatory yearly control points. The amount of control points per year increases every year as not all control points are mandatory in the first year. For instance compliance to control point I.B. 36 is not mandatory in the first year and control point I.B. 35 has no control points (see figure 5.4).

CP #	Control Point	Year 1	Year 2	Year 3	Year 4	Clarification for Compliance
Diversification						
I.B.35	The producer diversifies agricultural production and/or other sources of income to adapt to market and/or climate change.					Diversification considers intercropping, establishment of home gardens with highly nutritional plants or any other type of diversification.
Soil and fertility management						
I.B.36	Soil erosion is prevented by using soil conservation techniques. Soil is covered when clearing and/or replanting land (e.g. cover crops, mulch).					Visual and/or documented evidence shows these techniques are implemented. Fire is not used to clear vegetation when preparing fields.

Figure 5.4: Example of two criteria included in the code of conduct (UTZ Certified, 2014b).

5.6.2 Certification standards in practice

Certification is a means to an end, meaning the goal is not to certify farmers, but to make farmers produce more sustainably through certification standards. The driving force behind certification is the consumer that pressures companies into corporate social responsibility, which leads to companies seeking certification to accommodate the demand of the consumers (A. Kadja, personal communication,22/04/2016). What this means for how certification works in practice is that becoming certified is a passive decision for farmers. A farmer does not seek to be certified, but instead, companies seek certified produce and therefore need certified farmers. If, for instance, Mars wants to increase the amount of UTZ Certified cocoa it buys from the Ghanaian cocoa sector, it needs to link up to an LBC or a farmers cooperative (see section 5.3). The LBC or the cooperative will then seek out farmers who are willing to become certified and then proceed to provide the required trainings through extension officers whom are specialised in trainings for the UTZ Certified standard (or any other standard depending on the demand). It is important to note here that UTZ Certified and Fairtrade are the organisations that develop the standards, but are not those who do the implementation. The implementation is done through private companies (e.g. LBCs), NGOs (e.g. Solidaridad), or farmers cooperatives (e.g. Kuapa Kokoo, Kokoo Pa) on the ground (H. Gilhuis, personal communication, 19/01/2016). These are the organisations that provide the trainings (for farmers and extension staff) and do the capacity building that make certification of farmers possible. The role of international market actors such as Mars and Cargill is to provide the demand for certified cocoa on the international market, which leads to the implementation of the standard and the payment of the premium to farmers.

An important feature of certification is the auditing. Auditing firms verify whether farmers have implemented the code of conduct. A farmer will become certified once he has been audited and the code of conduct has been implemented to a satisfactory extent. The auditing takes place every year as certain criteria do not have to be met in the first year of certification (see section 5.3.1.). Once a farmer is certified he can start selling his product as UTZ Certified and he can record his sales in the UTZ Certified traceability system. The traceability system is what provides the assurance to a buyer that a product is produced sustainably according to the code of conduct. (UTZ certified, 2014b). Certified and conventional cocoa are transported separately to make sure the cocoa beans do not mix. This means that all certified cocoa is transported, stored and shipped in specific bags for certified cocoa (A. Kadja, personal communication, 22/04/2016). COCOBOD has played an important role in the traceability of certified cocoa by making it possible to separate certified from uncertified cocoa in the warehouses at the ports (A. Laven, personal communication, 22/07/2016).

An important factor that affects the uptake of certification is the business mindedness of cocoa farmers. According to the interview with UTZ Certified, the larger, more entrepreneurial farmers are more likely to adopt the standards than smallholder farmers with small farm(s) and low yields. The reason for this is that farmers that are more business oriented tend to plan further ahead and invest more in their farms. The business oriented farmer is therefore more likely to see the value of becoming certified than other farmers who grow cocoa as a means to sustain their livelihood (H. Gilhuis, personal communication, 19/01/2016). This is an important observation as this would mean that policies that can improve the entrepreneurial spirit of cocoa farmers would also increase the potential uptake of certification. In other words: COCOBOD policies that positively affect yields, access to land, access to inputs, access to microcredit and access to trainings positively affect the

uptake of certification as it becomes easier for farmers to move from cocoa farming as means to sustain their livelihoods to cocoa farming as a profit generating business.

5.6.3 Impact of certification

This section discusses what the impact is according to the interviewed stakeholders. The impact of certification for farmers will be discussed more thoroughly in chapter 6. The respondents were mostly positive about the impact of certification. The biggest benefit of certification is that it increases the productivity and the income of the farmers through good agricultural practices and a price premium. Another benefit is that it has improved working conditions for labourers and has increased the use of protective equipment during spraying. Furthermore, training in post-harvest activities has improved the quality of the cocoa by banning certain practices (V. Manu, personal communication, 23/03/2016). Besides benefits for farmers, certification also positively impacts communities. For instance schools are financed through the Fairtrade premium in communities where Kuapa Kokoo is active (S. Apent, personal communication, 10.03/2016).

5.6.4 Shortcomings of certification

One of the shortcomings of certification is that not all farmers want to be certified. This is most likely due to complexity of the standard which is a disincentive for farmers. Another explanation might be that farmers do not see the value of becoming certified. The uptake of certification is therefore limited as farmers remain uncertified. Another shortcoming related to uptake is the degree to which the farmer adopts the standard. Impact reports show that when standards are consistently complied with throughout the year, the output of the farm will increase. The problem here is that not all farmers do this consistently leading to a reduced impact (H. Gilhuis, personal communication, 19/01/2016).

Another shortcoming relates to the goal of certification. As mentioned before, the driving force behind certification are the consumers who pressure companies into certification as they want the product they buy to be produced free of issues such as child labour. Certification is a means by which companies can verify that the goods they buy are produced according to a certain standard. The result of certification for companies is a visible label of Fairtrade or UTZ Certified on their products as a sign of Corporate Social Responsibility (CSR) to consumers. The primary goal of certification standards is therefore not to resolve poverty issues at the farm level, but to provide companies with a means to accommodate the consumer demand for ethically produced products (H. Gilhuis, 19/01/2016). Therefore, certification, even though helpful, usually cannot take a farmer out of poverty. Good agricultural practices and good farm management, as included in the standards, can increase the yield per hectare from 350 kg to 500-600 kg, which will increase the farmers' income to some extent. An additional 150 kg of cocoa equals roughly an additional yearly income of 1000,- GHC. However, the yield increase and the price premium are often not sufficient and the farmer remains in poverty (I. Gyamfi, personal communication, 31/03/2016).

5.7 Summary of review of institutional conditions

The qualitative data has provided an overview of the roles of the different actors in the Ghanaian cocoa sector. In this research, the influence of COCOBOD and private certification standards at the farm level are central. Section 5.2 provided an institutional analysis of COCOBOD and an overview of the policies that affect farmers the result of the qualitative analysis is summarised in table 5.9.

The most important COCOBOD policies affecting uptake are the fixed cocoa price and the fixed LBC price margin, the extension services from CHED, the provision of seedlings, the provision of inputs and the establishing of the Ghana Cocoa Platform. Table 5.9 shows the policies along with a verdict whether they are likely to be beneficial for certification uptake and why. The verdict is based on the observation of UTZ Certified that business minded farmers would sooner become certified than other farmers, as proposed in section 5.6.2. In other words: if a certain policy is beneficial for the farmers entrepreneurial mind set (e.g. higher prices, better training), then it is likely that he would sooner become certified and implement the standard compared to farmers who only see cocoa farming as a means to sustain their livelihoods.

Table 5.9: Summary of policies affecting certification uptake along with a verdict and argumentation.

Policy	Expected outcome	Argumentation
Separating of certified and uncertified cocoa	Positive	This policy initiated by COCOBOD has made cocoa certification possible in Ghana. Without the separation of the two cocoa types, traceability would not be possible.
Fixed cocoa price	Inconclusive	The fixed price has both up- and downsides. The major benefit is protection from price fluctuations. The downside is that the fixed price is often low compared to actual world price due to high costs of CODAPEC/Hi-Tech.
Fixed LBC price margin	Positive	The fixed price margin leads to benefit for farmers as LBCs compete for cocoa. The competition between LBCs has benefits for farmers in the form of trainings, inputs or other goods.
CHED extension	Positive	The extension staff of CHED provides training for farmers on good agricultural practices which are also included in certification standards. Furthermore, CHED extension staff can be used for certification training if properly trained by, for instance, Solidaridad. Besides, Kokoo Pa extension staff is trained by CHED.
Seedling provision	Positive	The provision of seedlings makes farmers more resilient as old- or CSSVD infected trees can be removed without completely losing the income. The period of unproductivity can be compensated by planting food crops and shade trees that provide alternative incomes. It is likely that a farmer would step out of the cocoa sector if he has no access to seedlings after losing his trees.
Input provision	Negative	The input provision through CODAPEC and Hi-Tech have created a mentality where farmers over rely on free inputs. The lack of capacity to reach all farmers is unequitable and inputs that are delivered too late are useless. It would be beneficial for farmers if COCOBOD would abandon the policy, which would mean that they would be able to pay the farmers a higher price.
Cocoa Research Institute Ghana	Positive	The testing of inputs by CRIG ensures to a large extent the quality of the products. The high quality of inputs makes higher yields possible while also reducing the environmental impact of pesticide spraying. Reducing the environmental impact of pesticide spraying is part of certification standards.
Ghana Cocoa Platform	Positive	The Ghana Cocoa Platform enables various stakeholders to harmonise their efforts in the cocoa sector. This means that it becomes easier for certifiers to access farmers and provide trainings as they have an increased capacity as they can make use of extension officers from different stakeholders

The other actors that affect certification uptake, NGOs and cooperatives are both advantageous as their actions support the implementation of the standards. Especially the provision of trainings makes it easier for farmers to become certified when they become member of a cooperative. Furthermore, NGOs provide ways by which the capacity of extension services can be expanded. This makes it possible to reach out to more farmers and provide better quality trainings. COCOBOD supports both NGOs (through the Ghana Cocoa Platform) and cooperatives in their actions and incentivises farmers to become a cooperative member.

6. Quantitative data

This chapter discusses the quantitative data collected through structured interviews. Section 6.1 will show what the impact is of COCOBOD policies on the farm level and measure the uptake of certification by comparing the current situation with the situation before certification. Section 6.2 will then proceed to find explanations for the results found in section 6.1 by calculating correlations between relevant variables.

6.1 Results of quantitative data

6.1.1 Introduction of the data

The quantitative data used in this research was collected during two rounds of fieldwork around Kumasi in the Ashanti Region in March and April 2016. A total of six communities were visited where a total of 106 farmers were interviewed using the questionnaire provided in annex IV. The locations and characteristics of the communities can be found in the methodological chapter. The farmer communities included in this research are all located in the Ashanti region.

Table 6.1 shows the farmer characteristics for each of the cooperatives, as well as for the whole sample. The major differences between the cooperatives appear to be related to the length of certification, the amount of trainings and the price premium. Other characteristics show only small differences.

Table 6.1: Farmer characteristics per cooperative and for the complete sample.

Cooperative Characteristics	Kuapa Kokoo (n=50)	Kokoo Pa (n=56)	Complete sample (n=106)
Mean age	57,08	54,68	55,81
Sex (male/female)	Male: 34 Female:16	Male: 32 Female: 24	Male: 66 Female: 40
Mean length of certification (years)	9,6	4,1	6,7
Mean amount of yearly trainings	3,9	9	6,6
Mean price premium (GHC per bag)	4,-	15,9	10,3
Mean amount of bags produced	8,1	8,4	8,3
Mean amount invested (GHC)	886,5	856,7	870,-

6.1.2 Issues affecting cocoa farmers

Section 5.5 already discussed the issues affecting the cocoa sector as found in literature and from interviews with stakeholders. This section focuses on the most important issues that affect cocoa farming as experienced by the farmers themselves. Table 6.2 shows an overview of the issues named most often by the farmers. The issues have been divided in four different categories: financial, ecological, social, and other. The categories are based on the answers provided by the farmers. The question was open so some farmers named multiple issues.

The answers of the farmers, those of the stakeholders and the issues found in literature do appear to overlap to a great extent. The high incidence of pests and diseases is a big problem for farmers, as well as financial issues. Furthermore, table 6.1 showed a mean age of 55,81 for the farmers, which is

relatively high as the mean age in Ghana is 20,9 years (in 2015) with a life expectancy of 61 (Central Intelligence Agency, 2016: worldbank.org, 2016c). This indicates why the stakeholders are concerned for aging of cocoa farmers and the future supply of cocoa. Other farmer issues that were mentioned by stakeholders are the access to and the quality of inputs. Issues such as gold mining and land tenure-ship are not mentioned, likely because they do not affect farmers in this area or are seen as issues of secondary importance.

Table 6.2: Issues affecting cocoa farmers

Category	Issue	Frequency (n=106)	
Financial	Financial difficulties	27	
	School fees	16	
	Lack of money for inputs/labour	11	
	Health care bills	1	
	Total:		55
Ecological	Black pod	16	
	Pests	18	
	Droughts	17	
	Insects/parasites	8	
	Bush fires	6	
	Total:		65
Social	Sickness	3	
	Accommodation	3	
	Food	5	
	Availability of labour	1	
	Total:		12
Input quality/availability	Input quality/availability	13	

The table above shows that issues persist even though all farmers are certified. Especially financial and ecological issues are still widespread. The high incidence of pests and diseases is likely due to an inefficient distribution system for inputs or the lack of financial means to purchase inputs. The financial issues are likely caused by a lack of yield (related to the ecological issues) or that the price farmers receive for their cocoa is too low.

Table 6.3 shows whether there is a difference between the two districts on the frequency of the issues mentioned in table 6.2. The tables show the frequencies of the issues aggregated into the four categories mentioned above. Table 6.3 shows that financial issues persist about evenly in both districts. However, social issues occur more often in in Ejisu-Juaben, while Ahafo Ano-South faces more ecological issues and issues related to the quality and availability of inputs. It is possible that Ahafo Ano South receives fewer inputs from COCOBOD, which would explain the higher occurrence of ecological issues (e.g. pests) and the lack of availability of inputs. What the possible explanations are for the differences between the districts will be investigated in the quantitative analysis section (6.2).

Table 6.3: Frequency of farmer issues per district

District	Type of issue	Frequency (n=106)	
Ejisu-Juaben (n=50)	Financial	30	
	Ecological	13	
	Social	9	
	Input quality/availability	2	
	Total:		54
Ahafo Ano-South (n=56)	Financial	26	
	Ecological	29	
	Social	0	
	Input quality/availability	12	
	Total:		67

6.1.3 The effect of COCOBOD policies at the farm level

Section 5.5 identified the COCOBOD policies that influence the uptake of certification. The quantitative data serves as a way to check how the policies affect farmers and whether the criticisms and appraisals of the policies as described in the qualitative data section are justified. It should be noted that the quantitative data was collected before all qualitative data was collected and analysed. Therefore, not all the effects of the policies have been measured. The questionnaire (see Annex IV) did not include questions about the provision of seedlings or the exact effect of competition between LBCs as the relevance of these policies was only uncovered during the qualitative data analysis. Furthermore, the precise effect of competition between LBCs is hard to identify as benefits from cooperative membership and benefits of selling to a particular LBC are unclear as the LBCs the farmers sell to are either part of the cooperative or cooperate with the cooperative.

Organisation of the internal market

The internal cocoa market is organised in such a way that only Licensed Buying Companies are allowed to buy cocoa on the internal market and are obligated to sell to Cocoa Marketing Company for a fixed price margin. Farmers are free to decide to which LBC they sell their cocoa and for that reason LBCs attempt to incentivise farmer to sell to their cocoa to their particular LBC. Incentives include material goods or better access to services.

Figure 6.1 shows that all Kokoo Pa farmers sell to FEDCO and all Kuapa Kokoo farmers sell to Kuapa Kokoo Limited (KKL). FEDCO is the LBC that cooperates with Kokoo Pa and KKL is the LBC branch of the Kuapa Kokoo farmers union. Both Kokoo Pa and Kuapa Kokoo provide benefits through the LBC if farmers sell their cocoa to FEDCO or KKL and this has led to farmers feeling inclined to sell their cocoa to these LBCs. Benefits include access to spraying machines for Kokoo Pa farmers and free machetes to Kuapa Kokoo farmers. It must be noted that only farmers who are member of either Kokoo Pa or Kuapa Kokoo receive these benefits when selling to FEDCO or KKL. This makes the division between benefits from being member of a cooperative and selling to a particular LBC vague as the benefits are derived from both. The fact that farmers do receive benefits from selling to FEDCO or KKL shows that the organisation of the internal market is beneficial to farmers that are member of a cooperative it provides additional benefits that can improve cocoa farming.

Figure 6.2 shows that most farmers stay loyal to the same LBC over time. The most likely reason for farmers to stay loyal to an LBC is the fact that they are member of Kokoo Pa or Kuapa Kokoo, which

incentivises the farmers to sell to FEDCO or KKL. Reasons to switch to a different LBC are likely related to other LBCs offering better additional benefits or the need for timely sales of cocoa at a particular moment in time (often related to the unanticipated need for healthcare).

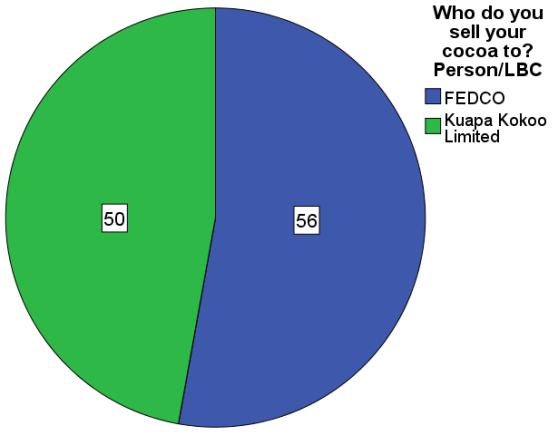

Figure 6.1: Amount of farmers selling to a particular LBC

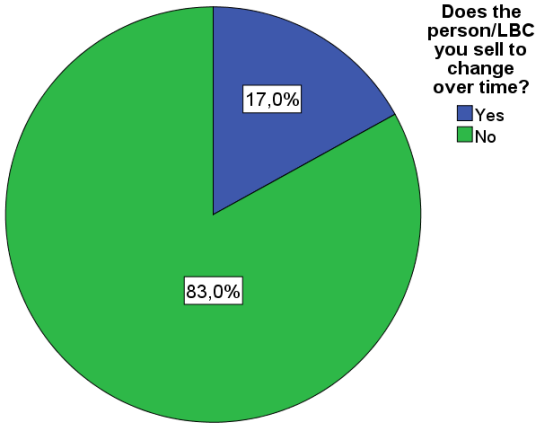

Figure 6.2: Variation in LBC cocoa is sold to (n=106)

Input provision through CODAPEC and Hi-tech

This policy is the most controversial of all COCOBOD policies. The qualitative analysis showed that the 'free' input provision is thought to be unequitable because it does not reach all farmers. Furthermore, the timing of the delivery of fertiliser is very important as it needs to be applied to the farm at a certain time in order to be effective. However, the quality of the inputs should be good since they have passed stringent testing by the Cocoa Research Institute. The farmers were asked if they received inputs from COCOBOD, how often they received the inputs, the perceived quality of the inputs, and whether they received a sufficient quantity for their farms. The results of the input delivery can be found in figure 6.3 to 6.5. Besides the delivery of inputs (mostly fertiliser) by Hi-Tech, the Cocoa Disease and Pest Control (CODAPEC) performs the spraying of pesticide and fungicides. Figure 6.6 and 6.7 show who or which organisation actually performed the spraying.

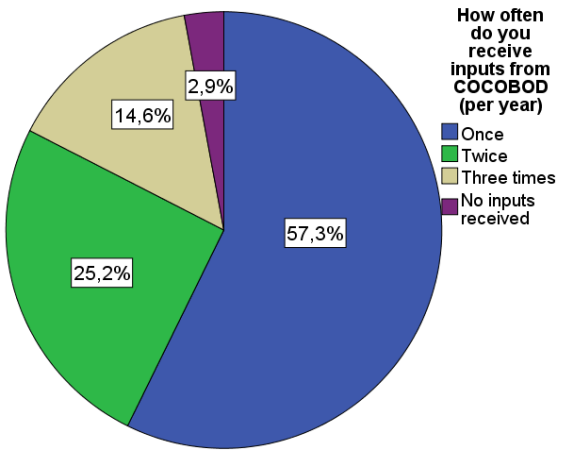

Figure 6.3: Frequency of input delivery by COCOBOD (n=103)

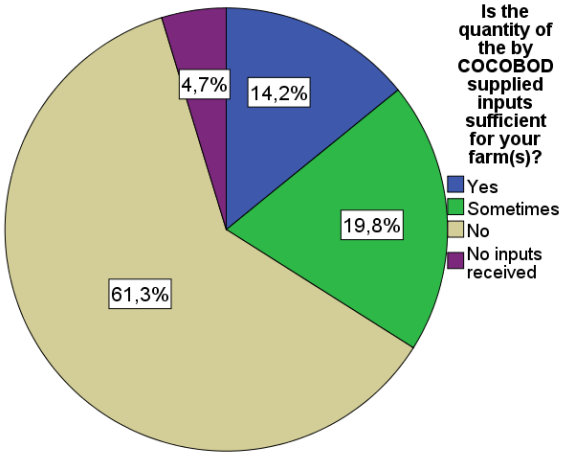

Figure 6.4: Sufficient quantity of inputs delivered by COCOBOD (n=106)

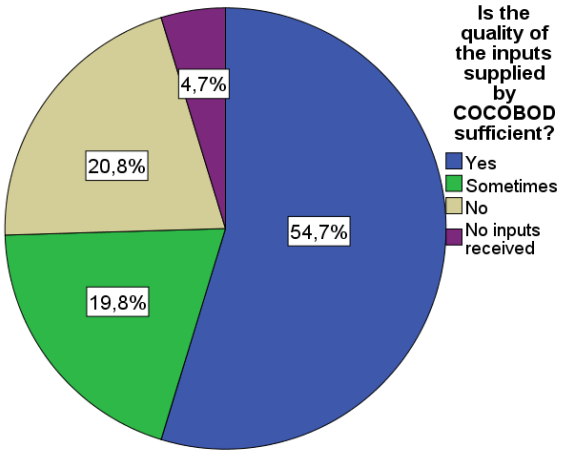

Figure 6.5: Quality of inputs delivered by COCOBOD (n=106)

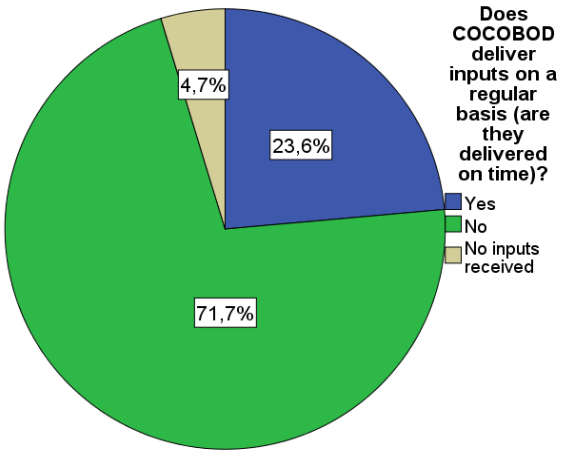

Figure 6.6: Timing of input delivery (n=106)

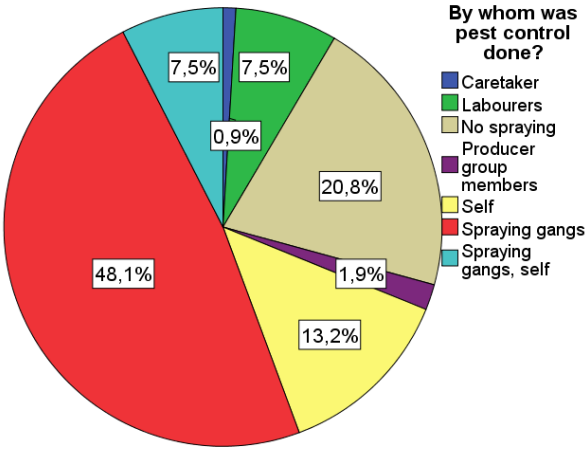

Figure 6.7: Spraying of pesticides (n=104)

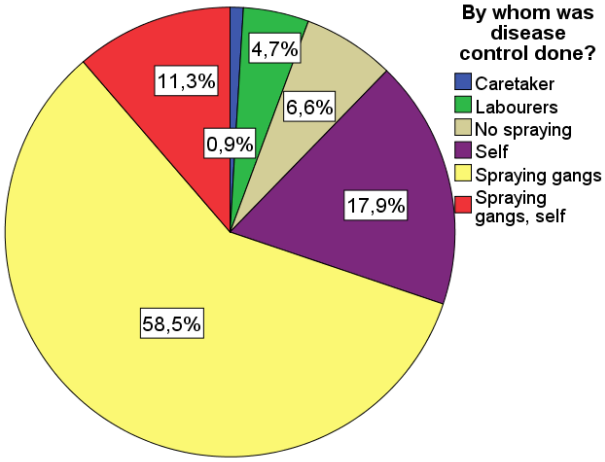

Figure 6.8: Spraying of fungicide (n=106)

Figures 6.3 to 6.6 show that only around 5% of the respondents did not receive any inputs from COCOBOD. This means that the 6 villages in the Ashanti region are well connected to the distribution network. However, Figure 6.6 shows that only 23,5% received their inputs on time. Section 5.2.5 highlighted the possible consequences of late input delivery, namely that it creates a mentality of farmers not to invest in their own inputs to receive them at the right time. The timing of fertiliser application is important for improving the yield of farms as the effectivity depends on the timing. The criticism on CODAPEC and Hi-Tech, that they do not have the capacity to deliver inputs on time, therefore seems to be justified. Figure 6.5 shows that only 14% get the right amount of inputs every time, while 20% sometimes get sufficient inputs. The majority, 61%, does not get the right amount of inputs for their farms. This is likely due to the fact that the input provision by CODAPEC (spraying) and Hi-Tech (fertiliser, seedlings) does not aim to provide farmers with all their required input. Farmers are expected to fill the gap themselves through their own invest in inputs from the open market.

The quality of inputs (figure 6.5) is, as was expected, relatively good due to the testing of inputs by CRIG. Over 50% of the respondents experienced the delivered inputs as being of good quality, while

only 20% was unhappy with the quality. However, it is remarkable that not all farmers are happy about the quality of the delivered inputs as all farmers should get the same brands. This might indicate that not all farmers get the same inputs from COCOBOD or it could be that not all farmers have the same perception of what quality inputs are. The timing of input delivery is also important as the effectivity of fertiliser depends on the timing of application. Late application of fertiliser may therefore be mistaken for low quality by farmers.

The fungicide and pesticide spraying by CODAPEC reaches a lot of the farmers in the respondent group. 55,6% of farmers have had their farm sprayed with pesticides from spraying gangs, while roughly 70% of farmers had their farms sprayed with CODAPEC fungicides. Most of the farmers that do not have their farm sprayed by spraying gangs do the spraying either by themselves, or hire labourers to do it. It is remarkable that the spraying of fungicides took place at a greater scale than the spraying of pesticides: 93,4% of farmers had their farm sprayed with fungicide versus 79% with pesticide. As mentioned before, CODAPEC only provides part of the spraying and any required additional spraying should be paid by the farmer himself. However, most farmers did not do any additional spraying for both fungicide and pesticide. The spraying by the spraying gangs may have been enough for most farmers, which seems unlikely as farms need repeated spraying throughout the year. Figures 6.17 and 6.18 show the total annual frequency of spraying done by the farmers. The size of the farms is likely important here, but it is likely that the lack of financial means to invest in spraying is the reason for not doing extra spraying. Another explanation could be that farmers do not know the amount of spraying required and assume the COCOBOD spraying is enough. The frequency of the spraying of fungicides and pesticides is counted as a good agricultural practice and will be discussed in section 6.2.3.

Cocoa Health and Extension Division

CHED provides trainings to farmers to improve their livelihoods. The trainings focus mostly on good agricultural practices and income diversification. The trainings from CHED and those related to certification overlap to a great extent. The farmers were asked if they received trainings, who provided the trainings and how often they received training. Note that trainings can be provided by multiple organisations throughout a year. The results can be found in table 6.4 and Figure 6.9. All respondents received training as it is obligatory in order to become certified.

Table 6.4: Provision of farmer training per provider.

Provider of training	n	Percentage of trainings	Percentage of farmers
COCOBOD (CHED)	18	11,9%	17%
Cooperatives	101	66,9%	95,3%
NGOs	6	4%	5,7%
LBCs	26	17,2%	24,5%
Total:	151	100%	142%

The farmers in the respondent group are all certified by Kuapa Kokoo and Kokoo Pa under the Fairtrade and UTZ Certified standard respectively. It is remarkable that only 95% of respondents state they receive trainings from cooperatives. 95% is a very high percentage, but all respondents are certified cooperative members should receive trainings from their cooperative. There are a number of explanations as to why not all farmers get trainings from their respective cooperative. Firstly, it

could be that an error in translation led to a wrong answer being written on the questionnaire or that a respondent was not aware that more answers were possible, secondly a farmer may not be aware of the difference between a cooperative and an LBC as Kuapa Kokoo is both an LBC and a farmers cooperative. Another likely reason is that a farmer was either sick or out of town during the training and therefore could not attend (F. Frimpong, personal communication, 08/06/2016).

According to table 6.4 COCOBOD does train farmers (through the Cocoa Health and Extension Division, CHED), but only 17% of the farmers stated that they received trainings from CHED. This is due to the fact that all the respondents are certified and therefore receive trainings on certification standards instead of trainings using the COCOBOD manual. As mentioned earlier, certified farmers receive trainings from the cooperatives in order to become certified. It is therefore remarkable that certified farmers still receive COCOBOD training as 100% of trainings should be done by cooperatives. The results were double checked with Kuapa Kokoo and Kokoo Pa who stated that all their trainings were provided through their own extension staff. It could be that farmers chose to attend COCOBOD trainings as well as the mandatory trainings from their respective cooperative.

Figure 6.9 shows the annual frequency of trainings farmer received. There appears to be a large variation in the amount of training farmers received in a year. Kuapa Kokoo farmers are trained through Kuapa Kokoo Extension Officers. The frequency of Kuapa Kokoo trainings depends on the society in which farmers live (F. Frimpong, personal communication, 08/06/2016). The minimum amount of trainings per year should be 4. For Kokoo Pa, on the other hand, the minimum amount of trainings is 10 per year. These 10 trainings are on certification and all community members (both certified and uncertified) receive at least 5 trainings that are unrelated to standard, which brings the total annual frequency of trainings to a minimum of 15. The frequency of Kokoo Pa trainings depends on the number of years a farmer has been certified and the topics a farmer has already received training on (F. Amponsah, personal communication, 16/06/2016). Explanations for farmers attending less than the minimum are that farmers cannot attend due to sickness or travels. Explanations for farmers attending more than the minimum is that there is no maximum amount of trainings a farmer is allowed to attend.

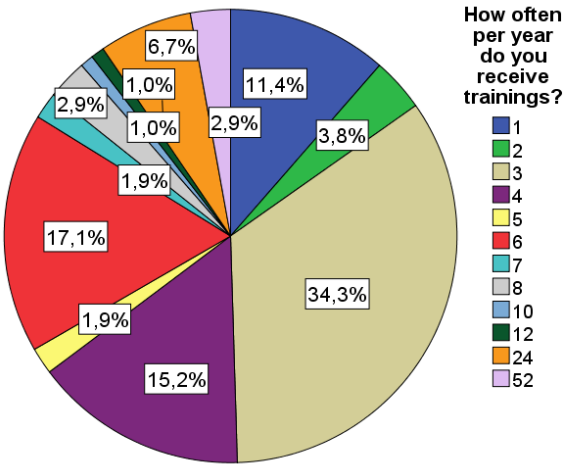

Figure 6.9: Number of trainings received per year (n=105)

6.1.3 Uptake of certification

The uptake of certification looks at the extent to which farmers have implemented the certification standard. Section 5.6.1 shortly discussed the UTZ Certified standard (UTZ Code of Conduct) and explained the standard development process and the auditing process related to certification. The UTZ Code of Conduct consists of 122 control points that should be met in order for a farmer to become certified. To check whether all criteria are met is not possible due to time and access constraints. Therefore, the questionnaire focused on only several of the criteria to check the extent to which farmers adopted good farming practices, good management practices and improved working conditions.

Good agricultural practices

The UTZ Code of Conduct contains 33 control points on good agricultural practices (UTZ certified, 2014b). Of these control points, 13 have been included into this research. The control points included are: frequency of pruning, frequency of weeding, frequency of defective pod removal, frequency of fertiliser application, frequency of pesticide and fungicide spraying, planting/removing of shade trees, handling of chemicals (use of PPE), storing of chemicals, storing of left-over chemicals, income diversification, and expanding of the farm (increasing acreage of farm).

Figures 6.10 to 6.12 show the way chemicals are handled and stored by the farmers. The UTZ Code of Conduct dictates that spraying can only be done in full personal protective equipment (PPE). Most farmers from the group of respondents have their farms sprayed by the CODAPEC spraying gangs and do not spray the farms themselves. The farmers that do spray their own farms make use PPE as prescribed. However 3% of the farmers use only part of the PPE, likely due to a lack of financial means to pay for the full PPE.

The UTZ Code of Conduct prescribes that the storing of chemicals before use meets certain criteria: in a room/box/sack inaccessible to children and in their original container (UTZ Certified, 2014b). Figure 6.11 shows that only 7,5% do not follow these instructions. Other farmers safely lock their chemicals either inside or outside the house, or in the original container (for Kuapa Kokoo farmers).

The leftover chemicals should be disposed of in a matter that minimises exposure to humans, the environment and food products. Figure 6.12 shows that most farmers store their chemicals either at the farm or outside the house. It is likely that this is not an adequate place for storing as storing at the farm does not minimise exposure to the environment and storing outside of the house likely leads to exposure to humans. Only 15% uses storage from either Kuapa Kokoo Farmers Union or a community container, while the rest uses either unsafe storage or has no leftovers. The low amount of farmers using a specially designed storage container could indicate a lack of adequate storage facilities in the communities.

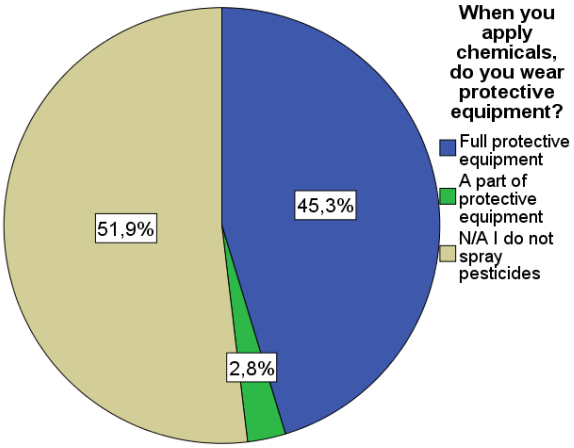

Figure 6.10: Use of PPE when spraying chemicals (n=106)

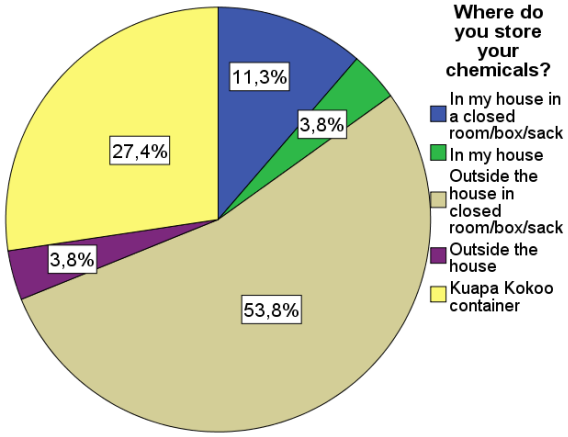

Figure 6.11: Locations of chemical storage (n=106)

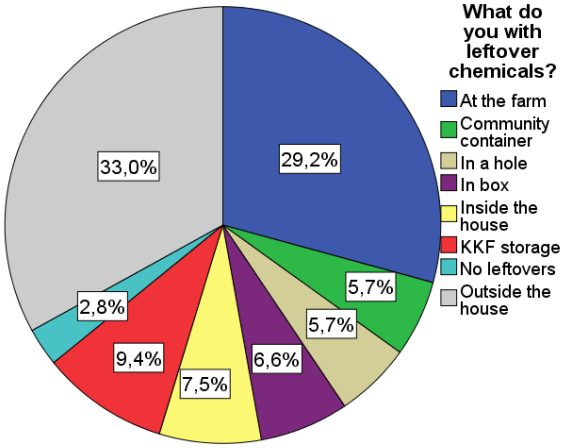

Figure 6.12: Locations for leftover chemical storage (n=106)

Figures 6.13 to 6.16 address matters biodiversity and alternative livelihoods. The UTZ Code of Conduct states that 'protecting biodiversity', so in order to have a clear definition, the Fairtrade Standard will be used to indicate what biodiversity protection means. The Fairtrade standard dictates that farmers should avoid the loss of natural ecosystems as it is a threat to sustainable production due to the loss of ecosystem services. Farms may only be expanded if it is in accordance with national legislation (Fairtrade International, 2011). 68,6% of the respondents have expanded their farm land. The rules to land tenure-ship in Ghana differ from district to district depending on traditions (see section 5.1.2). It is therefore not clear whether the expansion of farmland is in accordance with the national legislation as prescribed in the Fairtrade Standard. However, the UTZ standard states that biodiversity should be protected and turning forest area into farmland does not protect biodiversity.

On the other hand, farmers do plant shade trees more often than they remove them (see Figures 6.15 and 6.16). Shade trees are important as cocoa grows best in an agroforestry farm system (Rice & Greenberg, 2000). This is due to the ecosystem services that protect cocoa trees against pests and diseases as described in the Fairtrade Standard (UNDP 2012a: Fairtrade International, 2011).

Figure 6.14 shows that 83% of all farmers have other sources of income besides cocoa. Having alternative sources of income is part of the UTZ Code of Conduct and is encourage through CHED trainings as well. Table 6.5 shows that most alternative livelihoods relate to agriculture. This is due to the encouragement of shade trees on cocoa farms. Shade trees can have a dual purpose next to ecological benefits (see above) they can also be used as food crops to serve as a source of income between cocoa harvests. Most of the farmers have cocoa as their primary source of income (92,5%).

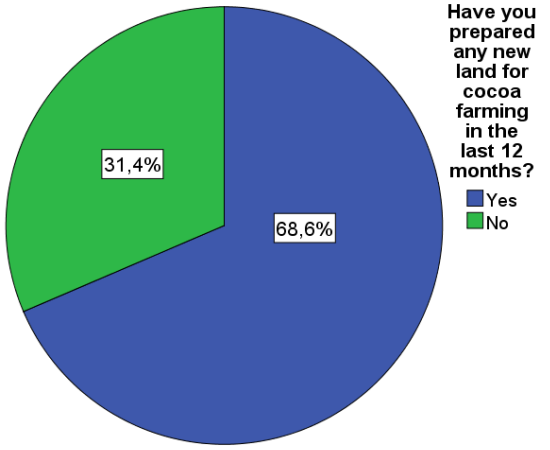

Figure 6.13: Expansion of farmland (n=105)

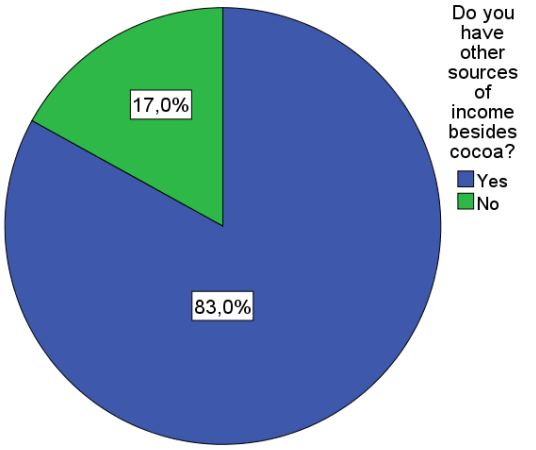

Figure 6.14: Alternative livelihoods for farmers (n=106)

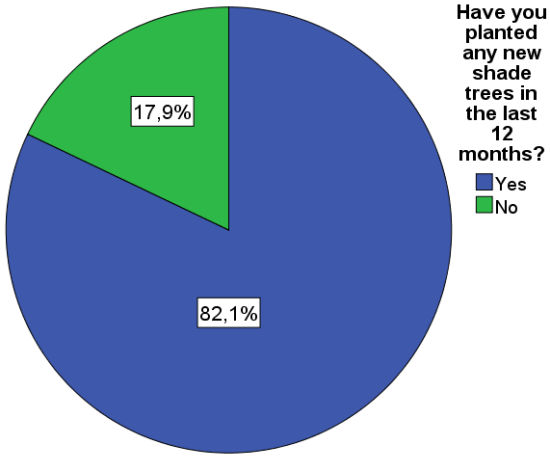

Figure 6.15: Percentage of farmers planting shade trees (n=106)

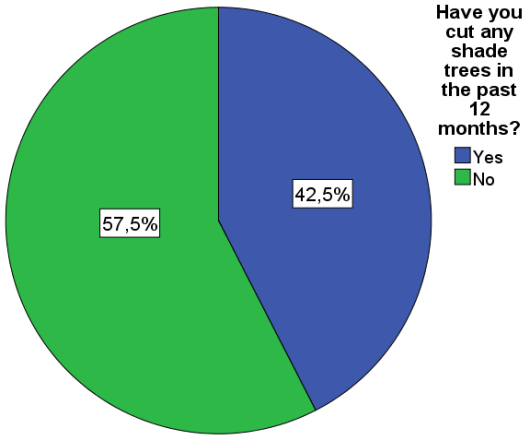

Figure 6.16: Percentage of farmers removing shade trees (n=106)

Table 6.5: Alternative sources of income for farmers

Category	Source of income	
Agricultural	Cassava	Palm nut
	Rice	Banana
	Cocoyam	Okra
	Plantain	Maize
	Palm Oil	Orange
Other	Carpenting	Masonry
	Rent	Remittances

Table 6.6 shows the changes in annual frequency of actions related to good agricultural practices between the time before and after certification. The pruning of trees, removing of defective pods, weeding of farms, and the application of fertiliser are all strategies that increase productivity of farms as trees are better able to take up nutrients from the soil (UTZ Certified, 2014b). Furthermore, the spraying of pesticide and fungicides are also counted among good agricultural practices. However, data lacks for these indicators, making a before and after comparison impossible.

The frequency of pruning, pod removal and weeding is hard to measure through a questionnaire as farmers often do not fully remember how often they do it as they do it either 'every time they visit the farm' or 'several times a year'. What farmers mentioned as 'several times' is put into the table as 'between 4-10 times'. It remains unclear how much 'every time' is, but in the table it is interpreted as the highest category, though every time might also mean 4 or 5 times for certain farmers.

Table 6.6 shows that farmers either maintain the same frequency of good agricultural practices or have increased the frequency. Only small percentage reported as having decreased the frequency of pruning (2,8%), weeding (1,9%), and fertiliser use (5,8%). The uptake of certification in terms of good agricultural practices therefore appears to be good for the farmers included in this research. This is supported by the percentage of farmers that state that they employ what they learned at the trainings on their farms. Most of the trainings relate to these agricultural practices. The outcomes of the practices will be discussed in section 6.2.4.

Table 6.6: Frequency and change of good agricultural practices before and after certification

	Pruning (n=106)		**Pod removal (n=106)**		**Weeding (n=106)**		**Fertiliser (n=104)**	
Frequency	Before	After	Before	After	Before	After	Before	After
Never	20	0	37	13	7	0	44	20
Once every 2 years	0	0	0	0	0	0	6	0
Once	30	17	8	8	18	0	36	45
Twice	21	31	14	9	45	43	10	12
3 times	14	25	12	11	31	53	3	15
4-10 times	11	10	18	34	4	7	4	11
11-25 times	13	3	3	2	1	1	1	1
"Every time"	8	20	14	29	0	2	N/A	N/A

	Change %	Change %	Change %	Change %
Increase	59,4	50,9	39,6	51,9
Decrease	2,8	0,0	1,9	5,8
No change	37,7	49,1	58,5	42,3

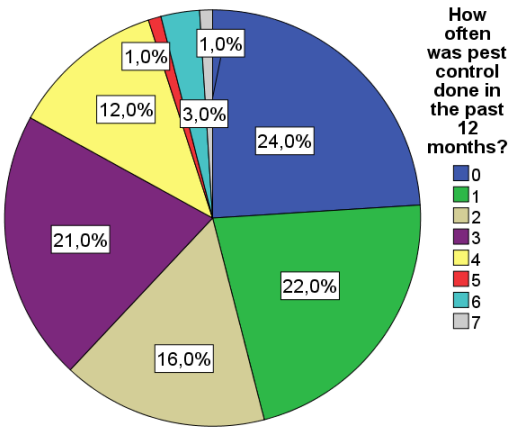

Figure 6.17: Annual frequency of pesticide spraying (n=96)

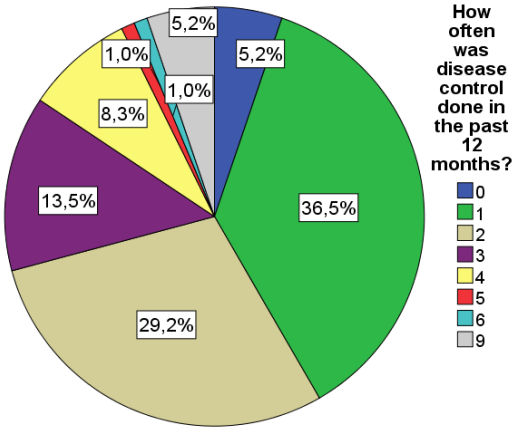

Figure 6.18: Annual frequency of fungicide spraying (n=96)

Good management practices

The UTZ Code of Conduct dictates that farmers should keep extensive record on their farming business. This entails the recording of the amount of fertilisers and chemicals bought, when they were applied, the amount of leftovers and the amount of cocoa produced, to whom it was sold and on which date (UTZ Certified, 2014b). Since all farmers are required to do the record keeping if they are certified, the farmers were asked when they started to keep records to see whether becoming certified was the reason for them to start. The question (question 86) was not filled in by most farmers claiming it was 'not applicable' (N/A). The translators were instructed to ask why this was the case, but most farmers refused to answer the question for unknown reasons. Both Kokoo Pa and Kuapa Kokoo require their farmers to keep records on their farm. Whether the farmers don't do the bookkeeping or simply did not want to tell is not known. The indicator has been taken out of the results because of the lack of answers.

The other indicators used for good management practices are the frequency of group of producer group meetings and frequency of attendance of these meetings. The annual frequency of farmer meetings and how often farmers attend these can be found in figure 6.19 and 6.20. Figure 21 shows that most producer groups meet monthly (43,4%) and the second largest group meets less than every 2 months (35,3%). Only a small amount of groups meet more often than once a month (12%). In the UTZ Theory of Change it is argued that more farmer meetings lead to stronger farmer groups as they can identify, discuss and amend problems in their communities (UTZ Certified, 2014a). 55% of the farmers stated that they attend all of the farmer meetings, 38,6% of respondents attend most of the meetings and only 6% of the respondents attend half or less than half of the meetings. Reasons not to attend meetings can be related to sickness or travels at the time of the meetings. The fact that the attendance of meetings is high in the visited communities shows that the farm groups are strong, which, in theory, should lead to individual benefits for farmers.

Table 6.7 shows the perceived benefits derived from cooperative membership. The question was asked as an open question and recalculated into a multiple response variable to be able to measure the frequencies. The perceived cooperative benefits usually relate to trainings, inputs (fertiliser, chemicals), equipment (machetes, spraying machines), and a bonus (price premium from certification). It is remarkable that not all farmers appear to receive the same benefits. Normally, all farmers from the same cooperative should receive the same benefits. It is likely that farmers only wrote down one or two benefits, forgetting the full extent of services they receive from

cooperatives. The access to trainings, inputs, farming equipment, and a bonus is likely beneficial for farmer livelihoods as it helps to increase productivity.

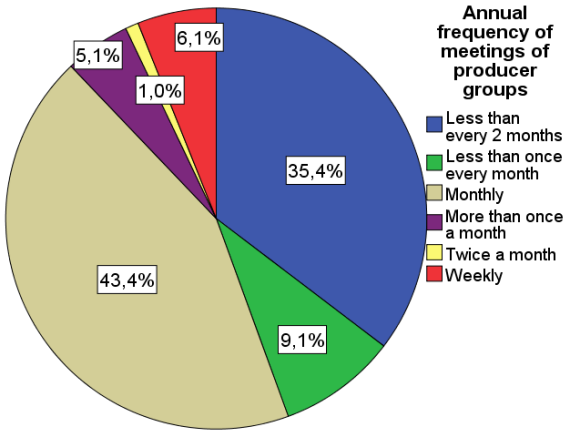

Figure 6.19: Frequency of producer group meetings (n=99)

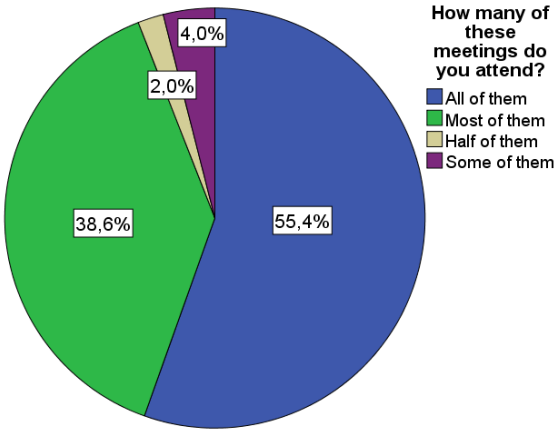

Figure 6.20: Frequency of attended producer group meetings (n=101)

Table 6.7: Benefits farmers received from producer groups

Benefits from farmer groups	Number (n=104)	Percent of benefits	Percent of farmers
Bonus	39	19,9%	39%
Inputs	26	13,3%	26%
Farming equipment	55	28,1%	55%
Training	76	38,8%	95%
Total:	196	100%	196%
Amount of benefits received			
0	1	N/A	0,9%
1	28	N/A	26,9
2	34	N/A	32,1
3	41	N/A	39,4%

Good social practices

The indicators related to good social practices relate to the use of child labour and to working conditions and wages of labourers. Child labour is an important issue that is addressed through certification as consumers demand child labour free products. The use of child labour should be reduced when a farmer becomes certified and replaced with paid labour. Figures 6.20 to 6.23 show the amount of farmers that get help from their children on the farm, how many minors help farmers and the hours a week minor's work on farms. Table 6.8 and figures 6.24, 6.25 and 6.26 relate to the paid labour hired to work on cocoa farms. It should be noted here that child labour is a very sensitive subject in cocoa production. This could have resulted in farmers giving socially desired answers instead of the real situation.

Figure 6.20 shows the percentage of farmers that make use of minor household members (<18) of their household. 66% does not make use of any child labour for their farms, while 33% does. Figure 6.21 shows that 23% make use of 2 or more minors. Households in Ghana are often large due to high

birth rates (Ghana has a total fertility rate of 4.3 children per women)(worldbank.org, 2016d). The big households often rely on their members for cheap labour, where children are used as well (Hütz-Adams & Fountain, 2015). In this case it is important to verify what is defined as child labour as even in developed countries children sometimes help out their parents after school. The UTZ Code of Conduct states that children (older than 15 years old) are allowed to work on the farm, but for light work only and as long as it is less than 14 hours a week and does not interfere with education (UTZ Certified, 2014b). Similarly, the Ghanaian government forbids labour performed by children younger than 15. Figure 6.22 shows that none of the respondents make use of child labour for more than 14 hours a week and are therefore not in violation of the standard, although it is not known how old the children are that worked on the farm, so it remains uncertain whether the age limit set by UTZ Certified and the Ghanaian is violated or not. Figure 6.23 shows that the total amount of work performed by minors on cocoa has decreased for 17% of the respondents, while only 3,8% reported an increase. It thus seems that the child labour (that was already within the limits set by UTZ) further decreases, which should result in an increase of the amount of paid labourers hired to work on the farms (see Figure 6.29).

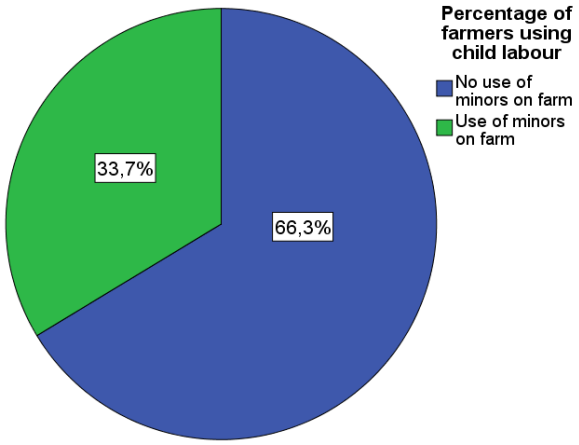

Figure 6.20: Percentage of farmers making use of minors (<18) (n=104)

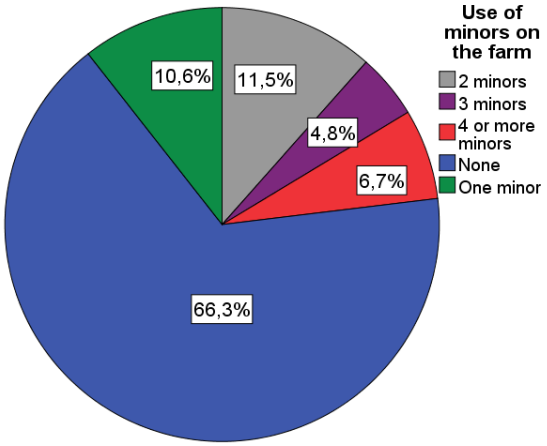

Figure 6.21: Amount of minors (<18) used by farmers (n=104)

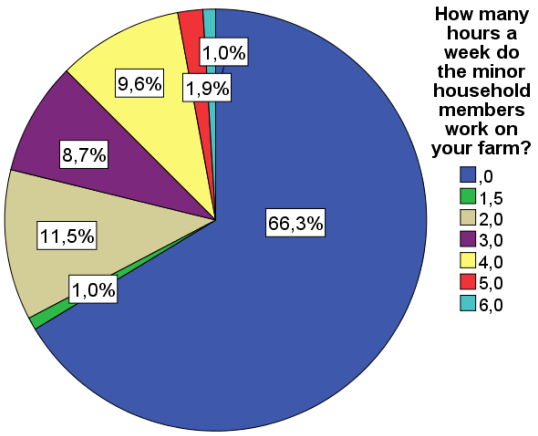

Figure 6.22: Amount of hours worked by minors (<18) (n=104)

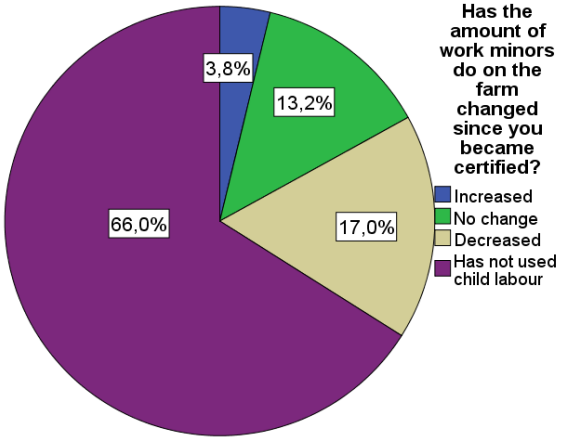

Figure 6.23: Change in amount of work by minors (<18) (n=106)

Both the UTZ Code of Conduct and the Fairtrade standard prescribe that hired labour should have the right to work in safe working conditions (UTZ Certified, 2014b: Fairtrade International, 2011). Table 6.8 shows the number of worker injuries that occur on cocoa farms. The amount of injuries indicate that worker still often suffer injuries, but Figure 6.24 shows that the occurrence decreases for 41,5% of farms. However, 47,2% indicate that there is no change and 11,3% report an increase. There is no data available on the average frequency of cocoa farming related injuries in Ghana as a whole. It is therefore uncertain whether the incidence of injuries as shown in table 6.8 is relatively high or low.

Table 6.8: Number of worker injuries from cocoa farming per year.

Type of injury	Number (n=106)	Percent of injuries	Percent of farmers
Machete injuries	68	25,6%	72,3%
Back aches from heavy loads	58	21,8%	61,7%
Burn injuries	24	9%	25,5%
Respiratory problems	38	14,3%	40,4%
Skin damage or irritation	31	11,7%	33%
Eye irritation	47	17,7%	50%
Total:	266	100%	283%

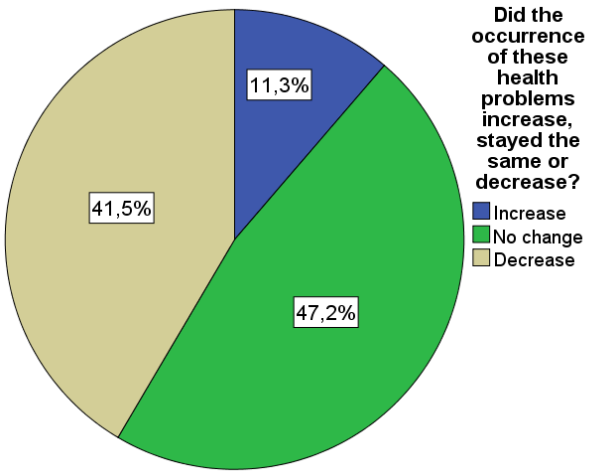

Figure 6.24: Change in occurrence of health problems (n=106)

The wages paid to hired labourers for a day's work is 15 GHC or higher (see figure 6.25). The UTZ Code of Conduct dictates that hired labour should be paid at least the national minimum wage. The minimum wage for a day's work in Ghana in 2016 is 8 GHC (Government of Ghana, 2016c). The labourers are thus well paid as they earn far above the minimum wage.

The number of labourers employed by farmers (see figure 6.26) stays the same for most farmers (48,1%), while the percentage of farmers that increased their reliance on paid is only slightly bigger than the percentage that decreased the amount of hired labour (29,3% versus 22,6%). This is remarkable as 17% of the farmers indicate that they rely less on child labour (see figure 6.23), but the change in hired labourers did not increase to the same extent. Financial difficulties (see section 6.1.1)

are likely the cause for this as farmers are not able to pay labourers a fair wage. It should be noted that figure 6.26 does not show the extent to which the amount of paid labour has increased or decreased, but only whether it has increased or decreased.

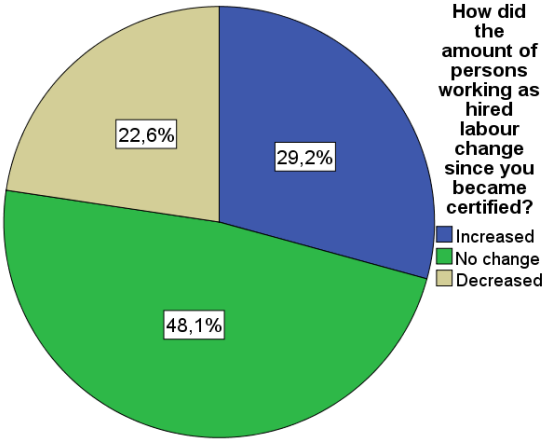

Figure 6.25: Wages paid to labourers for a days work (n=102)

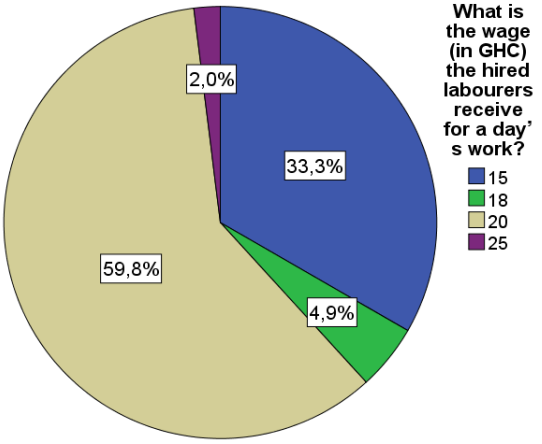

Figure 6.26: Change in amount of labourers hired by farmers (n=106)

6.2.4 Impact of certification

Section 6.1.3 discussed the uptake of certification and changes that have occurred since farmers have become certified. This section discusses what those changes have led to in regard to changes in farmer livelihoods. The changes in livelihoods will be measured along three pillars: People, Planet and Prosperity. These three pillars have several indicators as described in the methodology chapter. The changes in the three pillars will show what influence certification standards have at the farm level.

Change in 'Prosperity'

Two indicators are used to measure the change in prosperity for farmers: change in productivity of the farm (question 51) and change in financial situation (question 22 and 52). The change in financial situation is asked two times, first to ask if it has changed (improved, deteriorated or no change) and an open question to see what has changed in the past 12 months. Question 22 has been recalculated into a multiple response variable to be able to measure the frequencies of answers.

Figure 6.27 shows that 84% of the respondents have experienced an increase in productivity since becoming certified, 11,3% reported no change, and only 4,7% of the respondents experienced a decline in productivity. The increase in productivity for many of the farmers is likely a result of the implementation of certification standards and particularly the good agricultural practices. Low yield is a big problem in the Ghanaian cocoa sector and introducing production standards can improve yields. Higher yields per hectare are also beneficial as it reduces the need to expand farm lands, which is beneficial for both biodiversity and reduces the issues caused by declining land availability as described in chapter 5. Possible explanations for farmers who experienced no change or deterioration are the aging of cocoa trees, a higher incidence of pests and disease or the fact that not all farmers implement the good agricultural practices to the same extent (see table 6.6 and figures 6.18 and 6.19).

The financial situation of 75,4% of the respondents has improved since certification, 22,6% reported nothing has changed while only 1,9% experienced a deterioration (see figure 6.28). Becoming certified thus appears to be a positive decision for the farmers included in this research. The increased yields are a logical explanation for the increased incomes, but the price premium also plays a role. Furthermore, trainings on post-harvest practices likely reduced the amount of low quality cocoa being deducted from sacks when sold to LBCs, which increases total amount of cocoa being sold.

Table 6.9 shows the type of changes related to finances that occurred in the past 12 months. Most farmers reported positive changes such increases in income, savings, cocoa sales, remittances, and better access to healthcare and education. However, a large share of the respondents experienced no change or even experienced a deterioration of their financial situation. Table 6.9 has been simplified in order to have a good overview of the type improvements, but farmers reported increasing school fees and a higher cost of living as reasons why their situation deteriorated or did not change. An informal interview with the district officer of Kokoo Pa in Mankranso revealed that inflation erodes the positive effects of certification. In other words: their income did increase, but they need to spend more for the same standard of living. This is supported by data from the Bank of Ghana that calculated an inflation rate of 13.2% in 2015 (Bank of Ghana, 2016). This is also a possible explanation why not all farmers experienced a positive financial change as seen in figure 6.28.

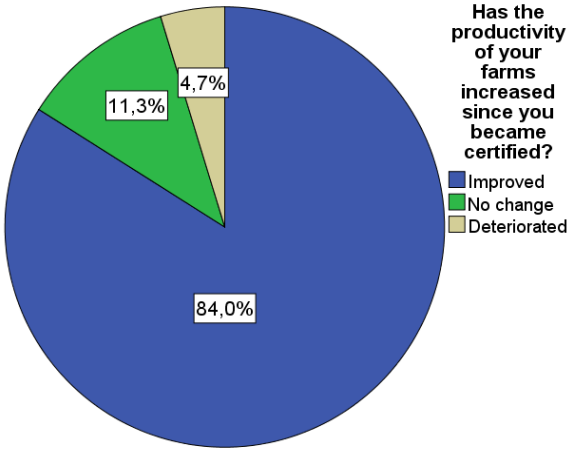

Figure 6.27: Change in yields since certification (n=106)

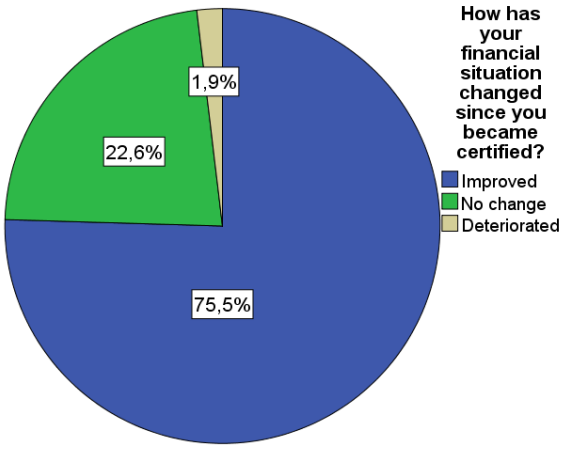

Figure 6.28: Change in financial situation since certification (n=106)

Table 6.9: Type of changes in financial situation in past 12 months

Changes in financial situation	Number (n=104)	Percentage of changes	Percentage of farmers
Improved income	34	29,8%	32,7%
Increased cocoa sales	3	2,6%	2,9%
Increased savings	21	18,4%	20,2%
Increased remittances	2	1,8%	1,9%
Better access to education	7	6,1%	6,7%
Better access to healthcare	3	2,6%	2,9%
Able to support family	3	2,6%	2,9%
No change	37	32,5%	35,6%
Deteriorated financial situation	4	3,5%	3,8%
Total	114	100%	109,6%

Change in 'People'

'People' in PPP relates to social aspects of sustainability. This research uses three indicators to measure the change in social aspects: change in housing (question 19), change in sanitation (question 21), change in health of household members (question 54), and the share of household members between ages 5 and 21 that attend school (question 58). Measuring change in school attendance would be a better indicator, but an error in the compiling of the questionnaire made it impossible to measure the change, therefore only the share household members that attend school in 2016 can be measured.

Figure 6.29 shows that most farmers have seen an improvement of their housing since they became certified. 57,1% of the respondents saw an improvement, 41,9% did not see any change, but only 1% saw a deterioration. Certification seem beneficial for improving housing quality, which is likely a result of the improved financial situation as discussed in the previous section.

Certification also positively impacts changes in sanitation in the case of the respondents. Figure 6.30 shows that 71,7% saw an improvement in sanitation, 26,4% saw no change, while only 1,9% of the respondents saw the situation deteriorate. The improvement in sanitation is likely due to social projects from cooperatives or NGOs that build new public toilets in the communities. The projects are often paid for with part of the premium that is not paid directly to farmers. Kuapa Kokoo uses part of the Fairtrade premium for social projects such as the building of schools, mobile health clinics, and boreholes and sanitation (installation of Kumasi Ventilated Pits) (Fairtrade.org.uk, 2016).

The health of certified farmers also improved for the majority of the respondents. Figure 6.31 shows that 56,6% of the respondents indicate that the health of their household members improved, versus 29,3% of respondents not experiencing a difference. It is remarkable, however, that 14,2% of the respondents indicate a deterioration in health of household members. As mentioned before, Kuapa Kokoo invests in mobile health clinics that should improve access to healthcare. However, only roughly half of the respondents are member of Kuapa Kokoo as the other half is member of Kokoo Pa. Kokoo Pa might not have the same projects. The improvement in health is likely caused by the improved financial situation, which makes access to food, clean water and health care easier. As is shown figure 6.28, not all farmers have seen an improvement, which could explain why not all farmers have seen improvements in health care.

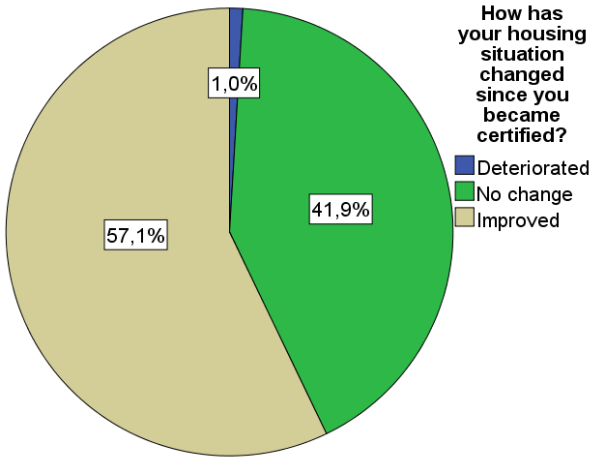

Figure 6.29: Changes in housing since certification (n=106)

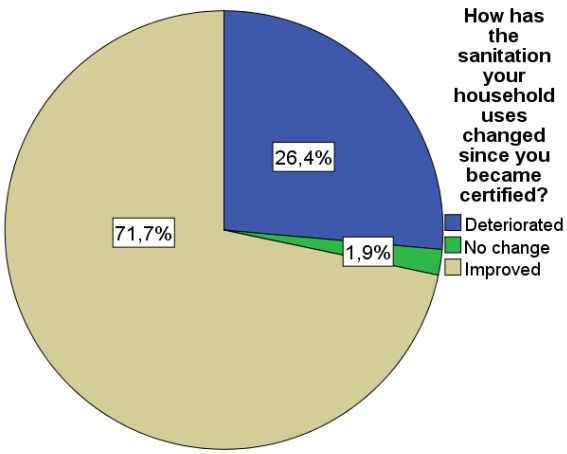

Figure 6.30: Changes in sanitation since certification (n=106)

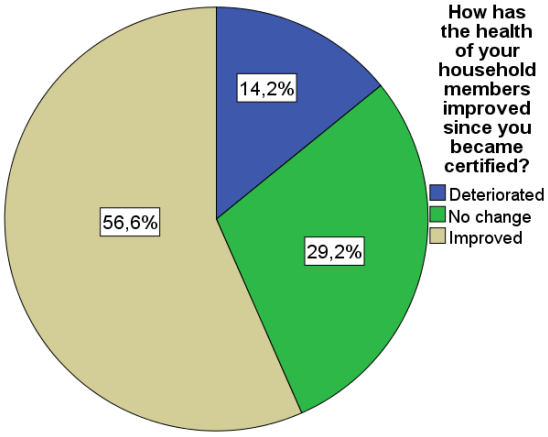

Figure 6.31: Changes in household member health since certification (n=106)

Changes in 'Planet'

Planet entails the environmental side of the impacts of certification. This research employs a single indicator for environmental impact: the change in soil fertility since certification. This indicator relates to variables discussed in the section on good agricultural practices, namely the planting of shade trees and the use of fertiliser.

Figure 6.32 shows that 48,1% of respondents experienced an increase in the soil fertility of their farms. However, 35,8% saw no change and 16% report a decrease in soil fertility. A farmer is able to increase the soil fertility of their farm by planting shade trees or using fertiliser. Other good farming practices, such as pruning, weeding, and pod removal decrease the vulnerability of trees for pests and diseases and stimulate pod production. It does not, however, affect the fertility of the soil (ICCO, 2008). The respondents that experienced no change or a decrease in soil fertility are likely farmers that have poor access to fertiliser or lack shade trees. Shade trees are indispensable for young cocoa trees as shade trees provide cocoa trees with shelter from direct sunlight and wind, while simultaneously retaining soil nutrients (Asare & David, 2010). A farm lacking shade trees will thus sooner face declining yields due to loss of soil nutrients than well shaded farms. Furthermore, a lack of access to fertiliser is a major issue in the Ghanaian cocoa sector (Wessel & Quint-Wessel, 2015). Financial constraints as well as lacking or inefficient distribution channels lead to farmers applying fertiliser either late, or not at all (see chapter 5).

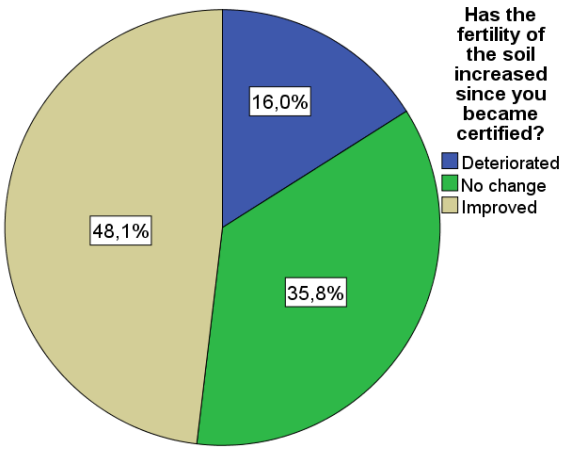

Figure 6.32: Change in soil fertility since certification (n=106)

6.2.5 Conclusion of quantitative descriptive results

The previous sections have shown the issues faced by farmers in their daily lives, the impact of COCOBOD policies at the farm level, the uptake of certification standards by the farmers and what the impact of certification is for farmers in regard to People, Planet, Prosperity.

All respondents in the research are certified and member of a producer group (Kokoo Pa or Kuapa Kokoo), and therefore receive trainings, a price premium and other benefits derived from producer group membership. The section on changes in prosperity has shown that certification has a positive impact on the majority of the farmers in terms of yield improvement and improved financial situations. However, a lot of the certified farmers still struggle financially as increasing school fees and a higher cost of living erode the benefits of certification. These results seem to support the criticism on certification that it is not helping farmers to an extent that they move out of poverty. Improved yields achieved through good agricultural practices and better prices thanks to price premiums help to a great extent, but only 51% of the farmers have been able to increase the frequency of fertiliser application (see figure 6.20). Furthermore, farmers still face a high incidence of black pod disease and other ecological issues. To increase its impact, certification standards should also find a way to improve access to inputs, most notably fertiliser and pesticides and fungicides. The distribution of these inputs is now predominantly the task of COCOBOD.

COCOBOD's role in the distribution of inputs has been heavily criticised in the qualitative interviews, as shown in chapter 5. The most notable criticisms are that COCOBOD lacks the distributing capacity to reach all the farmers, and that inputs do not reach farmers in time. The quantitative data shows that only 4,7% of farmers do not receive inputs from COCOBOD, which would mean that COCOBOD is effective in reaching farmers as 95,3% do receive inputs from COCOBOD. The criticism on the timing of the delivery, however, seems justified as 71,7% report that they do not receive COCOBOD inputs on time (figure 6.4). Late delivery of inputs can negatively impact yields as fertiliser is useless if applied at the wrong time and farmers are less incentivised to invest in their own inputs.

The quality of the inputs delivered by COCOBOD should be good as the inputs supplied are thoroughly checked by the Cocoa Research Institute Ghana to ensure quality and minimise negative impacts on non-target organisms. The work of the research institute does not seem to be as effective as expected as only 54% of the respondents claim that the quality of the inputs was up to their standard (figure 6.3). As for the quantity of the delivered inputs (Figure 6.2), over 60% of respondents do not receive the right amount of inputs for their farms. This is not remarkable as COCOBOD aims to supply farmers with part of the required inputs. The farmers are expected to get additional supplies themselves from the open market. Figures 6.5 and 6.6 spraying of pesticides and fungicides show that the majority farmers have their farms sprayed by CODAPEC spraying gangs, but only a small number of farmers do additional spraying themselves (32% for pesticides and 36% for fungicides). This could of course be because no additional spraying is needed, but this seems unlikely as pesticides and fungicides need to be applied multiple times a year for effective protection against pests and diseases. The analysis section will provide answers to the extent to which farmers really invest in their farms.

Perhaps the most important COCOBOD policy affecting farmer livelihoods is the fixed producer price for cocoa. Chapter 5 has shown how the price is determined, and how much of the gross FOB price goes to COCOBOD operations instead of to the farmers. The amount of farmers stating that the

biggest issue they face are financial gives the impression that the price for cocoa they receive is not high enough to make a decent living. Financial constraints are a major cause for other issues such as the lack of access to fertiliser, the use of child labour, and is also a prominent cause for younger generations of farmers to move out of cocoa (Hütz-Adams & Fountain, 2015). Higher prices for cocoa would likely reduce issues in the Ghanaian cocoa sector. The recommendation section at the end of this thesis will explore alternative ways by which farmers can earn more from their produce.

6.2 Quantitative analysis

Section 6.1 provided figures and tables with the results from quantitative data showing the problems faced by farmers, the impact of COCOBOD policies at the farm level, the uptake of certification standards, and the impacts of certification for farmers. This section will attempt to find explanations for the results found in section 6.1. Correlations between different variables will be calculated to see what the influences of certain factors are, and whether these influences are positive or negative. Besides correlations, the extent to which groups differ will also be calculated to see if there is a difference between, for instance, Kuapa Kokoo farmers and Kokoo Pa farmers.

The quality of the collected data is rather low as a result of non-response, errors in formulation, potential biases, and missing questions (see section 4.5.3). Most of the data that was collected is in the form of nominal variables. Nominal variables are not suitable for measuring correlations, but can be used to measure differences between groups. If there are significant differences between groups then it would explain why, for instance, some farmers are better off or have better access to inputs.

It should be noted that the errors in the setting up and the administering of the questionnaire significantly impair the quality of some of the results. Causality can only established when all potential influencing factors are incorporated into the analysis. The lack of data makes this impossible. The most important precursor for total yield is the size (acreage) of the cocoa farm(s). Unfortunately, no data was collected on farm size. It is therefore important to note that all analyses with '*amount of bags produced*' as dependent only explain part of the correlation or differences between variables. It can be established whether there is a correlation or difference between independent variables and the amount of bags produced, but it should be noted that the correlation or difference might just as well be explained by the size of the farm(s) and not just the independent variable.

The independent variables will be grouped into different categories: farm and contextual variables, variables related to COCOBOD policies, other variables, variables related to interventions from certification and the dependent variables related to PPP. This categorisation is needed to separate dependent from independent variables. Figure 6.33 on the next page shows the model used for the quantitative analysis and how the variables are grouped.

The left of the model shows the independent variables that potentially influence all other variables including the COCOBOD policies, and the certification interventions and outcomes. However, not all variables have a logical relations ship, for instance age might affect the uptake of good agricultural practices, but will not explain the influence of COCOBOD. At the bottom middle of the model are the variables that are influenced by the farmer- and contextual characteristics, but themselves also influence the outcomes of certification (also known as mediator variables). Furthermore, these variables also influence each other, for instance the COCOBOD policies might affect the uptake of certification interventions, the total production of cocoa and the amount a farmer invests into his

farms. The certification interventions, in turn, may affect also affect the total production of cocoa and the amount of money a farmer invests or vice versa. The notion that more business minded, larger farmers are more inclined to implement certification standards (e.g. good agricultural practices) is important here as total production of cocoa and the amount of money a farmer invests could indicate to what extent a farmer sees his farm as a business instead of a means to simply sustain their livelihoods. Finally, to the right are the dependent variables: the outcomes of certification related to People, Planet, Prosperity.

Not all variables that have been operationalised in the methodology (see annex III) have been included in the analysis. This is mainly because not every variable has a potential influence on the mediator- and independent variables, but also because some questions in the questionnaire have no variation in the answers. Questions that may have an influence on the mediator- or independent variables, but have no variation are 'openness' (farmer awareness of what the standards entail and his/her responsibilities) and 'inclusiveness' (does the farmer feel represented in the standard development process). The reason why there is no variation in these two questions is likely due to trainings on the production standards and it is likely that farmers feel represented in the development process because of the democratic nature of their respective cooperatives. This democratic nature, however, means that that they are represented in the decision making process of the cooperative (i.e. what is the premium used for), but not in the decision making of the standard development process.

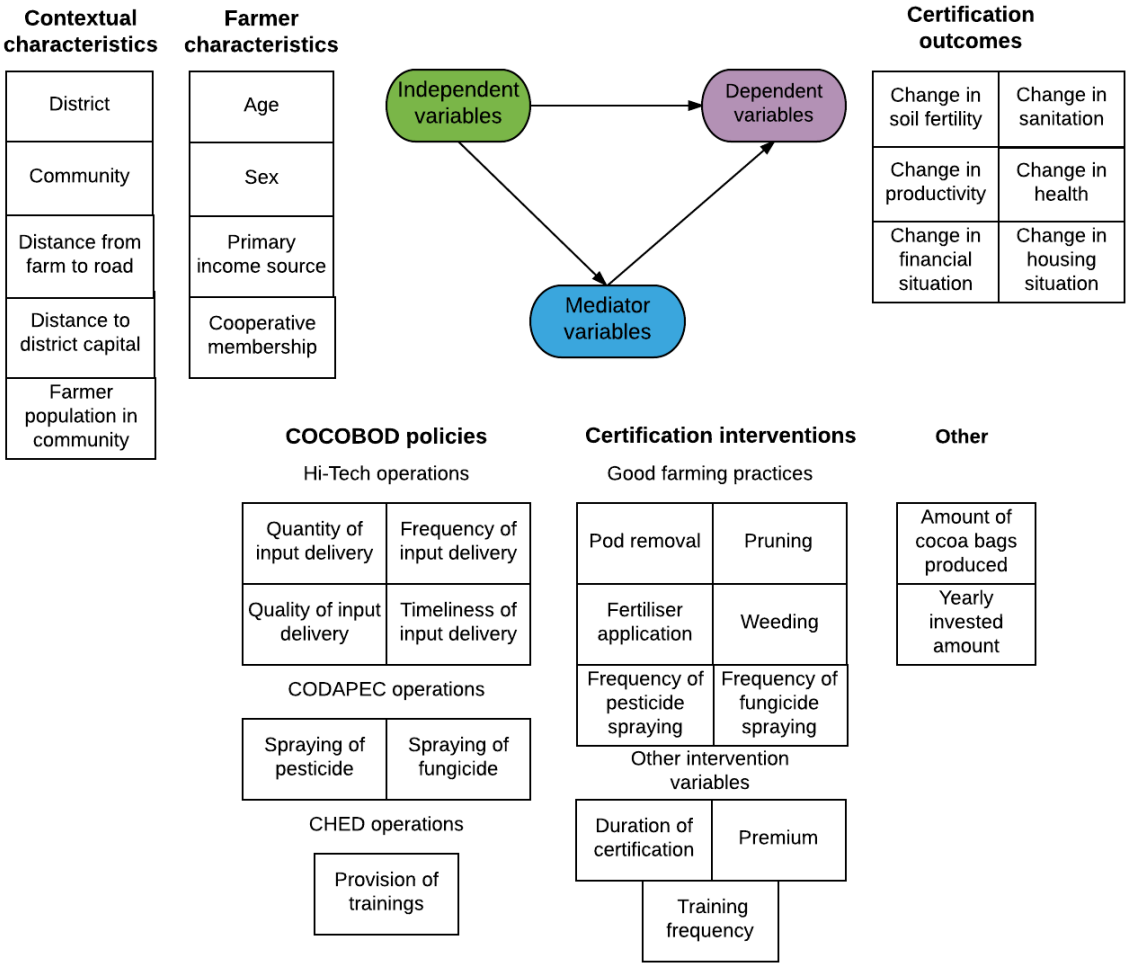

Figure 6.33: Model used for quantitative analysis showing the different variables included in the research.

6.2.1 The influence of farmer characteristics

This section will investigate what the influence of the characteristics of individual farmers is, as well as the influence of contextual characteristics (see top left in figure 6.33). Table 6.10 shows the results and other relevant information for the analyses for farmer characteristics. The table included in this section only shows the significant correlations or differences that have been found. The tables showing all the calculated correlations and differences can be found in annex V.

Four independent variables represent the characteristics of farmers: age (in years), sex (male or female), the primary source of income for farmers (cocoa or not cocoa), and cooperative membership (Kuapa Kokoo Farmers Union or Kokoo Pa). These variables are used to see whether they correlate with certain dependent variables. For instance does age affect the frequency of pruning for certain farmers? Table 6.10 shows the significant correlations between variables and differences between groups.

The results show that age has no significant influence on good agricultural practices, productivity, frequency of training, or the amount invested in the farm. For sex, similarly, no significant differences between male and female farmers were found, except for the total amount of bags produced where males produce significantly more. This is likely due to male farmers owning larger cocoa farms who are therefore able to produce more cocoa. There is a significant difference between male and female cocoa farmers in Ghana. One of those differences is male farmers owning larger farms compared their female counterparts (Laven, 2010). Both sex and age do not significantly influence outcomes in PPP.

Most farmers have multiple sources of income besides cocoa and most of them have cocoa as their primary income source. Some, however, have remittances or other agricultural goods as their first income source. Whether cocoa is or is not the primary source of income for farmers has a significant influence on the frequency of pruning, the frequency of defective pod removal and good farm practices in general. Farmers that have cocoa as their primary source of income adopted good farm practices to a greater extent than farmers that rely more on other sources of income. However, source of income is no significant precursor for variation in certification outcome.

The most significant difference is between the farmer cooperatives to which a farmer belongs. Kokoo Pa farmers have adopted the good farming practices to a greater extent than Kuapa Kokoo farmers (except for weeding), receive more trainings and a higher price premium for their cocoa. On the other hand, Kuapa Kokoo farmers are certified for a longer period of time and mentioned more benefits from cooperative membership. Furthermore, even though Kokoo Pa farmers perform good farming practices more often, Kuapa Kokoo farmers report greater in changes in PPP. Kuapa Kokoo farmers have seen significant more improvements in their productivity, financial situation, housing situation, sanitary situation, and in the health of their household members. This likely due to the fact that Kuapa Kokoo farmers have been certified for a longer period of time and therefore experience more improvements compared to the relatively shortly certified Kokoo Pa farmers. The correlation between duration of certification and certification outcomes will be calculated in section 6.3.2 on effects of certification.

Table 6.10: Significant differences between groups for farmer characteristics

Independent variable	Dependent variable	Statistical test	n=	Result
Sex (male or female)	Amount of bags produced	Mann-Whitney U	106	M: 57,98* F: 46,11
Primary source of income (cocoa or not cocoa)	Frequency of pruning	Mann-Whitney U	106	C: 54,85* NC: 37,00
	Frequency of pod removal	Mann-Whitney U	106	C: 55,07* NC: 34,31
	Aggregated farm practices	Mann-Whitney U	104	C: 54,03* NC: 34,19
Cooperative membership (Kuapa Kokoo Farmers Union or Kokoo Pa)	Frequency of pruning	Mann-Whitney U	106	KKUF: 41,15*** KP: 63,53
	Frequency of pod removal	Mann-Whitney U	106	KKUF: 40,50*** KP: 65,11
	Frequency of weeding	Mann-Whitney U	106	KKUF: 56,82** KP: 50,54
	Aggregated farm practices	Mann-Whitney U	104	KKUF: 33,49*** KP: 68,79
	Training frequency	Mann-Whitney U	105	KKUF: 46,28** KP: 58,88
	Premium amount	Mann-Whitney U	106	KKUF: 25,50*** KP: 78,50
	Duration of certification	Mann-Whitney U	106	KKUF: 74,45*** KP: 34,79
	Change in productivity	Mann-Whitney U	106	KKUF: 58,97*** KP: 48,62
	Change in financial situation	Mann-Whitney U	106	KKUF: 61,30*** KP: 46,54
	Change in housing	Mann-Whitney U	105	KKUF: 60,64*** KP: 46,31
	Change in sanitation	Mann-Whitney U	106	KKUF: 66,94*** KP: 41,59
	Change in household health	Mann-Whitney U	106	KKUF: 67,84*** KP: 40,70

(Differences between groups measured using Mann-Whitney U, *= p<0,1, **=p<0,05, ***=p<0,01)

6.3.2 The influence of contextual characteristics

This sub-section discusses the influence of contextual characteristics. The independent variables that have been analysed are: District (Ejisu Juaben or Ahafo Ano-South), Community (New Koforidua, Nobewam, Biemso 2, Fedeyaya, Kunsu Kumawu or Kunsu Camp), the distance between the cocoa farm and the nearest road (in minutes), and the distance between the community and the district capital (in kilometres). The contextual characteristics are used to see what affects the effectiveness of COCOBOD operations, namely the distribution of inputs and what affects the uptake of certification, namely good farming practices.

Influence of contextual characteristics on COCOBOD operations

The district in which the farmer lives appears not be a significant precursor for most of the COCOBOD distribution variables. The only significant relationship is between the district and the person/organisation that did the spraying of pesticide and fungicide and which actor provides the training. It is important to note here that the distribution of respondents is the same between cooperatives and districts (50 vs 56). Tables 6.11 and 6.12 show the distribution of who does the spraying of farms with fungicide and pesticide among the communities and the districts (not the

frequency of spraying). The results show that there is a significant difference between the districts as well as between the communities. It appears that the farmers living in Ahafo Ano South district receive more CODAPEC fungicide spraying, but farmers from Ahafo Ano South receive more pesticide spraying from CODAPEC. Private sector spraying (self, caretaker, labourers, cooperative) occurs more often in Ejisu Juaben, while farmers who do not spray their farms are mostly from Ahafo Ano South. This would indicate that the farmers from New Koforidua and Nobewam invest more in spraying compared to other inputs (average investments only differs slightly between the two districts, see table 6.1). The differences between the communities seem smaller and are likely to be caused by differences in the amount of respondents.

Table 6.11: Cross table for the distribution of the spraying of fungicide per actor and per district and community.

District	Community	Actors who provide the fungicide spraying			
		CODAPEC	CODAPEC+ private sector	Private sector	No spraying
Ejisu Juaben (n=50)	New Koforidua	15	0	10	2
	Nobewam	8	1	14	0
	Total for district:	23	1	24	2
Ahafo Ano South (n=56)	Biemso 2	9	7	1	5
	Fedeyaya	9	3	0	0
	Kunsu Camp	10	0	0	0
	Kunsu Kumawu	11	1	0	0
	Total for district:	39	11	1	5
	Total per actor:	62	12	25	7

Chi-square for district x fungicide spray actor: 34,680, significance: 0,000

Chi-square for community x fungicide spray actor: 64,155, significance: 0,000

Table 6.12: Cross table for the distribution of pesticide spraying per actor and per district and community.

District	Community	Actors who provide the pesticide spraying			
		CODAPEC	CODAPEC+ private sector	Private sector	No spraying
Ejisu Juaben (n=50)	New Koforidua	19	0	5	3
	Nobewam	9	0	15	0
	Total for district:	27	0	20	3
Ahafo Ano South (n=56)	Biemso 2	10	6	4	2
	Fedeyaya	4	1	1	6
	Kunsu Camp	4	1	0	6
	Kunsu Kumawu	6	0	0	5
	Total for district:	24	8	5	19
	Total per actor:	51	8	25	22

Chi-square for district x pesticide spray actor: 28,565, significance: 0,000

Chi-square for community x pesticide spray actor: 66,104, significance: 0,000

Table 6.13 shows the distribution of trainings among the districts and the communities. Especially New Koforidua appears to receive part of their trainings from the Cocoa Health and Extension Division (CHED) often. Farmers in Ahafo Ano South receive their trainings almost completely from private actors. All the farmers included in the research are certified which explains why CHED plays a minor role (all farmers already receive training from their cooperative). It is unclear why farmers in New Koforidua received CHED training far more often than farmers in other districts.

Table 6.13: Cross tables for distribution of training per actor and per district and community.

District	Community	Actor who provides the trainings	
		Private sector	CHED + private sector
Ejisu Juaben (n=50)	New Koforidua	13	14
	Nobewam	20	3
	Total for district:	33	17
Ahafo Ano South (n=56)	Biemso 2	22	0
	Fedeyaya	12	0
	Kunsu Camp	10	1
	Kunsu Kumawu	11	0
	Total for district:	55	1
	Total per actor:	88	18

Chi-square for district x training provider: 19,445 , significance: 0,000

Chi-square for community x training provider: 33,232, significance: 0,000

The community in which a farmer lives appears to be an important precursor for the input delivery of Hi-Tech. Table 6.14 shows that there is a significant difference between communities on how often they receive inputs, how farmers perceive quality of the inputs, and the quantity of the inputs. There could be a variety of explanations as to why certain communities are better connected to the COCOBOD distribution system. First of all, the total population of the communities could be of influence where larger communities receive inputs sooner than smaller communities. Another explanation could be the distance between the community and the district capital. All inputs are first shipped to the district capital before they are moved to the communities. Communities that are closer to the district capital could be better connected and thus receive inputs more often and in more adequate quantities. However, the total population of farmers in a community shows no significant correlation with any of the variables related to COCOBOD input deliveries. The distance between the community and the district capital does show a significant negative correlation for quality of the inputs. It therefore remains unclear why there is a significant difference between communities. One last possible explanation could be that the lead farmers in certain communities have better connections at the district level and can therefore better access inputs.

Table 6.14: The influence of contextual characteristics on COCOBOD operations

Independent variable	Dependent variable	Statistical test	n=	Result
Community (New Koforidua, Nobewam, Biemso 2, Fedeyaya, Kunsu Camp or Kunsu Kumawu)	Frequency of input delivery by COCOBOD	Kruskall-Wallis H	103	NK: 58,07*** NO: 42,37 B2: 52,18 FE: 30,00 KC: 62,50 KK: 77,25
	Quality of input delivery by COCOBOD	Kruskall-Wallis H	106	NK: 40,06*** NO: 59,39 B2: 39,70 FE: 46,67 KC: 72,50 KK: 67,56
	Quantity of input delivery	Kruskall-Wallis H	106	NK: 57,40** NO: 45,00 B2: 56,14 FE: 58,08 KC: 40,63 KK: 38,55

Distance from farm to road (in minutes)	Quality of input delivery by COCOBOD	Spearman's R	101	0,228**
	Quantity of input delivery	Spearman's R	101	-0,318***
Distance to district capital (in km)	Quality of input delivery by COCOBOD	Spearman's R	101	-0,232**

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

The influence of contextual characteristics on certification interventions and outcomes

Table 6.15 shows the differences between the communities for certification interventions and outcomes. The districts in which the communities are located have not been included as the distribution of respondents is the same across both district and cooperative (all Kokoo Pa farmers live in Ahafo Ano-South and all Kuapa Kokoo farmers in Ejisu Juaben). The distance from the farm to the nearest road appears to have no significant influence on certification uptake.

The results of the analysis show that the community in which a farmer lives is an important factor explaining the distribution of certification interventions. The analysis of the role of the cooperative showed that Kuapa Kokoo farmers receive less training than Kokoo Pa farmers, but are certified for a longer period of time. The distribution among communities shows a similar difference, where Kokoo Pa communities (Biemso 2 and Fedeyaya) receive more trainings. It is, however, remarkable that the other two Kokoo Pa communities (Kunsu Camp and Kunsu Kumawu) receive far less trainings, while being certified for roughly the same amount of time. It is possible that farmers gave wrong answers relating to the frequency of trainings, or that these communities are smaller compared to the others and therefore receive less training. The correlation between the total farmer population of a community and the frequency of trainings show a positive trend. This would mean that farmers living in larger communities receive more training.

The results of the analyses also show significant differences between communities for the uptake of certification. The results show a similar distribution on good farming practices as for cooperative membership: the Kuapa Kokoo communities (New Koforidua and Nobewam) show less uptake of certification compared to the Kokoo Pa communities. The cooperative to which a farmer belongs is therefore the important influencing variable. The full extent of differences between communities for good farming practices can be found in table 4 in Annex V.

The outcome of certification shows the opposite distribution: Kuapa Kokoo communities report improvements more often than Kokoo Pa farmers. Kuapa Kokoo farmers have been certified for a longer period of time. It is therefore likely that length of certification is more important for the outcomes of certification than the frequency of trainings because, for instance, good farming practices do not have an immediate positive effect. The correlations between certification interventions and certification outcomes will be discussed in the next section.

Table 6.15: Influence of contextual variables on certification interventions and outcomes

Independent variable	Dependent variable	Statistical test	n=	Result
Community (New Koforidua, Nobewam, Biemso 2, Fedeyaya, Kunsu Camp or Kunsu Kumawu)	Frequency of trainings	Kruskall-Wallis H	105	NK: 37,39*** NO: 57,18 B2: 84,68 FE: 70,29 KC: 12,14 KK: 41,59
	Length of certification	Kruskall-Wallis H	106	NK: 76,93*** NO: 71,54 B2: 25,18 FE: 62,75 KC: 28,95 KK: 29,36
	Change in frequency of fertiliser application	Kruskall-Wallis H	104	NK: 29,74*** NO: 72,83 B2: 49,84 FE: 63,00 KC: 42,36 KK: 65,73
	Aggregated good farm practices	Kruskall-Wallis H	104	NK: 31,74*** NO: 45,30 B2: 79,25 FE: 53,96 KC: 61,23 KK: 50,91
	Amount of bags produced	Kruskall-Wallis H	106	NK: 48,69*** NO: 57,11 B2: 60,23 FE: 18,54 KC: 63,64 KK: 72,32
	Change in productivity	Kruskall-Wallis H	106	NK: 60,13*** NO: 57,61 B2: 56,64 FE: 62,00 KC: 24,50 KK: 42,09
	Change in financial situation	Kruskall-Wallis H	106	NK: 60,72*** NO: 61,98 B2: 64,14 FE: 57,83 KC: 13,32 KK: 32,23
Total farmer population per community	Frequency of training	Spearman's R	105	0,447***

(Differences measured using Kruskall-Wallis H: *= p<0,1, **=p<0,05, ***=p<0,01)
(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

6.3.3 The impact of certification at the farm level

An important part of this research is to verify what the effect of certification is for farmers. A variety of variables have been taken from the UTZ Code of Conduct to investigate the extent to which farmers adopt the standard and to check what the effect of standard implementation is on PPP. The selected variables relate to good farming practices (pruning, weeding, pod removal, fertiliser

application, and the spraying of pesticide and fungicide). Other variables are used to see what determines the extent to which these practices are implemented. These variables are: the length of certification (in years), the yearly frequency of trainings, the amount of the price premium (in Ghana Cedi's per bag), the total amount a farmer invests in his farm, and the total amount of bags produced in the previous year. The amount of investment is also used to determine how business minded a farmers is. The more a farmer invests in his farm, the more he sees his farm as a business instead of a mean to sustain his livelihood. The hypothesis is that more business minded farmers sooner adopt certification standards than less entrepreneurial farmers.

Influence of certification interventions

The length of certification is an important influencing variable for the uptake of certification standards. Table 6.16 shows the significant results of the analysis with Length of certification as independent variable. The correlations show that the years a farmer has been certified has a negative influence on the amount of trainings attended, the frequency of good farming practices, and the amount a farmer invests in his farm. However, the outcomes of certification related to People, Planet, Profit (apart from health) are positively influenced by the duration of certification. It is important to note here that Kuapa Kokoo farmers have been certified significantly longer than Kokoo Pa farmers (see table 6.1). It is therefore possible that Kuapa Kokoo membership is a more important factor than the duration of certification. What is also not unimportant is that Kuapa Kokoo farmers are Fairtrade certified, while the Kokoo Pa farmers are certified according to UTZ Certified standards. Differences in certification outcome may therefore also be due to the differences between the Fairtrade and the UTZ Certified standard.

Table 6.16: Influence of length of certification on certification uptake and outcome

Independent variable	Dependent variable	Statistical test	n=	Result
Length of certification (in years)	Frequency of trainings	Spearman's R	105	-0,166*
	Change in frequency of pruning	Spearman's R	106	-0,266***
	Change in frequency of pod removal	Spearman's R	106	-0,444***
	Aggregated good farm practices	Spearman's R	104	-0,409***
	Yearly amount invested	Spearman's R	98	-0,247**
	Change in productivity	Spearman's R	106	0,311***
	Change in financial situation	Spearman's R	106	0,228**
	Change in housing situation	Spearman's R	105	0,175*
	Change in household health	Spearman's R	106	0,414***
	Change in sanitation	Spearman's R	106	0,326***

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

The amount of trainings a farmer attends correlates positively with the degree to which a farmer adopts good agricultural practices. This is a logical correlation as the farmers are taught these practices at the trainings. Furthermore, a higher training attendance also leads to improvements in productivity, financial situation, and household health. As was shown earlier in table 6.10, Kokoo Pa farmers receive training more often, but do not experience more improvements in People, Planet,

Profit compared to Kuapa Kokoo farmers. The duration of certification or membership to Kuapa Kokoo may therefore be more important factors.

Table 6.17: Influence of training frequency on certification uptake and outcome

Independent variable	Dependent variable	Statistical test	n=	Result
Frequency of trainings	Change in frequency of pod removal	Spearman's R	105	0,284***
	Change in frequency of weeding	Spearman's R	105	0,247***
	Aggregated good farm practices	Spearman's R	103	0,205**
	Yearly amount invested	Spearman's R	97	0,368***
	Change in productivity	Spearman's R	105	0,255***
	Change in financial situation	Spearman's R	105	0,348***
	Change in housing situation	Spearman's R	105	0,175*
	Change in household health	Spearman's R	106	0,414***
	Change in sanitation	Spearman's R	106	0,326***

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

Table 6.18 shows the influence of the premium amount farmers received for their cocoa in the last year. Table 6.1 showed that Kokoo Pa farmers received a much higher price premium compared to Kuapa Kokoo farmers. However, the analysis shows that higher price premiums do not lead to higher investments or more improvements in People, Planet, Profit (apart from improvements in sanitation). The amount of the price premium therefore seems of little influence for improving the livelihoods of farmers, although a negative impact would seem impossible. The results do indicate that length of certification and the frequency of trainings are likely more important factors that affect improvement in People, Planet, Profit. It is also possible that better market access to sell cocoa is an important factor, as determined by Calkins & Ngo (2005) (see section 5.3.2). This variable, however, has not been researched in this thesis. Another possible explanation is that Kuapa Kokoo only pays part of the premium in cash to farmers. The rest of the income from the premium is used for social projects such as mobile health clinics and providing water pumps (fairtrade.org.uk, 2016).

Table 6.18: Influence of premium amount on certification uptake and outcome

Independent variable	Dependent variable	Statistical test	n=	Result
Premium amount	Yearly amount invested	Spearman's R	98	-0,202**
	Change in financial situation	Spearman's R	106	-0,341***
	Change in housing	Spearman's R	106	-0,402***
	Change in sanitation	Spearman's R	106	0,497***
	Change in health	Spearman's R	105	-0,296***

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

The amount of money invested in the farm, used as an indicator for the extent to which a farmer is business minded, shows irregular significant correlations (see table 6.19). The amount of investments positively correlates with the total amount of bags produced, but shows a negative correlation with the extent to which good farming practices are adopted, the frequency of spraying of both fungicides

and pesticides, and the outcome of certification, namely improvements in production and in the financial situation. There can be a variety of explanations for these negative correlations: first, there is a time gap between the moment of investment and the benefits received from this investment. It therefore may be possible that even though farmers have invested large sums of money in their farm, the farm has not yet started producing more cocoa. Besides the time gap, agriculture is a risk inherit business as the occurrence of pests, diseases, droughts or other environmental factors can significantly reduce the positive impact of investments (H. Gilhuis, personal communication, 19/01/2016). Hütz-Adams & Fountain (2015) even argue that it is at present unclear whether investing in higher productivity actually results in a higher net farm income. A second explanation could be that the investments are in additional labour needed in the harvest and post-harvest process and not in production enhancing inputs (e.g. fertiliser). Especially older farmers would require additional labour as their age limits them in doing heavy labour. However, Age shows no positive correlation with the amount of investments (see table 1 in Annex V).

The total amount of bags produced shows little significant correlations (see table 6.19). The only significant correlation is positive for the change in housing. This means that large producers achieve housing improvements more readily than small producers. Large producers do not seem to necessarily achieve more improvements in other PPP variables, though it should be noted that the questions are formulated in a way that only shows if there was a change, and whether that change was positive or negative, but does not show the extent to which conditions have changed. This limits the quality of the analysis.

Table 6.19: Influence of investments and total production on certification uptake and outcome

Independent variable	Dependent variable	Statistical test	n=	Result
Yearly amount invested	Amount of bags produced	Spearman's R	98	0,260***
	Change in frequency of weeding	Spearman's R	98	-0,206**
	Change in frequency of pesticide spraying	Spearman's R	92	-0,202*
	Frequency of fungicide spraying	Spearman's R	89	-0,291***
	Change in productivity	Spearman's R	98	-0.350***
	Change in financial situation	Spearman's R	98	-0,441***
	Change in health	Spearman's R	98	-0,182*
	Change in sanitation	Spearman's R	98	-0,176*
Amount of bags produced	Change in housing	Spearman's R	106	0,192**

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

The influence of good farming practices

According to the UTZ Theory of Change, the adoption of good agricultural practices and the spraying of farms with pesticides and fungicides should lead to an increase in farm productivity. The calculated correlations show that there are little significant correlations between the farm practices and the desired outcomes (see table 6.20). Weeding does show significant positive correlations for both improvements in soil fertility and financial situation, but the other farming variables, as well as the aggregated farm practices, do not significantly correlate with higher farm productivity in the case of the farmers included in this research. The positive effect of good farming practices could be eroded by a high incidence of pests and diseases or droughts and bush fires. Another possible

explanation is that the farmers who have not been certified for a long period have yet to see an increase in productivity caused by farming practices.

The spraying of pesticide and fungicides do show significant positive correlations with improved farm productivity, improved financial situation, and the total amount of bags produced. This shows the importance of spraying as pests and diseases are a significant problem in West African cocoa production (Wessel & Quint-Wessel, 2015). Improved access to chemicals is needed to further improve yields because most farmers still report black pod disease and pests as being major negative influences on their lives as cocoa farmers (see table 6.2).

Table 6.20: Influence of good agricultural practices and pesticide and fungicide spraying on PPP

Independent variable	Dependent variable	Statistical test	n=	Result
Frequency of pruning	Amount of bags produced	Spearman's R	106	-0.195**
Frequency of pod removal	Amount of bags produced	Spearman's R	106	0,218**
Weeding frequency	Change in financial situation	Spearman's R	106	0,183*
	Change in soil fertility	Spearman's R	106	0,236**
Fertiliser application frequency	Change in soil fertility	Spearman's R	104	0,173*
Aggregated farm practices	Change in soil fertility	Spearman's R	104	0,297***
Frequency of pesticide spraying	Change in productivity	Spearman's R	100	0,272***
	Change in financial situation	Spearman's R	100	0,346***
	Amount of bags produced	Spearman's R	100	0,230**
Frequency of fungicide spraying	Change in productivity	Spearman's R	96	0,286***
	Change in financial situation	Spearman's R	96	0,324***

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

Correlations between certification outcomes in PPP

Table 6.21 shows whether changes in PPP correlate with each other to a significant extent. There are significant positive correlations between improvements in soil fertility and productivity, increases in productivity and improvements in financial situation, and an improvement in a farmers financial situation results in an improvement health for household members. However, no significant correlations were found between improvements in a farmer's financial situation and improvements in housing or sanitation.

Table 6.21: Correlations between outcomes in PPP

Independent variable	Dependent variable	Statistical test	n=	Result
Change in soil fertility	Change in productivity	Spearman's R	106	0,334***
Change in productivity	Change in financial situation	Spearman's R	106	0,646***
Change in financial situation	Change in health of household members	Spearman's R	106	0,193**

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

Conclusions for certification uptake

Section 6.3.3 has shown which variables influence the uptake and impact of certification. The most important variables that explain certification uptake appear to be the length of certification, the frequency of trainings, and the cooperative a farmer belongs to. It is important to note here that cooperative membership (either Kuapa Kokoo or Kokoo Pa) is likely to be most important factor as the difference between cooperatives is relatively big for both length of certification and the amount of trainings, besides the fact that Kuapa Kokoo farmers are Fairtrade certified and Kokoo Pa farmers are UTZ certified. Kuapa Kokoo farmers reported improvements in PPP more often than Kokoo Pa farmers, while receiving fewer yearly trainings. The length of certification therefore seems more important than the amount of trainings. The length of certification correlates negatively with trainings as it is likely that farmers that have been certified for a longer period already received training in the years before. This notion is validated by a Kokoo Pa representative that stated that training frequency decreases through the years as most topics already have been covered (F. Amponsah, personal communication, 16/06/2016). Conversely, the extent to which agricultural practices are adopted has a negative or insignificant influence on the outcome of certification. This is likely due to the possibility that good farming practices have not yet resulted in a higher production for the farmers that have only recently become certified. Improved market access also likely has a positive influence.

An important factor that has a big influence on all the results is that all variables related to the outcome of certification (PPP) are relative. The farmer was asked whether the situation changed and how, but not the extent to which the situation changed. It might therefore be the case that only minor improvements occurred for some farmers, but big improvements were made by others. The lack of detail in the data could be a cause for bias as Kuapa Kokoo farmers may have experienced huge improvements compared to Kokoo Pa farmers (or vice versa), but are coded as being exactly the same way in the dataset. It is, however, still certain that certification does help farmers in achieving better livelihoods through improvement in People Planet Prosperity. The Theory of Change, as presented in chapter 3, therefore seems to work, at least for the farmers and variables included in this research. This conclusion is further supported by the results of the quantitative data as reported in section 6.1, where the figures related to changes in PPP showed that the majority of farmers have experienced improvements.

6.3.4 The influence of COCOBOD operations

In order to answer the main research question, the qualitative analysis of the interviews showed which COCOBOD policies are relevant at the farm level. Not all the policies can be checked for their impact in practice as the quantitative and qualitative data collection overlapped in time. Furthermore, the influence of the fixed price cannot be verified because there is no variations between the farmers as all farmers receive the same price. The policies that have been included in the analysis are the operations of the Cocoa Health and Extension Division (trainings), Hi-Tech (input delivery), and CODAPEC (spraying of pesticides and fungicides). The preliminary results of the qualitative analysis indicated that the operations of Hi-Tech and CODAPEC are likely counterproductive, and therefore a negative influence for both certification uptake and impact. The operations of CHED, however, are thought to be positive as the training programs run parallel to those of the certification standards and should therefore be reinforcing.

The influence of Hi-Tech

The role of Hi-Tech has been divided into four variables: the frequency of input delivery in a year, the subjective appreciation of the quality of the inputs by the farmer, whether farmers received the right quantity for their farms, and the timeliness of the delivery of the inputs. Table 6.22 shows the significant correlations related to the Hi-Tech distribution of inputs. The frequency of input delivery correlates positively with the amount a farmer invests, but does not significantly correlate with a higher usage of inputs or improvements in PPP (see table 8 in Annex V). The subjective quality of the inputs correlates negatively with the frequency of fertiliser application. This is an unexpected result as one would expect quality inputs to correlate with high usage. Furthermore, the quality of inputs does not significantly correlate with a high annual production of cocoa or with improvements in productivity or PPP. On the other hand, the quantity of the inputs delivered correlates positively with the total amount of bags produced. However, the quantity of Hi-Tech input delivery correlates negatively with changes in productivity and financial situation. It therefore seems that the expectation that Hi-Tech operations are not beneficial for the outcomes of certification are justified based on the farmers included in this research.

Table 6.22: Influence of Hi-Tech operations

Independent variable	Dependent variable	Statistical test	n=	Result
Frequency of input delivery	Yearly amount invested	Spearman's R	95	0,348***
Quality of inputs delivered	Total frequency fertiliser application	Spearman's R	106	-0,163*
Quantity of inputs delivered	Amount of bags produced	Spearman's R	106	0,341***
	Change in productivity	Spearman's R	106	-0,202**
	Change in financial situation	Spearman's R	106	-0,208**

(Correlations measured using Spearman's Rho: *= p<0,1, **=p<0,05, ***=p<0,01)

The influence of CODAPEC

CODAPEC is charged with the spraying of cocoa farms with fungicides and pesticides, both to counter existing epidemics as well as a pre-emptive measure to prevent new outbreaks. Table 6.20 has shown the positive impact of spraying on production and certification outcomes. The analysis of the

role of CODAPEC is shown in table 6.23. The spraying activities have been divided into pesticide and fungicide, and the actors involved into CODAPEC, self-financed, both CODAPEC and self-financed, and no spraying done.

Significant differences have been found for the frequency of spraying pesticide where self-financed spraying occurs more often than CODAPEC spraying or a mix of both. Similarly, improvements in productivity as well as improvements in a farmer's financial situation are achieved more readily by farmers investing in their own spraying of pesticides than those that have their farms sprayed by CODAPEC. However, those that do not spray their farms are worse off in every case.

The spraying of fungicides shows similar results as the frequency of spraying is higher for farmers that pay for their own fungicides in addition to the spraying done by CODAPEC. However, there is no significant difference between the actors involved in spraying for changes in production. On the other hand, there is a significant difference between CODAPEC spraying and (partly) self-financed spraying where self-financed spraying appears to lead to improvements in the financial situation of farmers. No spraying, as is expected, has the lowest impact for financial improvements.

The results of the CODAPEC analyses show that self-financed spraying or a combination of self-financed and CODAPEC spraying yield the best results in achieving higher productivity or improvements in a farmers' financial situation. The fact that CODAPEC spraying along is insufficient appears to be in line with the goal of CODAPEC: providing farmers with part of the required spraying. The farmers themselves should finance any additional required spraying themselves. The spraying of CODAPEC is not necessarily bad as not all farmers may be able to access pesticides and fungicides, or afford them. However, if COCOBOD is to abandon spraying, leaving it to the free market, farmers would be able to get better revenues from their cocoa production as the costs of CODAPEC spraying is deducted from the gross FOB price (see figure 5.1). Policy recommendations will be discussed in chapter 9.

Table 6.23: The influence of CODAPEC operations

Independent variable	Dependent variable	Statistical test	n=	Result
Pesticide spraying (CODAPEC, Both, Self or No Spraying)	Frequency of pesticide spraying	Kruskal Wallis H	97	C: 56,70*** B: 56,50 S: 64,36 NS: 11,00
	Change in productivity of the farm	Kruskal Wallis H	106	C: 55,73* B: 48,23 S: 57,96 NS: 39,88
	Change in financial situation	Kruskal-Wallis H	106	C: 57,97* B: 58,38 S: 62,34 NS: 45,23
Fungicide spraying (COCOBOD, Both, Self or No Spraying)	Frequency of fungicide spraying	Kruskal Wallis H	96	C: 49,90*** B: 59,92 S: 50,28 NS: 6,33
	Change in financial situation	Kruskal Wallis H	106	C: 47,84** B: 61,08 S: 60,26 NS: 36,50

(Differences measured with Kruskall-Wallis H: *= p<0,1, **=p<0,05, ***=p<0,01)

The influence of the Cocoa Health and Extension Division

The Cocoa Health and Extension Division (CHED) is the COCOBOD division charged with providing trainings to farmers. Besides farmer trainings, CHED staff also trains extension staff for farmer cooperatives (see section 5.2.5). The trainings from CHED are similar to those of certification as good farming practices are a core feature in both training manuals. The expectation therefore is that farmers who receive trainings from both the private sector (LBCs, NGOs and cooperative) and CHED implement good farming practices to a greater extent and achieve improvements in productivity and financial situation more readily compared to farmers only receiving training from the private sector (note that none of the farmers receive trainings solely provided by CHED).

Table 6.24 shows the significant differences between the providers of trainings. The results show that for good farming practices, farmers trained through the private sector prune their trees more often and also use more fertiliser. Weeding however, is done more often by farmers that receive trainings from both providers. Most importantly, farmers that receive training from both the private sector and CHED have experienced improvements in productivity and their financial situation more often than those that only get private sector trainings. The results from the analysis thus show that trainings provided by CHED are likely to be beneficial for at least the impact of certification.

Table 6.24: Influence of CHED trainings

Independent variable	Dependent variable	Statistical test	n=	Result
Provider of trainings (Private sector or CHED+ private sector)	Frequency of pruning	Mann-Whitney U	106	PS: 55,46* CPS: 43,92
	Frequency of weeding	Mann-Whitney U	106	PS: 52,18* CPS: 59,94
	Frequency of fertiliser application	Mann-Whitney U	104	PS: 55,39** CPS: 36,63
	Change in productivity	Mann-Whitney U	106	PS: 51,76** CPS: 62,00
	Change in financial situation	Mann-Whitney U	106	PS: 51,43** CPS: 63,61

(Differences measured using Mann-Whitney U: *= p<0,1, **=p<0,05, ***=p<0,01)

7. Conclusion

Cocoa production in general faces a variety of issues which threaten the future supply of cocoa. Private certification standards have emerged as local governments have been ineffective in addressing these issues. The particular case of the Ghanaian cocoa sector is interesting as the government, through COCOBOD, maintains a strong regulating position while allowing private certification to operate. The result is two types of governance that attempt to address the issues in the cocoa sector: public governance from COCOBOD, and private governance in the form of certification standards. It became apparent that COCOBOD lacked the capacity to address the issues and therefore allowed private certification standards to step in. Both types of governance are working towards the same goal: a sustainable cocoa supply by improving farmer livelihoods. The goal of this study was to determine through what mechanisms and to what extent public policies from COCOBOD affect the uptake and impact private certification standards at the farm level in Ghana.

The data analysis, as well as the desk research have highlighted that issues related to cocoa farming still persist in Ghana. Especially financial and ecological issues were reported by the cocoa farmers, while the stakeholders mentioned more general issues such as land tenure ship and climate change. The data collected from farmers has indicated that private certification does have a positive impact on farmer livelihoods and thus addresses the issues to some extent. Most farmers have implemented good agricultural practices to a great extent and report improvements in their productivity and in other variables related to People, Planet, Prosperity. The analysis of the variables related to certification has shown that how long a farmer has been certified, which cooperative the farmer is member of, and the frequency of trainings are the most important variables that explain increases in productivity. An increase in productivity subsequently leads to improvements in a farmer's financial situation. However, high inflation rates and increasing costs of living erode part of the benefits of certification. Furthermore, good farming practices and the price premium appear to yield some positive results, but did not appear to be as important as the variables mentioned above. Also the amount of investments and the total productivity do not appear to have a significant influence on certification outcomes, nor on uptake.

However, the goal of the research is to verify what the influence is of the government regulator, COCOBOD, on the uptake and impact of certification. The first part of the research question, "*through what mechanisms"*, was answered through the qualitative data collected through interviews with stakeholder along with the use of several policy documents from the Ghanaian government. However, it was first important to know how public policies could affect the uptake and impact of private certification standards in the first place. It was assumed, based on stakeholder interviews, that farmers who see their farm as a business instead of a means to sustain their livelihoods are more likely to adopt and implement certification standards. It was therefore assumed that policies from COCOBOD that enable a farmer to generate more income from his farm are also positive for the uptake of certification as large farmers tend to be more business minded.

Desk research along with qualitative data analysis determined that there are several COCOBOD policies that affect the uptake of certification. These policies are: the producer price setting, the provision of trainings, the provision of fertiliser and pesticide and fungicide spraying, the testing of inputs by the Cocoa Research Institute Ghana, the fixed price margin for LBCs, the provision of

seedlings, and the setting up of a public private partnership platform called the Ghana Cocoa Platform. Section 5.7 provided the expected outcomes of these policies in relation with certification standards based on the stakeholder interviews. These expectations were further researched through quantitative data analysis in chapter 6. Unfortunately, not all expectations could be verified due to problems during the data collection.

The trainings provided by CHED are likely beneficial to uptake and impact of certification. The trainings cover roughly the same topics as the training manuals are similar. Furthermore, the quantitative analysis has shown that farmers that receive trainings from both private sector actors and CHED reported improvements in production more often. Furthermore, CHED staff also trains extension staff of both LBCs and cooperatives, increasing the capacity of private actors to provide trainings on certification, leading to improvements in the uptake of certification.

The input delivery by Hi-Tech, as well as the spraying of fungicide and pesticide by CODAPEC are subject to criticisms from other stakeholders. This criticism focuses mostly to the inefficient distribution of inputs and spraying, leading to inequities as all farmers pay indirectly for the inputs. The Hi-Tech and CODAPEC operations are also very expensive, causing farmers to receive a lower fixed price for their cocoa. The free inputs and spraying policies are therefore likely to be negative for the uptake and impact of certification, as is demonstrated in the quantitative data analysis. Abandoning these policies in favour of free market actors could lead to improvements in the efficiency of the delivery, while allowing farmers to receive a higher price for their cocoa.

The final conclusion of this research is that a heavily regulated cocoa sector, such as the Ghanaian cocoa sector, is likely to be positive for the uptake and impact of certification. COCOBOD policies in general do not seem to be necessarily negative for the uptake of certification. This is mostly because both COCOBOD and certification standards have the same goals: improving farmer livelihoods in order to secure future cocoa supply. Furthermore, both COCOBOD and private standards apply roughly the same methods: extension services. COCOBOD, NGOs, LBCs, cooperatives, and the certification standards all play a pivotal role in sustainable cocoa production. However, issues still persist, which is mostly caused by the lack of capacity of COCOBOD policies to effectively address these issues. Therefore, better cooperation between these stakeholders is required. The mechanism that is therefore most likely to be important in the future is the Ghana Cocoa Platform. This public private partnership platform can improve the efficiency of the stakeholder efforts by improving coordination and harmonisation between the various policies and projects, leading to an increase in the capacity of all stakeholders. This should lead to an increase in the farmers that can become certified and likely to lead to more improvements in People, Planet, Prosperity. Furthermore, improvements in the service delivery can alleviate issues such as the lack of access to inputs and credit and can also increase the amount of farmers that receive trainings. These improvements should subsequently lead to higher yields and improvements in farmers' livelihoods. However, a few policy changes from both COCOBOD and certification standards are likely needed in order to improve efficiency. Recommendations on how certain policies can be adapted are provided in chapter 9. There is still a long road ahead before sustainable cocoa production can be realised, but both COCOBOD and private certification standards can make a big difference for farmers and increasing cooperation between the stakeholders is therefore key to secure a sustainable cocoa supply in the future.

8. Discussion

The research conducted for this master thesis faced a variety of setbacks, especially during the data collection. Section 4.1 discussed the original research plan where Côte d'Ivoire was supposed to be the contrasting case in order to compare the heavy regulated Ghanaian cocoa sector with the Ivorian market which is only regulated to a small degree. The original plan also contained another comparison: between certified and uncertified farmers (as control group) to see what difference certification makes for the farmer. Both comparisons were not possible due to safety and accessibility reasons. This reduced the quality of the research as a baseline study with a comparison in time was the only method available to still verify the impact of certification. Also the missing comparison between Côte d'Ivoire and Ghana makes the conclusion on the influence of public governance modes less valid as it is unknown how effective private certification standards are in a less regulated cocoa sector.

Further setbacks were suffered due to errors in the questionnaire caused by last minute changes related to the setbacks mentioned earlier. Especially the missing question on the size of the cocoa farms is a significant problem as data on yield per hectare was therefore not available. Other issues related to the questionnaire also further reduced the quality of the research as the data only enables to check whether there was a change, and if this change was positive (e.g. change in productivity). The extent to which, for example, productivity changed is therefore unknown. The missing of the extent to which particular situations have changed is problematic for the analysis part of the research as ordinal variables are less suitable for correlations than scale variables. The results of the analysis are still valid, but the extent to which certain variables are important is unknown. It is for instance not possible to verify whether the length of certification is more important than the frequency of trainings. What should also be noted is that the questionnaire was largely based on the UTZ Code of Conduct, but, as it is impossible to verify for all control points (122 in total), only the control points that are most relevant for the UTZ Theory of Change have been included. The conclusion for uptake of certification is thus only valid for the control points that have been included in the questionnaire.

Section 4.5.3 discussed potential biases caused by the manner in which the data was collected. The sampling strategy was based on accessibility rather than random sampling. Also the necessity to use translators reduced the extent to which answers were verifiable, leading to some non-response and irregular answers. Furthermore, some questions, especially those related to child labour, may have been answered in a socially desirable way as some subjects are very delicate. This is despite the fact that farmers were informed on the fact that the researcher was conducting an independent research and is not affiliated to a Ghanaian or international organisation related to cocoa.

Most of the problems during the data collection part of the research relate to the quantitative data. The quality of the qualitative data, however, also suffered some setbacks. Accessibility was a big issue in Ghana as not all stakeholders were available at the right time. Especially stakeholders from the Ghanaian government were inaccessible during times spent in Accra. Also representatives from the Ghana Cocoa Coffee Sheanut Farmers Association were not reachable through both email and phone calls. Also smaller stakeholders in the Ghanaian cocoa sector, such as hauliers, district officers, lead farmers and local chiefs are not included in the research due to inaccessibility and time

constraints. The validity of the expected outcomes provided in section 5.5 could have been increased if more stakeholders could have provided their insights.

The problems faced during the research have reduced the quality of the collected data as well as the validity of the results. However, most of the findings in this research are supported by qualitative data and quantitative data, as well as scientific literature and previous reports on cocoa production in West Africa. The results related to the uptake and impact of certification are likely still valid despite the problems faced during the data collection. However, the results may not be generalizable to a greater population. Similarly, the expected outcomes for the influence of COCOBOD policies on certification are probably valid, especially those that have been double checked through quantitative analysis. This research should be seen as a more explorative research that highlighted the various roles of stakeholders in the Ghanaian cocoa sector along with the relevant public and private policies. The quality of the research has suffered to a great extent because problems during the data collection. Even though the results could be valid, further research with more time and more financial means is needed to verify the exact extent to which COCOBOD influences certification uptake and impact as not all the COCOBOD policies have been verified through quantitative analysis for their influence. Furthermore, a better questionnaire would like likely result in more valid results related to certification uptake and impact.

Future research into COCOBOD operations should also investigate the political nature of COCOBOD. Section 5.2.4 revealed how the members of the Board of Directors are selected. The President and the Minister of Finance have most power in the appointment of the board members and can therefore influence the policy development of COCOBOD to a great extent. It is not uncommon for COCOBOD to completely change its Board of Directors when a new president is elected. A change in the Board of Directors usually leads to the implementation of new policies. An example of this is that COCOBOD was gradually decreasing the scale of the input provision policy to leave it completely to the private market at the final stage. However, a change in government has led to a complete overhaul: instead of downgrading the input provision, the new COCOBOD management decided to go the opposite way and increase the operations of Hi-Tech and CODAPEC to reach more farmers (E. Quartey, personal communication, 04/04/2016). The political nature of COCOBOD also has a potential influence on the distribution of inputs. Inputs to be distributed are first transported to the district capitals before they are spread amongst the communities and to the farmers. Several people mentioned that the political party the majority of the people in a district voted for could affect the public service delivery in that district. For instance it is rumoured that road construction or road repair is carried out less often in districts that did not vote for the current president. The same could be true for input distribution: districts that do not back the current president could receive fewer inputs or could receive the inputs late. This is, however, mere speculation, but investigating the political nature of COCOBOD could possibly yield interesting information on the functioning of COCOBOD.

9. Recommendations

This final chapter of the thesis will provide policy recommendations for both COCOBOD and certification standards as to how they can increase their positive impact on cocoa farmers in Ghana. The recommendations are aimed at manners in which policies can be changed in order to enable farmers to increase their productivity as well as enabling them to improve their livelihoods.

The goal of this master thesis research was to verify what the influence is of public policies from COCOBOD on the uptake and effectiveness of certification. It was hypothesised that policies that are beneficial for the entrepreneurial spirit of farmers are beneficial for the extent to which farmers adopt certification standards. In other words: policies that enables farmers to produce more cocoa or to increase the profitability of farmers also lead to more farmers becoming certified and increase the extent to which the standard is implemented. The COCOBOD policies that have been discussed in this research were therefore checked for their impact on the farmers and on the productivity and profitability of their farms. The quantitative analysis has shown that the input distribution through Hi-Tech and the spraying by CODAPEC appear to be very inefficient as not all farmers are reached and not all farmers receive their inputs at the appropriate time. The inefficiency of Hi-Tech and CODAPEC leads to an inequitable and maybe even counterproductive situation. This is mainly because all farmer pay indirectly for the inputs, but not all farmers receive them, or receive them in the same quantity. This chapter will therefore provide a recommendation on how the 'free' input policy can be replaced. The provided recommendation is based on the interviews with the major stakeholders.

The stakeholders were asked during the interviews how the inefficient COCOBOD distribution system for inputs could be improved. The majority of the interviewees advocated abandoning the free input distribution by COCOBOD in favour of market actors. Reasons for COCOBOD to stop with the free input delivery are the high costs, the inefficient delivery to farmers (late or no delivery), and the unequitable nature of the policy (all farmers pay for inputs, but not all farmers receive them). It would, however, be unwise to abruptly stop with the policy and have private market actors take over immediately as they would lack the capacity to meet the demand for fertiliser, pesticides, and fungicides. A gradual downgrade of the policy would provide market actors time to increase their reach to farmers to, at some point, provide 100% of the inputs to farmers. At what pace COCOBOD should downgrade the distribution should be based on estimates on the demand for inputs and the current capacity of all actors that provide fertiliser and spraying to farmers. One of the benefits of abandoning the free input policy is that cocoa farmers would be able to get a higher price for their cocoa. This is due to the way the producer price is determined as shown in chapter 5. The cost of fertiliser distribution and mass spraying by COCOBOD is paid for by a part of the gross Free On Board (FOB) price. Abandoning the policy would lead to an increase in the net FOB price of which usually around 76% is paid to farmers. However, if farmers do not invest their additional income in inputs, then the abandoning the policy would not lead to an increase in the use of fertiliser and pesticides. Trainings through the Cocoa Health and Extension Division as well as from the private sector should instruct farmers on the benefits of input use and the importance of investments. The question that still remains is whether market actors would be more efficient in delivering inputs to farmers compared to COCOBOD. Economics usually advocate for free markets with as little government intervention as possible so that a balance in supply and demand can lead to an optimal price.

Furthermore, locations where a certain good is demanded should lead to supply following. One of advocates of abandoning the policy stated that: "*If you go to the remotest village you can always get a Coke to drink. It might not be chilled, but you will be able to get it. And how are they able to do that? Because it is not done by the government, but by the private sector who know where they have to do their marketing"* (E. Quartey, personal communication, 04/04/2016). Only time will tell what the exact effects of abandoning the policy are. However, a cost benefit analysis could provide insights on what the effect will be.

The shortcomings of certification were already discussed in section 5.3.4. The shortcomings mostly stem from the fact that certification standards are designed to aid private companies in displaying their commitment to Corporate Social Responsibility (CSR), rather than being specifically designed to aid farmers in improving their livelihoods. However, there are a variety of impact assessments and scientific papers that have shown that certification does lead to improvements for farmers. This research has also shown that the majority of the farmers have seen improvements in their situation related to People, Planet, Profit. Not all farmers included in this research have reported improvements in People, Planet, Profit. Similarly, the extent to which the situation has improved is also not clear from this research. The biggest shortcoming of certification is that it does not appear to do enough to pull a farmer out of poverty. Increasing yields, price premiums, and other benefits related to certification do help to a great extent, but more is needed to really aid farmers in improving their livelihoods. Low yields persist due to a lack of access to fertiliser and pesticides. What is therefore needed is to go beyond certification. Going beyond certification in this sense means working together with local organisations and institutions in order to improve a farmer's access to financial means and inputs (I. Gyamfi, personal communication, 31/03/2016). The improved accessibility should lead to farmers would being able to greatly improve their yield per hectare and would therefore be able to increase the profitability of cocoa farming. Private actors in the Ghanaian cocoa supply chain who would play a pivotal role in improving input accessibility are the same actors that are already used in spreading certification standards amongst farmers, namely LBCs and farmers cooperatives.

Although improving input accessibility would be important in the future, it is first important to increase the reach of certification standards. Only 17% of the cocoa produced in Ghana in 2012 was certified (Potts et al. 2014). Even though that percentage has likely increased since then, still not every farmer wants to become certified. The problem that some farmers do not want to become certified is likely caused by farmers not understanding what the benefit of certification is, or that they do not want to implement the standard because it is too much effort. What is needed is that farmers have access to organisations that can explain what the benefits of certification are for farmers. However, farmers that are unorganised do not have access to this information and will therefore less likely become certified (H. Gilhuis, personal communication, 19/01/2016). Reaching more farmers with the current state of certification standards should therefore be the priority before expanding the operations to include access to credit and inputs.

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Annex I: Semi structured interviews with Cocobod officials

Interview COCOBOD

About the research

The interview is part of my master thesis research. The research investigates the influence of COCOBOD and CCC policies on the effectiveness of cocoa certification for sustainable cocoa production. The research can be divided into three stages: actors from Europe (UTZ/Solidaridad/Cargill), government actors in Ghana, and farmers/cooperatives at the micro level. The goal of this interview is to create a full picture of the cocoa supply chain and the roles/perspectives of the various actors related to sustainable cocoa production.

The interview is semi-structured and consists of 12 open questions.

Is it OK if I record this interview on audio?

Questions:

Please state your name, function and organization name.

1. Can you explain the role Cocobod in the Ghanaian cocoa industry?
2. Is Cocobod an independent government institute or is it part of a ministry?
3. What are the different subsidiaries of Cocobod? What are their roles?
4. How are new policies formulated? How often? What actors are involved?
5. How is the standard price determined? Which actors are involved? What is the role of the price on the world cocoa market?
6. Is Cocobod transparent about their expenditures and incomes? What happens with profits from the CMC?
7. How is the standard profit margin for LBCs determined? Does Cocobod loan money to LBCs?
8. How is the supply of subsidised inputs organised? Where does Cocobod get the inputs?
9. Does Cocobod have the capacity to deliver subsidised inputs in a timely and adequate way?
10. What is the effect of subsidised inputs for farmers? For the private actors selling inputs?
11. How can the problems related to the distribution be resolved? Subsidising farmers instead of inputs?
12. How are Cocobod trainings organised? What do the trainings entail? How often do farmers get trainings?

Annex II: Semi Structured interviews with other stakeholders

About the research:

The interview is part of my master thesis research. The research investigates the influence of COCOBOD and CCC policies on the effectiveness of cocoa certification for sustainable cocoa production. The research can be divided into three stages: actors from Europe (UTZ/Solidaridad/Cargill), government actors in Ghana, and farmers/cooperatives at the micro level. The goal of this interview is to create a full picture of the cocoa supply chain and the roles/perspectives of the various actors related to sustainable cocoa production.

The interview is semi-structured and consists of 14 open questions.

Is it OK if I record this interview on audio?

Questions:

Please state your name, function and organization name.

1. Could you explain what the role of the World Cocoa foundation is in the cocoa supply chain? And Ghana in particular?
2. Who are the actors that the World Cocoa foundation works with? What role do these actors play?
3. What role do smallholder farmers play? How are they represented?
4. What are the major problems cocoa farmers are face in Ghana?
5. Could you describe the relation between the WCF and COCOBOD?
6. When you look at the role of COCOBOD in the Ghanaian cocoa sector, do you think their policies are beneficial to sustainable cocoa farming? For farmers?
7. Do you think that the way the Ghanaian cocoa market is designed (LBCs, CMC) impairs traceability of cocoa? What is the effect of competition between LBCs for farmers?
8. Do you think the provision of subsidized inputs by COCOBOD is beneficial? Why (not)? What do you think would work better than the input provision as it is organised now?
9. COCOBOD also provides trainings, can you shortly describe what these trainings consist of? Do you think the trainings by COCOBOD are effective to improve cocoa production?
10. What is the difference between trainings from COCOBOD and trainings from other actors (certification standards, cooperatives, LBCs)?
11. What is the relation between certification standards and the WCF?
12. Do you think private standards have a potential to be more effective than national governments (COCOBOD) in achieving a sustainable cocoa production?
13. What do you think is driving force behind certification?
14. What do you think the major downsides of certification are?

Annex III: Operationalisation of variables

Table 1: Operationalisation of farmer and household characteristics

Variable	Operationalisation	Question
Sex of farmer	Sex of farmer (Male/Female)	N/A
Activity in cocoa	Sold cocoa in the last 12 months (yes/no)	01
Age of farmer	Age of farmer in years	02
Minors in household	Number of children (5-21) in household	58
Primary source of income	Cocoa or not cocoa	24,25,26
Cooperative membership	Cooperative a farmer is member of (Kuapa Kokoo or Kokoo Pa	N/A

Table 2: Operationalisation of contextual characteristics

Variable	Operationalisation	Question
District	District in which the farmer lives	N/A
Community	Community in which the farmer lives	N/A
Distance to capital	Distance between the farmer's community and the district capital (in kilometres)	N/A
Farmer population	Amount of cocoa farmers living in a community	N/A
Accessibility	Distance from farm to nearest car/truck road in minutes	14

Table 3: Operationalisation of changes in farming practices

Variable	Operationalisation	Question
Good agricultural practices		
Pruning	Change in frequency of pruning between before after certification (more/less/same)	69,70
Defective pod removal	Change in frequency of defective pod removal between before after certification (more/less/same)	71,72
Weeding	Change in frequency of weeding between before after certification (more/less/same)	73,74
Fertiliser application	Change in frequency of fertiliser application before/after certification (more/less/same)	
Use of protective equipment	Change in use of protective equipment	81,82
Chemical storage	Location of chemical storage	83
Treatment of leftover chemicals	Location of leftover chemical storage	84
Alternative income	Farmer has alternate source of income (yes/no)	24
Planting/removing of shade trees	Amount of farmers that planted shade trees versus amount of farmers that removed shade trees	16, 17
Farm expansion	Amount of farmers that have expanded their farm	15
Good social practices		
Use of Child labour	Amount of minors (<18) working on the farm and hours a week a minor works on the farm	61,62
Safe working conditions	Occurrence of health issues related to cocoa farming	55
Use of labourers	Change in amount of workers hired on the farm	59
Wage paid to labourers	Amount of GHC paid to farmers for a day's work	60
Professional management		
Record keeping	Start of recordkeeping before/after certification	86
Farm group meetings	Amount of group meetings attended by farmer	68
Strong farmer groups	Amount of farmer group meetings	67

Table 4: Operationalisation of changes in livelihood outcomes

Variable	Operationalisation	Question
Increase in income	Amount of premium per bag received by farmer	12,13
No child labour	Change in amount work minors do on farm (more/no change/less)	63,64
Safe working conditions	Change in occurrence of health problems related to cocoa farming (more/no change/less)	55,56
Protection of natural habitats	Change in amount of shade trees on farm(s) (more/no change/less)	16,17
Habitat conservation	Change in amount of land used for cocoa farming (more/no change/less)	15

Table 5: Operationalisation of changes in livelihood impacts

Variable	Operationalisation	Question
Prosperity		
Economic Viability of farm	Change in productivity (higher/no change/lower)	51
Financial situation	Change in financial situation (better/no change/worse)	22, 52
People		
Better health	Change in health of household members (better/no change/worse)	54
Better housing	Change in housing (improved/no change/deteriorated)	19
Planet		
Soil conservation	Change in observed soil fertility (improved/no change/deteriorated)	18

Table 6: Operationalisation of the impact of COCOBOD policies

Variable	Operationalisation	Question
Fixed price	Does the received price for cocoa vary (yes/no)	06
Variation in LBC	Change in LBCs farmer sells to (yes/no)	04,05
Benefits through LBC	Do farmers receive benefits for selling to a particular LBC (yes/no)	66
Input provision	Frequency of inputs provided by COCOBOD	31,32
Timing of input provision	Do inputs from COCOBOD arrive on time/regular basis (yes/no)	35
Quality of input provided	Is the quality of inputs provided by COCOBOD sufficient (yes/sometimes/no)	34
Quantity of inputs provided	Is the quantity of inputs provided by COCOBOD sufficient (yes/sometimes/no)	33
Provision of trainings	Amount of farmers receiving trainings from CHED	45
Provision of pesticide spraying	Amount of farmers receiving pesticide spraying from CODAPEC	78
Provision of fungicide spraying	Amount of farmers receiving fungicide spraying from CODAPEC	80

Table 7: Operationalisation of other influencing variables

Variable	Operationalisation	Question
Market share	Output of farms in bags (64 kg)	23
Support for implementation	Amount of trainings a farmer attends per year	45,46
Openness	Awareness of what standards entail and what responsibilities of farmers are (yes/no)	09
Inclusiveness	Degree to which a farmer feels included in the decision making process	10
Alternative livelihoods	Farmer has other sources of income besides cocoa (yes/no)	24,25,26

Annex IV: Questionnaire for structured interviews with cocoa farmers

Questionnaire for cocoa farmers

Questionnaire #:….. Name of Respondent:……Sex: M/F

Village name:……

Introduction of research

My name is Cedric Steijn and I am a student from the Utrecht University in the Netherlands. I am currently carrying out a research investigating cocoa certification standards and cocoa production policies in Ghana as part of my master degree Sustainable Development. I am not employed by an LBC, trader or manufacturer. This entire project is an independent study for my university.

The results of the research will be used in a report, which will be publicly available to those that are interested. Your name and the rest of the information will be processed anonymously and will strictly be used for research purposes only.

This interview will take about 50 minutes and will consist of a variety of open and closed questions. By agreeing to be interviewed you agree that the information you provide me with will be treated confidentially and that results will be publicly available. You are invited to sign the consent form at the bottom of this page with your name, signature, and the date.

Consent form

I hereby confirm that I knowledgably give my consent to be interviewed by Cedric Steijn, master student from the Utrecht University.

I agree that the information I anonymously provide him will be used for his master thesis investigating the effectiveness certification standards.

I understand that this thesis research will be publicly available and can be shared with everyone interested in its content.

I confirm that I have read this document, understand it and signing it voluntarily.

Name:……

Signature:…….

Date:……

Part 1: Background information farmers and households

Farmer characteristics

01: Did you or anyone in your household sell cocoa in the last 12 months? (if no, end interview)
Answer: Yes/no

02: What is your age?
Answer: …

03: What are the major difficulties you face in your life as a cocoa farmer?
Answer:……
……

04: Who do you sell your cocoa to (person/LBC(s))?
Answer (person/LBC(s)): ……

05: Does the person(s)/LBC(s) you sell to change over time?
A: Yes B: No

06: Do you receive the same price for your cocoa each time you sell?
A: Yes B: No C: I don't know

07: What affects the price of your cocoa? (e.g. quality)
Answer:……

08: Under which standard is your farm certified? (more answers possible)
A: UTZ certified C: Fairtrade foundation E: Other:…….
B: Rainforest alliance D: Organic

09: Is it clear to you what the standards for certification entail and what your responsibilities are?
A: Yes B: No

10: Do you feel represented in the standard setting process of the standard under which you are certified?(see question 8)?
A: Yes B: No

11: How long have you been certified?
Answer: …. Months/years

12: Did you receive a premium for the cocoa you produced last year?
A: Yes (see question 13) C: Not yet
B: No D: I don't know

13: How much was the premium did you receive?
A:……Cedi per bag
B: The premium was not in cash, but was:…….
C: I don't know

14: How long does it take you to reach the nearest (car/truck) road from your farm?
Answer: …….minutes

Part 2: Livelihood impacts

Natural capital

15: Have you prepared any new land for cocoa farming the past 12 months?
A: Yes B: No

16: Have you planted any shade trees since you became certified?
A: Yes How many?..... B: No

17: Have you cut any shade trees since you became certified?
A: Yes How many?..... B: No

18: Do you feel the fertility of the soil on your farm has increased or since you became certified?
A: Increased B: No change C: Decreased

19: Is there a difference in the quality of your housing between now and before your farm was certified?
A: Yes, it has improved
B: No change
C: Yes, it has become worse

20: What types of toilet facilities do the members of your household use?

A: Flush toilet	*E: Public Toilet*
B: Pit/Latrine	*F: Toilet in another house*
C: Pan/Bucket	*G: No toilet facility (Bush/beach)*
D: Kumasi Ventilated improved Pit (KVIP)	*H: Other:……*

21: Has the sanitation your household uses improved since you became certified?
A: Yes B: Don't know C: No

Economic capital

22: Has your economic situation regarding jobs, Income, savings, credit, and remittances changed since you became you certified? What has changed?
Answer:……
……
……

23: In the last 12 months, roughly how many bags of cocoa did you sell from each of your farms?
Answer: Farm 1: …….. Farm 2: ……. Farm 3: …….. Farm 4: …….. Total: ……

24: Do you have other sources of income besides cocoa?
A: Yes, namely:.....
B: No

25: What was your most important source of income over the past 12 months?
Source of income: .....

26: What was your second most important source of income over the past 12 months?

Source of income: .....

27: How old would you estimate your cocoa trees? (oldest trees on the farm)

Answer:……. years

28: Have you ever removed trees because of their age?

A: Yes B: No

29: Since when have you started removing old trees from your farm?

Since……months/years ago.

30: Do you use additional inputs on your farm? (Multiple answers possible)

A: Planting materials (seedlings/pods) *D: Fertilisers*

B: Pesticides *E: Fungicides*

C: Farming equipment(cutlass, harvester hook, pruner, etc.) *F: I do not use inputs*

31: From whom do you get these inputs? (Multiple answer possible)

A: From COCOBOD (see question 32-35) *E: From COCOBOD + own investments(32-35+36-40)*

B: Other,…… *F: I do not use additional inputs*

C: I Invest in my own inputs (see question 36-40)

32: How often do you receive inputs from COCOBOD?

Answer:……. a year

33: Is the quantity of the by COCOBOD supplied inputs sufficient for your farm(s)?

A: Yes B: Sometimes C: No

34: Is the quality of the inputs supplied by COCOBOD sufficient?

A: Yes B: Sometimes C: No

35: Does COCOBOD on a regular basis (are they delivered on time)?

A: Yes B: No

36: How often a year do you receive inputs from your own investments?

Answer:…… a year

37: Is the quantity of the inputs you have access to sufficient for your farm(s), when you invest in your own inputs?

A: Yes B: Sometimes C: No

38: Is the quality of the inputs from your own investments sufficient?

A: Yes B: Sometimes C: No

39: When you invest in your own inputs, do you receive the inputs at the appropriate time?

A: Yes B:No

40: How much do you invest in a year?

A: Answer:…….. a year (see question 41) B: I do not invest (see question 42)

41: What do you invest in? (multiple answers possible)

A: Inputs (fertiliser, pesticides, fungicides, etc) *D: Farming equipment* *G: N/A*

B: Additional labour *E: Storage for chemicals*

C: Personal Protective Equipment (PPE) *F: Other,……*

42: Why do you not invest in your farms?

A: No funds *C: Don't know* *E: N/A*

B: I receive free inputs *D: Other,……*

43: Do you attend trainings?

A: Yes (See question 45)

B: No (See question 44)

44: Why do you not attend trainings?

Answer:……

45: Who provides the trainings? (multiple answers possible)

A: COCOBOD *C: (Local) NGO's* *E: Other……*

B: Cooperatives *D: LBC's*

46: How often do you receive trainings?

Answer:…….. times a year.

47: Do you apply what you learn at the trainings on your cocoa farm?

A: Yes (see question 49) *B: No (see question 48)*

48: Why do you not use the trainings on your farm?

Answer……

……

49: Do the trainings affect your total production/livelihood?

A: Yes, positively *B: No* *C: Yes, negatively* *D: Don't know*

50: Do you have any form of savings? (multiple answers possible)

A: Savings at home *C: Susu account*

B: Bank savings *D: No savings*

51: Has the productivity of your farms increased since you became certified?

A: Yes *B: No change* *C: No*

52: How has your financial situation changed since you became certified?

A: Improved B: No change C: Deteriorated

Human capital

53: If you compare the quality and availability of people working on your farm with 3 years ago, what changes do you see? (Examples: education, health, working conditions, availability)
Answer:……
……
……

54: Has the health of your household members improved since you became certified?
A: Yes B: No change C: No

55: Does any of your household face the following problems as a result from working on the cocoa farm? (Multiple answers possible)
A: Injury from machete or cutlass.
B: Back ache from carrying heavy loads.
C: Burn injuries.
D: Coughing or respiratory problems.
E: Skin damage or irritation
F: Eye irritation

56: Did the occurrence of these health problems increase, stayed the same or decrease?
A: Increase B: No change C: Decrease

57: How many members of your household are aged 5-21?
Answer:……

58: How many of them are currently enrolled at a school?
Answer:…….

59: Did the amount of persons working as hired labour increase since you became certified?
A: Increased B: No Change C: Decreased

60: What is the wage the hired labourers receive for a day's work?
GHC:……

61: How many household members assisted you on your cocoa farm in the past 12 months?
Number:……..

62: How many minor household members (under 18) assisted you on your cocoa farm in the past 12 months?
Number:…….

63: How many hours a week do the minor household members work on your farm?
Answer:……. Hours

64: Has the amount of work minors do on the farm changed since you became certified?
A: Increased B: No change C: Decreased

Social capital

65: Are you a member of a producer group?
A: Yes B: No

66: What are the benefits of being a member of a producer group for you?
Answer:……
……..

67: How often do the members of this group meet every year?
Answer:……

68: How many of these meetings do you attend?
A: All *C: Half of them* *E: None*
B: Most of them *D: Some of them*

Part 3: Environmental impacts

Good farming practices

69: How many times did you prune your cocoa trees in the last 12 months?
Answer:……..

70: How many times a year did you prune your cocoa trees before you were certified?
Answer:…..

71: How many times did you remove defective pods in the last 12 months?
Answer:……..

72: How many times a year did you remove defective before you were certified?
Answer:…..

73: How many times did you do weeding in the past 12 months?
Answer:……..

74: How many times a year did you weed before you were certified?
Answer:……

75: How many times did you apply fertiliser on your plots in the past 12 months?
Answer:……..

76: How many times a year did you apply fertiliser before you were certified?
Answer:……

77: Was any pest control (Capsis) done in the past 12 months?
A: Yes (see question 78) *B: No*

78: How often and by whom was pest control done in the past 12 months?
Answer……. By:……..

79: Was any disease control (Black pod) done over the past 12 months?
A: Yes (see question 80) *B: No*

80: How often and by whom was disease control done in the past 12 months?
Answer:……By:……

81: When you apply chemicals, do you wear protective equipment?
A: Full protective equipment (mask, gloves, boots, overall, goggles)
B: A part of protective equipment
C: No protective equipment
D: N/A I do not spray pesticides

82: Since when did you start using protective equipment (if applicable)?
Since……..months
83: Where do you store your chemicals?
A: I store them in my house in a closed room/box/sack *B: I store them in my house*
C: I store them outside the house in closed room/box/sack *D: I store them outside the house*
E: Other:…… *F: N/A, I do not use chemicals*
84: What do you do with leftover chemicals?
Answer:……

85: What did you do with leftover chemicals before you became certified?
Answer:……

86: Since when did you start keeping records on your farming business?
Since……months/years

87: Have purchasing clerks deducted kilograms from your cocoa production because they said it was low quality in the past 12 months?
A: Yes, in total…….kg was deducted due to low quality
B: No

88: Has the amount that has been deducted due to low quality reduced since you became certified?
A: Yes *B: No*

This is the end of the interview. Thank you for your time and cooperation.

Annex V: All results from the quantitative analysis

Table 1: Influence of farmer characteristics on certification interventions

Independent variable	Dependent variable	Statistical test	n=	Result	Sign.
Age	Pruning	Spearman's R	106	0,049	0,620
	Pod removal	Spearman's R	106	-0,019	0,849
	Weeding	Spearman's R	106	0,098	0,317
	Aggregated farm practices	Spearman's R	104	0,160	0,105
	Training frequency	Spearman's R	106	-0,117	0,236
	Amount of bags produced	Spearman's R	106	-0,063	0,524
	Yearly amount invested	Spearman's R	98	-,002	0,985
Sex (Male or Female)	Pruning	Mann-Whitney U	106	M: 51,06 F: 57,53	0,198
	Pod removal	Mann-Whitney U	106	M: 56,08 F: 49,25	0,242
	Weeding	Mann-Whitney U	106	M: 54,80 F: 51,35	0,269
	Fertiliser application	Mann-Whitney U	104	M: 49,87 F: 56,71	0,237
	Aggregated farm practices	Mann-Whitney U	104	M: 51,64 F: 53,88	0,682
	Training frequency	Mann-Whitney U	105	M: 54,28 F: 50,83	0,565
	Amount of bags produced	Mann-Whitney U	106	M: 57,98 F: 46,11	0,053
	Yearly amount invested	Mann-Whitney U	98	M: 52,44 F: 44,86	0,197
Primary income source (Cocoa or not cocoa)	Pruning	Mann-Whitney U	106	C: 54,85 NC: 37,00	0,053
	Pod removal	Mann-Whitney U	106	C: 55,07 NC: 34,31	0,053
	Weeding	Mann-Whitney U	106	C: 52,62 NC: 61,88	0,114
	Fertiliser application	Mann-Whitney U	104	C: 53,29 NC: 43,06	0,334
	Aggregated farm practices	Mann-Whitney U	104	C: 54,03 NC: 34,19	0,046
	Training frequency	Mann-Whitney U	105	C: 54,22 NC: 38,25	0,144
	Amount of bags produced	Mann-Whitney U	106	C: 54,67 NC: 39,19	0,169
	Yearly amount invested	Mann Whiney U	98	C: 49,08 NC: 56,00	0,562
Cooperative	Pruning	Mann-Whitney U	106	KKUF: 41,15	0,000

membership (Kuapa Kokoo Farmers Union or Kokoo Pa)				KP: 63,53	
	Pod removal	Mann-Whitney U	106	KKUF: 40,50 KP: 65,11	0,000
	Weeding	Mann-Whitney U	106	KKUF: 56,82 KP: 50,54	0,038
	Fertiliser application	Mann-Whitney U	104	KKUF: 50,39 KP: 54,31	0,487
	Aggregated farm practices	Mann-Whitney U	104	KKUF: 33,49 KP: 68,79	0,000
	Training frequency	Mann-Whitney U	105	KKUF: 46,28 KP: 58,88	0,030
	Amount of bags produced	Mann-Whitney U	106	KKUF: 52,56 KP: 54,34	0,765
	Yearly amount invested	Mann-Whitney U	98	KKUF: 43,77 KP: 53,98	0,077
	Premium amount	Mann-Whitney U	106	KKUF: 25,50 KP: 78,50	0,000
	Duration of certification	Mann-Whitney U	106	KKUF: 74,45 KP: 34,79	0,000
	Amount of cooperative benefits	Mann-Whitney U	104	KKUF: 71,13 KP: 36,54	0,000

Table 2: Influence of farmer characteristics on certification outcomes

Independent variable	Dependent variable	Statistical test	n=	Result	Sign.
Sex (Male or female)	Change in soil fertility	Mann-Whitney U	106	M: 49,80 F: 59,60	0,082
	Change in productivity	Mann-Whitney U	106	M: 52,30 F: 55,48	0,419
	Change in financial situation	Mann-Whitney U	105	M: 55,86 F: 49,60	0,174
	Change in household health	Mann-Whitney U	106	M: 53,36 F: 53,73	0,947
	Change in housing	Mann-Whitney U	105	M: 54,35 F: 50,80	0,500
	Change in sanitation	Mann-Whitney U	106	M: 56,45 F: 48,63	0,105
Primary income source (Cocoa or not cocoa)	Change in soil fertility	Mann-Whitney U	106	C: 54,37 NC: 42,88	0,267
	Change in productivity	Mann-Whitney U	106	C: 53,84 NC: 49,38	0,536
	Change in financial situation	Mann-Whitney U	106	C: 53,50 NC: 53,50	1,000
	Change in household health	Mann-Whitney U	106	C: 52,09 NC: 70,81	0,063
	Change in housing	Mann-Whitney U	105	C: 53,82 NC: 43,00	0,261
	Change in sanitation	Mann-Whitney U	106	C: 52,28 NC: 68.50	0,067

Cooperative membership (Kuapa Kokoo Farmers Union or Kokoo Pa)	Change in productivity	Mann-Whitney U	106	KKUF: 58,97 KP: 48,62	0,007
	Change in financial situation	Mann-Whitney U	106	KKUF: 61,30 KP: 46,54	0,001
	Change in housing	Mann-Whitney U	105	KKUF: 60,64 KP: 46,31	0,005
	Change in sanitation	Mann-Whitney U	106	KKUF: 66,94 KP: 41,59	0,000
	Change in soil fertility	Mann-Whitney U	106	KKUF: 55,03 KP: 52,13	0,597
	Change in household health	Mann-Whitney U	106	KKUF: 67,84 KP: 40,70	0,000

Table 3: The influence of contextual characteristics on COCOBOD operations.

Independent variable	Dependent variable	Statistical test	n=	Result	Significance
District (Ejisu Juabenor (Ahafo Ano-South)	Frequency of input delivery by COCOBOD	Mann-Whitney U	103	ED: 50,85 AAS: 53,08	0,670
	Timeliness of input delivery by COCOBOD	Mann-Whitney U	106	ED: 54,28 AAS: 48,03	0,152
	Quality of input delivery by COCOBOD	Mann-Whitney U	106	ED: 49,32 AAS: 52,52	0,538
	Quantity of input delivery	Mann-Whitney U	101	ED: 51,46 AAS: 50,58	0,860
	Spraying of pesticide	Chi Square	106	35,157	0,000
	Spraying of fungicide	Chi square	106	34,730	0,000
Community (New Koforidua, Nobewam, Biemso 2, Fedeyaya, Kunsu Camp or Kunsu Kumawu)	Frequency of input delivery by COCOBOD	Kruskall-Wallis H	103	NK: 58,07 NO: 42,37 B2: 52,18 FE: 30,00 KC: 62,50 KK: 77,25	0,001
	Timeliness of input delivery by COCOBOD	Kruskall-Wallis H	106	NK: 52,64 NO: 56,07 B2: 47,68 FE: 42,71 KC: 52,27 KK: 51,13	0,318
	Quality of input delivery by COCOBOD	Kruskall-Wallis H	106	NK: 40,06 NO: 59,39 B2: 39,70 FE: 46,67 KC: 72,50 KK: 67,56	0,001
	Quantity of input delivery	Kruskall-Wallis H	106	NK: 57,40 NO: 45,00	0,037

				B2: 56,14 FE: 58,08 KC: 40,63 KK: 38,55	
	Spraying of pesticide	Chi Square	106	76,219	0,000
	Spraying of fungicide	Chi square	106	82,852	0,000
Distance from farm to road (in minutes)	Frequency of input delivery by COCOBOD	Spearman's R	103	-0,117	0,239
	Timeliness of input delivery by COCOBOD	Spearman's R	101	0,260	0,260
	Quality of input delivery by COCOBOD	Spearman's R	101	0,228	0,022
	Quantity of input delivery	Spearman's R	101	-0,318	0,001
Distance to district capital (in km)	Frequency of input delivery by COCOBOD	Spearman's R	103	-0,120	0,227
	Timeliness of input delivery by COCOBOD	Spearman's R	101	0,071	0,480
	Quality of input delivery by COCOBOD	Spearman's R	101	-0,232	0,019
	Quantity of input delivery	Spearman's R	101	0,147	0,144
Total farmer population per community	Frequency of input delivery by COCOBOD	Spearman's R	103	0,029	0,771
	Timeliness of input delivery by COCOBOD	Spearman's R	101	0,039	0,699
	Quality of input delivery by COCOBOD	Spearman's R	101	-0.110	0,272
	Quantity of input delivery	Spearman's R	101	0,005	0,963

Table 4: Influence of contextual characteristics on certification interventions and outcomes

Independent variable	Dependent variable	Statistical test	n=	Result	Sign.
Community (New Koforidua, Nobewam, Biemso 2, Fedeyaya, Kunsu	Frequency of trainings	Kruskall-Wallis H	105	NK: 37,39 NO: 57,18 B2: 84,68 FE: 70,29	0,000

Camp or Kunsu Kumawu)				KC: 12,14 KK: 41,59	
	Length of certification	Kruskall-Wallis H	106	NK: 76,93 NO: 71,54 B2: 25,18 FE: 62,75 KC: 28,95 KK: 29,36	0,000
	Frequency of pruning	Kruskall-Wallis H	106	NK: 43,15 NO: 38,80 B2: 63,02 FE: 70,50 KC: 67,09 KK: 58,45	0,000
	Frequency of pod removal	Kruskall-Wallis H	106	NK: 39,39 NO: 41,80 B2: 81,93 FE: 44,63 KC: 65,86 KK: 53,05	0,000
	Frequency of weeding	Kruskall-Wallis H	106	NK: 50,41 NO: 64,35 B2: 53,68 FE: 48,50 KC: 48,50 KK: 48,50	0,008
	Frequency of fertiliser application	Kruskall-Wallis H	104	NK: 29,74 NO: 72,83 B2: 49,84 FE: 63,00 KC: 42,36 KK: 65,73	0,000
	Aggregated good farm practices	Kruskall-Wallis H	104	NK: 31,74 NO: 45,30 B2: 79,25 FE: 53,96 KC: 61,23 KK: 50,91	0,000
	Amount of bags produced	Kruskall-Wallis H	106	NK: 48,69 NO: 57,11 B2: 60,23 FE: 18,54 KC: 63,64 KK: 72,32	0,000
	Change in soil fertility	Kruskall-Wallis H	106	NK: 52,83 NO: 57,61 B2: 54,52 FE: 58,75 KC: 36,50 KK: 55,77	0,412
	Change in	Kruskall-Wallis H	106	NK: 60,13	

	productivity			NO: 57,61 B2: 56,64 FE: 62,00 KC: 24,50 KK: 42,09	
	Change in financial situation	Kruskall-Wallis H	106	NK: 60,72 NO: 61,98 B2: 64,14 FE: 57,83 KC: 13,32 KK: 32,23	0,000
	Change in housing situation	Kruskall-Wallis H	105	NK: 55,50 NO: 66,46 B2: 43,75 FE: 49,50 KC: 51,86 KK:42,41	
	Change in household health	Kruskall-Wallis H	106	NK: 65,52 NO: 70,57 B2: 40,27 FE: 49,96 KC: 39,18 KK: 32,95	0,000
	Change in sanitation	Kruskall-Wallis H	106	NK: 65,51 NO: 68,50 B2: 41,50 FE: 41,50 KC: 43,95 KK: 39,05	0,000
Distance from farm to road (in minutes)	Frequency of training	Spearman's R	105	-0,961	0,539
	Frequency of pruning	Spearman's R	106	-0,172	0,077
	Frequency of pod removal	Spearman's R	106	-0,086	0,381
	Frequency of weeding	Spearman's R	106	-0,091	0,354
	Frequency of fertiliser application	Spearman's R	104	-0,005	0,959
	Aggregated good farm practices	Spearman's R	104	-0,211	0,032
	Frequency of pesticide spraying	Spearman's R	96	-0,052	0,612
	Frequency of fungicide spraying	Spearman's R	96	-0,129	0,210
Total farmer population per community	Frequency of training	Spearman's R	105	0,447	0,000

Table 5: Variables influencing certification uptake and outcome

Independent variable	Dependent variable	Statistical test	n=	Result	Significance
Length of certification	Frequency of trainings	Spearman's R	105	-0,166	0,090
	Frequency of pruning	Spearman's R	106	-0,266	0,006
	Frequency of pod removal	Spearman's R	106	-0,444	0,000
	Frequency of weeding	Spearman's R	106	0,151	0,123
	Frequency of fertiliser application	Spearman's R	104	-0,121	0,222
	Aggregated good farm practices	Spearman's R	104	-0,409	0,000
	Amount of bags produced	Spearman's R	106	-0,124	0,207
	Yearly amount invested	Spearman's R	98	-0,247	0,014
	Change in soil fertility	Spearman's R	106	0,133	0,175
	Change in productivity	Spearman's R	106	0,311	0,001
	Change in financial situation	Spearman's R	106	0,228	0,019
	Change in housing situation	Spearman's R	105	0,175	0,074
	Change in household health	Spearman's R	106	0,414	0,000
	Change in sanitation	Spearman's R	106	0,326	0,001
Frequency of trainings	Frequency of pruning	Spearman's R	105	-0,038	0,703
	Frequency of pod removal	Spearman's R	105	0,284	0,003
	Frequency of weeding	Spearman's R	105	0,247	0,011
	Frequency of fertiliser application	Spearman's R	103	0,127	0,202
	Aggregated good farm practices	Spearman's R	103	0,205	0,038
	Amount of bags produced	Spearman's R	105	0,022	0,826
	Yearly amount invested	Spearman's R	97	0,368	0,000
	Change in soil fertility	Spearman's R	105	0,117	0,233
	Change in	Spearman's R	105	0,255	0,009

	productivity				
	Change in financial situation	Spearman's R	105	0,348	0,000
Premium amount	Yearly amount invested	Spearman's R	98	-0,202	0,046
	Change in financial situation	Spearman's R	106	-0,341	0,000
	Change in housing	Spearman's R	106	-0,402	0,000
	Change in sanitation	Spearman's R	106	0,497	0,000
	Change in health	Spearman's R	105	-0,296	0,002
Yearly amount invested	Amount of bags produced	Spearman's R	98	0,260	0,010
	Frequency of pruning	Spearman's R	98	0,124	0,222
	Frequency of pod removal	Spearman's R	98	0,132	0,195
	Frequency of weeding	Spearman's R	98	-0,206	0,041
	Fertiliser application frequency	Spearman's R	98	0,023	0,821
	Aggregated good farm practices	Spearman's R	97	0,025	0,809
	Frequency of pesticide spraying	Spearman's R	92	-0,202	0,053
	Frequency of fungicide spraying	Spearman's R	89	-0,291	0,006
	Change in productivity	Spearman's R	98	-0.350	0,000
	Change in financial situation	Spearman's R	98	-0,441	0,000
	Change in soil fertility	Spearman's R	98	-0,119	0,244
	Change in housing	Spearman's R	98	-0,126	0,219
	Change in health	Spearman's R	98	-0,182	0,074
	Change in sanitation	Spearman's R	98	-0,176	0,083
Amount of bags produced	Change in productivity	Spearman's R	106	-0,116	0,238
	Change in financial situation	Spearman's R	106	-0,049	0,618
	Change in soil fertility	Spearman's R	106	-0,069	0,484
	Change in housing	Spearman's R	106	0,192	0,050

	Change in health	Spearman's R	106	0,054	0,582
	Change in sanitation	Spearman's R	106	0,124	0,204

Table 6: The influence of good agricultural practices and pesticide and fungicide spraying on PPP

Independent variable	Dependent variable	Statistical test	n=	Result	Significance
Pruning frequency	Change in productivity	Spearman's R	106	-0.036	0,715
	Change in financial situation	Spearman's R	106	-0,081	0,406
	Amount of bags produced	Spearman's R	106	-0.195	0,045
Pod removal frequency	Change in productivity	Spearman's R	106	-0,037	0,710
	Change in financial situation	Spearman's R	106	0,062	0,525
	Amount of bags produced	Spearman's R	106	0,218	0,025
Weeding frequency	Change in productivity	Spearman's R	106	0,140	0,151
	Change in financial situation	Spearman's R	106	0,183	0,060
	Amount of bags produced	Spearman's R	106	0,144	0,140
	Change in soil fertility	Spearman's R	106	0,236	0,015
Fertiliser application frequency	Change in productivity	Spearman's R	104	0,136	0,168
	Change in financial situation	Spearman's R	104	0,090	0,362
	Amount of bags produced	Spearman's R	104	0,022	0,826
	Change in soil fertility	Spearman's R	104	0,173	0,079
Aggregated farm practices	Change in productivity	Spearman's R	104	0,020	0,840
	Change in financial situation	Spearman's R	104	0,096	0,333
	Amount of bags produced	Spearman's R	104	0,072	0,466
	Change in soil fertility	Spearman's R	104	0,297	0,002
Frequency of pesticide spraying	Change in productivity	Spearman's R	100	0,272	0,006
	Change in financial situation	Spearman's R	100	0,346	0,000

	Amount of bags produced	Spearman's R	100	0,230	0,021
Frequency of fungicide spraying	Change in productivity	Spearman's R	96	0,286	0,005
	Change in financial situation	Spearman's R	96	0,324	0,001
	Amount of bags produced	Spearman's R	96	0,126	0,220

Table 7: Correlations between outcomes in PPP

Independent variable	Dependent variable	Statistical test	n=	Result	Significance
Change in soil fertility	Change in productivity	Spearman's R	106	0,334	0,000
Change in productivity	Change in financial situation	Spearman's R	106	0,646	0,000
Change in financial situation	Change in sanitation	Spearman's R	106	0,128	0,192
	Change in health	Spearman's R	106	0,193	0,047
	Change in housing	Spearman's R	106	0,034	0,733

Table 8: The influence of COCOBOD at the farm level

Independent variable	Dependent variable	Statistical test	n=	Result	Significance
Frequency of input delivery	Amount of bags produced	Spearman's R	103	0,096	0,337
	Yearly amount invested	Spearman's R	95	0,348	0,001
	Fertiliser application	Spearman's R	101	0,041	0,684
	Change in productivity	Spearman's R	103	-0,56	0,571
	Change in financial situation	Spearman's R	103	-0,087	0,382
Timeliness of input delivery (Are inputs delivered on time: no/yes)	Amount of bags produced	Mann-Whitney U	101	No: 48,82 Yes: 57,62	0,191
	Yearly amount invested	Mann-Whitney U	95	No: 50,29 Yes: 41,58	0,174
	Fertiliser application	Mann-Whitney U	99	No: 50,97 Yes: 47,12	0,544
	Change in productivity	Mann-Whitney U	101	No: 51,92 Yes: 48,20	0,372
	Change in financial situation	Mann-Whitney U	101	No: 51,82 Yes: 48,50	0,499
Quality of inputs delivered	Amount of bags produced	Spearman's R	106	0,001	0,995
	Yearly amount invested	Spearman's R	106	-0,082	0,421
	Fertiliser application	Spearman's R	106	-0,163	0,099
	Change in productivity	Spearman's R	106	0,072	0,466
	Change in financial situation	Spearman's R	106	0,118	0,226
Quantity of inputs delivered	Amount of bags produced	Spearman's R	106	0,341	0,000
	Yearly amount invested	Spearman's R	98	0,072	0,480
	Fertiliser application	Spearman's R	104	0,043	0,664
	Change in productivity	Spearman's R	106	-0,202	0,038
	Change in financial situation	Spearman's R	106	-0,208	0,033
Pesticide spraying (COCOBOD, Both, Self or No Spraying)	Frequency of pesticide spraying	Kruskal Wallis H	97	C: 56,70 B: 56,50 S: 64,36 NS: 11,00	0,000
	Amount of bags	Kruskal Wallis H	106	C: 52,85	

	produced			B: 74,50 S: 55,54 NS: 45,05	
	Yearly amount invested	Kruskal Wallis H	97	C: 48,07 B: 43,44 S: 44,03 NS: 60,17	0,244
	Change in productivity of the farm	Kruskal Wallis H	106	C: 55,73 B: 48,23 S: 57,96 NS: 39,88	0,060
	Change in financial situation	Kruskall-Wallies H	106	C: 57,97 B: 58,38 S: 62,34 NS: 45,23	0,068
Fungicide spraying (COCOBOD, Both, Self or No Spraying)	Frequency of fungicide spraying	Kruskal Wallis H	96	C: 49,90 B: 59,92 S: 50,28 NS: 6,33	0,001
	Amount of bags produced	Kruskal Wallis H	106	C: 49,18 B: 61,25 S: 61,70 NS: 49,21	0,268
	Yearly amount invested	Kruskal Wallis H	98	C: 50,69 B: 38,63 S: 53,47 NS: 47,14	0,514
	Change in productivity of the farm	Kruskal Wallis H	106	C: 52,77 B: 52,17 S: 53,58 NS: 62,00	0,692
	Change in financial situation	Kruskal Wallis H		C: 47,84 B: 61,08 S: 60,26 NS: 36,50	0,024
Provider of trainings (Private sector or CHED+ private sector)	Frequency of trainings	Mann-Whitney U	105	PS: 52,79 CPS: 54,03	0,872
	Amount of bags produced	Mann-Whitney U	106	PS: 52,08 CPS: 60,44	0,291
	Frequency of pruning	Mann-Whitney U	106	PS: 55,46 CPS: 43,92	0,075
	Frequency of pod removal	Mann-Whitney U		PS: 52,90 CPS: 56,42	0,641
	Frequency of weeding	Mann-Whitney U		PS: 52,18 CPS: 59,94	0,054
	Frequency of fertiliser application	Mann-Whitney U		PS: 55,39 CPS: 36,63	0,016
	Aggregated farm	Mann-Whitney U		PS: 54,23	0,169

	practices		CPS: 42,97	
	Yearly amount invested	Mann-Whitney U	PS: 48,91 CPS: 52,32	0,652
	Change in soil fertility	Mann-Whitney U	PS: 53,48 CPS: 53,58	0,989
	Change in productivity	Mann-Whitney U	PS: 51,76 CPS: 62,00	0,043
	Change in financial situation	Mann-Whitney U	PS: 51,43 CPS: 63,61	0,040