Household food security of Ghanaian cocoa producers: the impact of UTZ-certification

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ABSTRACT

This thesis analyses the food security of cocoa farmers in Ghana and in what way UTZ-certification impacts this. Cocoa production takes part in millions of livelihoods globally and Ghana is the second largest cocoa producer in the world. Cocoa farmers grow a product in great demand that grows only in a small part of the world, yet many of the involved farmers live in poverty. UTZ-certification is implemented – among other things – to strengthen the livelihoods of producers with increased production and knowledge of Good Agricultural Practices. This study focuses on food issues, as food security is one of the most important indicators for understanding overall socio-economic conditions of people and stunting and child mortality rates are proven to be high among producers. Food security within certification schemes is often seen as the outcome of increased income, though both synergies and trade-offs can exist when zooming in on the ways in which a farmer obtains food for the household.

In this study, as a result, many farmers indeed increased their yields and productivity. This is also proven to correlate with better outcomes in the food security questions of the structural interviews (N = 63). In other words: the increase of income does synergize with an increase in food security. Though, farmers also argued that their own food production next to their cocoa is essential, even when they experience increased income of certification. Reasons for this were especially the high prices of food products on markets and the difficulties to reach these places. Cocoa farmers with less food crops and smaller sizes of food crop land also came out as more food insecure in the analysis of the data.

For food production, knowledge of GAPs is mentioned by farmer as a major spillover. Almost all farmers argued that their skills in food production increased because their skills in cocoa production increased. For inputs this is less the case, as farmers in this study generally did not use inputs for food crops as they assumed this was toxic. When applied in the right way, inputs can help in food production however.

A trade-off seems to exist however as in some cases the size of land used for food crops decreased and also the amount of food crops they produced reduced. In one project group the amount of crops reduced for 50% of the farmers. Though we can't blame this on certification only, it is an important occurrence that should be taken into account in the future. High value and more nutritional crops like fruits and vegetables - already rarely produced by the farmers in this study - also seem to decrease with certification.

Overall, certification seems to be impacting the productivity and the yields of cocoa farming, but food production comes out in this study as just as important for household food security. In reality there are quite some cases where the land for food crops decreased and also the amount of food crops produced reduced. It can't be proven that this is only to blame on the certification process, as many other factors intervene, but if certification indeed wants to contribute to the outcome of food security, the focus should be more on other assets than just the increased income. Lastly it is important to mention that the aim of this study is not to imply that certification schemes are obligated to include food security specifically in their program, but when claiming food security as an outcome of certification, the different synergies and trade-offs for the producer should be taken into account. These impacts then also can be communicated transparently towards chocolate consumers.

This study was done in collaboration with Solidaridad West Africa and therefore their UTZ-certification project groups were included in the research as part of an evaluation. This research is part of the *Follow the Food* research program. Solidaridad and partners developed the *Follow the Food* program in order to find out how different agribusiness models in Ghana, Ethiopia and Kenya impact local and regional food systems and ultimately the food security of farmer households.

ACKNOWLEDGEMENTS

This research would not have been possible without the valuable contribution of a large amount of people, whom I therefore like to thank:

First and foremost, all my colleagues at Solidaridad West Africa in both Accra and Kumasi. Thank you for all the support, the fun conversations and of course the office space, the air-conditioning was much appreciated with all that Ghanaian heat. A few people I would like to thank specifically: Mary Adjei Kwarteng and Elizabeth Boandoh for helping me prepare for my visit, Charles Addo and Abdulahi Aliyu for inviting me to come to Solidaridad and Erick Ajare for teaching me a lot about the Ghanaian cocoa Sector. Then Kwame Osei, Philip Kankam and Odum Bismark for supporting me in the field, it was a blast learning Twi from you. And of course also to the local PBC offices and Kokoo Paa: Thank you so much for the support.

In the Netherlands I would like to thank Guus van Westen for the great guidance and motivation. You were really supportive during the whole research process. I also would like to thank Katie Minderhoud of Solidaridad in Utrecht. The decision to do an internship for Solidaridad was pretty last minute, but you made it work. Also for the topic of my research, I owe you.

Then I would like to thank my parents, sister and grandma who not only always support me when I travel, even for longer periods, they also assist me when I change my travel plans suddenly.

And, last but not least, I would like to thank all the farmers that contributed to this study. They offered me some of their valuable time to help me with my research, and for that I am truly grateful. Medaase Pa!

CONTENTS

LIST OF ABBREVIATIONS

CBWE	Consultative Board On The World Cocoa Economy
COROP	Cocoa Rehabilitation and Intensification Programme
COSA	The Committee on Sustainability Assessment
DFID	Department of International Development (UK)
FAD	Food Availability Decline
FASDEP	Agriculture Sector Development Policy
FEDCO	Federated Commodities LTD.
GAIN	Global Alliance for Improved Nutrition
GAPs	Good Agricultural Practices
GDP	Gross domestic product
GPRS	Growth and Poverty Reduction Strategy
GSGDA	Ghana Shared Growth and Development Agenda
IFAD	International Fund for Agricultural Development
ILRF	International Labor Rights Forum
RSPO	Roundtable on Sustainable Palm Oil
MDGs	Millenium Development Goals
MoFa	Ministry of Food and agriculture
NGO	Non-Governmental Organization
PBC	Produce Buying Company
LBC	Licenced Buying Company
RSC	Rural Service Centre
SLA	Sustainable Livelihood Approach
SSCG	Sustainable Supply Chain Management
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WCED	World Commission on Environment and Development
WFP	World Food Program
WHO	World Health Organization
WSFS	World Summit of Food Security
WWF	World Wildlife Fund

1. INTRODUCTION

This thesis analyses the food security situation of UTZ-certified cocoa farmers in Ghana. Cocoa farmers grow a product in great demand that grows only in a small part of the world, yet many of the involved farmers live in poverty (Cocoa Barometer 2015: 7). Still, cocoa production takes part in millions of livelihoods globally and Ghana is the second largest cocoa producer in the world. UTZ-certification and other private certification schemes – in cocoa the others are Rainforest Alliance, Fair Trade and Organic – focus, among other things, on strengthening the livelihoods of producers through Good Agricultural Practices (GAPs).[1] The aim is to increase productivity and income which in turn has different positive outcomes, including food security. Though, in reality this might be more complex. This thesis looks at the way in which cocoa producers provide food for their households – either by purchasing food or by food production - and the way in which certification impacts this.[2]

1.1. Problem identification & scientific relevance

Food security is one of the most important indicators for understanding overall socio-economic conditions of people. Especially regarding cocoa farmers this is proven to be an important subject as the Global Alliance for Improved Nutrition (GAIN) published in a report that stunting and child mortality rates remain high among producers (De Vries et al. 2014: 4).

The food security status of cocoa farmer is also an important issue because cocoa is a cash crop. The production of cash crops – crops that are grown to be sold rather than for consumption by the farmer - has long been praised in developing countries as it would increase agricultural growth and create a synergy with the production of other food crops as farmers' knowledge increases (World Bank 1981: 49). Next to this, the assumption is that cash crops will increase farmers' income and therefore create food security because the farmer can buy food. When looking at the GAIN report, this might not be the case. When relying on food purchasing, local markets can have low amounts of food available or local food prices can be high due to climatic reasons or lack of infrastructure. Even though there are studies regarding the livelihoods of cocoa farmers and articles that claim cocoa production has synergies with food production and food security in general, there has not been any empirical evidence on this subject.

Furthermore, this thesis contributes to the impact debate of certification schemes. More and more research is conducted on the impact of sustainable supply governance on the livelihoods of cocoa farmers, but the topic is still much debated. In literature positive direct impacts like the increase in farm production (yield), product quality and farm income are mentioned. Also social capital and education levels would get stimulated with the certification process, but evidence of more direct poverty-related impacts like improved food security is lacking (WWF 2010: 6). Within certification research, there are no studies fully dedicated to food security, but also a potential negative affect is mentioned. The study of COSA (2013) found that certificated farmers reported more days without food than uncertified farmers, Mendez et al. (2010) found that higher revenues of certified farmers did not translate into more food security and Oosterveer (2014) coined the discussion of the possible negative (but also positive) effects of certification beyond its internal objectives. This thesis fills this gap by looking at the way in which cocoa farmers obtain household food security and in what way certification is impacting this. The expectation is that there can be positive spillover effects of

[1] These practices include pruning and weeding, having an appropriate waste management system, and reducing soil erosion from wind and water through hedging and ditching (UTZ 2014: 4). This goes together trainings in farm management, requirements of safe and healthy working conditions, abolition of child labor and protection of the environment.

[2] The thesis does not imply that certification schemes are obligated to include food security specifically in their program, but when claiming food security as an outcome of certification possibly different synergies and trade-offs for the producer should be taken into account.

certification like the improvements in knowledge, technology and also the input markets. At the same time the certification process can come with extra costs of production or land for food crops might be transferred into cash crop land only.

This thesis reflects on all four dimensions of food security (availability, access, nutrition and stability) but the main empirical study is done on food security on the household level which is mostly access-based as it implies "the ability of the household to secure, either from its own production or through purchases, adequate food for meeting the dietary needs of all members of the household" (WHO/FAO 1992: 74).

1.2. Research objectives

The objectives for this thesis are threefold. First it evaluates three project groups from Solidaridad on the impact of UTZ-certification regarding livelihood assets, livelihood strategies and the behaviour of buying or producing food.[3] It focuses on the changes through time with certification in order to see in what way certification is creating synergies or trade-offs for the ability to collect food for the household. One of the project group gained UTZ-certification through a farmer group and two of them through a Licenced Buying Company. All the UTZ-certification trainings are done by Solidaridad but at different times (six years ago, three years ago and four years ago).

Secondly the relations are analysed between household demographics, livelihood assets, livelihood strategies and an assessment of food security (based on the USDA Food Security questions) is made. The aim here is to see what kind of associations there are between certain livelihood characteristics and food security. This highlights important issues for future programs. Here, the entire pile of the survey data (N = 63) is used.

Next to both these aims on the producer-level, also other stakeholders were included in the research as it is not only important to reflect on what is happening on the ground, but also on the effort already done on food security issues of producers and the possible challenges within The third objective therefore is to see in what way food security issues like diversification are part of the scope within the cocoa sector. Ten stakeholders were interviewed on this topic and findings are listed in chapter 4.

The main research question of this thesis is: **How and to what extend do cocoa producers achieve food security and how does UTZ-certification impact this?**

The research is supported with the following sub-questions:

1. How do households access (produce or purchase) food?
2. How do cocoa farmers strategize their livelihood (diversification or specialization)?
3. How is UTZ-certification creating synergies or trade-offs with household food security?
4. How do UTZ and other stakeholders in the cocoa sector approach food issues of the cocoa producer? Is household food security part of their scope?
5. What are challenges in the cocoa sector regarding the improvement of cocoa producers' livelihood and specifically in their food security?

[3] This study was done in collaboration with Solidaridad West Africa and therefore their UTZ-certification project groups were included in the research as part of an evaluation. This research is part of the *Follow the Food* research program. Solidaridad and partners developed the *Follow the Food* program in order to find out how different agribusiness models in Ghana, Ethiopia and Kenya impact local and regional food systems and ultimately the food security of farmer households.

2. THEORETICAL FRAMEWORK

With this theoretical framework first the conceptualization of this thesis is explained in section 2.1. Following this, in section 2.2., the main scientific debates to which this study contributes are explained further and some expected results are listed.

2.1. Food security: defining the concept

Food security is one of the most important indicators for understanding overall socio-economic conditions of people. The term, defined since the 1996 World Food Summit for Food Security as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life", is an important component of human welfare and development (Yaro 2004: 23). Food security concerns have been present throughout history; and the concept of food security has been constructed in many ways, with the result that different elements of it have been emphasized by different institutions, individuals and organizations. Maxwell and Smith (1992) have documented more than 30 definitions of food security in published writings, showing that food security as a theoretical concept - used in the current development debate and as a guiding principle in development interventions - has evolved steadily over the last 50 years (Maxwell & Smith 1992: 24). Today, most scholars agree that the concept has evolved to be multidimensional and that it is almost impossible to include all aspects of food security in one definition.

Three major paradigm shifts in food security as a concept are identified in the literature (Maxwell 1996: 157). The root of concern with food security can be traced back to the world food crisis of 1972-1974. The primary focus of food security was on food supply as a major cause of food insecurity: 'The food availability decline (FAD) approach'. The concept of food security in this case was characterized by a national-level perspective, concentrating primarily on the supply side of food and the main concern was whether a country had sufficient supplies to meet its population's dietary needs either through domestic or foreign markets (Pinstrup-Andersen 2009: 1). This led to huge investments in Green Revolution technologies designed to increase food supplies for both national self-sufficiency and for export. The returns on these investments have been encouraging, especially in Asia and Latin America (the so called green revolution) as productivity per acre increased considerably. Following the 1974 World Food Conference, many warning systems were designed to monitor food supply in developing countries and these early concerns live on today in the preoccupation of many governments, African in particular, with national food self-sufficiency (Maxwell 1996: 155).

Shortly after, these the trickle-down advantages subsumed and the FAD approach ended up being somewhat unrealistic since distribution of available food among countries, regions, districts, households and individuals intervenes in the final assessment of the utilization of food. One factor in modifying views of food security was the evidence that the technical successes of the Green Revolution in Asia did not automatically and rapidly lead to dramatic reductions in poverty and levels of malnutrition. Food insecurity seemed to so still exist because of lack of demand. Also during the famines in the early '80s it became clear that hunger continued to exist even when there were adequate food supplies at the international and national levels (Maxwell & Smith 1992: 10). Therefore the focus on the supply side of food security is currently more contested, but it still remains embedded in many debates focused on the solution of growing more food to feed the global population.

The realization that food availability alone does not ensure access for all, as inequality in access leads to unequal distribution of food, created the first shift towards 'The entitlement framework'. The entitlement framework evolved from the pioneering work of Amartya Sen (1981) – though, the idea of entitlements already had commonplace in nutrition planning and had been amply demonstrated in field studies - who showed that famine could even occur when enough food was being

produced, simply because people might not have access to it. Sen suggested that personal entitlements such as labour and production have a strong influence on the food security of households. The FAD approach soon was followed by shifts from the global/national perspective to the household/individual perspective. The focus went from macro more to micro with access to food as the defining characteristic of food security. At this time, the availability of food was still important for the concept of food security. However, the ways in which households attain access to food gained importance in food security research (Maxwell & Smith 1992: 11).

The second paradigm shift is from a food first perspective to a livelihood perspective, and beyond that to a preoccupation with the long-term resilience of livelihoods. Studies of the famines in the Horn of Africa revealed interesting coping strategies of people; people often decided to go hungry for a period of time to preserve food for later. This showed that food was not a basic need automatically, but takes part into a livelihood of individuals combined with all types of survival strategies. The new view on food security identifies livelihood security as a necessary and often sufficient condition for food security and therefore focuses on the long-term viability of the household as a productive and reproductive unit (Maxwell 1996: 158).

BOX 2.1. Changes in the official concept of Food Security

Food security as a concept has been reformulated through the years.

1. The term originated in the mid-1970s.Food security was defined in the Proceedings of the 1974 World Food Summit as: 'availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices' (UN 1975).
2. In 1983 the FAO expanded its concept: 'Ensuring that all people at all times have both physical and economic access to the basic food that they need.' (FAO 1983).
3. In an influential World Bank (1986) report called *Poverty and Hunger* the concept of food security is further elaborated in terms of: 'access of all people at all times to enough food for an active, healthy life.'
4. The 1996 World Food Summit adopted a more complex definition in its *Plan of Action*: 'Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.' (FAO 1996)
5. This definition was again refined by the FAO in *The State of Food Insecurity 2001* with social entitlements added in the definition: 'Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.' (FAO 2002)

The third shift is from an objective to a subjective approach. This new perspective emphasizes the quality of food and people's perception of food security as well as anxiety about food availability. According to Maxwell & Smith (1992), optimal food intake is dependent on aspects as age, health, and occupation. Then there is the issue of the right quality of food and if your food intake is adequate today, you are still considered to be food insecure if you have inadequate access to food at other times, thus risking a deterioration in your nutritional status**.** Factors like adverse weather conditions, political instability, or economic factors (such as unemployment and rising food prices) all contribute to the ability to have sufficient food access.

The most noteworthy effect of the three paradigm shifts is the significant change in the food security agenda since the mid-1970s. Instead of a discussion largely concerned with national food supply and price, the discussion now is more concerned with the complexities of livelihood strategies in difficult and uncertain environments, and with understanding how people themselves respond to risks and uncertainties (Maxwell 1996: 160). The latter specifically is applicable to this research as it looks at the household as the unit of analysis and at the different livelihood characteristics that take

part in creating food security. Though, given the complexity of understanding and measuring food security, a single perfect measure of food security does not exist. The 1996 FAO definition of food security – sometimes with some adjustments - is widely used today and it is commonly agreed that attempts should be made to measure food security as a multidimensional experience. The World Summit of Food Security (WSFS) of 2009 therefore created four pillars of food security: (1 The physical availability of food, (2 The physical and economical access to food, (3 The right utilization of food and (4 The stability of these three over time.

2.1.1. Measuring food security: The Food Security Framework

To realize food security on a household, regional or national level, all four dimensions are important to take into account. The first three pillars of food security create the physical determinant (food availability, food access and utilization) and the fourth creates the temporal determinant (stability over time) of the food security status (Napoli, De Muro & Mazziotta 2011: 19). This shows that food might be available but that does not determine access by individuals due to lack of money or the physical ability to reach the markets. At the same time, access might be viable but does not guarantee utilization and all three can be disrupted by a lack of stability caused by climate change, conflict, unemployment, disease or other factors. When looking at the household as the unit of analysis not every dimension can be measured in the same way within this research. On the household level, food security refers to 'the ability of the household to secure, either from its own production or through purchases adequate food for meeting the dietary needs of all members of the household' (WHO/FAO 1992: 74). Thus food access in this case is more part of the scope, than availability, utilization and stability.

Food availability can be described as the extent to which food is within reach of households (for example in local shops and markets), both in terms of sufficient quantity and quality (FAO 2006). It is the dimension of the supply side. The World Food Summit defined availability as "The amount of food that is present in a country or area through all forms of domestic production, imports, food stocks and food aid" (WFP 2009: 170) and thus this can be depending on government policies, the functioning of international and domestic markets, and the state of the physical economic infrastructure (Woller et al. 2013: 4). This thesis approaches the availability of food through the experience of the farmer. It includes both questions about the actual availability of food products on markets as the experience of high prices.

Food access refers to the resources individuals have to obtain food. It is defined by USAID (1992) as when: "Individuals have adequate assets or incomes to produce, purchase, or barter to obtain levels of appropriate foods needed to maintain consumption of an adequate diet/nutrition level." (Woller 2013: 4). This dimension is important within this thesis as the focus lies on the ability of the household to access foods out of the (increased) income from certified cocoa, but also on the possible negative impact certification has on food production which in turn can contribute to less food access. Food access is influenced by physical, economic/financial and socio-cultural elements. Food might be inaccessible because of inefficient or non-existent transport infrastructure, the lack of affordability of food products or when a consumer is prevented from accessing food by being a member of a particular social group or gender. Food access is in turn influenced by the aggregate availability of food and the prices in the market (ibid.: 4). Within this thesis access is measured by the changes in income of farmers and the way in which this contributes to food security, combined with the food production of farmers and the way in which this is impacted by certification.

Food utilization refers broadly to the actual food that is consumed by individuals; how it is stored, prepared, and consumed; and what nutritional benefits the individual derives from consumption (ibid.: 4). Food utilization depends on both socio-economic and biological circumstances. The socio-economic dimension refers to decisions related to what kind of food is consumed and how the food is

allocated within the household. Women and children are particularly more likely to suffer from food insecurity because of their relatively limited control over assets and relatively weak intra-household bargaining power. The biological dimension of food utilization refers to the ability of the body to transform food into energy for daily activities. Hence, food utilization requires a healthy diet, a healthy body and a healthy physical environment, including safe drinking water and hygienic sanitary conditions (ibid.: 4). Food utilization is not a big focus in this research as one household member is included as the representative of the entire household. Intra-household relations therefore are not measured and attention to calorie intake also was not in the scope of research. Utilization is only approached by questions of "diverse and balanced" meals and when looking at the type of food products consumed.

The World Food Summit also stated that *stability* must be present "at all times" in terms of availability, access and utilization for food security to exist. The household should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). This dimension is included in this thesis as cocoa is a seasonal crop which has two harvest periods a year, something that creates a relatively vulnerable position when cocoa is the only income a household lives from. This dimension is not directly included in the household survey, but is reflected on by the analysis of the vulnerability context.

2.1.2. The Sustainable Livelihood Approach

To obtain more knowledge on the food security status of cocoa farmers and where food security seems to be coming from, information on livelihood assets is needed. In fact, the close relation between food security and livelihood is a consistent theme (explicit or implied) in definitions of food security, as noted by Maxwell (1992: 22): "food security will be achieved when equitable growth ensures that the poor and vulnerable have sustainable livelihoods."

This thesis therefore makes use of the Sustainable Livelihood Approach. Within this SLA the achievement of food security is one sub-set of objectives and food is one of a whole range of factors which determine the poor to take decisions and to spread risk. It follows the principle that in times of famine people choose to go hungry in order to preserve their assets and future livelihoods (Maxwell & Smith 1992: 29). The SLA focuses on the bi-directional relation of livelihood security and food security.

Here, food production constitutes one of the most basic livelihood activities, and can be a critical source of food access, particularly for rural households. The household's ability to purchase food in the marketplace is another critical determinant of food access, which in turn depends on the household's ability to generate income (Woller 2013: 8). Livelihood activities, moreover, enable farmers to manage risks, cope with stresses or shocks and to build new assets, which are all important determinants of household food security. Livelihood security is in turn affected by food security. Households with poor food access and/or poor food utilization tend to suffer more from illness or other physical debilitations thereby impairing their labour productivity and/or their ability to engage in livelihood activities. This again points out the importance of reflecting on food security issues.

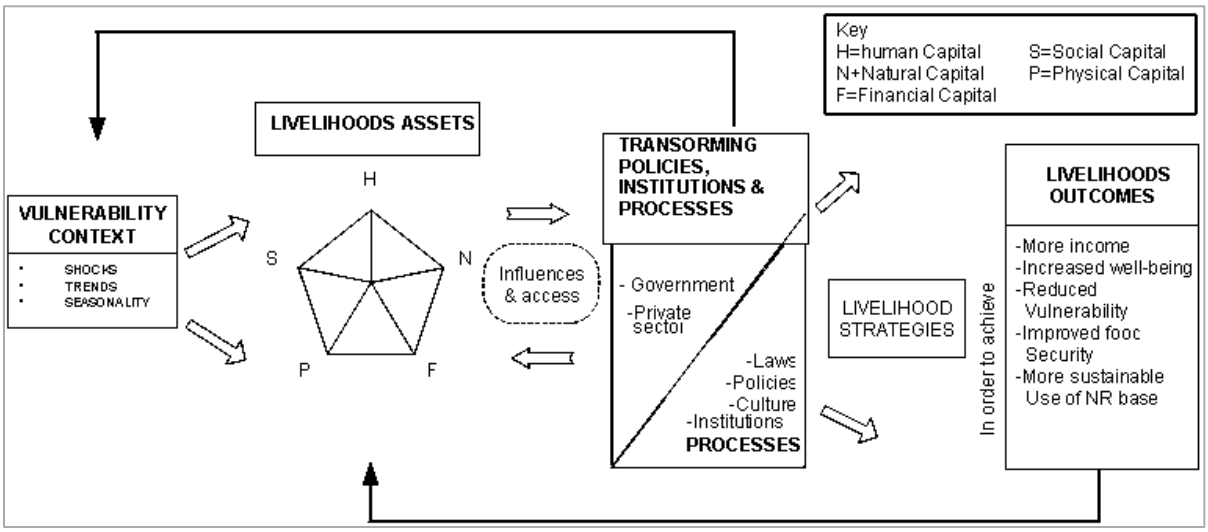
2.1.2.1. Livelihood assets

Conway and Robert Chambers argued in an International Development Studies discussion paper in 1991 that, in the case of sustainable rural livelihood, new concepts and analyses were needed for policy and practice. Working further on the definition of sustainable livelihood by the WCED panel in 1987 they defined sustainable livelihood as:

> "The capabilities, assets (stores resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels an in the short and long term" (Conway & Chambers 1991: 6).

In the paper Chambers and Conway offer a framework for development thinking that is both normative and practical. It presents a manageable way of understanding realities and sometimes conflicting issues faced by producers when constructing their livelihoods. Within the sustainable livelihoods approach different frameworks exist and this thesis makes use of the Sustainable Livelihoods Framework of the DFID. It looks at individuals with their assets available mainly categorized as: human capital, physical capital, social capital, financial capital and natural capital.

FIGURE 2.1. The Sustainable Livelihood Framework (DFID 1999:1)



This study did not aim at a comprehensive impact assessment, but a limited set of livelihood indicators were selected that could be compared to existing literature) and which were hypothesized to be most important to food security issues. The following assets are measured in the structural interviews with farmers:

1. Human capital (highest form of education, skills in cocoa farming, skills in food product farming)
2. Physical capital (infrastructure, housing, fertilizer/farming material)
3. Social capital (network)
4. Financial capital (cocoa yield, productivity, savings)
5. Natural capital (size of land used for cocoa, size of land used for food crops).

2.1.2.2. Livelihood strategies

Household livelihood activities generally fall under one of three categories: income generating activities, risk reduction strategies, and loss management strategies. It should be emphasized that household income generating activities are dynamic. Vulnerable households often engage in a continuously changing portfolio of income generating activities to spread risk or to take advantage of earning opportunities. Income generating activities in a single rural household might include food crop production, cash crop cultivation, day labour provided periodically by a household member, retail marketing of fruits and vegetables at the local market and remittances from an adult member of the

household working in the city (Woller 2013: 11). Farming households balance the benefits and risks of cash crop and food crop production in their cropping decisions to sustain their livelihood and food security. This can either be made up by the farmer themselves or risk management strategies can be provided by third parties (government or private sector) with crop or livestock insurance, or support policies (Achterbosch, Van Berkum & Meijerink 2014: 32).

By reflecting on the food security status of the cocoa farmers this thesis reflects on the question if farmers have food crops next to cocoa and in what way their income is diversified in general (having off-farm income, for example). Are cocoa farmers who have a diverse portfolio of income sources more food secure than farmers who rely solely on cocoa? As specialization into one crop could have positive outcomes as well. In literature it is found that farmers who are focused only on cocoa instead of alternative livelihoods were able to get higher returns from certification (Hoebink et al. 2014: 96), but it is also mentioned that the diversity of income is important for household food security and specifically the aspect of having off-farm income (Aidoo, Mensah and Tuffour 2013: 519).

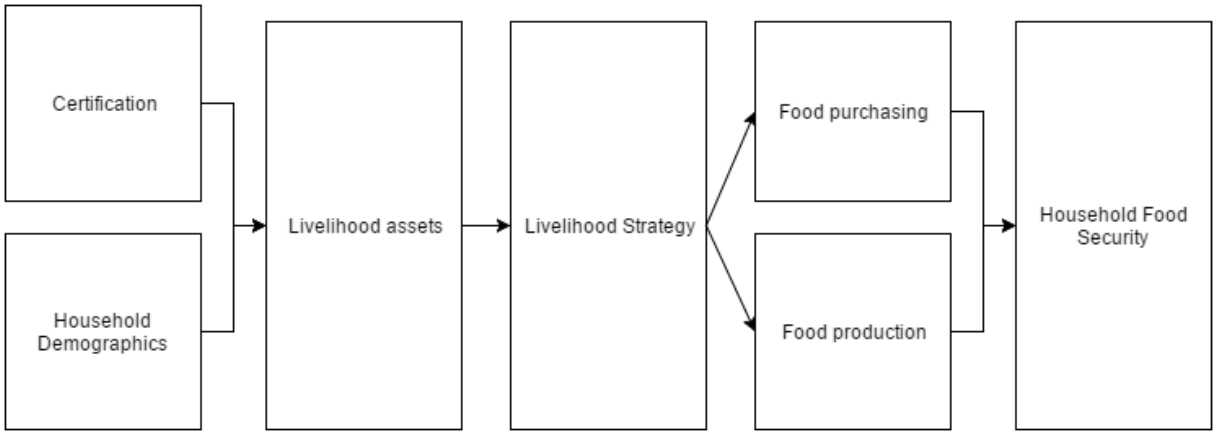
2.1.2.3. Vulnerability context

How well a household can draw on its assets to pursue its livelihood activities depends on the vulnerability context. Vulnerability refers to a household's susceptibility to a future acute loss and its capacity to maintain its livelihood (Woller 2013: 11). This is related to the dimension of stability in food security over time. The household's vulnerability context is influenced by factors both outside of and within its control. Those outside of its control include stresses and shocks as well as external structures and processes. Structures and processes include public and private sectors, civil society, laws, policies, culture, and social institutions that affect how households accumulate and utilize assets. In the case of cocoa farmers, stresses can be droughts or other climatic shocks and structures can be the lacking ability to get fertilizers and extension services for farming. In the case of the cocoa farmer, livelihood and food security already are cyclical in nature as the cocoa harvest has one main and one light season only (Kowurnu, Suleyman & Amegashie 2012: 30). Income diversification could therefore be important to create resiliency and to take away dependency.

2.1.3. Conceptual model

Zooming in on the subject of food security bound within the scope of this research, the following conceptual model is made (Figure 2.2.). This model clarifies the different concepts that are approached in this research. The assumption here is that the household demographics and the certification process together influence livelihood assets, which in turn influences the design of livelihood strategies. This leads to food purchasing and/or food production which supports the household in being food secure. The aim of this model is to see what kind of demographics, assets or strategies in turn are important for household food security. When comparing this to the way certification is creating changes, lessons can be learned on the impact of certification on food security. The different concepts therefore are supported by different variables and their operationalisation. These are listed in subchapter 3.2.

FIGURE 2.2. Conceptual Model



2.2. Cocoa: a value chain for sustainable livelihoods?

In the last months of 2014 a media scare shocked the world's chocolate lovers - of which there are quite a few - with the message that within a few years there might not be enough cocoa. To this day, once in a while a newspaper, radio broadcast or television program is asking the question: "Is the world running out of chocolate?" (The Cocoa Barometer 2015: 3). Though the world is not really running out of cocoa yet, the question of sustainability within the sector is reasonable. Young generations are not interested in cocoa farming, growing the crop is only possible in forest belts across the globe - which in some cases are threatened by deforestation – and in the meantime the demand for cocoa only increases. Together with the increasing occurrence of droughts by climate change this makes the livelihood of cocoa farmers insecure. Especially in West-Africa – where 70% of the world's cocoa is produced – farms together with their farmers are getting old and younger generations are not motivated to take over activities as poverty is rampant in West-Africa's cocoa fields (ibid.:3). In Côte d'Ivoire and Ghana 2 hectares of land are worth about $2.07 and $2.69 per day respectively. These values are just above the global poverty line of $1.90 per day. Considering that a typical rural household in these countries may exceed 5 people, the daily net income per person would be much lower than the global poverty line (UNCTAD 2015: 2).

Including smallholder farmers in international product chains was a key objective of trade liberalization reforms undertaken by producing countries in the 1980s and 1990s. Cocoa producers' income were expected to improve along with their linkages to international markets. However, the complexity of cocoa markets, characterized by transnational corporations who seek to achieve scale economies, have led to increased vertical and horizontal integration in the industry. As a result, a limited number of large trading and processing companies now control a significant share of global and local cocoa markets (UNCTAD 2015; Cocoa Barometer 2015). The three biggest cocoa trading and processing companies traded roughly 50 to 60 per cent of the world's cocoa production in 2013. In terms of cocoa processing, four transnational corporations now control more than 60 per cent of world cocoa grindings (UNCTAD 2015: 7). In theory, such a market structure can be cost effective and therefore ensure more benefits that are passed on to all stakeholders, but it currently creates little bargaining power for small buyers and smallholder producers (ibid.: 7) and creates unequal distribution of revenues. Not just the power differences in the value chain but also limited farmer organization and difficult logistics pose challenges for producing actors to benefit from the trade.

2.2.1. Cash crops and food security

The promotion of export-oriented cash crops has been based generally on the potential to contribute to agricultural productivity and small farmer incomes (Govereh & Jayne 2003: 39).[4] Hence, cash crop production also takes an integral part in strategies to improve development and food security, both at the national level and the level of farm households in developing countries. The idea is that cash crops create a spillover effect of productivity increases onto other crops. It works as a stimulus to agricultural innovation, by raising capital for agricultural investment and accelerating the build of institutions that enable further commercialization (Achterbosch, Van Berkum & Meijerink 2014: 7).

In a World Bank report in 1981, titled *Accelerating Development in Sub-Saharan Africa*, the production of cash crops in developing countries was recommended as they would increase agricultural growth and a synergy would occur with the production of other food crops (World Bank 1981: 63). Together with the Structural Adjustment Programs in the '80s, effort was put into liberalizing markets and including smallholder farmers in global trade (Achterbosch, Van Berkum & Meijerink 2014: 17). However, despite dramatic increases in crop yields over the past half century, rising and volatile food prices, fuelled by expensive agricultural inputs and climatic changes, are still pointing to chronic food insecurity in many parts of the world (Anderman et al. 2014:1), and despite these long-term efforts of development agencies and governments to promote cash cropping, there remains limited evidence documenting a relation between these crops and the food security of households cultivating them (ibid.: 1). The FAO states in a report *The State of Agricultural Commodity Markets (2015-2016)* that cash crop production can enable farmers and farm workers to increase their living standards and thus contributes to food security. It also adds that this might not be the case for every household, and that there can be cases in which cash crop production takes the place of food crops or that incomes might not increase (FAO 2015: 29). When we look at this farm household-level, the expectation is that cash cropping may have two very different effects on food production: either they compete for land and other resources and reduce food production (trade-off), or production is complementary and farmers with industrial crops also harvest more food crops (synergy).

2.2.2. UTZ and other private sustainability standards

Concerns about living conditions the farmer, child labour and environmental conservation by civil society organizations resulted in more attention to sustainable supply chain management (SSCG) and businesses started to work together with NGO's on this subject. One of the most used form of sustainable supply chain governance is the use of private sustainability standards. Retailers and manufacturers – in cooperation with certification bodies and NGOs or with their own standards – increasingly use sustainability-oriented standards and labels in their supply chain (Chiputwa et al. 2015: 1). In cocoa the biggest voluntary sustainability standards are Fairtrade, Organic, Rainforest Alliance and UTZ.[5] Except for Organic, which is regulated under national and European laws, all these private sustainability standards have been developed by private stakeholders in Western countries: Fairtrade and Rainforest Alliance are both initiated by civil society organizations, whereas UTZ is initiated by a retailer. As market shares of these certified products are growing, a whole set of

[4] "Cash crops" can be defined as both food and non-food crops. Mostly the raw product has to undergo considerable processing. Even if the end product is a food, this may not be readily available locally, or may be a specialized food that cannot contribute substantially to local diets, like cocoa (Wiggins, Henley & Keats 2015: 1). Currently, the term cash crops is used to differentiate marketed crops from subsistence crops, which are those used for livestock feed or household consumption. Though, subsistence crops often also play an income role as surpluses are regularly sold by farmers (Achterbosch, Van Berkum & Meijerink 2014: 17).

[5] In 2016 UTZ certified changed their name to UTZ as they imply to widen the scope beyond certification (UTZ, personal communication, 15th of April 2016).

literature is emerging on the contribution of these private sustainability standards to the conditions of the certified producers in the South (Dengerink 2014; Aidenvironment 2012).

The different certification schemes vary in their main focus or strategy for achieving a more sustainable cocoa production. Some of them focus on the creation of sustainable trade relations (e.g. Fairtrade), others focus on increasing productivity as a way to strengthen farmers' livelihood (e.g. UTZ Certified). Fairtrade differs in this sense from other schemes, as increases in productivity are not the main focus. Instead, Fairtrade aims for better and more just trade relations. UTZ and Rainforest Alliance are more explicit about their objective of increasing farmers' yields (ibid.: 16). Overall, it can be said that they seek improvements in farmers' livelihoods, focus on developing GAPs and on capacity building. Most of the time premiums are added when complying with the standards. This can either be translated into the bag price directly or go to community or group projects.

This research is focused on UTZ-certified cocoa farmers as the host organization Solidaridad mostly implements this scheme. On the farmers side the goal of UTZ is to let them implement good agricultural practices and manage their farms profitably with respect for people and planet, something that is visualised in the Theory of Change (ToC) of UTZ published this year. In this ToC requirements for producers – with the help of trainings – are a starting point. These are divided into better farming methods (i.e. bookkeeping), better working conditions (i.e. safe working conditions and worker rights), better care for the environment (i.e. waste and water management) and better care for next generations (i.e. safe living conditions and no child labour). These requirements will create 'better incomes', 'better crop' (meaning both productivity and quality), 'better environment' but also 'better life'. 'Better life' is mentioned as both the resilience of farms against shocks as a better standard of living for farmers. Farmers are supposed to have better housing, sanitation, water and food security due to certification (UTZ 2016). Thus, food security is mentioned in the activities of UTZ certification as an outcome resulting from both increased productivity and social, economic and environmental resilience (ibid.), but in reality this might be more complex. On the one hand, livelihoods can be improved with higher incomes, on the other hand the land used for food crops can decrease and the ability to purchase foods can be negatively influenced by costs of, for example, GAPs and school fees. This study zooms in on this matter specifically. It is important to mention that, currently, food security is not an inherent goal of UTZ certification and this thesis does not imply that this should be the case. It is vital however, to look closer at the impact of certification beyond internal objectives (Oosterveer et al. 2014: 220) and in this case to look at food security issues of cocoa farmers beyond assuming higher incomes are equal to food security.

2.2.3. Private sustainability standards: an impact debate

This thesis can be placed within the ongoing debate on the impact of voluntary sustainability standards. As of this moment, there seems to be no consensus on whether certification is positive for farmers or not. From a social, economic, and environmental perspective, there is very limited empirical evidence that certified farmers are better off than conventional farmers. In many cases, certified farmers receive higher prices, but sales prices alone are not a comprehensive indicator of livelihood impacts. For this reason, the impact of certification is currently a highly debated issue among scholars and professionals in the global sector.

Certification is considered by some as an adequate tool to promote sustainability in the cocoa value chain and to improve the livelihoods of cocoa farmers. Other actors involved seem to be less optimistic on the net benefits that certification offers at farm level and highlight the burden that it can bring in terms of required investments. Scientifically there is a growing body of literature about the impacts of standards on farmers, focusing mostly on coffee. There is only a limited amount of studies available for cocoa. As for now, it is assumed that conclusions from other commodities, in particular from coffee, also apply to a large extent to cocoa (KPMG 2013: 27).

Positive effects of certification mentioned are mostly the technical assistance and management skills, which increase productivity, quality and yield. Verkaart, for instance, found that UTZ affiliation in Uganda has contributed to higher productivity of certified coffee farmers as compared to non-certified farmers (Verkaart 2008: 3).

Negative effects of certification mentioned in literature are mostly the costs. Another much made point in literature is the lack of demand in certified products. Decline in demand forces certified producers to sell their products on the conventional market. Liu et al. (2004) cite the cases of coffee from Tanzania and cocoa from Ghana where only a low percentage of total production was sold on the Fairtrade market. Another downside of certification lies in the pre-certification situation as the certification process takes investment by the farmer, something that is easier for "better off" farmers. Also, certification schemes possibly choose farmers by their baseline situation as it is much easier to certify those farmers who are already 'on track' than those farmers that still have a long way to go until compliance. When certification schemes approach the relatively organized and well-off farmers, the more marginal producers – who need the certification the most – might be ignored (Dengerink 2013: 15).

Other than the impact on productivity and income there is limited and mixed evidence of increasing social capital (Aidenvironment 2012: 46) and there is only some positive evidence of increasing education levels with certification (ibid.: 189). Especially literature on more direct poverty-related impacts, like food security, is lacking (WWF 2010: 6).

2.2.4. Cocoa certification and food security: synergies or trade-offs?

When analysing the literature available on certification and food security some information can be found. Oosterveer et al. (2014) had some concern regarding the impact of global sustainability standards on food security. While voluntary certification schemes – their article focuses on Roundtable for Sustainable Palm Oil (RSPO) – are mostly oriented towards sustainability of primary production of the global commodities, they may have unintended and indirect impacts on food security as private certification schemes can entail supplementary costs for producers or divert attention from food production to crops with more attractive export markets (Oosterveer et al. 2014: 220). Mendez et al. (2010) did address food security in their research on certified coffee farming as a side note. They argue that although certified coffee producing households earned higher gross revenue, this did not translate to greater food security, possibly due to the higher production costs associated with certified production, or with the timing of payments for coffee production. Having more than one income source (i.e., not relying entirely on coffee sales for income) did, however, contribute to household food security, by providing a year- round income source. The main focus of their study was not on food security and therefore could not focus on the four different dimensions, but they state that this should be an important issue in the future.

As mentioned in the previous sub-chapter, talking about the impact of cocoa production or certification on food security enters many different debates in scientific literature. The use of export crops for development and food security as well as the impact of certification on livelihoods are much written about topics. This research hypothesizes that smallholder farmers participating in the certification programs of Solidaridad will be producing greater amounts of cacao and will have better food access because of higher family incomes with which they can purchase food. Also the bookkeeping of their farms can create a better managing of the household income. Though, relying on only food purchases, with markets that might not work (due to lack of infrastructure) and price fluctuations of food products, the farmers can be negatively affected. In Ghana, cocoa farmers declared that despite rising cocoa prices their real income decreased between 2010 in 2012 due to rising costs for food and non-food items (Cocoa Barometer 2014: 2). The case study of Anderman et al. (2014) on cash crop production (cocoa and palm oil) in the Ashanti region of Ghana identified this

trade-off as well. Households reported that local food prices had increased from 50% to 200% while prices for cocoa beans and oil palm fruit had remained relatively stable. Not only were food products expensive, they were also mentioned as lacking in quantities and varieties on markets (Anderman et al. 2014).

Another expected outcome is that cocoa producers grow food crops themselves. Coffee and Cocoa international magazine published an article that coined cocoa producers as the corner stone of food security as the mastered concepts of farmers are equally essential for producing food crops. And even though cocoa as a crop is reliable, often the few bags sold provide little income for a farm family and "certainly cannot feed either the farmer's family or West Africa's burgeoning population." Growing food crops next to cocoa is a necessity (C&CI 2012: 18) and, as mentioned by Mike Godfrey in a blog for the Sustainable Cocoa Initiative (2015), it is even essential for good cocoa cultivation. When cocoa trees are young, other crops like cassava and plantain can provide shade.

Though, literature provides mixed messages on growing food crops next to cocoa. In Cameroon cocoa farmers are found intercropping groundnuts, cassava, maize, cocoyam and plantain with cocoa (Kaziangi and Masters 2006: 20) but in Nigeria cocoa farmers were not able to grow food crops with their cocoa trees as the farming system were not well established to combine food crops with cocoa cultivation. Also in Ghana cocoa farmers argued to have difficulties combining food crops with their cocoa (Anderson et al. 2014:9). The main challenge here is that the shade provided for cocoa trees does not allow arables (food crops) to grow under it (Oluyole et al. 2009: 20). This can have consequences for the food security and nutritional status of the farming households. It is argued that in many cases, diversification into food crops on the farm is only done to satisfy the farmers' subsistence needs as they lack the capabilities to reach markets for these crops. In many producing countries, there is no advice available as to which crops to select for diversification. Farmers practice what has been handed down from generation to generation. There is no conscious investigation as to which products are demanded by markets in urban centres, or which crops would fetch a high price on the market, to maximize the resources available (CBWE 2010: 12).

Another spillover can be knowledge. The cocoa-focused trainings that farmers follow can create benefits for other farming activities: "A good cocoa farmer is a good farmer", Godfrey mentions (Sustainable Cocoa Initiative 2015). The same can be said regarding inputs. Fertilizer applied to an industrial crop in rotation might provide some residual nutrients to subsequent food crops. In addition, technologies and know-how for industrial crops may spill over to improve food crop yields as well (Wiggins, Henley & Keats 2015: 9).

Food utilization can be both positively as negatively influenced. Incomes from growing cocoa can allow households to buy more food, and more diverse food (ibid.: 9). But when smallholders rely on local markets only, their dietary diversity can decrease when locally available food items are limited (ibid.: 3).

In the case of stability, cocoa can expose growers to new risks, either from weather, pests and diseases. Certification might be providing higher incomes, making the farmer more able to save money for leaner times. At the same time, when not producing food crops, cocoa farmers are depending on de products in the market. Workers will be more depending on income for food, which might not be sufficient to live from (Wiggins, Henley & Keats 2015: 9).

3. METHODOLOGY

For this study UTZ-certified farmers were approached for structured interviews that asked the farmer about changes in their livelihood compared to the situation before certification. As this research is partly thought of by Solidaridad, the host organization, three of their project groups in the Ashanti Region were selected. Before the 63 farmers were approached with household surveys, four focus groups were held within the Ashanti region to get more information on the subject. Next to these farmers-level methods also stakeholders were interviewed to see what kind of challenges there are in the Ghanaian cocoa sector and in what way food security is part of their policy.

3.1. Methods

This research focuses on the household food security of cocoa farmers and the changes within this, and on the effort by stakeholders to approach food security issues within the cocoa sector. This thesis therefore makes use of a mixed-methods approach. It uses a combination of semi-structured stakeholder interviews (qualitative), focus groups with cocoa farming community members (qualitative) and structured interviews with a sample taken from three project groups of Solidaridad with a supportive household survey (quantitative).

3.1.1. Semi-structured interviews with major stakeholders

To get an overview of the major challenges and developments in the Ghanaian cocoa sector - specifically in relation to food security issues - semi-structured interviews were held with 10 experts and managers from NGO's, governmental agencies, research institutes and companies working within the cocoa sector. For these interviews there was somewhat of a fixed questionnaire, but space was created to go into more detail on certain aspects. In content no interview was the same, as every party had a different expertise. One stakeholder could be approached more on the context of Ghana and the other stakeholder could be approached more on the aspect of certification. Some stakeholders were asked more about food security, and the possible effort made into including food security into cocoa policies, than others. The interviews were mostly conducted in offices of stakeholders and recorded and transcribed. Before conducting the interviews, the purpose of the interview was clearly conveyed towards the stakeholder. In Table 3.2. every stakeholder and the representative with whom the interview was done is listed. Also, a few of the basic questions used in the interviews can be found in Annex I.

TABLE 3.2 Stakeholder interviews listed

Stakeholder	**Representative**	**Stakeholder**	**Representative**
Dutch Embassy	First Secretary Food Security & Agriculture	Kuapa Kokoo (Privately owned LBC)	Two Communication Officers
Kokoo Paa (Farmers Group)	IMS Manager	Ghana Cocoa Board	Head of Research
Produce Buying Company (State owned LBC)	Nkawie District Manager	World Cocoa Foundation	Technical Advisor
UTZ	Country representative Ghana / Nigeria	IITA	Regional Cocoa Agroforester
Solidaridad	CORIP Programme manager	Cargill	Assistant Sustainability Officer

3.1.2. Focus Groups

Before constructing the household survey, four focus group discussions were held in the Ashanti region. The research was piloted with the use of four focus group discussions to get more knowledge of the food security status of cocoa farmers in the Ashanti Area. The focus group discussions were planned to be held with groups of about 10 farmers, mixed groups of women and men. Because more farmers showed up than scheduled the total amount of farmers were more than 10. The communities approached were Mentukwaa (7 males, 4 females), Mmofra (9 males, 2 females), Biemso (4 males, 7 females) and Fedeyeya (6 males, 8 females). The discussion points varied from the way in which a cocoa farmer provides food for the household to possible challenges in the area regarding food and also regarding livelihoods strategies in general. The focus group discussions provided valuable information about food access and availability especially but also on the vulnerability context surrounding the farmers. The broad questions of the focus groups can be found in Annex II.

IMAGE 3.1 Focus group discussion

3.1.3. Structured interviews with farmers: The household survey

After the Focus Group Discussions a carefully designed household survey was applied to three project groups of Solidaridad. The survey was conducted with the household head or the spouse, who represented the entire household. Household is defined within this study as the amount of people that eat from the same pot daily.

For all three communities, different translators were used. This was due to the remote areas in which the project groups were located and to make it impossible to travel there in a short period of time. The translators were mostly working for Solidaridad at the regional LBC's or farmers groups in the approached communities. It therefore was important to inform the translators carefully so that the questions were asked in the same ways and to exclude bias as much as possible. Though, still the farmers can answer the question in a certain way as they are approached with a translator they indirectly work for.

The questions in the household survey were mainly based on questions of livelihoods assets and the livelihood strategy of diversification as they were hypothesized to contribute to food production and purchasing. Additional to this, two elements were included from the USDA Household Food Security Module. This method is based on the idea that the experience of food insecurity causes

predictable reactions and responses that can be captured and quantified through a survey. It includes among other things the perceptions that food is of insufficient quantity or quality and reflects on reductions of food intake (USDA 2012: 1). This questionnaire also was used for rural households in Ghana by Aidoo, Mensah and Tuffour (2013). The final questionnaire of this study can be found in Annex III.

IMAGE 3.2: Conducting the household survey

3.2. The operationalization of variables

For the structured interviews, the major bulk of questions compared the pre-certification situation (in 2010, 2012 and 2013) with the current situation in 2016. In table 3.3 - table 3.13 an overview is given of all variables, including the way in which they were operationalized and the question used in the questionnaire. The different variables are meant to first gain knowledge on the concepts of household characteristics, livelihood assets, and livelihood strategies. Then on food purchasing and food production and finally on the way in which the household perceives the food security situation. In the first part of the data analysis the concepts will be compared between the three project groups of Solidaridad and in the second part correlations between these concepts are analyzed. The household survey was meant to gain as much information on the topic in a small amount of time, though also some open questions were added to the list (see Annex II for the questionnaire).

TABLE 3.3 Operationalization: Community / Project group

Variable	Operationalization	Question
Community	1 = Ampnaponso/ 2 = Atwedie / 3 = Mpasatia	Intro

The aspect of the different communities in this research is an independent variable that is compared with livelihood assets, strategies and the outcome of food security. The three project groups and communities approached in this research were all certified in different years (Aponaponso 6 years, Atwedie 3 years and Mpasatia 4 years) which is important to keep in mind.

TABLE 3.4 Operationalization: Household Characteristics

Variable	Operationalization	Question
Age household head or spouse	Age in years	7
Gender household head	1 = Male / 2 = Female	1
Highest form of education attended	1 = No form of formal education / 2 = Primary School / 3 = Middle School / 4 = Senior Secondary School (SSS) / 5 = Post – Secondary School (PSS)	2
Position to land	1 = Land owner / 2 = Family land / 3 = Abunu[6] / 4 = Abusa[7]	4
Amount of household members	Number of members	10

It is important to know both the household characteristics and some characteristics of the head of the household or spouse as they make important decisions on livelihood strategies and the way in which food is accessed. The household heads and spouses used in this research are seen as household representatives.

The age of the household head is expected to have a negative relation with food security as older household heads are less capable of working and creating an income (Kowornu et al. 2012; Oluyole et al. 2009). Though, in literature there are also findings of households being more food secure when the household head is older (Arene and Anyaji 2010: 10).

The gender of the household head can be important as women are the household head in Ghanaian families when the husband has passed away. This can provide an insecure situation as the woman is left with much of the work, but at the same time it is also proven in literature that when women manage the household income the food security mostly gets positively impacted. Also female headed households tend to be older and have fewer years of education than male heads of household (FAO 2012: 19).

Education in literature is pointed out as an important positive variable for food security (Kuwornu et al. 2012: 26). Asamoah et al. (2013) argue for example that education 'no doubt' has implications on efficient application of pesticides for diseases and pest management of cocoa for example (Asamoah et al. 2013: 264).

The position of the household towards the land can be influential on food security issues as forms of sharecropping generally create less income than when the farmer owns the land he's harvesting on (Kuwornu et al. 2012: 35).

The household size can also be an important characteristic for food security, as the bigger the household the more mouths there are to feed and thus creating more food insecurity (Oluyole 2009: 11).

TABLE 3.5 Operationalization: Financial assets

Variable	Operationalization	Question
Amount of cocoa bags sold	Measured in 65 kg bags	15
Change of amount of bags	1 = More / 2 = The Same /3 = Less	16
Productivity	Measured in bags per acre	(calculated)
Change of productivity	1 = More / 2 = The Same /3 = Less	-
Change in total income (cocoa + other)	More / The Same / Less	14
Main costs	1 = School fees / 2 = Farming costs /3 = Social costs[8] / 4 = Food purchases / 5 = Medical costs	22

[6] Abunu is a Ghanaian tenancy arrangement in which the proceeds are divided into two between the farm owner and the tenant (Aneani et al. 2011: 4281)

[7] Abusa is a Ghanaian tenancy arrangement in which the proceeds are divided into three with two parts allocated to the farm owner and one part to the tenant (ibid.: 4281).

[8] 'Social costs' is used as an overarching term in this research for the costs for funerals, weddings and other expenses.

Changes in costs	1 = More / 2 = The Same /3 = Less	21
Access to savings	1 = No form of savings / 2 = Savings at home / 2 = Susu account[9] / 3 = Bank savings	20

The analysis of the financial assets was done in the first place with the operationalization of the amount of cocoa bags sold and the productivity of the farmer. This because yield and productivity are seen as the main focus points of certification and are expected to have positive outcomes on food security (Kuwornu et al. 2012; Olujole 2009). Though also the total difference in income was asked as this might be different from the cocoa income. Costs were included into the survey because the increasing costs of school fees and farming materials might be a negative impact (trade-off) of certification on food security. Another variable of income as measured with this survey is the access to a savings account. The access to a savings account can have a positive effect on the stability of income in the household as money can be saved for leaner times.

TABLE 3.6 Operationalization: Physical assets

Variable	**Operationalization**	**Survey Question**
Farming materials (i.e. cutlass)	1 = Yes / 2 = No	17
Seedlings and pods	1 = Yes / 2 = No	17
Pesticides	1 = Yes / 2 = No	17
Fertilizer	1 = Yes / 2 = No	17
Fungicides	1 = Yes / 2 = No	17
Change in inputs for cocoa	1 = More / 2 = The Same /3 = Less	18
Change inputs for food crops	1 = More / 2 = The Same /3 = Less	19

The physical assets that were included in this research were mainly the farming inputs used in farming. This is both asked for the cocoa crops as the food crops to gain knowledge on the possible spillovers of inputs.

TABLE 3.7 Operationalization: Natural assets

Variable	**Operationalization**	**Survey Question**
Size of land used for cocoa	Land size in acres	27/28
Size of land used for food crops	Land size in acres	39/30
Food crop / Cocoa ratio	Size of land for food crop measured against the total land	(calculated)

Natural capital was part of the household survey with the land size available for cocoa and the land size available for food crops and the way in which this changed with certification. For the analysis a food crop ratio was calculated to see if the amount of land used for food crops – compared to the total amount of land – influenced livelihood and food security issues.

TABLE 3.8 Operationalization: Social assets

Variable	**Operationalization**	**Survey Question**
Change in network	Open question	24

Social capital was not a big part of this research because it needs quite a lot of effort to quantify social aspects like the intra-household relations within a household. Though, one question on the changes in network and social relations was asked and the respondent was asked about the importance of social capital in the household food security.

[9] Susu is an informal way of collecting and saving money through a savings club or partnership.

TABLE 3.9 Operationalization: Human assets

Variable	Operationalization	Survey Question
Skills in cocoa farming	1 = More / 2 = The Same /3 = Less	25
Skills in food crop farming	1 = More / 2 = The Same /3 = Less	26

The approach regarding human assets in this study is mainly based on the skills (GAPs) for cocoa production and the way in which this possibly spills over onto food production.

TABLE 3.10 Operationalization: Livelihood strategies

Variable	Operationalization	Survey Question
Amount of income sources next to cocoa	1 / 2 / 3 / 4	13
Food crop income	1 = Yes / 2 = No	13
Off-farm income	1 = Yes / 2 = No	13
Livestock	1 = Yes / 2 = No	13
Other cash crop income	1 = Yes / 2 = No	13
Remittances	1 = Yes / 2 = No	13

Livelihood strategies in this study were approached with the variables of having certain types of income (e.g. off-farm, livestock) but also the amount of income sources next to cocoa. It is expected that having off-farm income can improve food security as it can earn extra money next to farming, but at the same time the wage can also be limited and therefore time could be better spent on farming (Kowornu et al. 2012: 35).

TABLE 3.11 Operationalization: Food production

Variable	Operationalization	Survey Question
Amount of food crops	0 / 1 / 2 / 3 / 4	31
Type of food crops	Multiple answers possible	31
Change in growing food crops	1 = More / 2 = The Same /3 = Less	31

Out of household assets and strategies both food production and food consumption follows. This thesis looks at this behavior. For the food production abilities of the household both the amount of food crops and the types of food crops were included in the survey. This because the types of food crops can be important for the utilization dimension of food security.

TABLE 3.12 Operationalization: Food purchasing

Variable	Operationalization	Survey Question
Type of food crops	Multiple answers possible	31
Where food is bought	1 = Local Market / 2 = Market in the city / 3 = Local market and market in the city[10] / 4 = Small shops in community	35
Difficulty to reach markets	1 = Difficult (further asked why) / 2 = Not difficult	34
Change in food prices	1 = More / 2 = The Same /3 = Less	
Coping mechanism	1 = I don't buy some food products / 3 = I buy less quantities /3 = I always buy what I need / 4 = I don't buy food crops in general	32
Change in buying food crops	1 = More / 2 = The Same /3 = Less	31

[10] After many farmers argued to combine the market in the city for the long-term food purchases and the local market for the fresh goods, this option was added.

For food purchasing the types of food crops were measured, but also variables on the perception of availability of food were included. For example the difficulties to reach food markets and the coping mechanism that households apply to overcome high food prices.

TABLE 3.13 Operationalization: Assessment of food security

Variable	Operationalization	Survey Question
Do you or another household member every skip meals or skip the size of a meal?	1 = Almost every month / 2 = Some months but not every month / 3 - Only one or two months / 4 = We never skip a meal or cut the size of a meal	39/40
Which of these statements reflects the situation in your household?	1 = Often we don't have enough food to eat / 2 = Sometimes we don't have enough food to eat / 3 = We have enough food to eat but not always the kind of food we want / 4 = We always have enough food and the kind of food we want	40/41

The last part of the questionnaire consisted of food security questions based on the USDA Food Security scale. These are ways in which the difficult and multidimensional aspect of food security could be quantified. The first question tackles the aspect of skipping meals or cutting the size of meals by households. The second one focuses both on the right amount of food and on the types of food provided to the household.

3.3. The research area

The project groups that are approached with the household survey are situated in the Ashanti Region. Cocoa farmers in Ashanti Region are reported to have relatively large farm sizes, high yields and high rates of pesticide and fertilizer application compared to other cocoa-producing regions (Hainmueller et al. 2011: 25). The main Licensed Buying Companies (LBC's) in this region are the Produce Buying Company (PBC), Kuapa Kokoo and Adwumapa Buyers. In the map below the different communities of the project groups are shown. The red line shows the area of the Ashanti Region and within the three communities approached for this research are noted.

MAP 1 Ashanti Region and the approached communities

3.3.1. The three project groups

Solidaridad uses two types of models for Ghanaian cocoa farmers: the LBC-model and the Producer Group model. Both are included in this research.

Two project groups of the 'LBC model' were selected. These were certified via PBC, the biggest and only state-owned LBC in Ghana (it used to be inherent to Cocobod). The certification was requested by the French cocoa trading company Touton which has been responsible for the financing of the process. The collaboration of Touton, PBC and Solidaridad in certifying farmers started four years ago. The field officers train farmers in Good Agricultural Practices in cocoa farming, protection of the environment, social responsiveness, health and safety, record-keeping and professionalization of farming activities. The Touton project covers 277 in different years (2012 and 2013). Atwedie is located close to Kononго, on the eastern side of Kumasi. Mpasatia is located west from Kumasi, about half an hour drive on dirt roads from Atwima (where the District PBC is located).

The second model used is the Producer Group model. In this model, Solidaridad collaborates with farmers' organizations, in this case Kokoo Paa. Kokoo Paa has been assisted by Solidaridad West Africa and supported by cocoa trader Ferrero, processor Noble Group and the Licensed Buying Company Federated Commodities (FEDCO) in gaining UTZ-certification for farmers. Which means that farmers sell their cocoa to FEDCO, who delivers the cocoa to the Cocoa Marketing Board (CMC) after which it is shipped to Europe for the Swiss commodity trader Noble Resources, part of the Noble Group, a multinational supply chain manager of agricultural and energy products. Kokoo Pa has 7269 members in total and they are all UTZ-certified. As the demand for certified cocoa can still be low for the farmers group, Kokoo Pa is looking for another cocoa buyer in the future (Kokoo Pa, personal communication, 29th of February 2016). With this model it is anticipated that an exit strategy is developed to ensure that the producer group becomes independent after its capacity has been built (Waarts et al. 2013: 26), something that indeed happened in the case of Kokoo Pa. The community approached for this model is Aponaponso which is located near Mankranzo, the capital of Ahafo Ano South District, but it can only be reached with a dirt road branching of from the main road to Tepa.

Regardless of the type of model, the process towards certification is comparable for all participating farmers (Waarts et al. 2013: 25). There is a difference in certificate ownership however. In the Producer Group model, the farmer group is the owner of the certificate and the group can decide to which LBC they sell their cocoa. Hence in the Producer Group model, the farmers are more independent. Second, in the Producer Group model, activities start on a small scale and build up over time, and the training activities are more development driven (ibid.: 25). Kokoo Pa for example implemented an alternative livelihoods program (specifically for plantain and cassava growing) into the trainings. The LBC model is more commercially focused with high interest on large scale implementation in order to get large volumes of certified cocoa for sale in a short time span, leading to the LBC model to target a lot more farmers from the onset than the Producer Group model. This thesis partly serves as an evaluation of the three project groups and it should be interesting to see if there is a difference between the two models. As every certified group per community contained about 60 farmers, around the 20 farmers were approached for the survey. Sometimes more people showed up than planned and these extra cases are also added in the sample. In table 14 the sample of the communities are listed.

TABLE 3.14 Project groups of Solidaridad and the applied samples

Project group	Community	Total	Sample
Kokoo Pa	Aponaponso (Kwaebibirem District)	71	23
Touton	Mpasatia (Nkawie district)	60	20
Touton	Atwedie (Asante-Akim South District)	50	20

4. COCOA & FOOD SECURITY

At independence, Ghana was promised a bright future. Its economy was one of the strongest on the continent: rich in land, gold and forests and well-established as the world's leading cocoa producer. Already one of Ghana's main exports, cocoa has been central to the country's debates on development, reforms, and poverty alleviation strategies. Despite these assets, subsequent economic growth was slow, and even reversed by the 1970s. Major reforms were carried out in the 1980s; economic growth resumed and has been sustained. At the same time, Ghana has become one of the most politically stable countries in Africa, with elections regularly leading to changes in leadership.

The country has been emerging as an African success story: it was the first country on the continent to achieve the first Millennium Development Goal (MDG) of halving its national poverty rate against its 1990 level and it reached the middle-income status as classified by the World Bank in 2011 (UNDP 2015: 7). Since the adoption of the MDGs, Ghana has mainstreamed them into its successive development policy frameworks, namely the Ghana Poverty Reduction Strategy (GPRS I) for 2003- 2005; the Growth and Poverty Reduction Strategy (GPRS II) for 2006-2009, the Ghana Shared Growth and Development Agenda (GSGDA I) for 2010-2013 and the GSGDA II for 2014-2017. In line with the Millennium Development Goals (MDGs) set in 2000 Ghana successfully achieved most of the indicators specified in 4 out of the 8 goals. The four goals Ghana had largely achieved by 2015 were to eradicate extreme poverty and hunger, to achieve universal primary education, to reduce child mortality, and to develop a global partnership for development. In the UNDP evaluation report in 2015 the achievements of Ghana are hailed but also downsides are mentioned. The expansion of the economy has not translated into productive and decent employment and eradication of income inequality. Rural poverty is much higher than in the city: 40 % of rural people are living below the poverty line (ibid.: 7).

4.1. Ghana and food security

Ghana is considered a success story in Africa for its robust economic growth over the past three decades – GDP grew by an average of 4.5 percent a year since 1983 and by 14 percent in 2011 with the help of cash crops together with domestic food production, promoted by policies, institutional reforms and investments under the 1991–2000 Medium-Term Agricultural Development Programme (FAO, WFP & IFAD 2015: 19).

The Millennium Development Goals report as published by the UNDP (2015) states that Ghana is food secure because domestic production of selected staple food crops continues to exceed national demand. Production of almost all the selected domestic staples have increased consistently. Cassava and yam recorded the highest surplus, estimated at about 43 percent and 32 percent of supply respectively. However, demand for rice continues to exceed total production, creating a deficit (UNDP 2015: 16). The self-sufficiency ratios for rice (50%), fish (60%) and meat (30%) are low (Dzanku & Sarpong 2011: 191) and also in other cereals (maize, millet, sorghum) Ghana is not self-sufficient even though these are the most consumed food products. Also the seasonal food insecurity is widespread in Ghana, due to the almost total dependence on rain-fed agriculture and weak postharvest capacities (ibid.: 191). Ghana is paying the price for neglecting food crop productivity as high food prices are fueling inflation (Wolter 2008: 1). Especially during the global financial crisis the food prices in the country increased, making an extra 18% of the population having too little income for the minimum food basket as a result (WFP 2009: 11). Therefore, there is evidence available that the economy of Ghana on a macro level is doing well, but equally worth noting are the high food prices, the changing climatic patterns and the continuous deforestation (Kuwornu et al. 2012: 26)

Also, despite these achievements, farming households in Ghana are recognized as most affected by poverty with almost half of them (46%) falling below the poverty line (WFP 2009: 29) and ironically also smallholder farming households are most affected in terms of food insecurity (Kowornu et al. 2012: 26). So, when only looking at food supply issues of food access should not be forgotten, something which is especially relevant in a rural context. It is important to mention that in Ghana considerable differences exist in national poverty measurements and nutrition at the regional level. Ghana's GDP has increased rapidly and poverty has declined, but less progress has been made in reducing undernutrition in rural areas especially. Overall in Ghana, in rural area's people are up to four times more likely to live below the poverty line than people in urban area's. Although the proportion of children under five years of age which are underweight has been nearly halved since 1993–95, less progress has been made in reducing prevalence of stunting, still about 23 percent of children under five years of age were stunted in 2011 (FAO 2013: 32). [11]

The State of Food Insecurity in the World-report of 2015 mentions that increased food production and more competitiveness of rural households with higher incomes are essential to food security issues. Productivity growth in small family farms contributes to more inclusive growth, not only by reducing the prices of staple foods but also by improving access to food for these involved farmers (FAO, WFP & IFAD 2015: 19). In Ghana the food crop production remains below potential. Agriculture is largely rain-fed as traditional systems of farming still prevail in most parts of the country and Ghana's irrigation potential remains almost untapped. Poor technology and small production units prohibit economies of scale and lead to sub-optimal yields and the sector suffers from public underinvestment. Oxfam Novib published a monitoring report on investments in agriculture and food security in Ghana stating that the main focus on non-poor smallholder producers in the cocoa sector is leaving out the poor farmers in other crops and livestock, which creates the most growth. For this reason, the goal of reducing inequality and attainment of food self-sufficiency could become a major challenge for Ghana Oxfam states (Oxfam Novib 2012: 3). Therefore, the support for export crops should not be at the expense of attention to food crops, as the rural population is depending on food crop production mostly (Chamberlin et al. 2007: 2). Multiple studies suggest that the government of Ghana should pay more attention to food crops, as opposed to exclusively promoting export crops, since the production of food crops is vital for poverty reduction as well as for reducing the north-south divide of the Ghanaian economy (UNDP 2015; Wolter 2008; Chamberlin 2007). The government through the Ministry of Food and Agriculture (MoFa) has been embarking on various interventions to revert the situation with the Food and Agriculture Development Strategy (FASDEP II) with which food security-enhancing commodities were targeted and agricultural income diversification was facilitated. [12] With the Ghana Export Promotion Council in 1963 the diversification into other crops and livestock by farmers was promoted (Asamoah et al. 2011: 4277). Notable among the interventions are fertilizer subsidies which allow farmers to access fertilizer for free or at reduced prices and also provision of livestock to selected farmers to serve as out growers. Until now the government has put various incentives (e.g. tax reduction) in place to promote food processing but the response has been low as major bottlenecks such as the lack of infrastructure and credit remain (Wolter 2008: 15). Though the interventions are a good initiative, in implementation there are many challenges. For instance, the fertilizers come too late, sometimes several months after farmers have planted their crops (Kuwornu et al. 2012: 30).

[11] Stunting refers to children being too short for their age as result of poor diet and poor health circumstances (De Vries et al. 2014: 4).

[12] Diversification can mean both adding another crop on the farm and investing in livestock as engaging in off- and non-farm activities (Anchirinah, Owusu-Ansah & Asamoah 2011: 4278)

4.2. The role of the Ghana Cocoa Board

Cocoa takes up an important part in the income of the government of Ghana, but much has changed in the way this is managed. From 1947, Ghana's government started to tightly control the cocoa trade with the implementation of the Ghana Marketing Board. In the 1990s, this control slightly loosened at the behest of the World Bank and International Monetary Fund in order to provide loans for "structural adjustments" and liberalisation soon followed (The Borgen Project 2016). After the 1992 elections, the reform of board gained momentum making the staff reduce from over 130,000 in the early 1980s to 10,400 in 1995 and just over 5,100 staff by 2003. Since then the private Licensed Buying Companies (LBCs) were set up to compete with the state-owned Produce Buying Company (PBC) (ibid.).

Ghana is the only cocoa producing country in the region that has only partly liberalized its marketing and pricing system; the government still plays a governing role in the sector (Laven 2010: 220). Even though currently gold has overtaken cocoa as the country's main foreign exchange earner in absolute terms, foreign exchange from cocoa is more accessible to the government; as foreign exchange from gold is largely foreign-controlled and often remitted abroad, while cocoa revenues flow through government channels (Williams 2009: 9). By taking this role the state functions both as 'balancer' as well as 'bottleneck'. It protects farmers from price-fluctuations providing them with a stable income and reinvesting part of the income back into the cocoa sector (ibid.:220). Cocobod in also guarantees international buyers the supply of premium quality beans. But a downside of the pricing system is that it does not provide farmers with incentives to produce superior quality of cocoa beans. It also does not allow negotiation for better prices. This is mentioned in a report by the Overseas Development Institute (Vigneri & Santos 2007: 2). The state can even work as a hinderer of development with lack of transparency on how the state calculates and distributes the costs, benefits and risks involved in cocoa production and marketing (Laven 2010: 197). Currently 30 percent of the cocoa price is taken by Cocobod and there is no transparent communication on where this money is used for. The main issue here is to determine an optimal level of taxation which will contribute to supporting national development policies, without excessively eroding small farmers' incomes (UNCTAD 2015: 30). Currently is seems that cocoa is gaining much income for the economy of Ghana and still not much seems to be invested in the farmers. The high amount of taxes Cocobod currently is taking from the cocoa export price can be regarded as high as cocoa farmers don't see much coming back to them in return. The head of research of Cocobod in a personal interview even criticized this:

> "Currently Cocobod builds roads, hospitals and boreholes, but not every farmer benefits from this. We as Cocobod now changed our liberalized position back and take too much money from the cocoa farmers. I think it is better to just give the money to the farmer and with the high incomes in the cocoa producing area's roads and hospitals will follow." (Cocobod, personal communication, 5th of May 2016).

4.3. Challenges in the Ghanaian Cocoa Sector

One major challenge in the Ghanaian cocoa sector much mentioned during the fieldwork of this research is climate change. There is a dire need for climate change adaptation in Ghana with more shaded production. Given the low incomes of most farmers and the low motivation to further invest, most farmers are not able to adopt recommended practices to mitigate the impacts of climate change and their high level of vulnerability to climate change effects (Anim-Kwapong & Frimpong 2004: 4). Adaption methods can be diversified cropping - incorporating cash crops and food crops to increase the resilience of these systems -, the use of drought resistant crop varieties and the implementation of irrigation schemes. Also using bigger shade trees can keep trees coo. Though, the objective of using

agroforestry should consider using species that satisfy the household needs for home consumption and opportunities for market commercialization (CBWE 2012: 5).

Another major challenge in Ghana is still productivity, especially due to the aging of farms and the lack of investments into the replanting of trees and the application of fertilizers. Something which in turn comes out of the little revenue farmers make out of cocoa to date. Within the cocoa sector this issue is mainly mentioned as the quest for "the entrepreneurial farmer". The idea is that in order to create more productivity and more sustainable livelihoods, the farmer needs to approach cocoa farming more as a business case. Farmers often inherit there farm from family members and do not replant or invest in new trees. Currently this business mind by farmer is also intervened by the offering of free inputs by Cocobod. Fertilizers are promoted to be delivered to farmers for free but many times they don't reach the farms on time, never reach them at all (Dreppeler, Fromm & Aidoo 2015: 1) or the quantity is not enough (Cocobod, personal communication, 5th of May 2016). This makes farmers incentivized to invest in inputs. Also the quality of the inputs on the markets that are available to farmers is low:

> "Fertilizers in Ghana are the same as medicine in this country. They are counterfeit." (Solidaridad West Africa, personal communication, 5th of April 2016).

A new initiative that tries to resolve this problem is *The Cocoa Rehabilitation and Intensification Programme*, shortly: CORIP (2013-2017) which is organized by the Dutch Embassy in Ghana, Solidardiad West Africa and collaborating partners. [13] The main strategy of CORIP is the establishment and operation of cocoa Rural Service Centres (RSC) across the cocoa belt of Ghana. Six initial private sector cocoa companies participate and co-fund CORIP and they are therefore also directly involved in the implementation of the cocoa RSCs. [14] With the contribution of these companies, the RSC's in different regions can be organized in different ways. In an interview with Solidaridad West Africa the possibility of supporting services for food crop production was coined. The difficulty here is however that the RSC's are commercial centres and therefore the project has to take this with care:

> "Some companies want to sell vegetable seeds at the RRC's, but we are cautious. We don't want the commercial part to overshadow the support of farmers." Solidaridad West Africa, personal communication, 5th of April 2016).

4.4. Cocoa in Ghana: are food security issues part of the scope?

Stakeholders in the cocoa sector of Ghana have a focus on stimulating cocoa production with better livelihoods result. Though the keeping of land for food crops is advised, farmers are not obliged to keep food crops growing when participating in certification or similar programs (Kuapa Kokoo, personal communication, 11th of April; Solidaridad West Africa, personal communication, 5th of April 2016). The Cocoa Livelihood Program of the WCF works from this same assumption but adds to this, that the focus on increased productivity in turn creates efficient use of land and on the pieces that a farmer does not use, the production of food crops is stimulated:

> "It is part of our focus that land is used efficiently. Pieces of unused farms therefore are stimulated for food crops like plantain and vegetables." (WCF, personal communication, 9th of May, 2016).

[13] The International Fertilizer Development Center (IFDC), Ghana Cocobod/Cocoa Research Institute of Ghana (CRIG) and The Dutch Sustainable Trade Initiative (IDH).
[14] Cargill, Olam, Mondelez, Armajaro, Touton and ADM

Next to this, also more and more direct attention is made to other issues as food security. The assumption is now that some issues that need a more holistic approach than just increasing cocoa production. First it is important to mention that UTZ during this study extended their aims and even changed their name. The name changed from UTZ certified to just 'UTZ' as the goal is now to go 'beyond certification' with an increased focus on climate change adaptation, alternative livelihoods and living wage (UTZ, personal communication, 15th of April 2016). In the personal interview with the country representative in Ghana no implications could be given on the direct approach on food security yet, but these are steps in the right direction.

There are programs and projects within certification schemes or from companies' own programs that are focusing on enhancing more than just cocoa production, but also non-cocoa incomes and food crop production. Cargill – who uses both UTZ and Fairtrade certification, based on the market - pointed out that regarding food security a holistic approach is needed. Not only the productivity and the increased income of farmers is necessary but also Community Livelihood Development with empowering the position of women and increasing education on nutrition. For this reason separate projects are implemented by Cargill to work on these topics (Cargill, personal communication, 10th of May 2016).

5. RESULTS & ANALYSIS

The results of the household survey are analyzed as divided into the three project groups. The empirical results of the questionnaire are compared with both findings in literature as lessons learned from the focus groups.

Following these first hand results of the household survey also SPSS was used to analyse the associations between the different variables. With the help of SPSS and specifically the use of binary correlation on ordinal scaled variables relations between them were analyzed with the Spearman's rho-coefficient. The significance of level 0,1; 0,05 and 0,001 were taken to reject the null hypothesis, as this study for now is mainly explorative. [15] From this data no direct measures or actions are taken, for this more research with a larger sample and in combination with non-certified farmers. Though, still the 0,1 level should be taken with care. It is important to note that correlations never reflect the direct effect of one variable to another, but merely provides information of related variables. Thus the Spearman's rho-coefficient can be both positive, meaning that the variables move upwards or downwards together, as negative, meaning that where one variable goes up the other variable goes down. The negative or positive character of the coefficient has for the analysis of the data everything to do with the way the variables are ranked. This can be found in the operationalization in subchapter 3.1.

5.1. Household demographics

Before analyzing the differences in the changes households have gone through, it is important to evaluate in what way the project-groups may differ demographically, also before certification. Both household characteristics as characteristics of the household head or spouse are included, as they make important decisions on livelihood strategies and the way in which food is obtained.

5.1.1. Gender of household head

When looking at gender, the respondents in both Atwedie (75%) and Mpasatia (70%) were mostly men while the women were dominant in Aponaponso (56%). Relatively many women are included in this study, even though cocoa farming is officially seen as mostly dominated by men. Instead of only looking at the gender of the farmer approached for the survey, it is also important to look at the gender of the household head as this can have impact on the way in which the household accesses food. Traditionally men are seen as the household head and responsible for the allocation of income inside the household. When the man dies, the woman has to fill the shoes which can create a double burden, making the household less food secure.

Especially in Aponaponso there were many women who were household heads (30%), in Atwedie this was just 10% and in Mpasatia all the female respondents were the spouse. Correlation show that the gender of the household head is related to many livelihood and food security issues. Generally households with female heads reported more often that their income decreased than the equivalent with male household heads. This can be explained by the amount of bags that a household sells, as this also more often is lower when the household head is female (-0,211*). The gender of the household head also is negatively associated (– 0,384**) with having remittances as an income. This means that women more often have remittances as part of their income portfolio, than households with a male household head. Also the households with female heads are more likely to sell less cocoa bags (-0,230*). When we look at the food security question, the outcomes are not significant but they do show that female headed households generally are more likely to skip meals and to not have the right

[15] The significance of the correlations are noted as: * = $p < 0.1$, ** = $p < 0.05$ and *** = $p < 0.01$.

amount of food for the household. This could be due to the lack of ability to grow food crops: generally the land for cocoa is smaller in the case of female headed households or they don't have food crop at all (even though this is not proven to be significant). The female headed households also are more likely to experience decreasing in cocoa land size with certification (0,213*). This can be explained by the neglect of the farm. During an interview a women argued:

> "My husband passed away so I struggling to work on the farm. I had hired labour but I can't afford it anymore." (Cocoa farmer Atwedie, personal communication, 10th of April 2016).

5.1.2. Age

When we compare the household demographics of the three communities especially Mpasatia stands out when it comes to age. The average age in Aponaponso is 54, in Atwedie it is 53 and in Mpasatia the average age of the household heads and spouses was 63. In chart 5.1 the age categories of the respondents are shown and this shows that Mpasatia has the most farmers above 56 years. The fact that many of the respondents are older does not come as a surprise, as it is known that younger generations are not really picking up cocoa farming (Cocoa Barometer 2015: 3).

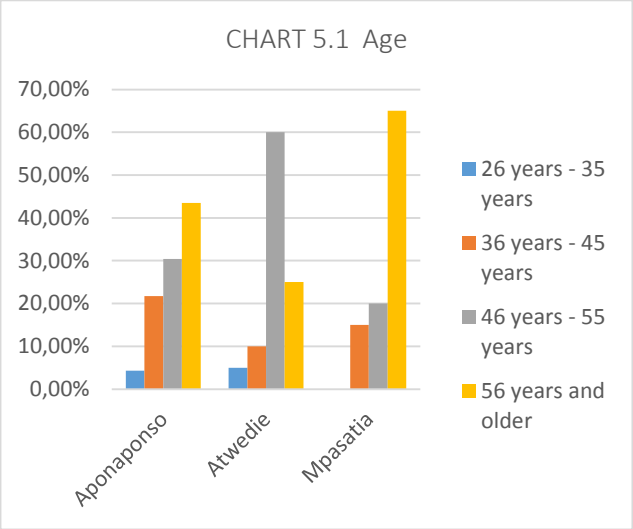
When we analyse the correlations of age, the variable generally is negatively related with food security. The age of the household head is in the first place negatively related (-0,255**) with the changes in income, meaning that when a farmer is older the farmer also is more likely to mention that the household income has decreased. Age also is negatively correlated with the land size of the household used for food crops (-0,244*) and older farmers are generally likely to have no food crop income (0,217*). This correlation is even stronger in having off-farm income (0,408***) meaning that older household heads are less likely to have off-farm income to support their household. In turn, older household heads are more likely to rely on remittances (– 0,305**) so in other words: households with older heads generally have less income sources next to cocoa (- .336*) and also grow less food crops in general (– 0,214*). When looking at the impact of certification, households with older heads also generally reported more often that their ability to grow food crops decreased with certification (– 0,232*) supported by the fact that they were more likely to report that their knowledge in food crop farming (skills) decreased (0,355**). Also their input use generally decreased with the certification process (0,241*). This outcome supports the expected results (Kowornu et al. 2012; Oluyole et al. 2009).

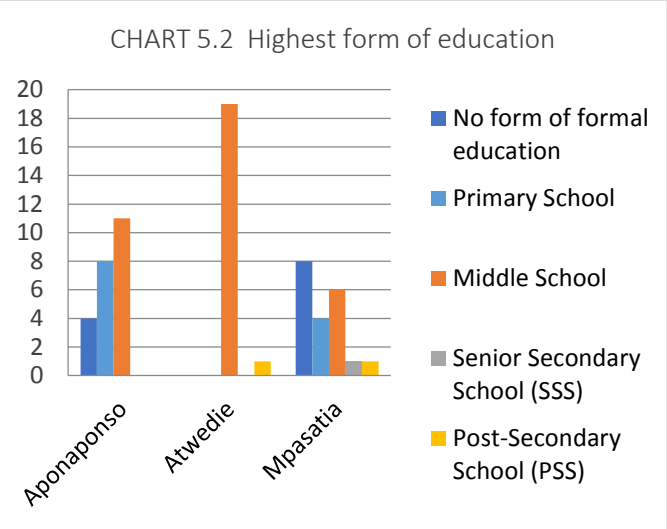
5.1.3. Education

Education also is quite different between communities. In Aponaponso most people have either finished middle school or primary school or haven't had any education at all and in Atwedie almost all people have finished middle school except for one: somebody with a PSS-degree. In Mpasatia it is very mixed, many people don't have any degree at all or people have either finished primary or middle school (see chart 5.2). This is a similar outcome compared to the research of Asamoah et al. (2013) in which less than 5 percent of the cocoa farmers in Ghana had obtained education above senior high school.

When using the statistical analysis education comes out as an important livelihood characteristic. The higher the level of education the household head has attended, the more likely the household is to have many sources of income (0,308**). The use of inputs also is positively correlated with education, which supports the statement made by Asamoah et al. (2013) as they argued that education 'no doubt' has implications on efficient application of pesticides for diseases and pest management of cocoa (Asamoah et al. 2013: 264). But within this study this is only significant for the use of seedlings and pods. The higher the household head is educated, the more likely the amount of bags a household sells is also high. This could be the reason why Atwedie has the highest educated

farmers and also the farmers with the highest income. Finally, the educational level of the cocoa farmer also has a positive correlation with the amount of meals a household skips or cuts (Spearman's rho .230*) which implicates that education generally has a positive relation on positive livelihood and food security issues.





5.1.4. Position to land

The position of the household towards the land seems to be quite the same in the three communities. Mostly the land is fully owned by the farmer (70% in Aponaponso, 85% in Atwedie and 65% in Mpasatia). Only in some cases the farmer only gets half of the proceedings (abunu) or one third (abusa). This result supports the study done by Hainmueller et al. (2011) from which 84% of the farmers in the Ashanti region owned their own land. Their research collected data of all cocoa producing households and the percentage of land ownership is the highest in the Ashanti region. When we look with crosstabs to the distribution of answers, the farmers involved in abunu are generally worse of regarding their income. 20% of the farmers who own the land argued that their income decreased with certification, 17% of the people who work on family land and 30% of the people who take part in an abunu teneurial system.

5.1.5. Household size

The average household size in Aponaponso at the start of certification was 7,1 in Atwedie this was 6,9 and in Mpasatia the average amount of household members was 5,9. The characteristic of household size also has to be measured twice, as it can change in time. In Aponaponso it increased to 7,9 in Atwedie to 8,0 and in Mpasatia to 6,1. When comparing the mean of household members to the study of Hainmueller et al. the households included in this study are quite big. Their average was measured as 5 and they argue that this is quite consistent across all cocoa producing regions in Ghana (Hainmueler et al. 2011: 14).

Correlation shows that the bigger the household, the more food crops a household generally grows (0, 274**), the amount of cocoa bags sold is higher (0,348***) and the reporting of skipping meals or cutting the sizes of meals is less likely (0,208*). This is an unexpected result, as the assumption is that when there are more mouths to feed, the household is more likely to be food insecure. This can be explained by the factor of age however. The households that reported to often skip meals or cut the size of meals were small (two members mostly) as all children already left the household.

5.2. Livelihood assets

As mentioned earlier, this study did not aim at a comprehensive impact assessment, but a limited set of livelihood assets were selected that could be compared to existing literature and which were hypothesized to be most important to food security issues. Here natural capital, financial capital and human capital are more severely analyzed than for example physical and social capital as they were less part of the scope of this research. Especially researching social capital needs a more in depth assessment of many different characteristics like intra-household relations. For food security research this is really important, but it was not possible to include this within this three-month period.

5.2.1. Natural capital

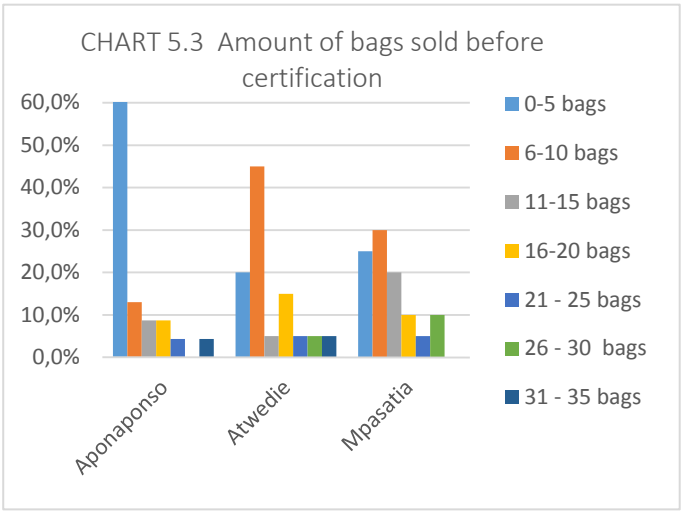
To start with natural capital, the size of the land a farmer has is very influential on the outcomes on the household income or the production of food crops specifically. When analyzing the amount of acres a farmer has to work with, the sizes differ quite a lot between the three project groups. In Atwedie the average farm was 12,25 acres when the certification process started, Mpasatia 10,80 acres and in Aponaponso this was 8,38 acres. Though, this compared to the average cocoa plot size of 4 acre in the report of Hainmueller et al. (2011) shows that the farmers in this study have relatively large land sizes. Ashanti region which are the biggest in the country. Also, when talking about estimations like farm size, it is important to take into account the over- or underestimation by farmers. Though, fortunately the sizes in this study were checked by the Extension Officer which has a documentation of plot sizes. When we look at the changes of land size since certification, quite surprisingly the land sizes in some cases have reduced. In Aponaponso the land sizes currently are 8,04 on average. In Mpasatia it increased until 11 acres and in Atwedie until 13, 25 acres. Aponaponso is the project group that has been certified the longest and possibly the farmers are producing more with less land.

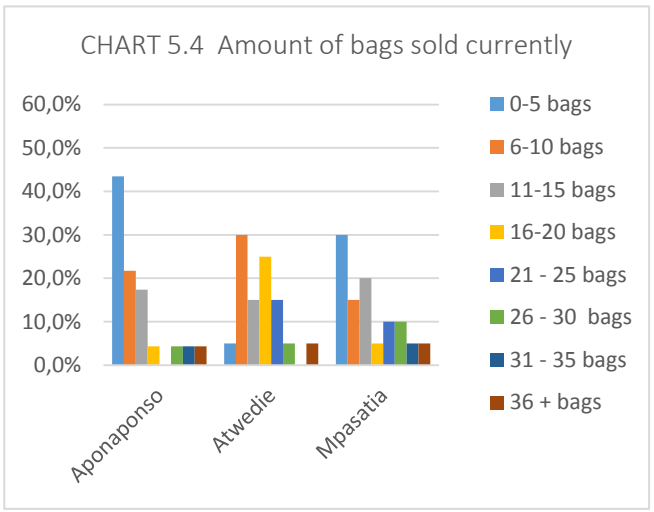
Next to the size of land used for cocoa, also the size of land used for food crops is important to take into account. Farmers were asked about the size of their land used for food crops currently and the size of their land used for food crops before certification. This is not a straightforward task as many times food crops (mostly plantain, cassava and maize) are intercropped with cocoa seedlings in the beginning stages of the farm. During this time the cocoa trees are not providing income and the shade crops can support the household when the crops are sold. After about three years the cocoa trees get bigger and the food crops are left in the shade. When we look at the three project groups of Solidaridad, the land of food crops differ quite a bit, where the average piece of land for food crops is 2,47 acre in Aponaponso, it is 4,63 acre in Atwedie and 2,60 acre in Mpasatia. After certification the land for food crops decreased in Aponaponso (to an average of 2,14 acre) and Mpasatia (to 2,40 acre) but it increased in Atwedie (to 4,89 acre).

That the average land size for cocoa in Aponaponso decreased and the average land sizes for food crops in both Mpasatia and Aponaponso decreased is not a good sign as land sizes are proven to be related to many other livelihood and food security related variables. In the first place the land for cocoa is (not surprisingly) positively related to the amount of cocoa bags sold (0,537**) which in turn is positively related with food security. Next to this, also the size of land used for food crops is an important asset for food security: the bigger the land for food crops (0,297**) and the more types of food crops a household produces (0,342***) the less likely a household is to skip or cut the size of meals. A positive note here is that big sizes of cocoa land are related to big sizes of food land (0,848***). This supports the expectation of farmers being good farmers in general as the bigger the cocoa land also the more food crops a farmer produces (0,444***).

5.2.2. Financial capital

Financial capital is an important factor for the food access of cocoa households, and the main focus of certification it to improve income by increasing productivity with the use of GAPs. When asked if the total income – cocoa and other sources of income - increased, stayed the same or decreased the answers per community were quite different. Still 17,4% of the farmers in Aponaponso argued that their income decreased compared to before certification, in Atwedie 15% answered this and in Mpasatia quite a large percentage, 30%, answered that their income currently is less than before certification. When we compare the amount of cocoa bags sold in the three project groups there are also quite some differences. In Aponaponso many farmers sold just between zero and five bags (61%), while in Atwedie many farmers sold between six and ten bags (45%). In Mpasatia it was quite mixed. When we look at the averages before certification: 7,04 in Aponaponso, 12,25 in Atwedie and 11,60 in Mpasatia. And we compare this with the amount currently: 10,72 in Aponaponso, 17,35 in Atwedie and 12 bags in Mpasatia. The yield in all cases increased. Although, in Mpasatia the production only increased with 0,40 bags per year (see chart 5.3 and 5.4). When we look closer at these changes we see that in the group of Aponaonso 83% of the farmers actually started selling more bags of cocoa and in Atwedie this is the case for 85% of the farmers compared to only 65% of the farmers in Mpasatia.





The amount of cocoa bags sold is still depending however on the size of the land farmers have where they cultivate their cocoa on. This shows that Mpasatia, compared to the other groups, has relatively many farmers whose yield have not increased but the land invested in cocoa did increase. This makes it important to not only look at the yield per year, but also at the yield as relative to the amount of land used, especially when aim of GAP's is to increase the amount of cocoa bags the farmer can sell with increasing the productivity. Therefore this study also calculated the productivity of farmers as the amount of bags per acre (see table 5.1 for the averages per project group). This calculation shows that the farmers in Aponaponso generally have increased their productivity the most, which can be explained because Aponaponso has been certified the longest (6 years so far). And in Mpasatia the productivity per acre has increased barely even though the farmers started a year earlier with the certification process than the farmers in Atwedie. An outcome that might needs more attention for the future of the project group. When we compare these mean yields in bags per acre to the research done by Deppeler, Fromm and Aidoo (2014) the yields found here are actually low. For UTZ-certified farmers in the Ashanti Region they came across the average yield in bags per acre of 2.31 (Deppeler, Fromm and Aidoo 2014: 7).

TABLE 5.1. Productivity in bags per acre

	Aponaponso (6 years)	Atwedie (3 years)	Mpasatia (4 years)
Before certification	1,03	1,13	1,02
After certification	1,33	1,31	1,05
Change	+ 0,30 bags per acre	+ 0,18 bags per acre	+ 0,03 bags per acre

When we look at the correlations between increased income, sold cocoa bags, productivity and other livelihood assets and food security outcomes, not surprisingly, the households which reported increased income also had high productivity (-0,294**) supporting the fact that increasing productivity of farmers can support the increase of the overall income of farmers. Higher total income also is negatively correlated (-0,294**) with productivity which means when income is reported as decreasing, the farmer also is likely to have low productivity (as income is coded as 1 = More, 2 = The Same and 3 = Less). Also, the changes in income are positively correlated with the changes of input use. This means that where the household income is reported as less than before certification also the input use is reported as less (0, 412***). Income also is positively correlated with the food security question, focusing on the amount and kinds of foods a household has access to. In other words: farmers who reported that their income has increased also reported that they have the right amounts of food and the kind of food they want for their household. The amount of cocoa bags sold also is positively related to the amount of food crops a household is growing (0,452**) which supports the synergy of land use for cocoa and land use for food crops that was mentioned earlier. On the other hand and less surprisingly: the cocoa farmers who sell many cocoa bags also report more often that they never skip meals (0,231*) and that they have enough food and the kind of food they need (0,266**). This also can be supported by the research done by Arene & Anyaeji (2010) who found that the income of the household in Nigeria positively increased the household food security (Arene & Anyaeji 2010: 10).

Next to the increase in financial capital with higher production also extra costs should be taken into account. Especially regarding the requirements for farmers to obtain the certificate: the children need to be in school and the GAPs take up more investments into the farm. At the same time the trainings can also release the farmer of costs as inputs are used more strategically. In the focus groups farmers mentioned both these outcomes:

> "It is more expensive to uphold my farm now, as I replanted some trees. Though I still hope that the produce will be big as well." (Focus group participant, personal communication, 2nf of March 2016).

> "I think I am saving money now because I was using too much fertilizers before. I didn't have the knowledge on the rights amounts to use before." (Focus group participant, personal communication, 1st of March 2016).

When the farmers were asked about the change of costs with certification generally the majority indeed answered that the costs increased with certification. Two farmers responded that their the costs were less (in Aponaponso and Atwedie) due to the decreasing of social costs. The following question was asked on the main increased costs of the household and many times either farming material costs or school fees were mentioned. Though, quite surprisingly, in Mpasatia the farming material costs were less mentioned as the main increased cost. This outcome can be supported by the fact that farmers in Mpasatia also reported less use of inputs compared to the other groups.

5.2.3. Human Capital

When talking about assets, also human capital can be an important possible spillover of certification onto food crop production. In the focus group discussions, but also within the structural interviews, the main advantage of certification as mentioned by farmers was the training they receive. This finding can be supported by the research done by Deppeler, Fromm and Aidoo (2014) in which the farmers confirmed that the training received were the most important reason to stay in a certification group (Deppeler, Fromm and Aidoo 2014: 9). The trainings given by the certification staff are also known to be more effective than official extension services by for example Cocobod. These services can be quite top-down and less farmer driven than the farmer support provided by NGO's and public-private partnerships (ibid.: 9). During both the Focus Groups and the structural interviews, farmers mentioned that they preferred the extension services to be more often. Though, still all farmers in every project group in this study argued that their skills in cocoa production increased with the certification process, With skills for food crop production this was not as much the case. In both Aponaponso and Atwedie two farmers argued that their skills in food crops stayed the same and five farmers mentioned this in Mpasatia. With the open question on what kind of service they would prefer to support their livelihood one farmer said:

> "I would like to have help for food crops as well. My food crops are not growing since a few years." (Cocoa farmer Mpasatia, personal communication, 30th of March 2016)

When zooming in on the farmers who answered that their skills in food crop production stayed the same, there is a correlation with households relying on remittances (-0,216*). Farmers who reported to not have increased skills in food production also reported smaller land sizes for food crops in general, and with certification this land more often decreased for them as well (0,486***) . This shows that there are quite some (often old) farmers that are struggling with keeping food crops. Something that also was directly mentioned by a farmer during the interview:

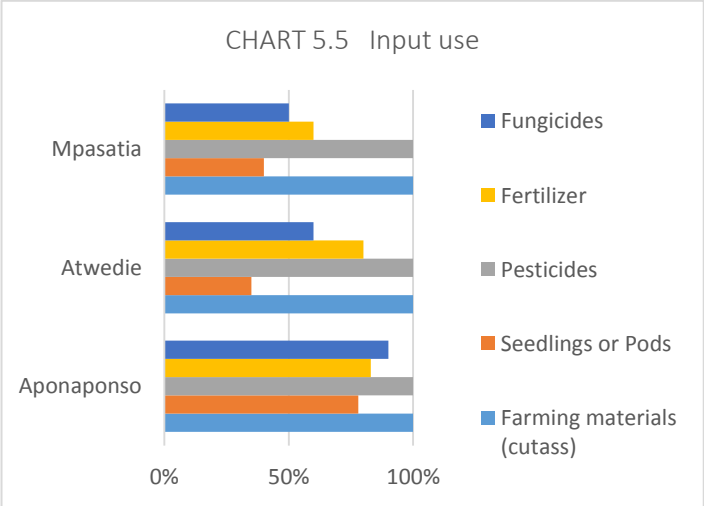
> "I am old and have not been taking care of the farm. Nothing is growing on it now. I am trying to hire somebody that will be the caretaker." (Cocoa farmer Atwedie, personal communication, 10th of April 2016).

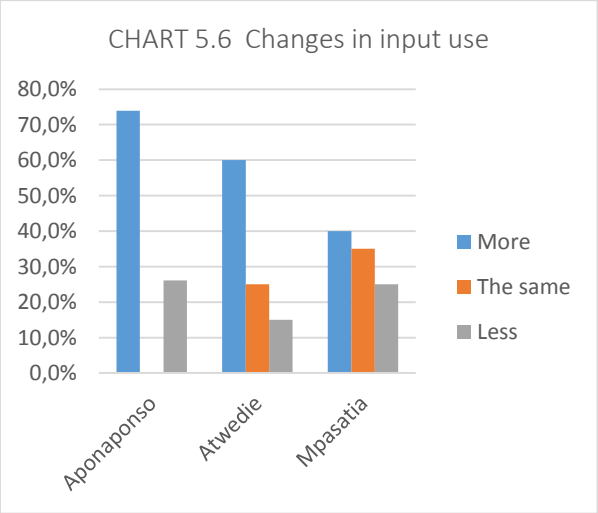
5.2.4. Physical capital

The next asset which is important in cocoa productivity, and can spill over to food crop production, is the access to and the use of fertilizers. A typical Ghanaian producer is known for low yielding cocoa and does not use fertilizer and limited amounts of pesticides (Gockowski 2013: 332). In the Focus Groups and interviews of this research the limited availability of fertilizers was mentioned as a problem farmers face many times. Currently the government of Ghana is offering the fertilizers for cocoa free, but in reality they never arrive on time of don't arrive at all for the farmers (Dutch Embassy in Accra, personal communication, 17th of February 2016; Kowornu et al. 2012). Surprisingly, the inputs seem to be used quite regularly by the producers included in this research. In all the three project groups all farmers use farming materials (f.e. a cutlass) and all the farms are applied with pesticides (which is mostly done with spraying teams of Cocobod). But also fertilizer use seems to be quite frequent, especially in Aponaponso (83%) but also in Atwedie (80%) and in lesser extent in Mpasatia (60%). Also fungicides are mostly used in Aponaponso (91%) and less in Atwedie (60%) and Mpasatia (50%). The use of seedlings and pods is a lot higher in Aponaponso (78%) than in Atwedie (35%) and in Mpasatia (40%) (Chart 5.5). Though it is important to add that the amount of input applied is not measured here.

When looking at the changes with the certification process generally farmers reported that they use more inputs for production since certification, though in Mpasatia the use of inputs is not increasing as much (see chart 5.6.). This could be related to the small increase of yield and productivity in Mpasatia related to the other communities. During the structured interviews in Mpasatia also the access to fertilizers was much requested by farmers supporting the fact that the input management in Ghana also was seen as problematic by many stakeholders (see subchapter 4.4.). Fertilizers and other inputs are in literature mentioned as possible spillovers towards food security, as they could be applied to the food crops, but in this research all farmers argued that only the farming materials (the cutlass specifically) are used on food crops. One farmer also mentioned during the interview that the use of chemicals on food products is not preferred in Ghana. The fertilizers would intoxicate the food. Also a report on fertilizer use in Ghana by the FAO argues that generally fertilizers and other inputs are primarily used for export crops (FAO 2005: 14) even though when applied right fertilizer can increase and commercialize food crop production.

When looking at internal relations of inputs with other variables, the use of inputs is positively correlated with an increase in productivity and with the increase in income (0, 412**). This means that farmers who reported that their income increased generally also reported that their input use increased and the other way around. This can say both that the input use might have increased productivity and therefore income, as that income increased the purchasing of inputs.





5.2.5. Social capital

The impact of UTZ-certification on social capital was just shortly mentioned in the survey with an open question if farmers thought the amount and the strength of social contacts had increased. All farmers agreed to this. Social capital also came forwards as an important asset as producers generally argued that the certification process had a positive impact on the contact with other farmers which was something the farmer could learn more skills from. When farmers were asked about coping mechanisms when they did not have enough money to buy food many times they answered that they could get some food of shops or other farmers on credit. This characteristic was not further analyzed within this research and it is an interesting food security issue for further research.

5.3. Livelihood strategies

Another point made often within food security research is the importance of resilience of a rural household with different income sources to rely on. Therefore, when harvests fail or the lean season starts, the farmer has other ways to support the household. As cocoa only has two harvest moments in

a year, farmers are hypothesized to need extra sources of income in leaner times. As made visible in chart 5.7, not every farmer in the included project groups has income next to cocoa. There are still quite some farmers from which cocoa is the only income (17% in Aponaponso and 35% in Mpasatia) except for the farmers in Atwedie, there every farmer has at least food crop income. The outcomes in this study are relatable to the 38% of the farmers who relied on cocoa only in the study of Hainmueller et al. (2011).

The sources of income in this case are categorized as off-farm income (mostly petty trading), growing other cash crops beside cocoa (such as palm oil), growing food crops which can partly be sold for extra income and remittances (monetary gifts by family members). Interestingly, remittances were rarely pointed out as an income source in this study. This can be supported by the research of Hainmueller et al. where 80% of the farmers reported that they never receive any remittances (ibid.: 35). The most important second income source for cocoa farmers in this research are food crops, though it differs quite a lot between the project groups. In both Aponaponso and Mpasatia 12 of the 20 farmers produced food crops next to cocoa and in Atwedie every cocoa farmer produces food crops next to their cocoa trees. Also, in Atwedie there are some farmers who have livestock income as additional income next to their cocoa and food crops (see 5.8). The scale of the other income sources is not measured in this study, but cocoa was the main and most important income source for almost all the farmers followed by food crop income.

CHART 5.7 Amount of income sources next to cocoa

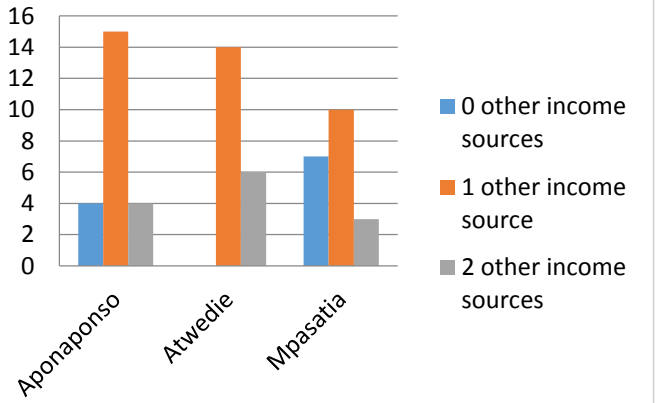
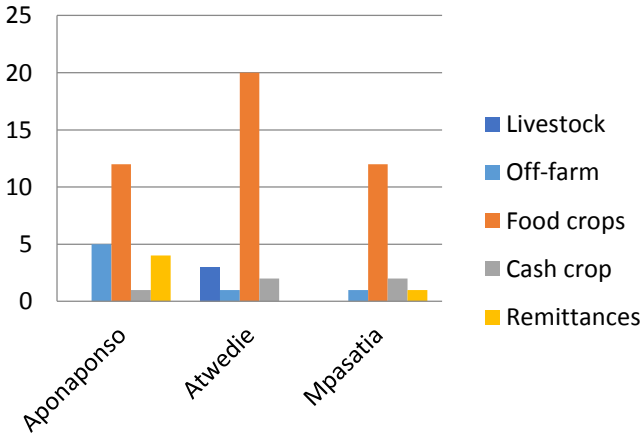


CHART 5.8 Type of income next to cocoa



Generally cocoa farmers who sell many cocoa bags also grow many types of food crops. Though, this coefficient (0,198) is only small and not significant. This supports existing literature which shows that diversifying income is something that costs money as well. Poorer households generally fall back on subsistence instead of diversification of income (Dzanku and Sarpong 2012: 194). Also when looking at having off-farm income, food crop income, cash crop income and remittances income; they all seem to be correlated to reporting an increased income but the coefficients are very small and not significant. The amount of income sources in turn seem to be positively related to food security, which means that households with more income sources generally also report not to skip or cut sizes of meals and report to have the right amounts of food, though also these are not significant. This outcome is different than the study of Mendez et al. (2010) where having more than one income source (i.e., not relying entirely on coffee sales for income) did contribute to household food security. In this study it seems that for household food security the diversification of income is not as important as for example the amount of cocoa bags that the household sells (which is positively correlated with a coefficient of 0,240**).

In the focus group discussions, when asking about the way in which farmers think their livelihoods and food security could be better, many farmers were unsatisfied about the risks of farming.

The focus group discussions and the structured interviews were all held in March and April, a period in which cocoa is not growing and the incomes from the other sources were little to provide them with. In one of the discussion groups the farmers agreed that they would like more support for creating off-farm alternative incomes.

> "I would like to learn how to earn money outside of farming. I don't earn much from the farm especially when the weather is bad. Off-farm income would be more secure."
> (Focus Group Discussion, personal communication, 1st of March 2016).

This outcome, combined with the insignificance of off-farm income and food security shows how that having other income sources can provide more food security when the cocoa production is not providing enough (f.e. cocoa trees are old or the weather is off) but generally the increase of selling cocoa is more positively related with food security. It could therefore be important to support the alternative livelihoods more, in order to let this create more revenues or implement more overall business related trainings in stead of focusing on farming only.

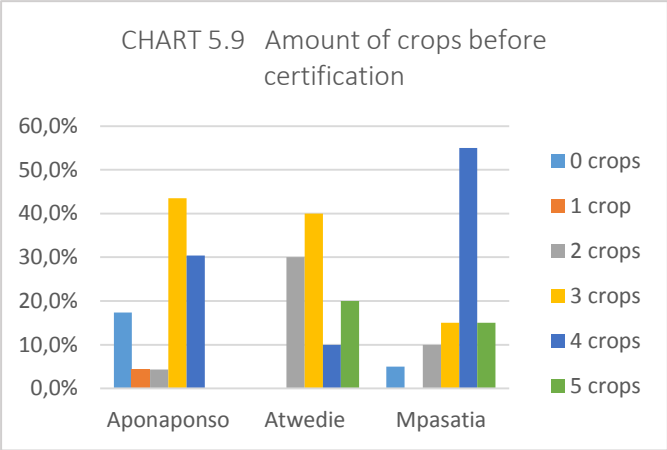
5.4. Food production

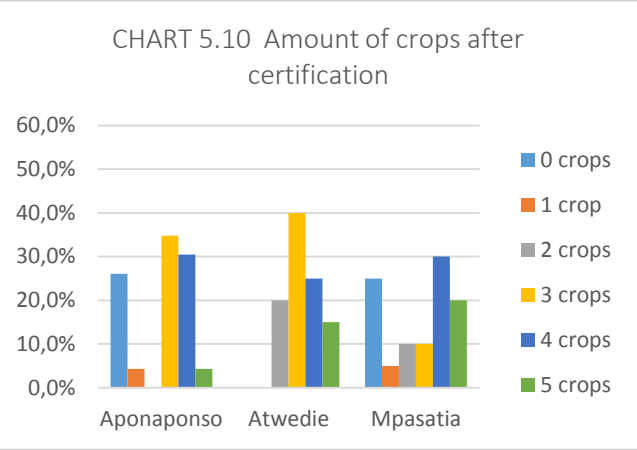
So are cocoa producers really also producing food and in what way are they doing this? Literature gives mixed messages on food crop production next to cocoa farming. On the one hand it is mentioned as a necessity (C&CI 2012: 18) and on the other hand studies showed that cocoa farmers were not able to combine food crops with their cocoa farms (Oyulole et al. 2009: 20). Within this research farmers in focus groups mentioned that growing food crops is essential for the livelihood of the farmer as these crops are providing food for the household and income when there is produce left, especially during the lean months of cocoa:

> "Now my cocoa is not growing so I try to sell food crops in these periods. Unfortuntately the weather is not providing enough rains though, it looks like we only have cassava to live from."
> (Focus group participant, personal communication, 1st of March 2016).

Earlier the sizes of land used for food crops were mentioned, but also the amount of food crops and the amount of different food crops growing on that land can be of influence on food security issues and therefore also this was measured. This showed that not only the land size of food crop farms are bigger in Atwedie, also a relatively large amount of food crops is grown in that project group as many of the farmers have either three or four crops growing (see chart 5.9 and 5.10). Aponaponso in this case has the least amount of food crops growing on average.

When we compare the situation of food crop production with before certification the amount of food crops reduces. 50% of the farmers in Mpasatia started to produce less crops, 10% of the farmers in Atwedie and 13% of the farmers in Aponaponso (see chart 5.9 and 5.10). An alarming outcome as growing food crops is closely related to the food security of the households included in this study. As mentioned earlier: the bigger the land for food crops (0,297**) and the more types of food crops a household produces (0,342***), the less likely a household is to skip or cut the size of meals. The same is proven for the question on the 'amount and kinds of food available': when households produce more food crops they generally also are more likely to have enough and the right types of food available for the household (0, 343***). The fact that households within this study generally are more food secure when having more types of food crops growing (0,342***), is different than stated by Dzanku & Sarpong (2011). In their research the diverse portfolios were not associated with higher food security.

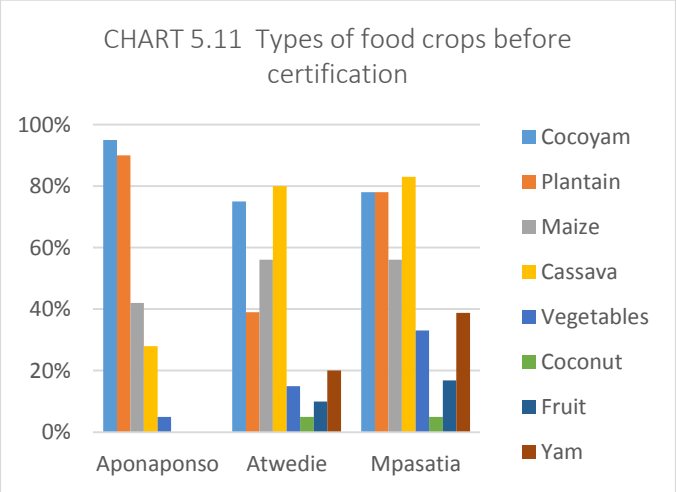


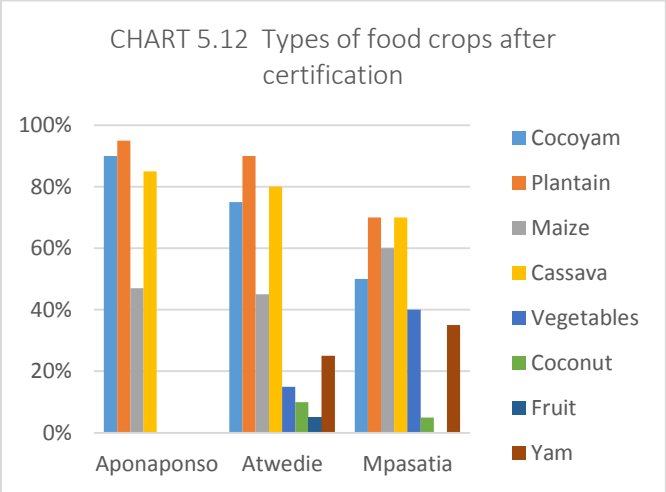


When we look at the type of food crops produced, we see that there is relatively little variety in food crops in Aponaponso when compared to Atwedie and Mpasatia. Next to this, certification seems to have declined much of the variety. Vegetable and fruit production specifically has disappeared with the certification process. This could be explained by the fact that fruit trees generally are used as shade trees in the early stages of cocoa. Cocoa farmers barely grow vegetables or fruit and it can be concerning when this production further decreases (see chart 5.11 and 5.12). This is an outcome which is not expected from certification, and might be due to the extra work that is needed for the certification process of cocoa. More attention to this can be useful as there is also literature that addresses vegetable farming in the unused corners of cocoa fields and the use of fruit trees for climate resilience (Freeman 2014; Wieger, van Dorp & Torgerson 2011).

Fruits – mango, oranges pineapple and papaya specifically – and vegetables – in Ghana often eggplant, tomatoes and okra are planted - potentially improve nutrition through direct own consumption or through increasing the household income which in turn is used for supplying the food basket. The data of this study can't prove the importance of nutritious crops specifically however. When looking at the different types of crops households are growing generally all crops have a positive effect on food security issues, though not all are significant. One variable that does stand out is the growing of vegetables. Households that grow vegetables are significantly reporting that their diversity of meals have increased (0,412***), but farmers that grow vegetables did report that they skip meals or cut the size of meals (-0,293**) which shows that growing relatively healthy crops do not automatically create food security alone. Another significant variable was the growing of yam: farmers who grow yam generally are also reporting that they do not skip meals or cut the size of meals.

Farmers who grow food crops sometimes, but not always, also sell the food crops when they don't need them for their own consumption. Unfortunately the specifics for this were not inherent to the interviews, but in one focus groups one discussion arose on the difficulties of marketing their food crops, especially as many of the produced crops are plantain and cassava, for which the prices are low. This supports literature on the overproduction of low value crops, as farmers generally have traditionally been used to do this (CBWE 2012: 4). During the focus group an argument even arose between some of the farmers and a farmer who had a small shop. They argued that the shop owner sold food crops that were bought from the cities, instead of using their produce. The shop owner then explained that the local produced crops were not distributed frequently enough (Focus group discussion, personal communication, 1st of March 2016). This sheds light on the fact that when farmers are more supported in their food crop production as well, and are offered entrepreneurial training in choosing the right crops to intercrop their cocoa with - instead of just producing low value crops - the food crop production can offer both food security and an increased and more secure income.





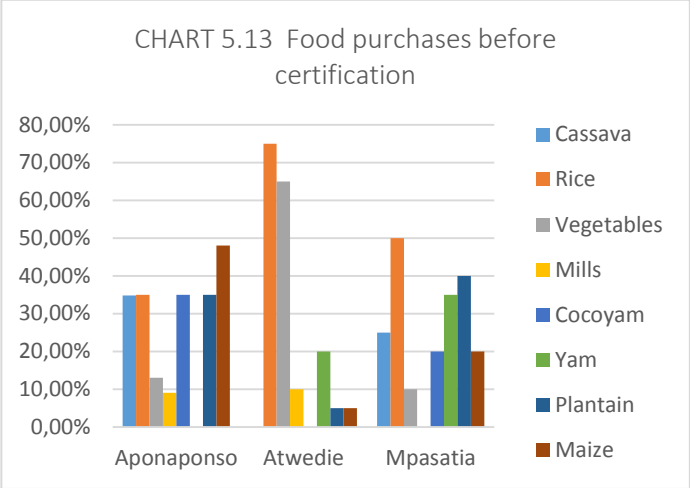
5.5. Food purchasing

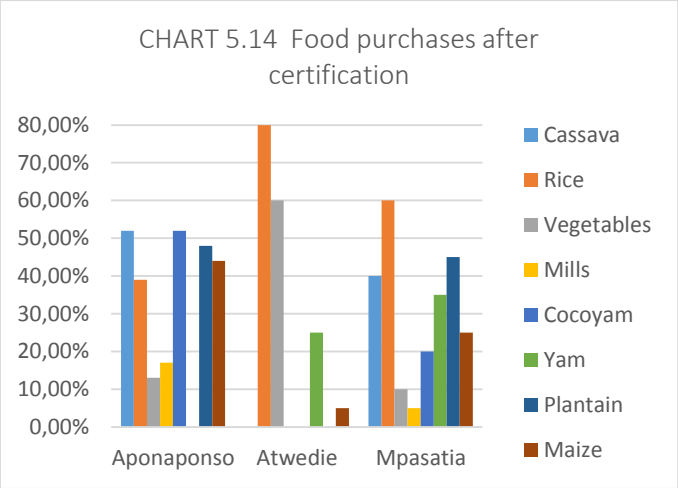
Next to food production, food also can come from purchases on local markets. Food purchasing is the main characteristic that would be positively influenced by certification as the higher productivity increases the income of the farmers' household.

In the first place here – equal to the food production questions – the types of food products that the households buy were analyzed and compared with the situation before certification. Quite striking here was that many cocoa farmers – also when producing food crops – still bought quite a lot of food products. This supports the finding of Hainmueller et al. (2011) who concluded that the farmers in their study spend as much as they earned out of cocoa income on food and other supplies. Also Asmaoah et al. (2013) found that 54,2% of the total household expenditure was dedicated to food. This when the farmers were expected to get some food crops on their farms. They argue that this brings up a food security concern for cocoa producers and more research should be done (Asamoah et al. 2013: 366).

The main food crops both grown and purchased by cocoa farmers are cassava, plantain and cocoyam and another much purchased food crop is rice. When we compare the three project groups the consumption of maize is exceptionally big in Aponaponso and the consumption of vegetables in Atwedie. Vegetables are mostly more expensive as they need more water, but they have much nutritional value. Though, with certification it seems that the consumption of the main staple crops increased, but the consumption of vegetables decreased a bit. This is an unexpected negative outcome of certification (see chart 5.13 and 5.14).

When we compare the consumption behavior of the cocoa farmers and the changes with certification; in Aponaponso 26% of the farmers started to purchase more food with certification, in Atwedie just 10% and in Mpasatia 50%. This might be because in Atwedie farmers are generally producing a lot of food crops and therefore feel less need to buy food. 60% of the farmers in Atwedie argued that they started to purchase less with the ongoing of the certification process and 30% argued that their purchasing behavior stayed the same.



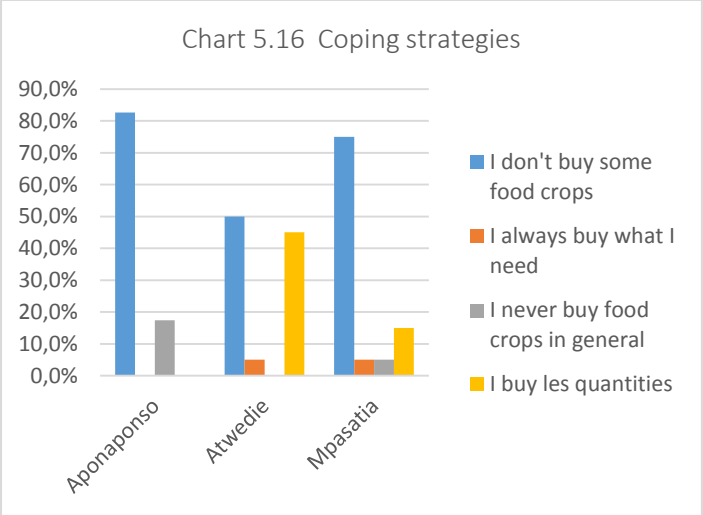


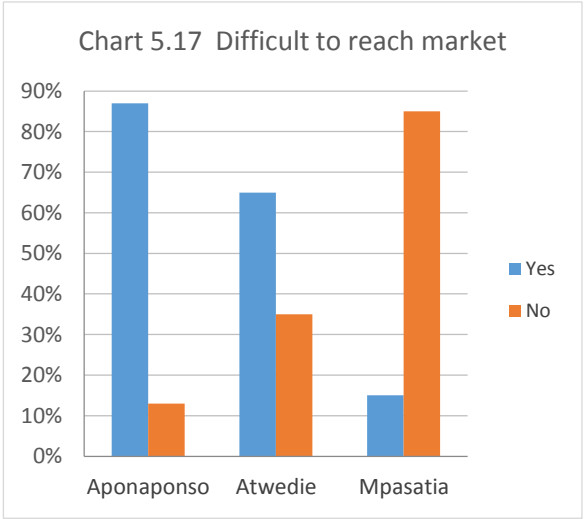
Another important aspect of food purchasing is of course the price of food products. Almost every farmer in this study argued that the prices of food products increased in the last few years. Just one farmer – in Mpasatia – thought the prices for food are the same as before certification. Explanations for increasing prices can be the inflation in Ghana, but also the migration towards the Ashanti region due to goldmining. The communities inluded in this research also are quite remote which makes food products like rice higher in price due to transportation costs. The experience of higher prices in this study supports the findings of Anderson et al. (2014). The cocoa and palm oil farmer in their research experienced increasing prices from 50% to 200% and in the cash cropping households in their study described having limited capability to buy sufficient food (ibid.: 9).

This study therefore also wanted to know more about the coping strategies of households when prices of food products where too high and/or their budget too low. This showed that in Aponaponso and Mpasatia farmers mostly decide not to buy some food products at all and in Atwedie more farmers choose to only cut the quantities of food (see chart 5.16). But, when not looking at the differences between the groups, it also becomes clear that farmers generally experience difficulties when relying on food crops only. In the focus groups somebody added:

> "It is not possible to always get food on the markets as sometimes the prices are really high or they are not available at all. Now there is no yam available for example." (Focus group participant, personal communication, 1st of March 2016).

Next to financial access to food, also physical access is important to take into account when talking about food purchassing. In the rural areas of these project groups, food markets might not be nearby. For this reason the place where the household purchased food was measured and if it was difficult to reach these places (see chart 5.17). An open question was included in the survey to learn why the markets were difficult to reach. The main answer here was that the transport costs are high. When looking at the results, often the combination of both the local market for short term food purchases and the city for long term purchases were mentioned. For the latter, once in a while a lot of food products were bought to avoid having to pay high transport prices multiple times. The data shows that in Mpasatia people felt that the places to buy food were not difficult to reach, but generally farmers then also reported more often that they skip meals or cut the size of meals (-0,255**). This proves that food purchasing in this study does not have as much effect on food security, as expected.





The overall changes in food purchasing compared to the situation before certification are, not surprisingly, related to the changes in food crop growing. When cocoa farmers have food crop income they generally state that they started buying less food crops compared to the situation before certification (-0,503***) and more directly: when farmers started to grow more in terms of food crops, they generally argue that they buy less food crops (-0,332***). Where growing less food crops is negatively correlated with the household food security questions (-0,337***) for the question on skipping meals and for the question on the amount and types of food (-0,280**) the purchasing of food is actually positively correlated with the food security question of skipping meals. Meaning: when households are reported to buy less food crops they generally also reported that they never skip meals or cut the size of meals (0,273**). The question on the amount and types of food of the USDA Food Security-scale was not significant, but also positive. This shows that food secure cocoa farming households are more likely to fall back on their own food production than on the purchasing of food products.

5.6. Assessment of food security

Now that the differences in livelihood assets, livelihood strategies and food production and purchasing behavior are listed, they can be analyzed next to the USDAS-scale questions. The first and foremost outcome of this, is that their food security situation generally has not improved with certification. When we compare the three project groups regarding the skipping of meals or the cutting in the size of meals, the impact immediately shows not to be linear. Farmers in Atwedie seem to be having the best food security status, and through time this decreased. In Aponaponso the result are quite mixed with a positive change with certification and in Mpasatia farmers are relatively food insecure with also a small negative change with certification (see chart 5.19 and 5.20). This can be due to certification, but this question is also very much depending on the perception of the farmer. The household survey was conducted in a food insecure period where cocoa was not harvested. Next to this also the drought was severe compared to other years. As a farmer argued:

> "Every year the weather seems to be less profitable for my farm. I go to my farm and cry as the trees are dying." (Focus group participant, personal communication, 1st of March 2016).

Because this study is based on the memory of farmers instead of a previous baseline study - with data on food security issues before certification- the answers are less certain. Possibly farmers do not remember the state of food security of 3 till 6 years ago. Though, the question was emphasized on the

process of certification. That the farmers answered in this way still is important as it provides information on the food security state the farmers are in now, that this is because of certification or climatic reasons left aside.

CHART 5.19 Meals before certification

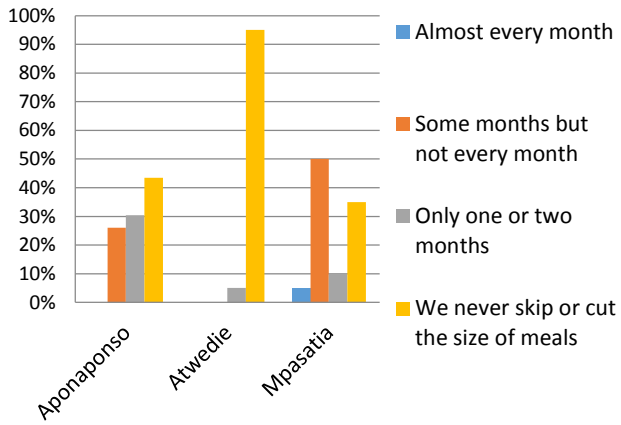
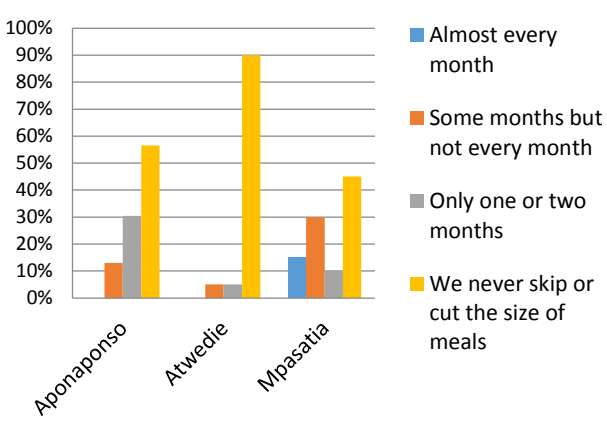


CHART 5.20 Meals after certification



The second question based on the USDA-scale was based on different statements. The respondent in turn could chose a statement that fitted the household food security situation. The statements were: 'Often we don't have enough to eat', 'Sometimes we don't have enough to eat, 'We have enough to eat but not always the kind of food we want' and 'We always have enough to eat and the kind of food we want'. During the interviews some farmers pointed out that 'the kind of food preferred' is less of an issue as there is not much to choose from:

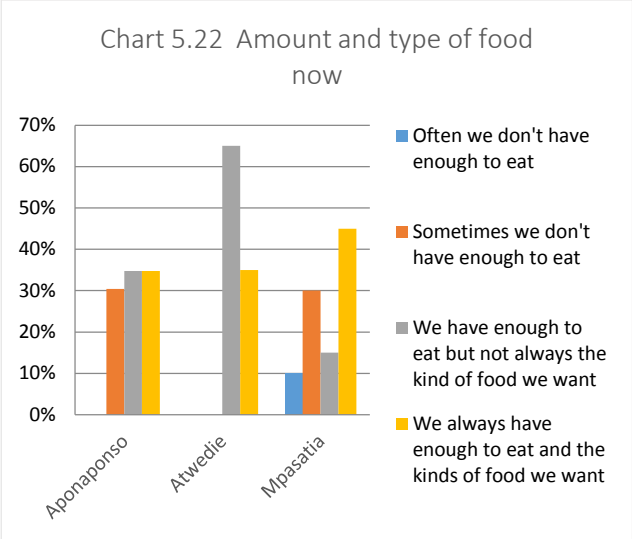
> "We eat what is available, it never really a matter of choice. In this time food is not really available so we mostly eat cassava only.' (Focus group participant, personal communication, 2nd of March 2016).

Though, when looking at the data farmers – mainly in Aponaponso and Mpasatia – did also point out that they sometimes do not have enough to eat for the household. This also seems to be negatively ánd positively affected with certification as more farmers pointed out that they currently often lack food to eat while also more farmers argued that they now have enough food. In Atwedie though, many farmers argue that they do no thave the type of food which is preferred, something that is less pointed out in the other communities. This characteristic also increased with certification, something that is reason for concern (see Chart 5.21 & Chart 5.22). When referring back to the decrease in types of food produced and the decrease in food purchases, the farmers households might be lacking sufficient food types to meet the needs of the houseold members.

Conclusively, when zooming in on the two questions that assess the household food security, both the higher yields of cocoa as the high amount of food production are important for the food security of the household. This is shown in the positive correlation between the amount of cocoa bags sold (0,250**) ant the reporting of never skipping meals or cutting the size of meals. The same can be said for the positive correlation of sold cocoa bags (0, 280**) and the reporting of having enough food and the right type of food on the table. Also when the total income of household increased with certification they generally report to have the right amount and type of food for their household (-0,264**). Thus the assumption for higher incomes for food security seems to work out also in reality for the farmers included in this research.

Then, also the size of land and the amount of food crops a household produces is related to the household food security. The land used for food crops is positively correlated with skipping meals or cutting the size of meals (0,297**) and the amount of food crops that a household grows has a positive relation with never having to skip meals (0,342***). The amount of food crops also is positively related (0,343***) to having the right amount and types of food for the household and the size of the land for food crops as well (though not significant). It is not possible to get a clear image of which food crop is more essential for food security than the other. Generally vegetable production in this research came out as having a positive effect on the experience of diverse and balanced meals by the households, but not as having an effect on skipping meals. Households who produce yam here are likely to never have to skip meals or cut the size of meals.

When we then look at the outcome of households who never skip meals or cut the size of meals, they are also more likely to report that they are purchasing less food crops with certification (0,273**) and growing more food with certification (-0,337***) more light is shed on the own food production of cocoa farmers. Possibly food production is even more important than the increased income, especially with the constant increase in food product prices and the difficulties that farmers have to reach places to buy food.



6. DISCUSSION

The aim of this study was to analyse the way in which cocoa farm households obtain food for their household and in what way UTZ-certification creates synergies or trade-offs in their food security. This was measured for three project groups with UTZ-certification to serve as an evaluation of the programs, but also with the total dataset certain household characteristics were proven to be significant for the household food security of the cocoa farmers. This is useful for further plans regarding the three project groups.

The most remarkable changes with certification are found in the yield (the increase in the amount of cocoa bags sold) and productivity (increase in the amount of bags harvested per acre). Though this is not for every project group as positive, especially in Mpasatia this impact on produce was only small. Both yield and production are proven in this study to be correlated with the household food security of the farmer and thus supports the synergy of increased cocoa income and household food security. When we analyse the current productivity of the farmers, these are still below potential. Support in the increasing of productivity thus, still has much to gain.

While analysing the data, the second important outcome is that cocoa farmers generally do produce food crops next to their cocoa and they argue also that this is proven to be important for providing food for the household even when their income increases. When we compare the behaviour of producing or purchasing food, generally food production seems even more related to food security than food purchasing. In this research the more food secure a farmer reports to be, the more likely the farmer is to purchase less food products. This can be explained by the experience of increased food product prices by farmers and the difficulty (mainly the high transportation price) to reach markets. In the focus groups farmers even argued that without food production, they would not be able to eat enough. Supporting this, many cocoa farmers argued that they purchase less food with certification and this was thus correlated with the food security questions. Therefore this characteristic proves that not only the increase of income is enough for achieving food security, but generally also food crop production next to cocoa is important. This supports literature on the importance of maintaining significant levels of subsistence, even when participating in cash crop production (Govereh and Jayne 2003: 41).

The structural interviews with farmers subsequently show that synergies exists between food production and certification when it comes to farming skills. Almost every farmer argued that the skills learned with certification also increased their skills in food crop production. There could be a synergy also with the use of inputs, as certification generally creates more input use by farmers, but currently only the cutlass is used for the food crops as well. Other forms of input use are perceived to be toxic for the food crops growing, but when applied in the right way, inputs can indeed help in food production.

A possible trade-off with certification is visible as in a few cases the size of land used for food crops decreased, which can be reason for concern. In Mpasatia the amount of crops reduced for 50% of the farmers with certification, in Atwedie for 10% of the farmers and in Aponaponso for 13% of the farmers. Though we can't blame this on certification only, it is an important occurrence that should be taken into account in the future. Further research should provide more information on the reasons why this happens. Especially also because in some cases food products with high nutritional value seem to decrease with certification, like the production of vegetables and fruits. As the data of this study proved that the amount and types of food crops produced are proven to be important for household food security, the certification project management probably should focus more on this characteristic.
The diversification of income is coined in literature as an important risk-coping strategy for cocoa farmers. Within this study the amount of income sources or the ownership of either 'off-farm income', 'food crop income', 'other cash crop income' or 'remittances income' did come out as positively

related to food security, but these correlations are weak and not significant. Here it seems that generally the diversification of income can have a positive effect regarding the vulnerability context of farming (especially the insurance against climatic shocks), but possibly within the livelihoods of the farmers in this study the alternative incomes are not as substantial. The increase in yield and production in turn is stronger and more significantly related to the food security of the farmers.

When reflecting on these results it is important to mention that there are also limitations to this research. This study contributes to the impact debate of certification, but just as the most respectable studies in this category (COSA 2013; KPMG 2013) it is difficult to extract the impact from certification only. Many other variables potentially intervene, especially as this study only makes use of a small sample and as there was no control groups included. Next to this, there are characteristics of food security and sustainable livelihoods still untouched by this study. Especially the social aspect and utilization aspect of food security. Not only do intra-household relations have much impact on individual food security, also the possible role for food gifts and loans within communities were not included. Farmers during the structural interviews a few times mentioned the ability to buy food products on credit, something that was not possible to further add into this study. Possibly more research on this contributes to approaching specific food security and nutrition security issues of cocoa farmers.

7. CONCLUSION

This study opens up the ways in which cocoa farmers obtain food for their household, zooms in on which livelihood assets specifically are important, and how this changes with the certification process. For the farmers in this study, certification so far has not directly positively impacted their food security, as both synergies and trade-offs existed. This is listed in the discussion of this thesis. For this reason, íf certification indeed wants to contribute to the outcome of food security, the focus should be more on other assets than just the increased income. This standpoint does not stand alone as many stakeholders spoken to in Ghana also argued that the approach regarding cocoa farmers is due to change: more and more the focus lies on 'beyond certification', where there is more attention made to climate change adaptation and alternative livelihoods. For this reason also stakeholders are now focusing on "beyond certification". The idea is to focus on issues outside of GAPs like alternative livelihoods and climate change adaptation. The UTZ country representative argues: "We discovered that certification alone can't address all issues so the scope had to be adjusted." (UTZ, personal communication, 15th of April 2016).

To contribute to this, this study wants to advocate for more research and policies focused on bringing food security into the value chain of cocoa (and other export crops for that matter). There is much added value in putting nutrition more forward into policies regarding cocoa farmers. Possibly in regular training in certification – Good Agricultural Practices, Good Social Practices and Good Environmental Practices – also Good Nutritional Practices could be included (Freeman 2014: 21). This can include farm borders with nutrient rich vegetables and fruit trees or more structural intercropping of nutrient rich trees for shadow (ibid.: 22). This together with a shade based production system, which then is more resilient against climatic shocks, could provide much support in a cost effective way. Not only does this positively influence the productivity of the farmer, this also tackles the occurrence of stunting and malnutrition and this creates more incentives to work in cocoa for the next generations.

Overall, certification increases the productivity and the yields of cocoa farming, but the produce of the farmers included in this study is still below potential. This makes the focus on productivity within certification programs reasonable. Tough, also food production comes out in this study as important for the household food security. Farmers interviewed in the field argued that their own food crops are essential for their households and in reality there are quite some cases where the land for food crops with certification decreased and also the amount of food crops growing reduced. It can't be proven that this is to blame on the certification process, as many other factors intervene, but it is important to create more attention for this matter. Here it is important to mention that the aim of this study is not to imply that certification schemes are obligated to inherently include food security in their program, but when claiming food security as an outcome of certification, the different synergies and trade-offs for the producer should be taken into account. These impacts then also can be communicated transparently towards chocolate consumers.

8. RECOMMENDATION

A few recommendations can be made regarding the host organization Solidaridad – or other stakeholders involved in cocoa - as this study partly was an evaluation of the process of three of their UTZ project groups. The first recommendation is to reflect back on the certification process of the three groups included in this research. When looking back at the evaluation of the three project groups, mainly more attention should be brought towards Mpasatia where the least farmers are positively affected with the certification process. Not only has the productivity increased less in this community, many farmers argued that their income even decreased as well as their food crops production. It is valuable to discover why the impact of the projects were this different as the approach towards the individual farmer is for every group the same. Next to this also for every project group the productivity is still relatively low. Therefore, there is no harm in maintaining the support for higher cocoa yields. Especially as cocoa within this study also is proven to be related to food secure households.

Next to the continuous focus on cocoa productivity the second recommendation is for a more overarching and holistic approach towards the livelihoods of cocoa producers. Possibly even with a specific way of addressing food crop production, even when grown on another set of land. Farmers in the focus groups specifically asked for more support in both food crop production as off-farm income. Something that can't be seen as separate from the cocoa sustainability program. The goal is to create sustainable livelihoods that can create and maintain well fed cocoa producers. This in turn will have positive outcomes for productivity. Key is to focus on a better established farming system that assists the food security and nutritional securities for the cocoa farmer as incomes, even when they have increased with certification, might not be sufficient enough in supporting these needs. Trainings and support in food production could be more inherent in trainings for example. The support of food crop production in turn can be made more profitable by trainings in bringing them to the market. Currently farmers mostly grow the same food crops (cassava, plantain and maize) which have low values when they sell them. There can be potential in organizing farmers into groups to tap into the larger export markets for fresh fruit or vegetables for example (CBWE 2012: 4). Possibly also more can be done with vegetable growing in unused corners of farms. This kills two birds with one stone as both an additional income is established - which decreases vulnerability - as the household food security.

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ANNEX 1 Interview guide stakeholder interviews

1. Can you tell me more about your role in the Ghanaian cocoa sector?
2. Do you focus on food security within your activities?
3. What are the major challenges the Ghanaian cocoa sector is currently facing?
4. In what way is cocoa supporting the livelihoods of farmers?
5. Do you think cocoa competes with food crops or do they work well together?
6. Which role does certification play within your activities?
7. What do you think is the impact of certification on livelihoods and specifically food security?
8. How do you see the future of cocoa in Ghana?

Round up.

ANNEX II Focus Group guide

Intro (General)

1. How do cocoa farmers provide food for their households? (Growing crops - buying food).
2. Do you think cocoa farmers have difficulties in providing food for their households? Why do you think that is?

Food availability

3. In a normal year how does a cocoa farmers' household obtain food? When do you grow and when do you buy food? Does this change over the year and how?
4. Do you grow/buy more food now that you are certified?
5. Is the same food always available on the market? Do prices differ?

Food access

6. In general and in normal years: What are your major agricultural activities? Which crops are grown, cash (to be sold) or food (for own consumption) crops?
7. Has the certification of cocoa increased or decreased the production of other crops? (food or cash crops) Or has it had no influence?
8. Do you act out other (nonagricultural) income generating activities?
9. How would you describe the importance of cocoa farming in your household's income?
10. How does cocoa certification impact your income? (are there extra costs of production?)

Food utilization

11. What do you consider to be a good quality diet? (Rank the foods listed before according to importance)
12. Do you think it is difficult as a cocoa farmer to gain obtain such an adequate diet (to be food secure)?
13. Do you think certification played a role in getting a more adequate diet?

Stability

14. Do you experience periods in a year in which you are more food insecure?
    If yes: what do you do in such a situation?
15. Are you able to save foods for leaner times?
16. Are you able to save money for leaner times?

ANNEX III Questionnaire for structured interviews with cocoa farmers

Questionnaire for cocoa farmers

Survey No.: … Name Respondent: …… Sex: M / F

Introduction of research

My name is Eva Schouten, I am a student from Utrecht University in the Netherlands. I am carrying out a research investigating cocoa certification and the relation with food security of the producers in Ghana. This is done in collaboration with Solidaridad. I am not employed by an LBC, manufacturer, trader or processor. This project is an independent study for my university.

The results of this research project will be written down in a report, which will be made available to whoever is interested. This report will not mention your name or the locations of your farms. Any information you will provide me with will be used for research purposes only.

The interview will take about 20 minutes of your time. If you agree to be interviewed for my master thesis, you also agree that the information you provide me will be treated confidentially and you finally do agree that the results will be used to create a report that is publicly available, you are invited to sign the consent form on the first page of the questionnaire with your name, signature and date of the interview.

Consent Form

I confirm that I consent to be interviewed by Eva Schouten, master student from Utrecht University, the Netherlands.

I agree that the information I will provide him with will be used for his master thesis on the food security status of cocoa farmers.

I understand that this master thesis will be publicly available and shared with any person which might be interested in its content

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

Name:

Signature:

Date:

Farmer characteristics

01: What is your position in the household?

☐ Household head ☐ Child
☐ Spouse ☐ Other Adult

02: What is your age?

Answer: …

03. What is the highest form of education you attended? (multiple answers possible)

☐ Primary school (6 years) ☐ Post-Secondary (3-4 years)
☐ Middle school (4 years) ☐ Vocational
☐ Junior Secondary School (JSS) ☐ No form of formal education

04: What is your position in cocoa farming?

☐ Land owner ☐ Abunu
☐ Family land ☐ Abusa

05: To which person / LBC do you sell your cocoa?

……

06: Does the price you get for cocoa change?

☐ No
☐ Yes; how?.....

07: Is your farm certified? (multiple answers possible)

☐ Yes, Utz certified ☐ Yes, Rainforest alliance
☐ Yes, Fairtrade ☐ No

08: How long have you been certified?

……

09: Did you receive a premium for the cocoa you produced last year?

☐ Yes:……. Cedi per bag ☐ No
☐ Not yet ☐ I don't know

Household characteristics

10: How many people are part of your household? (include all the people that eat from the same pot; Father, mother, children, permanent dependents like grandparents, temporary dependents)

Number: …

11: How many people were part of your household before you were certified?

Number: …

12: How many members of your household work on the cocoa farm(s)?

Number: …

Financial Capital

13: What are your households' sources of income? Please rank them in importance.

Examples: Selling cocoa, selling other crops (specify which), off-farm activities (specify which), loans, remittances by children that left the household or by other family members).

1.
2.
3.
4.
5.
(etc.)

14: Is your households' total income more, less or the same as before certification?

☐ More
☐ Less
☐ The same

If A or B; specify what sources of income have changed

……
……

15: In the last 12 months, roughly how many bags of cocoa did you sell?
(Both main and light/mid-crop)

…….. bags

16: How many bags did you sell before certification?
(Both main and light/mid-crop)

…….. bags

17: Do you use additional inputs on your farm? (pesticides, fertiliser, fungicides, seedlings)

☐ Planting materials (seedlings/pods)
☐ Pesticides
☐ Farming equipment (cutlass, harvester hook, pruner, etc.)
☐ Fertilisers
☐ Fungicides
☐ I do not use inputs

18: Are the inputs you use on your cocoa farm more, less or the same as before certification?

☐ More
☐ Less
☐ The same

If A or B; specify what imputs of income have changed

……
……

19: Are the inputs you use on your farm with food crops more, less or the same as before certification?

☐ More
☐ Less
☐ The same
☐ I don't have food crops

If A or B; specify what imputs of income have changed

……
……

20: Do you have a form of savings?

☐ Savings at home
☐ Bank savings
☐ Susu account
☐ No savings
☐ Other

21: Did your costs change with certification?

☐ More
☐ The Same
☐ Less

22: What main costs is this specifically?

……
……

Physical Capital
23: If you compare the buildings and infrastructure you and your household are benefiting from with your situation before certification, what kind of changes do you see? (Examples: houses, sheds, sanitation, water and electricity connections) …… ……

Social Capital
24: If you compare the network you and your household can rely on now and your situation before certification, what changes do you see? (Examples: Family, NGO's, churches, farmers associations, local leaders) …… ……

Human Capital
25. Have your skills on agricultural practices for cocoa improved since certification? ☐ Increased ☐ Decreased ☐ Stayed the same 26. Have your skills on agricultural practices for food crops improved since certification? ☐ Increased ☐ Decreased ☐ Stayed the same

Natural capital
27: How big was your land used for cocoa before certification? ……acre 28: How big is your land used for cocoa now? ……acre 29: How big was your land used for food crops before certification? ……acre 30: How big was your land used for food crops now? ……acre

Food production & purchasing

31. What foods do you buy/grow and how has this changed with certification?

Grow Before Certification	Buy Before Certification

Grow after Certification	Buy after Certification

Reasons for changes:

……

……

……

32: Do you experience price changes for the food products you buy?

☐ No

☐ Yes; How?.....

33: What do you do when you can't afford products?

☐ I don't buy food products

☐ I buy less quantities

☐ I always buy what I need

☐ I never buy food products

34: Where do you buy food?

☐ Small shop in the community

☐ Local Market

☐ Market in city

☐ Other

35: Do you experience difficulty in reaching the places to buy food?

……

……

……

……

Food production & purchasing

36: Do you think the diversity/quality of your meals has changed since you have been certified?

☐ Better

☐ A little better

☐ The Same

☐ A little worse

☐ Worse

37: Do you think the amount of food you can buy has changed since certification?

☐ Better

☐ A little better

☐ The Same

☐ A little worse

☐ Worse

38: Do you think the amount of food you can grow has changed since certification?
☐ Better
☐ A little better
☐ The Same
☐ A little worse
☐ Worse

39: Did you or other family members in the household ever cut the size of your meals or skip meals because there was not enough money for food before being certified?
☐ Almost every month
☐ Some months but not every month
☐ Only 1 or 2 months
☐ We never skip meals

40: Do you or other family members in the household currently ever cut the size of your meals or skip meals because there is not enough money for food?
☐ Almost every month
☐ Some months but not every month
☐ Only 1 or 2 months
☐ We never skip meals

41: Which of these statements best describes the food eaten in your household:
☐ We always have enough to eat and the kinds of food we want
☐ We have enough to eat but not always the kinds of food we want
☐ Sometimes we don't have enough to eat
☐ Often we don't have enough to eat

42: Which of these statements best describes the food eaten in your household before certification?
☐ We always have enough to eat and the kinds of food we want
☐ We have enough to eat but not always the kinds of food we want
☐ Sometimes we don't have enough to eat
☐ Often we don't have enough to eat

43: What are the challenges you face in getting enough or the right food for household? Can you think of a possible solution for this?
:……
……

Final remarks

44: What services do you require most in your village? (mention 3 in order of importance)
☐ Education …
☐ *Health …*
☐ *Roads …*
☐ *Water …*
☐ *Electricity …*
☐ *Sanitation …*
☐ *Agricultural extension services …*
☐ *: Access to loans …*
☐ *Projects assisting women …*
☐ *Communication …*

45: Do you have questions or additions regarding this survey?
……
……

Thank you very much for participating! Medasi!