

Perennial tree-crop diversification among smallholder cocoa farmers in Côte d'Ivoire:

A Sustainable Livelihoods Analysis



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Perennial tree-crop diversification among smallholder cocoa farmers in Côte d'Ivoire: *A Sustainable Livelihoods Analysis*

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Abstract

Smallholder farmer's poverty is the underlying cause of many challenges that the cocoa sector is currently facing, such as child labour, deforestation, and human rights violations. It is therefore critical to support the ways in which farmers make a living to enhance the sustainability of the cocoa sector.

After decades of quasi-monoculture farming systems, an increasing amount of cocoa farms in Côte d'Ivoire are currently in a process of diversification with other perennial tree-crops such as rubber, oil palm, cashew or coffee. This research explores tree-crop diversification processes as a way to strengthen household's economic resilience and address the issue of cocoa farmer's poverty. Indeed it is assumed that households that combine multiple crops are less vulnerable to external shocks than households that rely on a single crop.

The purpose of this research is to bring in-depth knowledge on perennial tree-crop diversification processes in order to formulate recommendations on how to efficiently support farmer's households in their livelihood strategies. For this, three sub-domains of interest are explored: why do farmers diversify, how do farmers diversify and what type of institutional support do they benefit from. The study case of smallholder cocoa farmers in Côte d'Ivoire is chosen to illustrate the argumentation with an 8 weeks fieldwork, underpinned by the conceptual lenses of the Sustainable Livelihoods Framework (DFID, 1999).

The findings first show that farmer's households diversify in order to reach the Livelihood Outcomes of increased income, increased well-being, and reduced vulnerability. Environmental degradation causing replanting cocoa issues is here presented as an important factor for diversification, although it is not recognised as the leading factor by the farmers interviewed. Secondly, farmer's opportunity to implement diversification strategies are determined by their access to resources – which is itself widely influenced by the prevailing Organisations and Institutions. Farmers household perform trade-off mechanisms between their available Capital Assets to undertake a portfolio of Livelihood Strategies. In this regard, Institutions and Organisations can support farmer's households by facilitating their access to resources such as secure land and working arrangements, affordable financial services, technical and marketing assistance. This research concludes that diversification should not be considered as a 'one size fits all' type of solution to rural poverty – as farmer's households have the agency to choose their preferred strategy based on the available resources.

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Acronyms and Abbreviations

<i>Aboussan</i>	Type of sharecropping arrangement
ANACACI	Association Nationale des Coopératives Agricoles de Côte d'Ivoire
ANADER	Agence Nationale d'Appui au Développement Rural
CCC	Conseil Café Cacao
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
CNRA	Centre National de Recherche Agronomique
DFID	The British Department for International Development
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GIZ	Die Deutsche Gesellschaft für Internationale Zusammenarbeit
ICCO	The International Cocoa Organization
ICI	The International Cocoa Initiative
ICRAF	The World Agroforestry Centre
IDH	The Sustainable Trade Initiative
NGO	Non-Governmental Organization
SLF	Sustainable Livelihoods Framework
WCF	The World Cocoa Foundation

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1. Introduction

The production of cocoa (*Theobroma cacao*) beans in Côte d'Ivoire involves everyday more than 800.000 farmers and supports the livelihoods of 5 million people, roughly 21% of the population. (Ehrhart, 2015). Despite the importance of cocoa farming in the Ivorian economy, a large majority of farmers households remain under the international poverty line threshold. In this regard, it is of critical interest to explore and support the ways in which cocoa farmers make a living to secure their livelihoods.

After decades of quasi-monoculture farming systems, an increasing amount of cocoa farms in Côte d'Ivoire are currently in a process of diversification with other perennial tree-crops such as rubber (*Hevea Brasiliensis*), oil palm (*Elaeis guineensis*), cashew (*Anacardium occidentale*) or coffee (*Coffea*). This research explores tree-crop diversification processes as a way to strengthen household's economic resilience and address the issue of cocoa farmer's poverty.

Diversification is defined as "*the process by which households construct increasingly diverse livelihood portfolios, making use of increasingly diverse combination of resources and assets*" (Niehof, 2004: 321). In the existing literature, diversification is often approached in rural development studies as the addition of non-farming activities to a household's livelihood portfolios (Winters et al., 2009; Barrett et al., 2001). This research, however, focusses on 'crop-diversification', meaning the diversification of cultivated species on farm, with a special attention to perennial-tree crops. Within the literature on rural development, crop-diversification processes are studied from an economic perspective (Ruf, 1995; 2013; Ruf and Schroth, 2004; 2013; Schroth and Ruf, 2014). Research studies with quantitative or mixed methods also look at the impact of diversification on household's wealth (Reardon et al, 1992; Adams and He, 1995, as referred to in Ellis, 1998; Ellis, 2000; Lindenberg, 2002). The agronomic field of research also provides literature on crop-diversification processes although this body of literature was not extensively studied.

This research approaches crop-diversification from a socio-anthropological perspective and brings in-depths knowledge to crop-diversification as a result of households decision-making processes with regards to initial motivations, available assets, and existing background organisations and institutions.

Smallholder farmers livelihoods largely depend on the single cocoa tree-crop and are therefore particularly vulnerable to external pressures that may affect it: market instability, pests and diseases, environmental change or sudden policy shocks. Since different risks "tend to affect different crops differently", this research starts with the assumption that households that combine multiple crops are less vulnerable to external shocks than households that rely on a single crop. (Schroth & Ruf, 2014: 140).

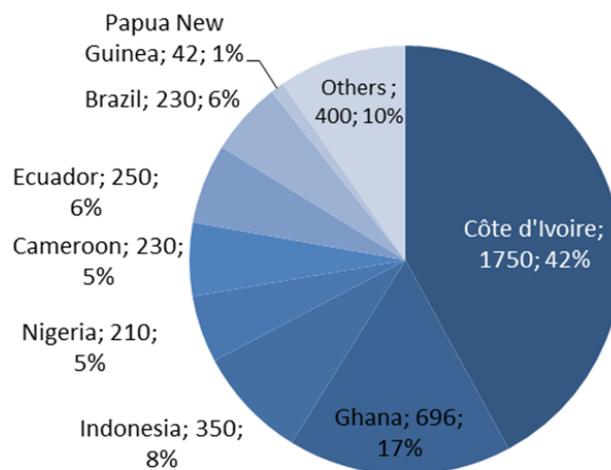
This research subject is important for the sustainability of the cocoa sector, as it explores the transition from an extensive monoculture 'full sun grown' cocoa farming system to a more intensive, diverse and resilient model where diversification acts as a form of "self-insurance" (Barrett et al, 2001: 322). Smallholder cocoa farmers will durably stay in cocoa production only if they are able to make a living income; in this sense, crop-diversification participates to the survival of the cocoa sector itself.

1.1. Background to the research

1.1.1. The cocoa sector

The cocoa production is concentrated in tropical and humid regions in Western Africa (72%), Asia and Oceania (12%) and Americas (16%) and involves around 6 million smallholder farmers around the world. Among the cocoa-producing countries, Côte d'Ivoire is leading the chart since 1978 and provides today about 40% of the global supply, which represents over two million tons of cocoa beans this year. (World Cocoa Foundation, 2014; ICCO, 2017).

Figure 1.1: The world's cocoa bean producers, 2015, in thousands of tons and percentage. (ICCO, 2015; as featured in Balineau, Bernath, & Pahuatini, 2016)



Source: ICCO, quarterly bulletin of cocoa statistics, Vol. XLI, No3, published 28-08-2015

Since the independence in 1960, the Ivorian government encouraged agricultural specialisation by setting up migration policies to support the creation of a 'cocoa belt' in tropical forest areas (Ruf & Schroth, 2013). Today the cocoa sector is the backbone of the Ivorian economy: it accounts for 20% of its national GDP (Gross Domestic Product) and 40% of its exports revenues. (ICCO, 2017). Unlike other crops, cocoa comes at 90% from small family farming systems with a typical farm size covering about 4 hectares: this explains the critical importance of cocoa farming in rural development. This working force is also largely constituted by migrant workers coming from neighbouring countries.

Due to an ever-increasing cocoa production and a rather stable global demand, cocoa prices have drastically dropped since 2016 and reached their lowest rate in the past decade. In Côte d'Ivoire, the Conseil Café Cacao – the governmental council that regulates the sector – sets a fixed minimum farm gate price that represents at least 60% of the international CIF prices. This system attempts to reduce farmers vulnerability to international price fluctuations by selling forward a part of the harvest to a range of aggregated exporters. For the season 2017-2018, the fixed price was set at 700 franc CFA/kg (equals to 1.07 EUR/kg), the lowest since the conception of this price-regulation system in 2012. Criticism has been expressed throughout the interviews about the national taxation policies that feed this regulation system, without yet having shown their efficiency.

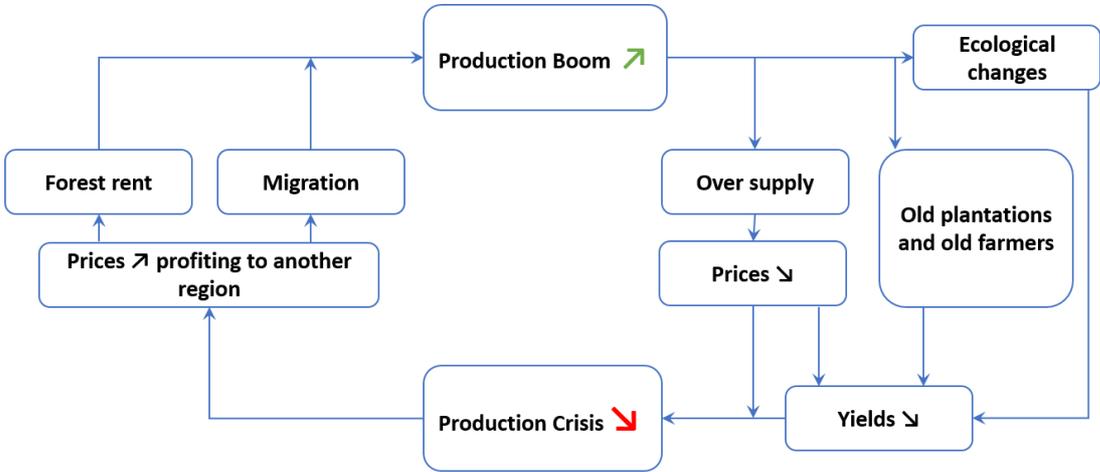
Behind these numbers, the cocoa sector is facing several critical challenges such as human rights violations, child labour and deforestation – which are unfortunately anything but new to the sector. (Fountain et al, 2015; Mighty Earth, 2017). Preliminary informal discussions with experts of the cocoa industry indicate that all the preceding issues directly relate to the underlying cause of smallholder farmer’s poverty. For this reason, this research contributes to address the poverty issue among farmers communities, which can also impact on other challenges within the cocoa sector.

Small plot surface, low productivity, and low gate prices partly explain why cocoa farmers are currently not able to make a living income. Estimations of their revenues vary between studies – from 0.5 USD a day (Fountain et al, 2015) to 1.17 USD a day (Balineau et al, 2016) – but generally speaking remain far under the international poverty line threshold set by the World Bank at 2USD a day.

1.1.2. The theory of the cocoa cycles in relation to diversification strategies

One author – François Ruf, researcher at CIRAD – participates extensively (if not exclusively) to the existing literature on perennial tree-crop diversification. (Ruf, 1995; 2013; Ruf & Schroth 2004; 2013; 2013; Schroth and Ruf, 2014). To truly understand perennial tree-crop diversification, one must first pay attention to the boom-and-bust cycles within the agricultural history of cocoa farming. Ruf (1995; 2013) argues that a peak in cocoa production is almost always followed by a production crisis.

Figure 1.2: The theory of the cocoa cycles (Created by the other from Ruf, 1995; Ruf & Schroth, 2013)



The theory of the cocoa cycles (Ruf, 1995; Ruf and Schroth, 2013) explains that an increase of cocoa price and incentive public policy are almost always followed by strong migration waves towards tropical forest areas. This ‘pioneer front’ of migrant farmers settles in forest areas to benefit from the ecological advantages of ‘the forest rent’; which ensure a fast and easy growth of the cocoa seedlings without having to use fertilizers. Freshly deforested grounds are indeed known to be more fertile, enjoy a favourable micro-climate, and are less vulnerable to pests and diseases. Cocoa production booms are usually explained by pioneer migration waves and massive deforestation.

A boom in cocoa production is almost inevitably followed by a crisis in cocoa production; attractive cocoa prices encourage more and more migrant farmers to settle in forest areas, and the expansion of monoculture cocoa plantations leads to ecological degradation. This 'exhaustion of the forest rent' features degrading soil and climate conditions as well as increasing pests and diseases. Combined with aging plantations 15 to 30 years after the first exploitation, farmers experience difficulties to replant cocoa seedlings and regenerate their cocoa orchards due to a depletion of the natural resources. Low prices, high production costs and low yields lead to a production crisis. Furthermore, the cocoa demand is rather steady; it implies that the supply determines the cocoa prices – and prices determine the migration cycles. A boom in cocoa production (oversupply > decline of prices) is therefore almost always followed by a production crisis (undersupply > increase of prices) – and so on.

Following the ecological changes with the exhaustion of the forest rent, farmers have 3 options: (Ruf & Schroth, 2013)

1. Abandon the cocoa plantations and migrate towards a new pioneer front in tropical forest areas in order to start a new cocoa cycle.
2. Keep the cocoa plantation and start replanting cocoa trees by investing in Human and Physical Capital (e.g: use of inputs) to compensate for the loss of the forest rent.
3. Diversify the farming system in order to adapt to the ecological changes. In this latter option, access to land is decisive in the diversification process.

The first option can be assimilated to a Malthusian extensification strategy; Malthus (1798) argues that an increase of population [as the result of migration waves] leads to a depletion of the natural resources. Migration is the strategy used by the populations to exploit new lands and continue the destructive cycle. (Ruf & Schroth, 2013). This option, adopted until recently with a 'pioneer front' logic, is slowly running out due to a pressure on land distribution and a quasi-disappearance of tropical forest areas in Côte d'Ivoire. This strategy can nonetheless cross borders and settle in the remaining tropical forest areas of Africa.

The second option can be considered as a Boserupian intensification strategy; she also argues that an increase in population leads to environmental degradation. For Boserup (1965), intensification of production through investment in innovation and in technology can be a solution. (Ruf & Schroth, 2013). This option is largely adopted by the stakeholders of the cocoa industry with cocoa regeneration programmes featuring access to agricultural inputs, improved planting material and Farmers Fields Schools trainings.

Finally, the third option can also be considered as an innovation in the Boserupian sense; the transformation of extensive monoculture systems into diversified farming systems as an adaptation to ecological changes. In this regard, Ruf & Schroth (2013) argue that crop-diversification strategies intervene as a response to cocoa regeneration issues caused by the exhaustion of the forest rent. The dialogue between cocoa production and crop-diversification is explored throughout this MSc Thesis as it reveals much of the logic followed by the stakeholders involved.

1.2. Research Objectives and Questions

This research aims at having a deeper understanding of the crop-diversification processes at smallholder cocoa farmers level, in order to identify potential means for Institutions & Organizations to further support rural households livelihoods strategies. This is reached by exploring the initial motivations that trigger cocoa farmers to diversify and the ways in which they access and mobilize resources to implement this strategy; from the perspective of the farmers and the institutional background.

The following question guides the research:

What do the diversification strategies of smallholder cocoa farmers in Côte d'Ivoire tell us about how Organisations and Institutions can more effectively support the ways in which cocoa farmers make a living ?

This main question is divided into three sub-questions that structure the answer throughout the research:

1. *Why do smallholder cocoa farmers decide to diversify?*
2. *How are the diversification processes operated at farm level?*
3. *How do Organisations & Institutions currently support smallholder cocoa farmers in their diversification strategies?*

The research questions defined here-above point to three domains of investigation, which correspond to the three main concepts taken from the theoretical framework: Livelihood Strategies, Livelihood Assets, and Transforming Structures and Processes. The theoretical concepts are intrinsically carried out by people and institutional processes and bring attention to the views and actions of smallholder cocoa farmers and stakeholders of the cocoa industry.

The first sub-question is critical to apprehend the current changes in households' livelihood strategies with the diversification of the farming systems. The second sub-question looks at the influence of households' available resources in engaging such diversification strategies. The third sub-question widens the analysis by taking into consideration institutional processes in the definition of resource distribution mechanisms. This approach brings new contributions to the current crop-diversification literature that up until now essentially focuses on farming systems and somewhat neglects the wider institutional background.

1.3. Thesis Outline

Following this introduction, Chapter 2 elaborates the methodology for analysing crop-diversification strategies by introducing the theoretical framework and methods chosen to carry out this research, as well as its limitations. The findings of the empirical analysis are presented in Chapter 3 that answers to the first sub-question and Chapter 4 that answers to the second and third sub-questions. Chapter 5 discusses these results and reflects on the theoretical framework. Finally, Chapter 6 presents a synthesis of the main findings and formulates recommendations for further research.

2. Conceptual Framework and Methodology

This chapter develops the theoretical framework chosen to analyze the empirical results (Section 2.1) and the research methods used to collect and analyze the data (Section 2.2).

2.1. Theoretical Framework

2.1.1. The Sustainable Livelihoods Framework (DFID, 1999)

The theoretical perspective chosen to underpin this research is the Sustainable Livelihoods Framework (SLF), (DFID, 1999). The SLF is one of the most elaborate and used framework to understand how people live; it evolves around the idea that people's choices are shaped by constraints and opportunities as defined by their ability to access and mobilise resources. This framework is preferred over other approaches because it combines an actor-centred perspective of households motivations to undertake specific livelihood strategies, and a holistic overview of all the external factors shaping people's livelihoods. This approach is therefore particularly suitable with my objective of analysing both smallholder farmers motivations to diversify and the current institutional support for diversification strategies. The SLF takes the household as a primary unit of analysis – which is an aspect that will be discussed in Chapter 5.

“A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.” (DFID, 1999)

The livelihoods perspective was first developed in the 1990s (Chambers and Conway, 1991; Carney, 1998; Scoones, 1998; DFID, 1999) to understand how poor and vulnerable people make a living. This approach has been developed in close collaboration between the Institute for Development Studies (IDS) – a research institute – and the British Department For International Development (DFID) – a national development agency. The first articulation of ‘sustainable livelihoods’ as a concept has been developed with the precursors Chambers and Conway (1992) for IDS. It was explicitly raised against previous neo-liberal discourses of the Washington Consensus and technocratic approaches which ‘do not fit or capture the complex and diverse realities of most rural life’ (Chambers and Conway, 1992: 4). Rather than focussing solely on efficiency and productivity, the livelihoods approach introduced a bottom-up and actor-centred perspective aiming at understanding *why people do what they do*. (Levine, 2014).

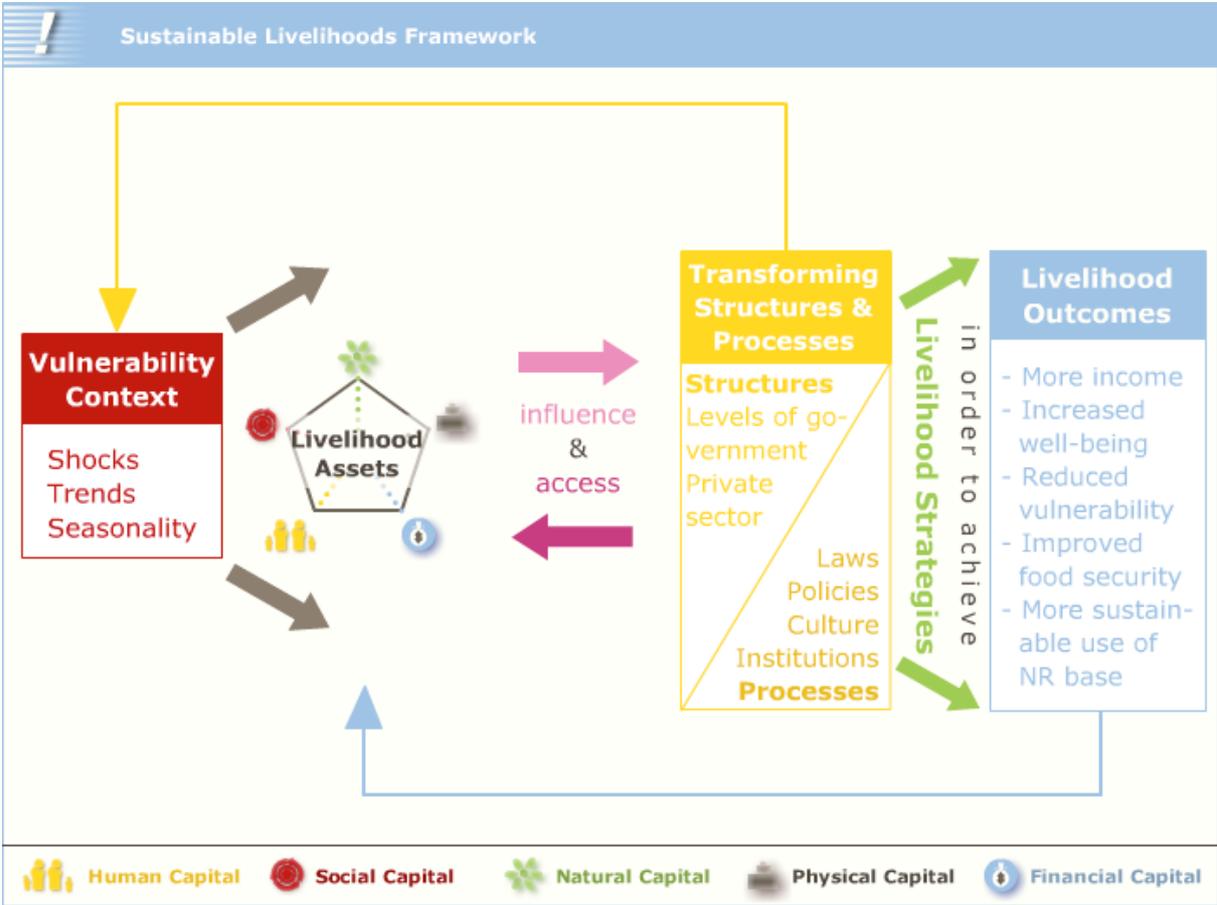
Five years later, the Sustainable Livelihoods Approach had already marked its integration into the public policy sphere; the DFID placed it at the core of its ‘pro-poor strategy’ and used it as a tool to assess or plan new development interventions. (Solesbury, 2003). Drawing on earlier work of Scoones (1998), the DFID adapted the livelihoods perspective into the ‘Sustainable Livelihoods Framework’. (DFID, 1999). Multiple authors have contributed with their own version of a livelihoods framework, taking different approaches and interpretations (Chambers and Conway, 1992; Carney, 1998; Scoones, 1998, 2009; Bebbington, 1999, DFID, 1999; Ellis, 1998, 2000). All approaches aim at addressing communities’ poverty.

As previously mentioned, the framework bridges between two opposite micro and macro approaches; on the one side, the SLF is an actor-oriented perspective, as it considers rational individuals as agents of their own livelihoods choices; on the other side, the SLF takes a holistic view and presents the same rational individuals as constrained/enabled in their decisions by the

societal structures – power relations, politics, institutions, etc. In this matter, the Sustainable Livelihoods Framework can also be considered as a form of political economy analysis. (Collinson, 2003).

The SLF is depicted into a visual model (Figure 2.1) that represents the inter-relations between the main elements of the framework. In line with Levine (2014) it has to be clearly stated that no single model can fully explain livelihoods nor depict the reality and complexity of the dynamics that shape them. The Sustainable Livelihoods Framework shall be considered as a tool to approach the research questions, where one should keep the focus on the arrows rather than on the boxes.

Figure 2.1: The Sustainable Livelihoods Framework (DFID, 1999; in GLOPP, 2008)



Kollmair et. al (2002) as summarise the core elements of the framework as follows:

“In its simplest form, the framework depicts stakeholders as operating in a **context of vulnerability**, within which they have access to certain **assets**. Assets gain weight and value through the prevailing social, institutional, and organizational environment (**transforming structures and processes**). This context decisively shapes the **livelihood strategies** that are open to people in a pursuit of their self-defined beneficial **livelihood outcomes**.” (Kollmair et al., 2002: 4, as featured in GLOPP, 2008).

The guidance sheets provided by the DFID (1999) constitute an excellent source to understand how to apprehend and use the framework;

The standard SLF analysis usually starts by depicting **the Vulnerability Context**. This context refers to the economic-political-social-cultural-demographic background environment in which the research subjects evolve. “Vulnerability emerges when human beings have to face harmful threat or shock with inadequate capacity to respond effectively” (GLOPP, 2008: 3). The vulnerability context has influence on the availability of livelihoods assets, and on the options available to transform them into positive livelihoods outcomes.

Evolving in a vulnerability context, people draw on five types of **Livelihood Assets** [or ‘Capital Assets’] to undertake livelihood strategies and achieve their desired Livelihood Outcomes; Human Capital, Social Capital, Natural Capital, Financial Capital and Physical Capital. The main objective of the Livelihoods Approach is to find ways to increase people’s access to the Capital Assets, in order to support their Livelihood Strategies and eradicate poverty.

For this, it is of interest to study the dynamic relationships between capital assets: is there a specific combination of assets required to undertake a chosen Livelihood Strategy? Can an increased access to one Livelihood Asset compensate for the lack of access to another one? Practitioners of the SLF usually depict together with the target population their living conditions by reviewing their Assets base.

The **Transforming Structures and Processes** are one of the most important elements of this framework. They represent any local, regional, national or international institutions, organisations, policies and legislations that regulate and affect people’s livelihoods. They are both the rules of the game and the players of the game (North, 1990). The Transforming Structures and Processes determine people’s *access* to the Capital Assets and the terms of exchange between them. They also determine people’s ability to transform those assets into concrete Livelihood Outcomes. Since no single study can fully depict the existing Structures and Processes, this research is going to narrow down the focus to few relevant selected Organisations and Institutions.

Livelihood Strategies are defined as “... the range and combination of activities and choices that people make/undertake in order to achieve their livelihood goals...”. (DFID, 1999). People use their access to the Livelihood Assets in order to build Livelihood Strategies. Such decisions are shaped by the Vulnerability Context and the Transforming Structures and Processes. This research explores the Livelihood Strategy of perennial tree-crop diversification at farm level.

Finally, the **Livelihood Outcomes** are the (expected) results of the Livelihood Strategies. Those goals are set by the people themselves and shouldn’t be solely measured on income maximisation; well-being, food security, and reduced vulnerability or sustainable use of natural resources can also be set as priorities. Livelihoods Outcomes are subjects to trade-offs and can be conflicting. Such trade-off mechanisms will be further explored in Chapter 5.

I am not using the Sustainable Livelihoods Framework in its empirical conception: the necessary resources to conduct a complete Livelihoods analysis are not available, nor is the aim of this research to plan a development intervention. I am using the framework as a conceptual background, structuring the results interpretation and answers to the research questions. As explained in the research objectives, the research sub-questions mainly focussed on three key aspects of the theoretical framework that define the domains of investigation: Livelihood Strategy, Livelihood Assets and Transforming Structures and Processes.

This approach differs from the standard way of using the SLF in two ways:

Firstly, the research doesn't attempt to provide an extensive analysis of the Vulnerability Context or all domains the Transforming Structures and Processes and their interactions with smallholder farmers. This type of project is too wide for the purpose of this research and no single study can truly capture all factors that shape people's livelihoods. Second, the choice of Livelihood Strategy is not the ending point of the project but rather its starting point.

My approach is to narrow down the focus of the research to the sole Livelihood Strategy of perennial tree-crop diversification (itself comprising so many variants) and start directly with a direct consultation of smallholder cocoa farmer's livelihoods choices and available Capital Assets. The Vulnerability Context and the Structures and Processes will be analysed at a later stage, based on the perspective of the farmers. Understanding why and how people do what they do (Levine, 2014) will help me formulate recommendations on how to support their livelihoods' choices.

2.1.2. Bebbington's perspective

Bebbington (1999) draws on the literature developed by Chambers and Conway (1992), Serageldin and Steer (1994), or Scoones (1998) that considers (rural) livelihoods in terms of access to a certain range of 'Capital Assets': Produced, Human, Natural, Social, and Cultural. He proposes two major additions to the Livelihoods Approach:

First; "Assets – or what I call capitals in this framework – are not simply *resources* that people *use* in building livelihoods: they are assets that give them the *capability* to be and to act. [...] the capability to *change* the world." (Bebbington, 1999: 2022). He refers to Giddens (1979) in the idea that capitals are not only means of survival, they are "the basis of agents' *power* to act and to reproduce, challenge or change the rules that govern the control, use and transformation of resources" (Bebbington, 1999: 2022). For him, assets are both inputs and outputs, means and capabilities, survival and empowerment.

Second, Bebbington brings Social Capital at the centre of the question of access to resources. For him, access to Social Capital is prior to access to resources – as relationships with other actors almost always condition the distribution or the transformation of other resources. Social Capital therefore determines " [...] how actors engage with other actors in the spheres of market, state, and civil society [...]" and how they are able to renegotiate the resources distribution. (Bebbington, 1999: 2023).

I decide to integrate Bebbington's perspective to the current theoretical framework chosen for this research, for he brings more emphasis on people's agency and capability to engage with societal structures in order to secure their livelihoods. This interpretation confers people with a stronger ability to engage in power relations and appears to be less top-down than approaches that anticipate development interventions to be necessary to secure their livelihoods. People's agency and capability to engage with other elements of the framework is further discussed in Chapter 5.

2.2. Research Methods

2.2.1. Data Collection

This research adopts a qualitative case study design in order to bring in-depth understanding to the subject of enquiry. It is felt that an anthropological approach is the most appropriate for comprehending the research subjects and the logics they adopt. A “case” study focuses on a single occurrence of a certain event hence not allowing for a generalization of the results; although different cases can be used as a point of comparison. Case studies reveal contextual nuances that enable reflection on the complexity of the empirical processes at play and the theoretical foundations used to analyze them. This is precisely what this research is aiming for.

The data was gathered during an eight weeks fieldwork in Côte d’Ivoire situated in Western Africa, carried out between October and December 2017. The primary fieldwork aims to collect data according to the domains of investigation as defined in the research questions: Livelihood Strategy, Livelihood Assets, Transforming Structures and Processes.

Most interviews were semi-structured with a previously defined set of questions focusing on specific elements of the conceptual framework – yet allowing the flexibility to bring up external points of interests. (Bernard, 2011). The research findings are based on the primary data of 54 semi-structured interviews featuring 27 smallholder cocoa farmers (composed of 23 diversified farmers and 4 non-diversified farmers) and 27 representatives of organisations of the cocoa (24), palm (1) and rubber (1) industry. A focus group interview was also carried out at the very beginning of the fieldwork with 7 farmers in order to reveal the key issues experienced by the households and refine the farmers questionnaire accordingly.

Photograph 2.1: Focus group at CAYAT cooperative (taken by the author)



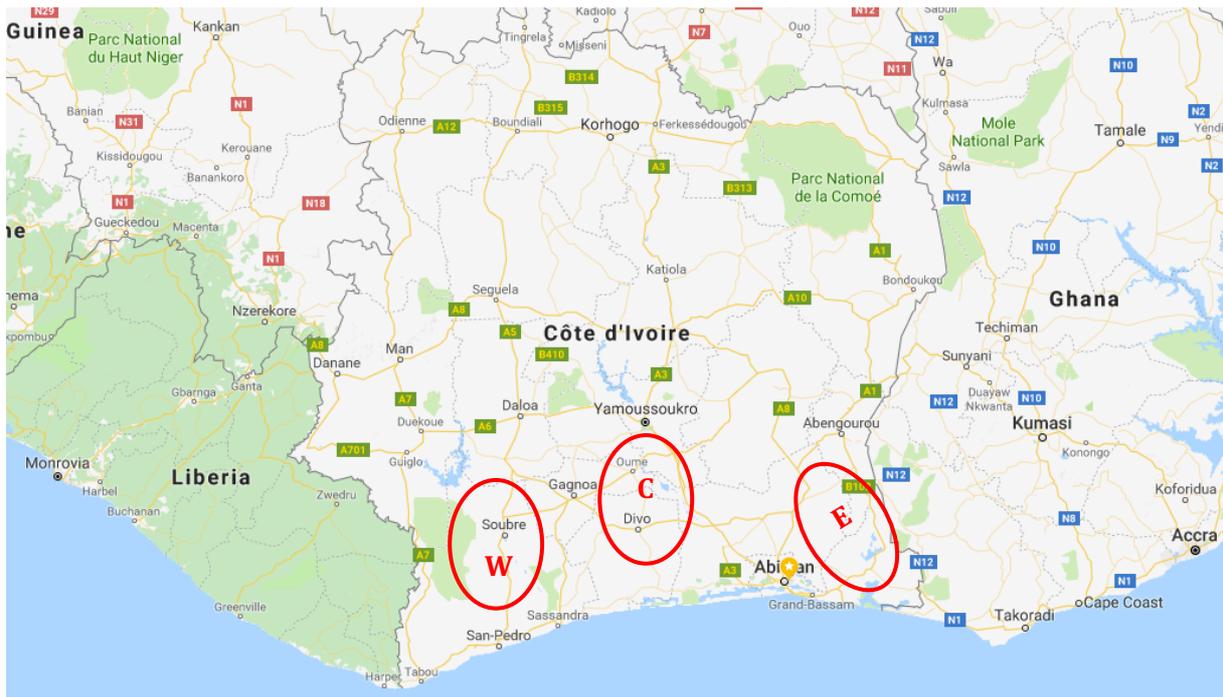
Multiple informal interviews were also carried out prior and after the field research. In addition, several secondary data sets from quantitative and qualitative studies on cocoa farmers livelihoods were used (Balineau et al., 2016; EMC, 2017; Royal Tropical Institute, 2018) as well as one book combining a range of research articles on crop-diversification (Ruf & Schroth, 2013). Since I visited myself all research areas and conducted all interviews in person, the results interpretation is necessarily affected by the participatory observation gathered throughout the field visits.

Smallholder cocoa farmers were reached through 10 producers organisations (or ‘cooperatives’) supplying the cocoa processor company Cargill, scattered rather equally between the East (E), Centre (C) and West (W) regions in Côte d’Ivoire (Figure 3.2). The selection of the farmers was made indirectly: I first selected 10 cooperatives scattered over the ‘cocoa belt’ using a purposive sampling method (Bernard, 2011) based on relevance for the study, reachability (distance from the main road), suitability with the accompanying team’s agenda, and willingness to cooperate. Following this first selection, the farmers sampling was performed by the producer’s organisations themselves, based the instructions given with regards to the relevance for the study (experience with diversification strategies, small scale farmers) and availability of the respondents. It was required for all participants to be diversified with the presence of at least one additional cash crop on farm. Despite this selection criteria, 4 non-diversified farmers also integrated the selection sample, which eventually was of great use as it enabled to reflect on the barriers to diversification.

Figure 2.2: List of cooperatives from which cocoa farmers were interviewed

Region	Cooperative name	Date of interview(s)	Number of interviewed subjects
Region of Adzopé (East)	CAYAT	03.11.17	7 (focus group)
	KGS	08.11.17	4
Region of Aboisso (East)	COOPEBIA	09.11.17	2
	SOCAS	09.11.17	2
Region of Yamoussoukro (Centre)	SOCCODD	13.11.17 and 14.11.17	4
Region of Divo (Centre)	COOPALO	21.11.17	3
	COOPAKOF	22.11.17	3
Region of Soubré (West)	BENKADI	28.11.17	4
	SCAPB	29.11.17	3
	SOCANC	30.11.17	2

Figure 2.3: Mapping of the research areas in Côte d'Ivoire



The three research areas were also selected based on a strategy of purposive sampling (Bernard, 2011). The southern part of Côte d'Ivoire represents what is referred to as the 'cocoa belt' and corresponds to tropical humid areas where cocoa takes a large part of the farming landscape. All the same, it is important to select areas from the East, Centre and West, as the regions correspond to different 'cocoa cycles' over the decades; starting from the East in the 1960's and spreading towards the West in the 1980's-1990's. The cocoa cycles indeed affect the Ivorian farming landscape and the oldest cocoa producing region (East) is currently at the most advanced stage of crop-diversification compared to the youngest cocoa producing region (West). In this regard, an equal distribution between the various regions ensures a better representativeness of the diversification phenomenon and its barriers.

The fieldwork was carried out during the main cocoa harvesting season, hence the obligation to reach out to cooperatives in advance in order to ensure that a few selected farmers would stay at the village to do the interviews. On top of getting access to their producer's organisations, Cargill also participated to this fieldwork by providing logistical support and multiple informal interviews.

When it comes to the institutional analysis, a selection of relevant stakeholder to interview for the research was established prior to the fieldwork based on a desk research. This list was modified based on the availability of the interviewees and their willingness to cooperate. Eventually it was decided to extend the selection to a few companies of the rubber, palm and agro-chemical industries in order to keep a holistic view on the Transforming Structure and Processes influencing the diversification decisions. 27 semi-structured interviews were carried out with 14 organisations and 10 producer organisations representatives. The detailed list of organisations and interviewees is displayed in Appendix 1.

2.2.2. Data Analysis

Qualitative research methods were adopted for the analysis of the empirical results, which cannot provide statistical evidence of the arguments sustained but allows for in-depth understanding of the subject. The data collected is necessarily interpreted through the lenses of the theoretical framework, but also through the interpretation of the researcher himself, that can complete the data collection with personal observations gathered during field visits. Although a statistical model was not developed due to the methods chosen and sample size, I attempted to gather all data from interviews into a comprehensive matrix in order to compare answers between respondents and have an overview of the logics that drive the various actors interrogated. This was particularly useful for the farmers interviews, as it enabled to draw an order of importance between the motivations to adopt diversification strategies (Chapter 3). All the same, interviews carried out with organisations representatives are detailed in the Appendices.

2.2.3. Limitations

The main limitation to this research project relates to the sampling methods available for the farmers selection. It was first decided to narrow down the selection to cocoa farmers that were already diversified with other cash-crops. This selection criteria had the advantage of bringing many qualitative information on the adoption and implementation of perennial tree crop diversification strategies. Nonetheless, it also became clear that the selected farmers were not representative of the 'average Ivorian cocoa smallholder farmer' for they featured larger land surfaces than what the literature advances (World Cocoa Foundation, 2014). Few large land-owners did not match the criteria of relevance for the study and were nevertheless selected for the interviews, which affected the total average land size of the farmers selection. This can trigger the question whether the 'average Ivorian cocoa smallholder farmer' with 3-4 hectares of land is in fact also able to diversify; thus it seems critical to improve the diversity of interviewed farmers in further developments. This limitation shows that the results of this project cannot be generalised.

Photograph 2.2: Abou Koné, Farmer 4. (taken by the author)



Secondly, the sole entry point to get in touch with cocoa farmers during the field research was to operate via farmers cooperatives – which are the direct cocoa suppliers of the company Cargill that was logistically supporting me to carry out this project. Although all visits were made on very short notice, there is a possibility that producers organisations have presented me with their ‘best farmers’ in order to appear as well-functioning structures; and that the farmers themselves have modified their answers due to the presumed linkages with a cocoa company.

In order to tackle these potential research biases, I have tried to organise field excursions with two research institutes – namely ICRAF and CIRAD – that are more ‘neutral’ stakeholders in the resources distribution. This option was nonetheless not available at the time of the research as both organisations refused to provide their support due to lack of available staff and transportation means. My only option was therefore to repeatedly voice my wish to have a truthful representation of the realities on the field. I clearly and continuously stated my independence from Cargill and from the cooperatives administration board – and I ensured the confidentiality of the detailed interviews at the beginning of each interview.

Photograph 2.3: Storage of cocoa bags at the cooperative SOCODD (taken by the author)



3. Why do smallholder cocoa farmers decide to diversify?

3.1. Introduction

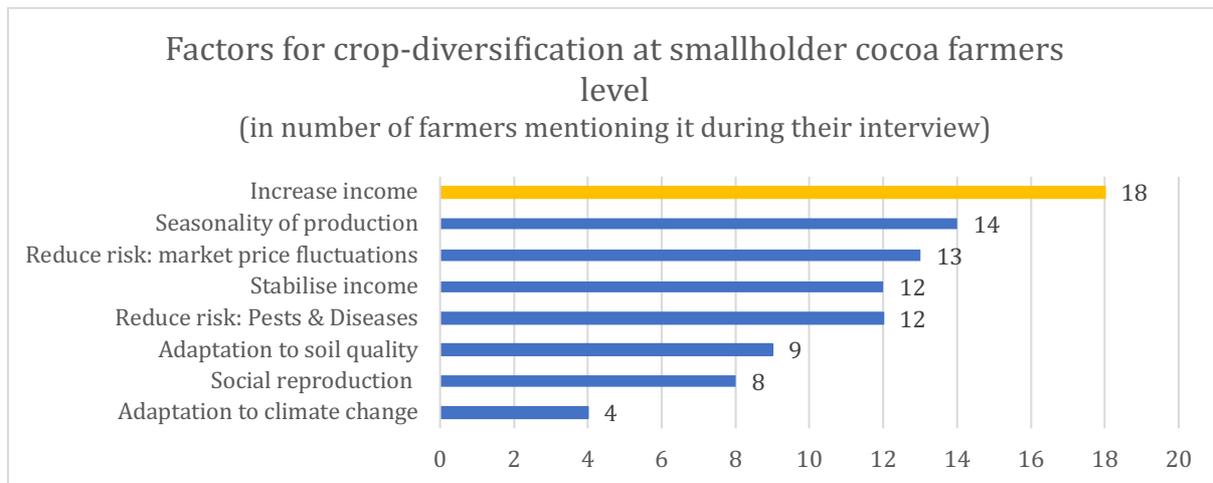
This first empirical chapter explores the various motivations that trigger smallholder cocoa farmers to diversify. Three main drivers were identified during the farmers interviews and are discussed under the sections 3.2) increasing revenues, 3.3) stabilising revenues and 3.4) reducing vulnerability.

This chapter explores both the pull factors¹ (such as the Livelihood Outcomes) and the push factors² (such as the Vulnerability Context) to explain diversification strategies from a farmer's perspective.

3.2. Increasing Revenues

The findings provide evidence that farmer's first motivation to diversify is to increase their revenues: it is the most frequently indicated factor for diversification with 18 out of 23 diversified farmers mentioning it in their interview;

Figure 3.1: Identified factors for perennial tree-crop diversification at cocoa farmers level. (based on the data collected during fieldwork).



With regards to the Sustainable Livelihoods Framework (DFID, 1999), the empirical analysis shows that the Livelihood Strategy of crop-diversification is firstly motivated by the expected Livelihood Outcome of increasing income (refer to Figure 2.1). For this, farmers take two main points into consideration: the price comparison between available crops (Section 3.2.1), and the site characteristics (Section 3.2.2).

¹ Pull factor: "something that attracts people to a place or an activity". (Cambridge Dictionary, 2018).

² Push factor: "something that makes people want to leave a place or escape from a particular situation". (Cambridge Dictionary, 2018)

3.2.1. Price ratio calculation between crops:

Among the 18 interviewees that mentioned income increase as a motivation to diversify, a majority of farmers stated that the introduction of an additional cash crop to the farming activities was the result of a price ratio comparison with the previous crops³.

“All of us adopted rubber about 10 years ago, with the fall of the coffee prices.”
(Focus group, 03.11.17)

“There was a time where cocoa prices weren’t good, and that’s when I decided to diversify. [...] It was for the price: back then cocoa was worth 300 CFA/kg and rubber was worth 1100 CFA/kg; that’s why I decided to plant rubber.”
(Farmer 21, 28.11.17)

“We started to replace coffee with cocoa when prices were low, so we don’t have much coffee left.”
(Farmer 22, 28.11.17)

To interpret these quotes, there is a need to dig a little into Côte d’Ivoire’s agricultural history: the country used to be one of the leading coffee producers up until the mid-1970’s when the Ivorian government chose to favour cocoa’s pricing policy, at the expense of coffee. Combined with a global decline of the coffee prices, the country started a diversification process by combining coffee and cocoa production. Eventually many farmers tore off their coffee plants in order to replace them with cocoa; one can hardly talk about diversification process, as many farmers ended up entirely switching to a new monoculture system. This ‘diversification’ wave raised Côte d’Ivoire to the status of 1st cocoa producer worldwide since 1978. (Ruf, 2013). The switch from coffee to cocoa due to the price advantage of cocoa is clearly observable the previous quotes.

The same price mechanisms are at play in the recent diversification process observed with rubber and palm. The global cocoa prices fell in the early 1990’s and 2000’s, leaving a price advantage for rubber and palm to settle in the farming agricultural landscape in Côte d’Ivoire (Sayam and Cheyins 2013; Fiko and Yao 2013). This wave of diversification was also accompanied with a favourable State pricing policy to support the rubber industry. The following figures show a certain correlation between the price advantage of rubber compared to cocoa in the 1990’s (Figure 3.2) with the gradual introduction of rubber in the agricultural landscape in Côte d’Ivoire (Figure 3.3).

³ Those estimates are based on the yields and prices accurate at that time.

Figure 3.2: Estimated mean revenues per hectare of cocoa and rubber in Côte d'Ivoire from 1986 to 2008. (Ruf et. al, 2013)

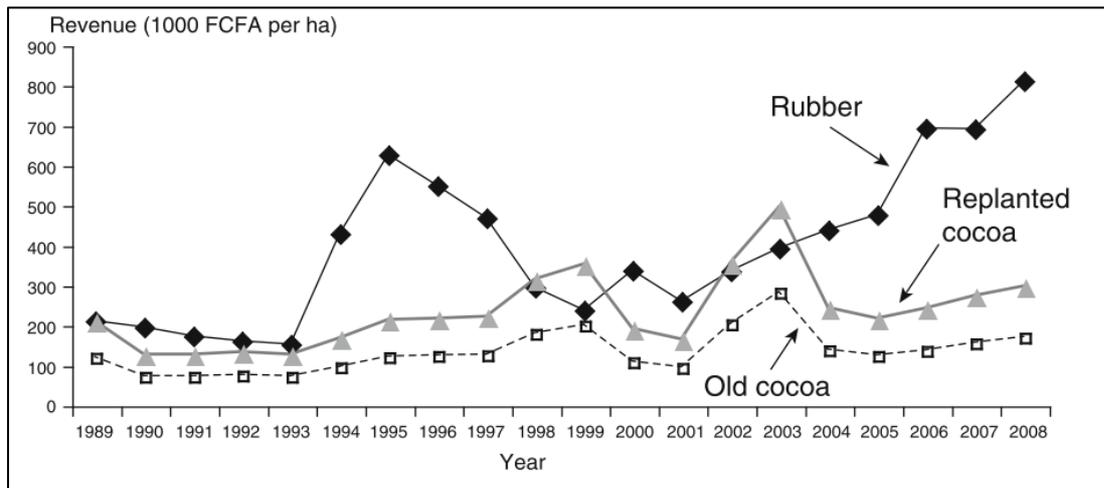
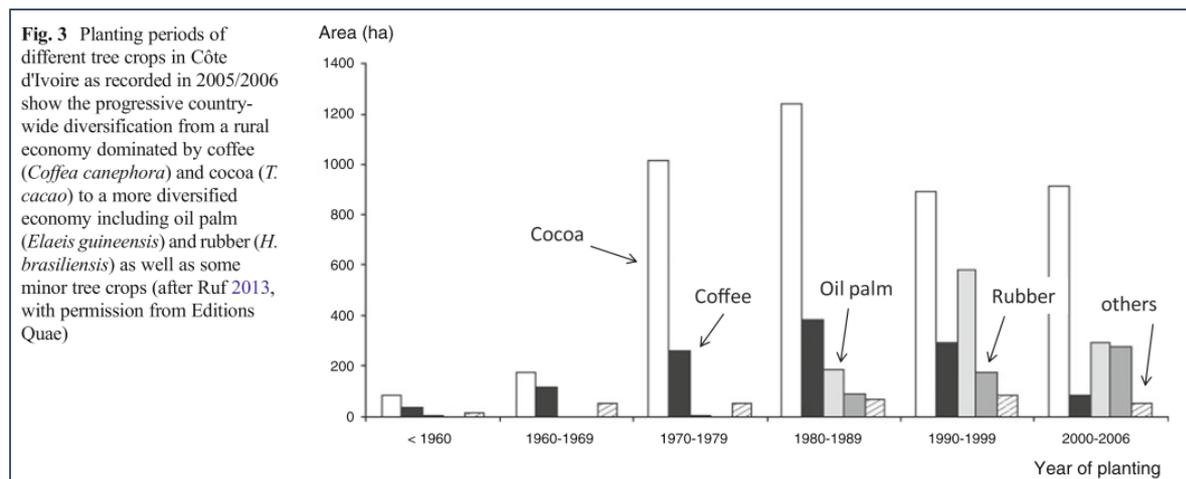


Figure 3.3: Planting periods of different tree crops in Côte d'Ivoire as recorded in 2005/2006 (Ruf, 2013).



It is unfortunately impossible to find more recent figures on perennial tree-crop diversification in Côte d'Ivoire due to a lack of recent literature. Over the past decade, rubber and cocoa prices have drastically dropped – yet rubber and palm are expected to have durably settled in Côte d'Ivoire's farming landscape.

Many stakeholders of the cocoa industry feared that the diversification wave might lead towards a complete replacement of the cocoa tree by the 'competitive' tree crops of palm and rubber. Nonetheless, the price ratio advantage of rubber to cocoa has decreased in recent years, and the cocoa crop remains one of the most lucrative ones. Within the course of the interviews, only one farmer expressed his wish to entirely abandon cocoa cultivation. For the rest, smallholder farmers seemed genuinely attached to cocoa cultivation for they were 'born into it', and accumulated what Bebbington refers to as 'Cultural Capital' over multiple generations. (Bebbington, 1999)

The assumption that diversification decisions are driven by a price comparison between the various crops is particularly acute within the interviews carried out in the Eastern region of Côte

d'Ivoire. Almost all respondents have switched from coffee/cocoa plantations to cocoa/rubber plantations in the course of a few decades and mentioned price as the primary explanatory factor.

Another explanatory factor relates to regional land use history; being one of the earlier pioneer front for cocoa cultivation, the East region was also the first one to face the problem of aging cocoa plantations and cocoa replanting issues – leading to a regional rehabilitation with other cash crops. For this reason, diversification processes have been triggered earlier on and the presence of infrastructure such as rubber and palm factories enable farmers to easily diversify. On the contrary, the West region is a more recent pioneer front for cocoa cultivation, and farmers experience less pressure to diversify due to the presence of younger and more productive cocoa plantations. Rubber and palm factories have started to settle in the region only in recent years. Regional differences show that beyond price considerations, the presence of enabling infrastructures is necessary for diversification processes to be possible.

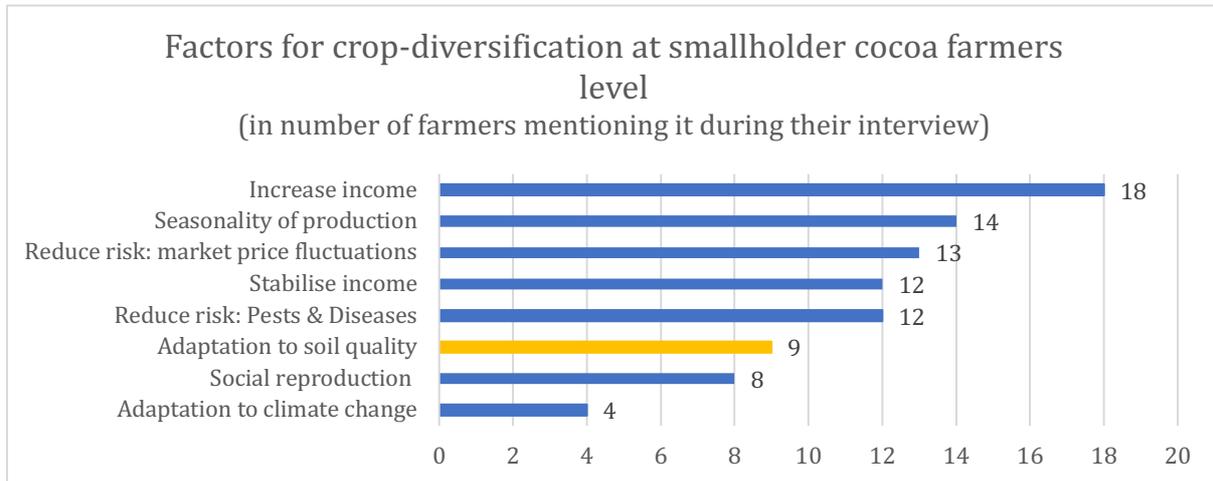
Farmer's land use decisions are mainly driven by the objective of increasing their revenues, based on a price comparison between crops. This finding demonstrates how household's diversification decisions are influenced by the Transforming Structures & Processes such as the international commodity market structure and the intervening Ivorian national pricing policies – that determine crop prices and may favour one crop at the expense of another one. Through such price mechanisms and regulations, Structures and Processes determine the fluctuations of the Natural Capital assets and to which extent smallholder farmers can transform their Livelihood Assets into the desired Livelihood Outcomes.

All the same, price shocks as witnessed in the mid 1970's on coffee prices and early 2000's on cocoa prices are also strong drivers of diversification as the result of an adaptation to the Vulnerability Context. Price fluctuations in relation with crop-diversification strategies can be interpreted in two different ways: first as a pull factor, encouraging entrepreneurial land use decisions with the main objective of maximising revenue streams; second as a push factor, revealing the insecurity of farmers livelihoods that rely on fluctuating Natural Capital assets.

3.2.2. Land use opportunity:

A second means for farmers to increase their revenues is to optimise land use by taking into account the various site characteristics;

Figure 3.4: Identified factors for perennial tree-crop diversification at smallholder cocoa farmers level. (from the data collected during fieldwork)



Aside from economic considerations, land use decisions are also determined by the land characteristic of the farm itself. This factor – although mentioned fewer times than income considerations along the interviews – has been identified as *the* most important factor for diversification by the respondents of the focus group:

“There are some arid lands where cocoa won’t work, so we are forced to plant another crop, rather than losing our time with cocoa. Rubber works with most soil types.”
(Focus group, 07.11.17)

Farm sites are rarely homogeneous and compose with various terrain slopes, water/sun exposition levels and soil fertility; furthermore, each crop has different agronomic requirements - site characteristics often determine which crop shall be planted on which part of the plot.

“This diversification is firstly due to the different soil types. [...] Some soils are best for planting teak, others are best for planting cocoa. You need to select the suitable crop.”
(Farmer 12, 14.11.17)

“I am planting palm here because this plot doesn’t accept cocoa. I got the idea of planting palm when all my cocoa seedlings died. Palm resists better in the drought.”
(Farmer 18, 22.11.17)

“There was some unused land – the soil is sandy, so we can’t grow cocoa on it, it doesn’t work. I would prefer to grow cocoa. It’s only because the soil isn’t adapted that we’ve put some rubber.”
(Farmer 27, 30.11.17)

The preceding quotes show that farmers decision to adopt rubber/palm wasn’t primarily based on their economic advantage but rather on their agronomic properties. As such, the economic (dis)advantage of a certain crop might be counterbalanced by its agronomic suitability to the soil quality.

As confirmed during the interviews, the rubber crop is less demanding than the cocoa crop and adapts more easily to different soil types. This particular feature encourages many farmers to engage in rubber cultivation on plots that are (or became)⁴ unsuitable for cocoa cultivation. This higher tolerance to low soil quality and drought can be explained by the larger roots of rubber compared to cocoa, allowing the tree to pump nutrients and water deeper in the soil. (oral communications, Cargill agent, 2017).

Moreover, low-lying sites which are often exposed to water logging are usually only suitable for rice or palm cultivation. Literature also mentions fish farming in recent years, although it requires a higher investment capital and has not been witnessed during fieldwork. Palm needs abundant sunlight and water throughout the year: as such, low-lying plots that were usually unused are now being converted to small-scale palm plantations.

Photograph 3.1: Farmer presenting oil palm fruits (taken by the author)



Farmers hence optimise their land use opportunities (Natural Capital) by planting more suitable tree-crops in relatively low fertile soils. This strategy is meant to optimise the natural resources available and maximise revenues. For this being, Human Capital such as the knowledge to establish one's own soil diagnosis and the corresponding suitable crops is required. This knowledge is transmitted through the use of Social Capital; via intergenerational exchange, social networks such as neighbours or surrounding villages, or through more formal Structures & Processes such as extension services provided by the State, Private Sector, or NGOs.

I have so far presented site conditions as an invariable factor with which farmers can 'play' through a land use optimisation process in order to increase their revenues. Nonetheless, site

⁴ Ruf (1995, 2013) argues that decades of cocoa monoculture have led to a depletion of the natural resources, hence causing a general degradation of farm sites conditions. Refer to Section 3.4.2.

characteristics can also be considered as a variable factor as they evolve over time. For instance, land use history can trigger a suitable soil for cocoa to become infertile with the 'exhaustion of the forest rent' (Schroth & Ruf, 2014).

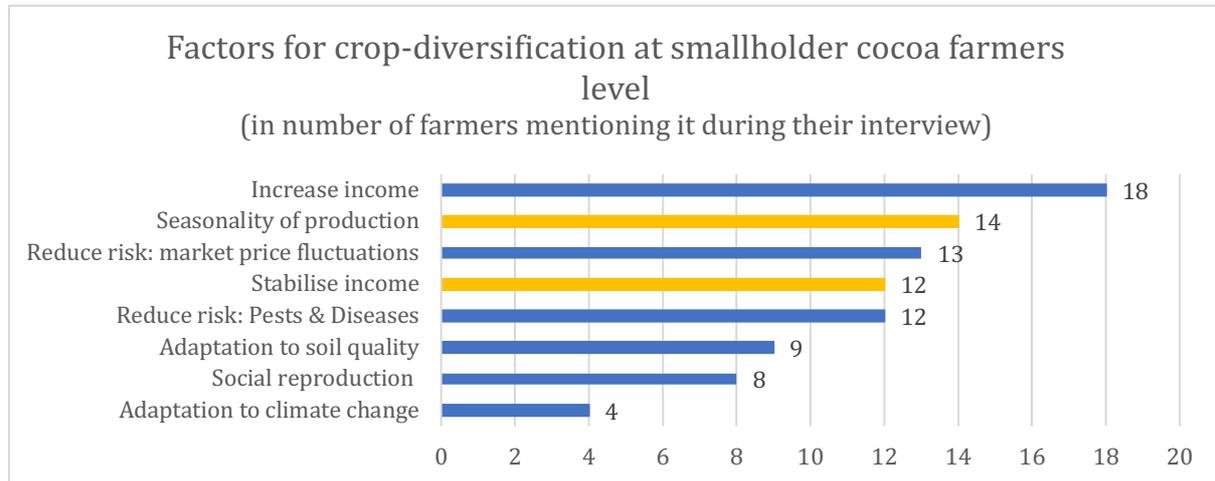
There is an important distinction to make between diversification as the result of a land use optimisation process on a given site; and diversification as the result of an adaptation to a *change* in the site's characteristics. On the one hand, the land use optimisation is motivated by the pull factor of reaching for a desired Livelihood Outcome of increasing income. On the other hand, land use adaptation is triggered by the push factor of adapting to the Vulnerability Context and reducing risks. The latter will be further elaborated in section 3.4.2 of this chapter, when discussing environmental change and land fertility degradation.

All in all, farmers make land use decisions in order to increase their total income. The diversification process is the result of i) a price ratio comparison between available cash crops and ii) a soil quality diagnosis, as perceived by the farmer himself.

3.3. Stabilizing revenues:

The empirical analysis reveals that the second motivation for cocoa farmers to diversify is to stabilise their income distribution throughout the year;

Figure 3.5: Identified factors for perennial tree-crop diversification at smallholder cocoa farmers level. (based on the data collected during fieldwork).



With regards to the SLF, the objective of stabilising income can be assimilated to the Livelihood Outcome of ‘increase well-being’. It is a thin line that separates the various Livelihood Outcomes, hence when households manage to reach other objectives such as increasing income or reducing risk/vulnerability, they also affect the Livelihood Outcome of increasing well-being/stabilising income. In this regard, the structure adopted to separate the various Livelihood Outcomes in this section is not strictly set and can be subject to rearrangements.

The results show that farmers attempt to reach income stabilisation in two ways: by combining various crops according to their seasonality of production (Section 3.3.1), and/or by opting for rubber cultivation that features year-round production (Section 3.3.2).

3.3.1. Seasonality of production during the year and between years:

Different crops have different harvesting periods, therefore crop-diversification can help to spread those harvests throughout the year and stabilise farmers’ income distribution. As displayed here-above, 14 farmers out of 23 mentioned ‘seasonality of production’ as an explanatory factor of their diversification decision. The dataset shows that the farmers interrogated combine between 2 and 4 cash-crops on farm. Combining multiple crops requires a strict organisation over the yearly-calendar in order to make sure that the various harvesting periods do not collide, as farmers are constrained by the availability of working force (Human Capital).

“When the cocoa harvest is going to be over, coffee is going to replace it. When coffee will be finished, then cashew will replace it. I also have manioc all year long to sell on the

market.”

(Farmer 9, 13.11.17)

“I opted for diversification because those crops don’t have the same production period throughout the year. The cocoa harvest is over in December – cashew starts in February. We can enjoy rubber cultivation from March to November. The objective is to earn a little bit of money every month to defend myself; avoid lacking money over the course of the year and be able to sustain the family.”

(Farmer 19, 28.11.17)

“The cocoa harvest coincides with the beginning of the school year. We can finance the tuition fees for the children with the cocoa harvest, and also the Christmas festivities [laughters]. We start to sell coffee from February-March, when the tuition fees have already passed. So when we receive the money of the coffee there are no more expenses to cover so we can spend it on constructing our house.”

(Focus group, 03.11.17)

The previous quotes show how households combine different harvesting periods to spread their income distribution throughout the calendar and organise their yearly budget.

All the same, some farmers also mentioned the temporality of production between years. Households combine crops with different years of entry into production in order to ensure a stable income distribution throughout the years. In this regard, diversification with annual food crops comes first, then comes diversification with perennial tree crops and finally diversification with timber-trees. In a way, farmers households adopt their own agroforestry models.

“You cannot just plant teakwood and wait for 17 years until it is ready to be sold. You have to diversify, because all crops don’t have the same year of entry into production. Teak is 17 years, cocoa is 3 years, papaya is 1 year, yam is 6 months. So you need to diversify. Diversification is meant for us to not feel too much the need for money.”

(Farmer 12, 14.11.17)

One of the main difficulty mentioned by the farmers is the survival of the household during the first years of the diversification process, before the first harvest(s). Indeed, farmers invest their savings, their land and their working force to introduce a new crop on the farm. Since we are focussing on perennial tree crops, this type of diversification implies a delay between the time of investment and the first return on investment. For instance, one of the disadvantages of rubber is that it takes up to 8 years until the first harvest, compared to 3-4 years for palm and cocoa. Nonetheless, the comparison of Figure 3.2 and Figure 3.3 as presented in the previous Section shows that despite a longer waiting period, farmers still gave preference to rubber when there was a price advantage over cocoa.

An interesting research finding shows that farmers households choose to intercrop their perennial tree crop seedlings with annual food crops during the years before the first harvest. In this way, households ensure their survival by increasing their food security and generating additional revenues with the sales of food surpluses on market. This technique is adopted both by households that regenerate their old cocoa orchards and/or by households that introduce new perennial tree crop seedlings.

Photograph 3.2: use of plantain to provide shade in new cocoa orchards (Source: Pye-Smith, Kouame, Yossi; 2016)



Within farmers households, women are in charge of most food production and market sales whereas men are in charge of perennial tree-crops or livestock breeding. With regards to the *Sustainable Livelihoods Framework* (DFID, 1999), some criticism can be expressed about the lack of consideration for gender differences within the same household. One household may not have the same desired *livelihood outcomes* – and one *livelihood strategy* may not benefit men and women the same way. In this case, women generally benefit more from the introduction of new tree crop seedlings during the years before the first harvest, as they are able to sell the surpluses of food on the market. In this setting, women become the main source of income of the household and have greater influence on how this income is being spent. On the contrary, the food crops have to be removed from the plot once the additional tree crops have reached their mature age; the men of the household are then handling the main source of revenues and decide how it should be spent.

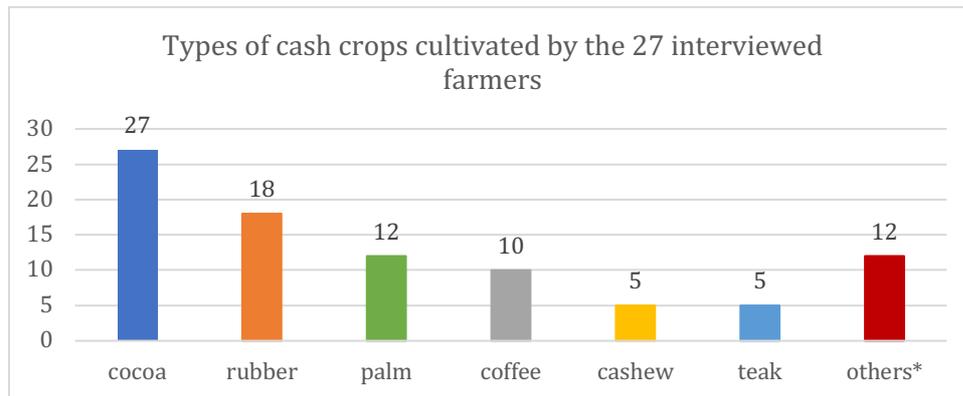
For this reason, many development organisations and NGOs such as the GIZ or Care International focus their efforts on food-crop diversification initiatives as part of their women empowerment and food security programmes.

3.3.2. Earning a monthly income with rubber cultivation:

The diversification process in Côte d'Ivoire most commonly involves the introduction of rubber in the farming activities. Based on my personal findings, 66.7% of the cocoa farmers interviewed 'one-on-one' have adopted rubber as an additional crop (72.7% when taking the respondents of the focus group in consideration).

Farmers preference for rubber cultivation was first explained by its price advantage over the cocoa crop⁵ (Section 3.1.1) and its adaptability to a larger range of soil quality (Section 3.1.2). The following section explores yet another attractive feature of rubber, which is its quasi year-round productivity⁶.

Figure 3.6: Types of perennial tree-crops cultivated by the 27 interviewed farmers.



*others: food-crops mainly destined to be sold on market, such as plantain, rice, tomato, eggplant.

As opposed to the cocoa tree-crop that has a bi-yearly harvest, rubber can be harvested on a monthly basis. Half of the farmers interrogated during the fieldwork mention the advantage of having a monthly income as one of the main reasons to diversify; they refer to it as 'a small salary' enabling them to cover expenses of the everyday life. The vocabulary employed to describe the advantages of rubber is interesting, as it often refers to the family and the support of primary needs. Households usually allocate cocoa money for large expenses (e.g. school fees, diseases, funerals) and keep rubber money for daily expenses.

"With rubber, it is as if I would become an employee. I have a salary each month."
(Farmer 3, 08.11.17).

"Planting rubber was my own initiative. Because at each month-end, you receive something to take care of your family [...] Having a monthly income, rubber also helps you to ask for a school loan at the bank. I am very satisfied."
(Farmer 7, 09.11.17)

"Before, when I used to produce cocoa only, I used to have the problem that I wouldn't earn anything on a monthly basis. With rubber cultivation, I receive something every month and I have a fixed program; I am not waiting for it to ripen."
(Farmer 20, 28.11.17)

⁵ At a certain time reference.

⁶ This advantage is also applicable for oil palm cultivation.

My interpretation of the results is that the stability of income is actually *more* attractive to farmers than an increased income per se.

If we consider the 7-8 years of waiting period for rubber to enter into production, it means that farmers are currently enjoying the first results of diversification decisions taken almost a decade ago. This also means that land use decisions cannot easily be revised according to the price fluctuations. Many farmers planted rubber in the 1990's and early 2000's, when prices were comparatively more attractive than cocoa. This price advantage has faded away over the years; and yet the farmers interrogated are *unanimously* satisfied with their diversification decision and do not express any regrets with their choice for rubber. This means that although they didn't necessarily reach their Livelihood Outcome of increasing income, they remain satisfied with their decision due to the stability of income that comes hand in hand with an increased well-being. All farmers justify their satisfaction with the same answer, relating monthly income and basic needs support.

During the expert interviews was mentioned multiple times that smallholder cocoa farmers don't necessarily earn little money. For instance, on a yearly basis an 'average' cocoa farmers earns about the same as an 'average' State employee in Côte d'Ivoire. Yet, the farmer is generally speaking in a situation of poverty whereas the State employee is not. This gap can [partly] be explained by the temporality of income distribution. A smallholder cocoa farmer receives large amount of cash flows twice a year, in correspondence with the two harvesting seasons; whereas the State employee receives his cash flow at the end of each month and spread throughout the year. Other factors may of course come into play, such as the number of children to provide for – generally speaking higher in rural areas than in urban areas.

One of the main argument brought up during the interview with IDH (The Sustainable Trade Initiative) was about the importance to offer financial products and financial services to cocoa farmers for the same reasons. The possession of large amounts of liquidity on a very sporadic basis doesn't encourage farmers to save up money, hence a majority of household fall into poverty only a few weeks after receiving the cash flow. Enabling farmers to open savings account may encourage them to spread their revenue streams more evenly along the months.

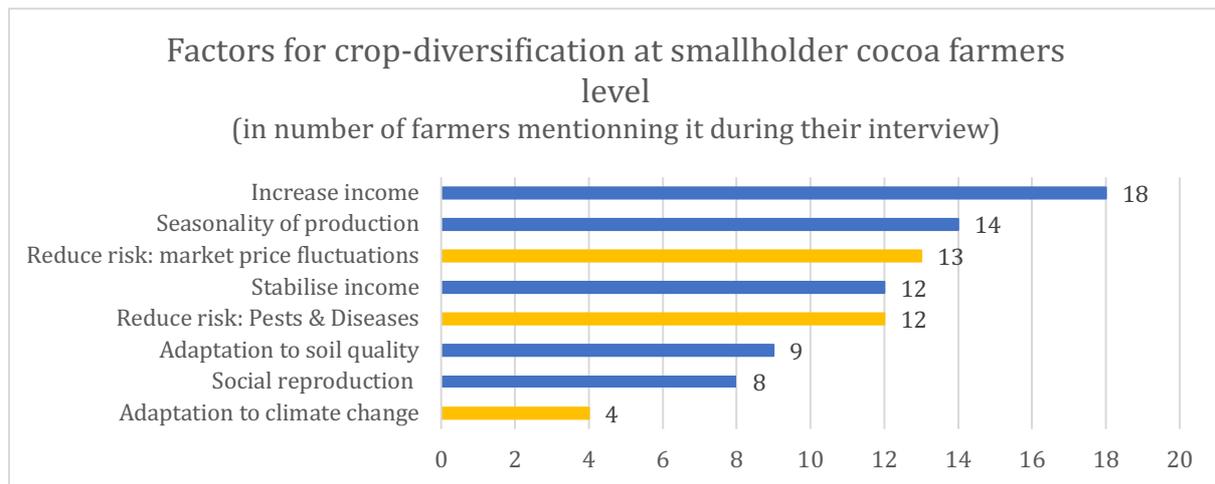
Furthermore, an interview with the main rubber company in Côte d'Ivoire SAPH revealed that each rubber farmer in their supply chain is paid on a monthly basis via direct banking transfer. This entails that all farmers growing rubber [must] have individual bank accounts fed with regular inflows – where they are able to accumulate savings. It is therefore not unrealistic to envision a similar system for the cocoa sector.

All in all, farmers diversify in order to increase their well-being by stabilising income distribution throughout the year. For this, farmers combine crops with different harvesting seasons within the year and between years. A majority of farmers also opt for the introduction of rubber on farm, attracted by its year-round productivity. In this regard, smallholder farmers do not solely seek for accumulation of Financial Capital but also for its stable distribution over time. These findings reveal the limits of the theoretical framework as temporality is barely captured within the Assets distribution.

3.4. Reducing Vulnerability:

The third and last reason why smallholder cocoa farmers decide to adopt perennial tree crop diversification strategies is to pursue the Livelihood Outcome of reducing their vulnerability to external risks. This objective also contributes to stabilising household income and increasing well-being (Section 3.3). Pressures are here-under identified as market and environmental risks:

Figure 3.7: Identified factors for perennial tree-crop diversification at smallholder cocoa farmers level. (based on the data collected during fieldwork).



Farmers evolve in a context of vulnerability to external shocks and stresses; namely market price fluctuations, pests and diseases, environmental change and policy shocks. (Malézieux and Moustier, 2005). The first assumption starting this MSc thesis was to acknowledge that diversified farmers that can rely on multiple crops tend to be less vulnerable to external risks than farmers that rely on a single crop. (Schroth & Ruf, 2014). Different crops are indeed not usually affected by the same risks nor at the same time and diversification is used as a form of “self-insurance” (Barrett et al, 2001: 322).

With regards to the theoretical framework, crop-diversification strategy is here considered as a direct adaptation to the Vulnerability Context. It is nonetheless sometimes difficult to establish a clear differentiation between farmers’ objective to reduce vulnerability and the objective to increase income/well-being. For instance, price fluctuations can be considered as a pull factor that attracts farmers towards a more lucrative crop – which fits with the objective of increasing income. On the other hand, price fluctuations can also be experienced a factor pushing farmers from a vulnerable crop – which then fits with the objective of reducing vulnerability. In this matter, farmers engage in different Livelihood Strategies depending on their personal resources and perceptions of their own situation.

Farmers attempt to tackle two identified key vulnerabilities through their diversification decisions: market price fluctuations (section 3.4.1) and environmental degradation (section 3.4.2).

3.4.1. Market price fluctuations:

Market price fluctuations are an important factor for diversification with 13 farmers out of 23 mentioning it in their interview. This driver was particularly strong during the fieldwork as cocoa prices had severely dropped for the harvest of 2017/2018;

“Sometimes there is a fall in prices so if you only produce one crop you’re not going to earn any money. We do a little bit of everything so that when there’s one crop which is low [in value] we can rely on the other ones.”

(Farmer 9, 13.11.17)

“I diversify because when cocoa prices fall, I can still earn on rubber. If rubber prices fall, I can still earn on cocoa. In Ivory Coast prices are not stable, they go up and down.”

(Farmer 17, 22.11.17)

“We shouldn’t stay with one single crop, because sometimes cocoa pays good, and sometimes cocoa prices fall. When you only have one cultivation, it doesn’t pay well. This explains why I want to do another crop to support me.”

(Farmer 26, 30.11.17)

Diversification is used as a way to balance out the risks inherent to the international market price fluctuations. Farmers often make reference to their past experience of having been ‘trapped’ by the fall of cocoa or coffee prices; they see diversification as a learning experience from the past that participates to the improvement of their future financial situation. In this regard, diversification serves as a risk mitigation strategy and aligns with the objective of both stabilising revenues and reducing vulnerability.

Farmers that produce perennial tree-crops are particularly vulnerable to the volatility of the international market prices because their production is precisely destined for this market. As North (1990) may refer to it, farmers have to play along with *‘the rules of the game’* that are the market institutions. Building on this, farmers are therefore not only subject to the Vulnerability Context in which they evolve, they are also subject to the direct influence of the Structures & Processes that are shaping the Vulnerability Context, which is represented by an arrow connecting the two boxes in the Sustainable Livelihoods Framework. (Refer to Figure 2.1)

We have already established that Structures such as national and international market organisations shape the Processes of market regulations and directly influence commodity prices and the ability for farmers to grow their assets base. Ruf & Schroth explain that the national marketing board (Conseil Café Cacao) that regulates cocoa/coffee prices in Côte d’Ivoire was virtually protecting farmers from all market risks, which encouraged them to convert into cocoa production. This resulted into the massive production boom of the 1970’s that raised Côte d’Ivoire to the status of first cocoa producer worldwide. This national regulation system nonetheless imploded in 1988 – unable to sustain the international market variations any longer – and farmers were suddenly exposed to the global price fluctuations with a loss of 70% of cocoa/coffee value within 2 years (Ruf & Schroth, 2013). For the authors, this sudden vulnerability to the market volatility triggered the first wave of country-wide diversification towards rubber and palm. The national price regulation system has been re-established in Cote d’Ivoire since 2012 but farmers are still experiencing market fluctuations from one year to another.

Market risks can also be offset by diversifying into crops that have a wider range of selling options; for instance food crops can be auto-consumed by the household or sold onto local market, or palm

which features other commercialisation options than the export market as it can be easily transformed and consumed locally as palm wine. Nonetheless the rules of supply and demand apply just the same at smaller scale – and regional & local markets also come with inherent market risks. For instance, I visited the village of Djékanou in the Centre region where most farmers cultivated papaya as a cash crop to generate revenues. They were experiencing difficulties to commercialise their products due to an oversupply on the regional markets; in this regard, market risks are not only confined to the international market.

“Papaya is currently rotting in the field because this year was a good production for fruits. The whole village is planting papaya, that’s why there is a lot. [...] And there is competition on the market from other fruits like avocado and orange – that is why the papaya sales have slowed down.” (Farmer 9, 13.11.17)

All in all, farmers diversify in order to strengthen their resilience to international price fluctuations and reduce their vulnerability. The following section argues that farmers also diversify as a risk mitigation strategy to face growing environmental pressures on the cocoa crop.

3.4.2. Adaptation to environmental degradation:

The following section explains how smallholder cocoa farmers decide to diversify in order to reduce their vulnerability to various environmental pressures; the exhaustion of the forest rent (section 3.4.2.1), various pests & diseases (section 3.4.2.2), and the impacts of climate change (section 3.4.2.3).

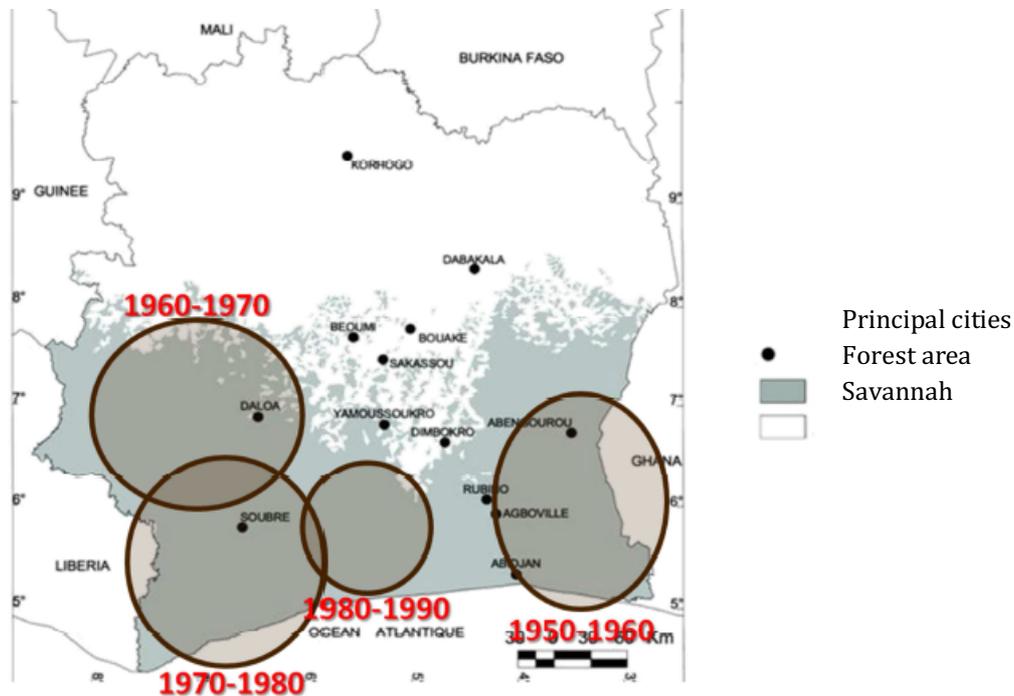
3.4.2.1. The ‘*exhaustion of the forest rent*’ (Ruf, 1995):

The following section largely relies on the theory of ‘the exhaustion of the forest rent’ proposed by Francois Ruf over the course of his various researches on diversification;

Ruf (1995) explains a boom of cocoa production as the combination of a migration wave of farmers towards tropical forest areas and a massive deforestation process with the progressive settlement of cocoa plantations in those forest areas. In other words, favourable cocoa prices and incentive public policy [Transforming Structures & Processes] encourage the formation of a ‘pioneer front’ of migrant farmers that come in tropical forest areas to settle their new cocoa plantations. This phenomenon took place in Côte d’Ivoire from the 1960s onwards and moved from East to West, creating what we call today a ‘cocoa belt’.

The cocoa migrations can be explained by the ecological advantages of ‘the forest rent’: freshly deforested grounds are known to be more fertile, enjoy a favourable micro-climate, and are less vulnerable to pests and diseases. (Ruf, 1995). For a few generations, farmers enjoy a fast growth of their cocoa trees and an abundant production without having to invest in fertilizers.

Figure 3.8: The four waves of migration representing the four cocoa cycles in Côte d'Ivoire. (Ruf, 1995; Bouquet, 2003; Brou and Chaleard, 2007; as featured in Robin, 2013).



Decades of cocoa cultivation in monoculture systems and without taking any soil conservation measures have led to ‘an exhaustion of the forest rent’ with a “*general degradation of environmental conditions, as seen in declining soil fertility, increased pressure of weeds, pests and diseases, and drier microclimate that may aggravate the difficulties of replanting of sensitive crops such as cocoa*” (Ruf & Schroth, 2004: in Schroth & Ruf, 2014: 145).

Ruf (1995; 2013) argues that crop-diversification in Côte d'Ivoire is the result of an adaptation to a general environmental degradation caused by the exhaustion of the forest rent; after a few decades of farm exploitation, farmers start experiencing the above mentioned factors, resulting in difficulties to regenerate their cocoa orchards. Indeed, one cocoa tree cycle lasts for about 40 years and the cocoa plantations settled back in the 1970's now need to be gradually replaced with new cocoa seedlings. This regeneration process comes with great difficulties as cocoa trees cannot benefit from the ‘forest rent’ any longer. Such environmental pressures on the cocoa crop urges farmers to diversify with less demanding crops such as rubber and palm. (See Section 3.2).

Photograph 3.3: Farmer presenting his cocoa production (taken by the author)



Bearing Ruf's theory in mind, part of the questionnaire was focussed on farmers difficulties with the cocoa cultivation itself and particularly with replanting/regeneration issues.

“Some brothers did that in the village; the cocoa regeneration didn't succeed so they tried with hevea and it worked. [...] For me, the evolution of my hevea field will depend on the progression of the cocoa regeneration. If I see that cocoa regeneration works, I may increase the cocoa surface on my plots. [...] If I see that my other cocoa plot in San Pedro is exhausted and starts to age, I am going to replace with some palm instead.” (Farmer 23, 29.11.17)

The empirical findings absolutely confirm the 'exhaustion of the forest rent' theory leading to replanting issues and can be summarised as follows;

- ✓ Farmers experience 3 main environmental pressures: increased pests & diseases, soil quality degradation and climate change.
- ✓ All 3 environmental pressures are translated into cocoa regeneration issues, appearing about 40 years after settlement of the farms into forest areas;
- ✓ Low productivity of old plantations & cocoa regeneration issues are conducting farmers to engage in a diversification strategy towards less demanding crops.

As opposed to Francois Ruf, the findings show that this environmental degradation does not necessarily act as the main driver for diversification, for other factors were mentioned more often by the interviewees (Refer to Figure 3.7) For instance, income considerations (increase & stabilise) were mentioned 30 times by the respondents, whereas the combination of pests & diseases,

adaptation to soil quality and climate change together account for 25 mentions. To counterbalance those results, it is also conceivable that the exhaustion of the forest rent (which is a trend) is experienced by cocoa farmers more gradually than other shocks and stresses such as commodity prices. This could lead farmers to both perceive and mention income and market price fluctuations as stronger factors for diversification.

3.4.2.2. Pests & Diseases:

One of the characteristics of the general environmental degradation is the increase of pests and diseases in cocoa-culture over the past 20 years, encouraging smallholder cocoa farmers to diversify with other crops. Pests & diseases are mentioned by 12 farmers out of 23 as a driver for diversification;

“We are affected by [...] the diseases, mainly for the cocoa-tree now we need to spray. In the past we didn’t have many diseases – but now we are forced to notice that there are plenty of diseases.”
(Farmer 12, 14.11.17)

“The swollen shoot disease hit us and today there is no more cocoa left. I survive on my sales of eggplants and bananas, awaiting for the cocoa regeneration. [...] I choose to diversify because our parents used to rely solely on cocoa but now with the swollen shoot we have nothing left – we cannot even afford to pay for the fish in our sauces anymore... As of now, I want to cultivate many crops. [...] If one fails, the other can replace it.”
(Farmer 25, 29.11.17)

“My cocoa orchard is dying so I planted rubber on the part of the plot which is already dead. [...] Every year it dies as the swollen shoot is spreading. The disease has hit us since about 6 or 7 years. At first we didn’t know that it was a disease but now we are able to recognise the symptoms. You saw hevea fields on your way here; it used to be cocoa fields but now everything is dead. So people prefer to plant hevea.”
(Farmer 23, 29.11.17)

In recent years, West Africa suffered from the *swollen shoot*, a new disease spreading fast and difficult to contain, that destroyed much of the villagers cocoa plantations. Some regional differences are observed in the findings: the respondents of the Western region [Soubré] were particularly affected by the disease, as featured in the previous quotes. The sample of farmers from the South West also happened to be the least diversified among all respondents – which is representative of the regional situation that remains the heart of the cocoa production. I notice that farmer’s diversification decisions in the South West are more recent (2010-2016) than in the East (1990-2010) where respondents have had one foot in rubber production for a longer time already.

Figure 3.8 shows how the Eastern region historically was the first cocoa producing region in Côte d’Ivoire, whereas the South West region is the most recent one; this means that the end of the cocoa cycle & the exhaustion of the forest rent was reached earlier on in the East – leading to an earlier diversification process. Other than this, farmers of the Centre region were also experiencing difficulties with pests & diseases invading their plantations.

Theoretically, pests & diseases can be prevented with the adoption of Good Agricultural Practices (GAP) and the application of phytosanitary products. With regards to the theoretical framework,

it means that a decrease in Natural Capital can be compensated by an investment in Human Capital (education) and Physical Capital (agricultural inputs).

In practice, many farmers were nonetheless either not able or not willing to apply the GAP thoroughly for lack of Financial Capital to invest in crop-protection products. For this reason, farmers would rather adopt diversification strategies by introducing other tree-crops that act as a physical barrier to slow down the spread of the disease.

All in all, farmers [e.g. of the South West region] decide to diversify into palm and rubber in order to reduce their dependence on cocoa and increase their resilience to shocks caused by pests & diseases. I notice that farmers adopt this risk averse strategy *after* they have been hit by pests & diseases and not *before* – which shows that farmers perceive diversification rather as a constraint due to the environmental pressure exerted on the cocoa crop rather than as an opportunity. This remark also demonstrates the importance of taking temporality into consideration in the SLF.

3.4.2.3. Climate Change:

Another environmental pressure exerted on the cocoa crop comes from climate change, which was mentioned by 5 farmers of our sample: 3 farmers in the Centre region and 2 farmers in the South-West region.

“Our biggest difficulty for all crops is the rain, it doesn’t rain enough. For the cocoa crop we also have pests and diseases. If there’s no rain there is no production.”
(Farmer 9, 13.11.17)

“I am more or less satisfied with my production. The climatic hazards are worsening it. 10 years ago it used to rain quite good. Now it’s been at least 5 years that the lack of rain is reducing our yields.”
(Farmer 12, 14.11.17)

“I chose to do both crops because of the price fluctuations and also because hevea is a tree. [...] The vegetation can trigger a change in the climate and the rainfall. If there are trees, there is rain. We now see that life is less easy without trees.”
(Farmer 20, 28.11.17)

The previous quotes show that farmers are able to perceive a transformation of the climate and the rainfalls over the past few years at their individual scale. This phenomenon is explained by Läderach et al. (2013) as a process of displacement of the forest-savannah boundary due to an increasingly dryer climate. This desertification is leading to an increase of droughts, which is endangering cocoa production in these areas. In the Sustainable Livelihoods Framework, climate change can be identified as a ‘trend’ in the Vulnerability Context. As mentioned already, farmers experiencing such climatic pressure on their cocoa production tend to diversify with less drought-sensitive crops such as rubber and palm in order to increase their resilience to environmental stresses.

Some farmers attribute the decrease of rainfalls directly to the deforestation that took place in their regions – for them, replanting rubber trees participates to rebuilding the vegetation and might improve the climatic conditions. In some way, this belief endorses Schroth & Ruf’s argument about how the exhaustion of the forest rent triggers micro-climatic change and decrease in rainfalls. (Schroth & Ruf, 2014). In my personal view, rubber plantations are nonetheless inflicting

equal environmental harm as cocoa plantations do – in both cases, primary forest is removed in order to be replaced by perennial tree-crops.

3.5. Conclusion to Chapter 3

The preceding chapter provides an overview of the motivations that trigger smallholder cocoa farmers interviewed to implement crop-diversification as a Livelihood Strategy;

The empirical findings show that farmers diversify in order to reach the Livelihood Outcomes of increasing their revenues, stabilising their income, and reducing their vulnerability to external shocks and stresses such as market price fluctuations and environmental degradation. Based on the preceding objectives, farmers households mainly opt for diversification with rubber due to its adaptability to degraded soil conditions and its year-round productivity.

Secondly, cocoa farmers are responsive to the Vulnerability Context in which they evolve and tend to adopt diversification strategies when their current cocoa-culture is suffering from external pressures that can endanger their productivity or revenues. Cocoa regeneration issues caused by the 'exhaustion of the forest rent' constitute a strong incentive to adopt risk-mitigation measures such as the introduction of an additional crop. Finally, farmers households have the agency to choose from an array of diversification strategies according to the perception they have of their personal situation and the resources available.

4. How do smallholder cocoa farmers implement diversification strategies at farm level and how do Organizations & Institutions currently support smallholder farmers in their diversification strategies?

This fourth chapter provides a detailed mapping of the diversification practices as performed by smallholder cocoa farmers on plantation, as well as an overview of the current institutional support mechanisms.

4.1. Introduction: the Livelihoods Assets

The chapter is structured in sections that correspond to each of the five Livelihoods Assets of the Sustainable Livelihoods Framework: Natural Capital (section 4.1), Human Capital (section 4.2), Physical Capital (section 4.3), Financial Capital (section 4.4) and Social Capital (section 4.5). Each Livelihood Asset is going to be examined in order to establish how farmers access and mobilise the available resources to implement diversification strategies on farm. A final section (Section 4.6) explores the current institutional support mechanisms in place with regards to diversification strategies.

This chapter starts with the hypothesis that farmers constraints & opportunities to diversify are determined by their access to the Livelihood Assets. With regards to this hypothesis, I am going to explore the following questions for each of the capital assets;

1. How do farmers **access** the Livelihood Assets required to engage in a diversification strategy?
2. How do farmers **mobilise** the Livelihood Assets in order to implement their diversification strategy?

By answering these questions, I aim to reveal the key issues encountered by smallholder farmers during their diversification processes. This chapter doesn't solely focusses on the access & mobilisation of each Livelihood Asset; it also aims at revealing the dynamic interactions and trade-offs between capital assets, and their relations with other elements of the framework. In this regard, the Transforming Structures & Processes (refer to Figure 2.1) are a critical element of analysis, as they determine both farmers access to the Livelihoods Assets their ability to transform them into diversification strategies. (DFID, 1999).

4.2. The *Natural Capital* asset: Land availability & Land security.

The following section presents how farmers access and mobilise their Natural Capital in order to implement crop-diversification strategies. Two problematics are exposed hereunder: land availability and land security.

4.2.1. How do farmers access land?

First and foremost, the implementation of cash crop-diversification strategies strongly depends on land *availability*. As a matter of fact, all 4 farmers that were not diversified at the time of the interview mentioned lack of available land as one of the explanatory factors for *not* engaging in diversification strategies;

“If there is a lack of available land, I cannot start an additional crop, even if I had more money.”

(Farmer 16, 22.11.17)

“The land constraint concerns those who didn’t diversify and stayed in cocoa. About half of them confess that they would like to diversify but they don’t have enough land.”

(Francois Ruf, 15.11.17)

Lack of available land is a barrier to diversification: it is therefore relevant to explore the various institutional channels leading to land ownership in Côte d’Ivoire. The qualitative interviews reveal four ways in which farmers are able to access land; heritage, purchase, sharecropping & rental agreements, and clearing forest land areas;

1. Land ownership is firstly determined by heritage within the family – almost all farmers interviewed declare having inherited their farm from their parents. Since the cocoa-belt was built on migration waves, land tenure issues are now arising with regards to land-heritage within migrant families and local communities.
2. Other studies (EMC, 2017) have shown land purchase as a common practice among smallholder farmers, although this is not something that appears in the findings of this research.
3. Another option to access land can be granted through sharecropping or rental agreements; this option is very common for migrant farmers from neighbouring regions/countries, nonetheless it doesn’t usually lead to land ownership.
4. Finally, a majority of farmers declare that their farm was installed on freshly deforested grounds at the time of their parents. Nowadays and although it is prohibited in protected forest areas, few farmers of the South-West region also confessed to be ‘*looking for forest every day*’ in order to settle new plots and benefit from the ‘forest rent’. Nonetheless, decades of deforestation have left very little forest areas in Côte d’Ivoire, and this means of land acquisition is not prevailing any longer.

The qualitative interviews reveal that access to *sufficient* land surfaces enables farmers to implement cash-crop diversification strategies. The following hence explores land size as a factor for diversification;

Firstly, the group focus revealed a demographic pressure on land acquisition via heritage:

“It is not difficult to access land as it is done by heritage. [...] You have to admit that land is lacking. There is a demographic issue – we are now having more children. Say your father had 3 children, then it’s OK. But if now I have 10 children, how am I going to divide this land? So very often, there is a land issue.”

(Focus Group, 02.11.17)

The fast-growing Ivorian population exerts a demographic pressure on the traditional channel of land acquisition by heritage, where farmers access to sufficient land is endangered. Such observations very much relate to the Malthusian debate between natural resources vs. population growth.

Second, one of the sampling criteria for the farmers selection was to interview farmers that already had an experience with perennial tree-crop diversification. For this reason, 30 out of the 34 farmers interviewed (when including the respondents of the focus group) were already engaged in diversification processes. Along the interviews, I discovered that the farmers selection was not representative of the ‘average smallholder cocoa farmer’ due their land surface; a standard cocoa farm size in Côte d’Ivoire covers in average about 4 hectares of land (World Cocoa Foundation, 2014), whereas the average farm size within my farmers selection covered 3x more surface with about 13 hectares of land per household (including unused plots). This high average is influenced by the presence of 3 very large land owners (between 30 and 80 hectares) among the respondents. Nonetheless, only 33% of the respondents featured a standard farm size of 5 hectares or less. Based on this farmers selection, I can deduce that cocoa farmers that engage in tree-crop diversification strategies tend to own larger land surface than the average smallholder cocoa farmer.

A fortiori, I can argue that farmers’ access to *sufficient* land surface is an enabling factor for diversification. This also means that lack of sufficient available land is a barrier to diversification. In my view, this can be explained by the confrontation of 2 different models in food commodity production systems: specialisation and diversification.

The current mainstream capitalist system of global food production relies strongly on the model of ‘agricultural specialisation’, which is based on a monocultural system and adheres to the principle of economies of scale⁷. This economic model has been promoted by the first President Felix Houphouët Boigny during the 1970’s and led to a boom in cocoa production in Côte d’Ivoire. The specialisation model thrives globally for it is a very cost-efficient scheme that can bring a nation to the top ranking of the international market shares. On the other hand, it causes considerable environmental degradation and comes with greater risks due to its dependence on the production of a single crop/commodity and a greater vulnerability to the international market price fluctuations.

On the contrary, agricultural diversification is a model that reduces vulnerability to external shocks and stresses as it spreads market and ecological risks over multiple crops. On the downside, Schroth & Ruf argue that: “*Diversification may reduce economies of scale (e.g., from efficient use of processing or drying infrastructure) and may increase the cost of marketing small quantities of produce, especially in remote locations.*” (Schroth & Ruf, 2014: pp141). Applying these principles to a micro-economic scale, individual farmers have to find the right equilibrium between the two opposite models specialisation/diversification in order to balance cost efficiency and ability to adapt to the *vulnerability context*.

⁷ “A proportionate saving in costs gained by an increased level of production” (Oxford Dictionary, 2018).

The argument here is to show the importance of available land surface in diversification decisions; a farmer that owns a relatively 'large' plot of land can easily combine the two models and find the right equilibrium. The larger the plot, the more economies of scale can be realised even whilst maintaining a diversified production. On the contrary, a farmer that owns a relatively 'small' plot of land starts with reduced options for he may not be able to combine models and might suffer from additional costs. Since cocoa production is at 90% produced by smallholder farmers with an average farm size covering about 4 hectares of land (World Cocoa Foundation, 2014), one can understand the importance of land size in the diversification equation. Furthermore, some crops are more land consuming than others; multiple farmers mentioned not having sufficient land surface for palm production, whereas this doesn't seem to affect diversification decisions with rubber.

Further quantitative research shall be conducted on the causal relation between land surface and diversification decisions. This type of research would enable to determine which land/production size constitutes the 'break-even' point from which it becomes economically interesting for an individual farmer – or a farmers' cooperative – to diversify its agricultural activities.

Furthermore, the qualitative interviews reveal that access to *secure* land also influences farmers ability to engage in diversification strategies;

"Land tenure issues are critical; a minuscule proportion of cocoa farmers possess an official land certificate. Based on modern law, almost none of them can truly pretend to their land rights. [...] The challenge is to transform informal property rights into something more permanent."

(Interview with Francois Ruf, 15.11.17)

This type of land tenure issues relates to land ownership via heritage within migrant farmers families. The cocoa boom taking place in Côte d'Ivoire in the 1970's-1980's was mainly built on decades of migration waves of farmers from the 1930's forming 'pioneer fronts' and setting their cocoa farms into tropical rainforest areas (Ruf, 1995). Those migration waves came from various regions of Côte d'Ivoire & neighbouring countries such as Burkina Faso. Back then, the migrant farmers bought land from the aboriginal communities – who were sometimes not left with much of a choice – and progressively settled their plantations from East to South-West, transforming the Ivorian farming landscape into a 'cocoa belt'.

"Strictly speaking, I do not have a land title yet. For the law of Côte d'Ivoire I need this paper. Verbally, I am land owner. It is the case of multiple cocoa farmers here. I inherited from my dad, but without any official land title."

(Farmer 19, 28.11.17)

"Back then in 1970 – the Bakoué gave the land to our parents. [...] Here we are in the region of the Bakoués. Our parents Baoulés migrated here and the Bakoués gave them the land. They sold it for a nominal fee, just water and bread."

(Farmer 20, 28.11.17)

This system worked fine for years but from the 1980's, the demographic pressure increased tensions on land distribution. Such tensions are now opposing the second generation of cocoa farmers that inherited their land from their migrant parents to the second generation of aboriginal communities that demand a re-negotiation of the land distribution as they are sometimes left with

less land surface than the migrants. Tensions are particularly acute in the South-West region of Côte d'Ivoire (Soubré – San Pedro), which is the latest 'pioneer front' of migrant cocoa farmers and the current main hub of cocoa production. (Interview with François Ruf, 15.11.17)

With regards to the empirical findings, all interviewed farmers declare having inherited their land from their [migrant] parents and consider themselves as rightful 'land owners'. None of them mentioned land security as an issue – nonetheless very few could pretend having an existing and official land certificate; which adheres to Ruf's explanation. The various farmer's interviews conducted during the fieldtrip reveal very little content about land tenure issues as they remain a very sensitive subject in some regions of Cote d'Ivoire. For this reason, I had to discuss the issue throughout the 'experts' interviews. These reveal that land tenure issues can affect diversification decisions in 2 contradictory ways;

A. Land tenure issues dissuade cocoa farmers to diversify;

Land security is one of the key issues currently addressed in rural development and poverty alleviation programmes implemented by various development agencies & United Nations Organisation bodies such as the FAO and the World Bank. The argument is that uncertainty of property rights affects people's decisions to invest on their land; "*Pressure on land resources accentuates tenure insecurity and this insecurity, in turn, discourages people from making medium – and long – term investments to improve the productivity of their land.*" (FAO, 2008). Diversification strategies represent an investment of Capital Assets in the introduction of an additional crop. It is rather straightforward that a farmer that perceives his land rights as insecure is less willing to invest in a diversification strategy.

Secondly, it is very common to encounter various types of contract farming in the cocoa producing regions of Côte d'Ivoire between indigenous and migrants communities. A widespread sharecropping arrangement is called '*aboussan*': the land owner rents his plot to the *aboussan* [contracted sharecropper] for a defined crop and amount of time and gets redistributed 2/3rd of the production after harvest. In exchange, the worker is responsible to maintain and keep the plantation flourishing, and gets to keep 1/3rd of the final production.

This land tenure system does not provide much land security to the *aboussan* who can see his contract terminated for X and Y reasons. In this matter, *aboussan* workers – that constitute a large portion of the cocoa farmers – are not encouraged to engage in diversification strategies as their working contract was most commonly based on cocoa cultivation only; therefore any changes brought to the land use may lead to unfavourable terms in a contract re-negotiation with the land owner.

B. Land tenure issues incite cocoa farmers to diversify;

According to François Ruf, some migrant farmers *that do not face a direct threat* on their property rights tend to use perennial tree-crop diversification as an 'occupation strategy' to secure their land;

"Some [farmers] plant rubber in order to occupy the land and prevent aboriginal communities to claim it. Those plots were usually unused fallow land or old cocoa plantations."

(Interview with Francois Ruf, 15.11.17)

During the farmers interviews, one respondent confirmed this occupation strategy;

“Some people were saying that they wanted to take our plot. On this plot we cannot do cocoa because it’s too sandy, so we planted hevea. We have to occupy the land, otherwise we’ll have to pay the town hall to sign the official papers.”

(Farmer 27, 30.11.17)

The last quote shows that farmers descending from migrant families have a strategy of occupying the land with perennial tree crops in order to secure their rights on the property. This is usually accomplished with cocoa cultivation – but the farmer mentions a sandy soil, which makes cocoa cultivation impossible. In this case, it is interesting to see that the farmer would rather diversify into rubber cultivation and occupy the land [customary law] than go through an official procedure [modern law] that he perceives as too costly.

This customary law of land occupation is rather widely respected in Cote d’Ivoire and comes from a principle set in 1963 by the *father of the nation* Felix Houphouet Boigny that declared; « *la terre appartient à celui qui la met en valeur* »⁸. (Chauveau, 2000). The preceding findings show that this customary law remains somewhat respected by the various ethnic groups exercising pressure on land distribution.

Those contradictory findings show that land tenure issues can affect diversification decisions in multiple ways depending on how the farmer perceives the threat on his property rights.

Finally, the Transforming Structures & Processes such as the State, formal and informal regulations or local administrations [including the chief of the village] are necessarily widely involved in the problematic of farmer’s access to sufficient and secure land. I quickly mentioned institutions such as the *aboussan* working contract or the confrontation between modern and customary law as having direct influence on farmer’s willingness/ability to diversify due to the status of their property rights. It is not the purpose of this research to elaborate further on this, nonetheless it is important to state that land tenure issues can be addressed by various institutions – State regulations in the first place – in order to secure farmer’s situations and encourage their willingness to invest on their property.

4.2.2. How do farmers mobilise their land?

I am now going to expose how farmers mobilise their Natural Capital in order to pursue their Livelihood Strategy of crop-diversification.

First and foremost, the introduction of a new perennial tree-crop on farm is usually the result of a land optimisation process based on the site characteristics (refer to Empirical Chapter 1, Section 2). There are 2 main sites variations to take into account: terrain slopes and soil fertility. The additional crop is generally introduced on a plot that was either unused [fallow land or abandoned cocoa plantation] or inappropriate for cocoa cultivation [sandy soil, water logging area, cocoa regeneration issues].

Secondly, all farmers interviewed also optimise their land allocation by intercropping annual food crops with their additional perennial tree crop(s) during the years before the first harvest. (See Chapter 3). In this matter, the diversification process enables farmers to maintain – and in some cases improve – farmers’ food security. Eventually when the tree seedlings have reached their

⁸ Translation: “the land belongs to those who develop it”

'adult' age for harvest, farmers are constrained to transfer their annual food crops onto another plot.

"Hevea takes 7 to 8 years before it can be bled, it was a difficult time. [...] When we plant hevea or coffee, we also put all types of fruits and vegetables: eggplant, plantain, maize... But after a few years when it grows, then these crops can no longer stay on this plot, so we have to remove it to another plot."

(Focus group, 03.11.17)

In my view there can be a tension on land use between cash-crop diversification and food-crop diversification for farmers that do not possess sufficient land to combine both. The introduction of a new perennial tree-crop on farm may lead to the reduction of the food crop production or its displacement on rented plots. Nevertheless, farmers are rational actors that take diversification decisions for a reason – hence, one can expect that the additional income generated by the introduction of a new cash-crop covers for more than the loss in food-crop production.

Third, the mobilisation of Natural Capital is intrinsically linked and constrained by the availability of Human Capital (labour) and Financial Capital. One of the biggest difficulty experienced by farmers during the diversification process is the land preparation itself, for it requires hours of tedious labour and financial means to invest in the planting material (seedlings). Some farmers mentioned having sufficient [fallow] land available in order to expand their agricultural activities, but lacking either labour force or financial means in order to be able to undertake new initiatives. This point shows a strong inter-dependency between the Livelihood Assets.

Finally, the findings show promising involvement of the Transforming Structures & Processes in farmers land mobilisation. For instance, I encountered a communal land use scheme for food production at the cooperative SOCODD; based on villagers donations of low lying-land (unsuitable for cocoa and coffee production), the cooperative managed to gather 100 hectares of land to plant rice-fields. This pilot project benefits two villages and affects community and women empowerment, food security and diversification of income. Such examples of communal land use schemes facilitated by the structure of the cooperative remain nonetheless exceptional to witness (Interview with François Ruf, 15.11.17)

Furthermore, I trust that the Transforming Structures & Processes have a great potential to support farmers on land use decisions through a soil diagnosis process. I witnessed this type of capacity support carried out by the not-for-profit organization ICRAF during a participatory observation at a cooperative. Within the frame of the agroforestry programme 'Vision 4 Change' by the Mars Inc. company, selected cooperatives would benefit from ICRAF's expertise to establish soil diagnoses to support well-informed diversification decisions and encourage replanting shade-trees.

As a conclusion, availability of *sufficient* and *secure* land are factors that encourage farmers to engage in diversification processes. This is the subject of many ethnical and economic tensions in Côte d'Ivoire and there is a strong potential for external organisations & institutions to support farmers on land tenure issues and soil diagnosis. In this matter, it is important for farmers to consider the availability and security of their Natural Capital assets before investing in diversification strategies.

4.3. The *Human Capital* assets: Working force & Knowledge .

Human Capital is defined as: “*the skills, knowledge, capacity to work, and good health that together enable people to pursue different livelihood strategies and achieve their livelihood outcomes.*” (DFID, 1999). Two components of Human Capital are going to be explored: a physical one related to the workforce (leaving out health aspects); and an intellectual one related to skills & knowledge.

In this section, workforce availability and capacity knowledge are considered as factors enabling the implementation of diversification strategies. Due to the length of the following section that covers two different components of Human Capital, I am going to regroup the problematics of access & mobilisation of Human Capital under a single banner.

4.3.1. How do cocoa farmers access & mobilise labour?

Cocoa production in Côte d’Ivoire relies on family farming systems, which means that household members constitute the main working force on farm. The workforce is usually mobilised as such; the male adults of the household are in charge of the perennial tree crops production such as cocoa, coffee, rubber and palm – whereas the women are in charge of the annual food crops & commercialisation of the surpluses. Women are also often required to help on plantations during the peak season with the harvesting and opening of the pods. Both men and women are also likely to carry out other on and off-farm activities. The interviews show that smallholder cocoa farmers can also rely on the support of the bigger family (brothers, uncles and cousins) for punctual physical tasks such as the preparation of the land before the introduction of an additional perennial tree-crop.

Second, it is very common for smallholder farmers to rely on contract farming and sharecropping agreements. There are many different forms of contract farming; the main difference being between seasonal workers and daily workers. The main form of sharecropping I encountered is called *aboussan*; the *aboussantier* is contracted to maintain a cocoa plot year-round and must re-distribute 2/3rd of the yearly harvest to the land owner.

Additionally, it is also common for individual farmers or farmers cooperatives to employ groups of young migrant workers from neighbouring countries to accomplish specific physical tasks such as land preparation or transportation/unloading of cocoa bean bags.

Photograph 4.1: Group of migrant workers employed by the cocoa cooperative to unload cocoa bean bags from the trucks to the storage location. (taken by the author)



The following table is taken from an income study that was performed by EMC – Etude de Marché et Conseil (an Ivorian consultancy company) on 48 households from 16 different locations across the country. The sample of respondents is similar to this research as all household interviewed work with cooperatives that supply Cargill. As opposed to my sample selection, this study did not emphasize on meeting with diversified cocoa farmers.

Figure 4.1: Workforce characteristics (EMC, 2017)

Workforce category	Minimum	Maximum	Average	Concerned households	
Non-paid family workforce	0	7	2	47	97,9%
Paid family workforce	1	10	2	19	33,3%
Contractual workforce	1	30	7	17	35,4%
sharecropping (Aboussan)	1	4	1	23	47,9%
Mutual aid (other farmers)	3	25	11	36	75%

This table shows that the type of workforce employed on cocoa-farms is highly diversified. It confirms that almost all producers use family resources, and sharecropping arrangements

(*aboussan*) are a very common practice that concerns close to 50% of the interviewees. As a side note, this statistic shows that the respondents are farmers with a certain standard of living as they are land-owners that can afford to lend some plots to migrant workers.

The preceding established how farmers access workforce and which types of arrangements are usually prevailing. I am now going to focus on the workforce mobilisation, which constitutes one of the main issues expressed by the cocoa farmers interviewed. This problem concerns both family based labour, contract farming and sharecropping arrangements;

“When you have a bit of money, you can solicit the young people of the village to do some work for you. I have difficulties to find them. [...] Often you have the money but you can’t manage to find someone to do the job for you. [...] Back in the days, our cocoa orchards were productive so we used to employ *aboussantiers* – you could tell them ‘do this, or do that’. Nowadays the cocoa fields are dead, so the *aboussantiers* left the region. Now we have to contract daily workers whereas before it used to be *aboussan*.” (Farmer 23, 29.11.17)

– The workforce is very difficult to find. Back in the days, our parents didn’t send their children to school. Now all the children go to school so it’s difficult to find workforce.
– Do you mean that the workforce used to be children?
– No, the workforce wasn’t the children, but because they didn’t have much education they would end up working in the fields. Nowadays children go studying, they leave for the city and they don’t come back after school to help here.” (Farmer 20, 28.11.17)

“It’s difficult to find working force. The younger generation of nowadays wants to work in gold. We the cocoa farmers are not ready to work the gold.” (Farmer 21, 28.11.17)

Most farmers interviewed mentioned having difficulties to find workforce – the preceding quote reveal 3 explanatory reasons:

The first quote shows how cocoa farmers are experiencing difficulties to find seasonal workers/*aboussans*. Such types of contract farming and sharecropping agreements are suffering from the consequences of pests & diseases that hit the cocoa production a few years ago and from the exhaustion of the forest rent. Since the *aboussantiers* only live on 1/3rd of the total yearly cocoa production, one can understand that such sharecropping agreements cannot be maintained in a context of drop/stop of the production. The migrant workers most likely displaced their working services towards another region with higher productivity, another crop, or another activity. With regards to the Sustainability Livelihoods Framework, it means that the availability of Human Capital (labour) is also influenced by the Vulnerability Context (pests & diseases) and the Structures & Processes that frame working relations (*aboussan* sharecropping agreements).

The second quote reveals a phenomenon of rural exodus/urban migration directly related to the increasing level of education in rural communities. Farmers reference to ‘school’ does not necessarily only relate to lower school but also to professional formations. A generational change sees the younger generation benefitting from higher levels of education than their parents, leading to a lack of working force in agricultural activities.

The last quote shows that some groups of young migrant workers that used to be employed on cocoa plantation are currently displacing their services to a new activity in Côte d’Ivoire: gold mining. This phenomenon has been mentioned several times by farmers over the course of my

fieldtrip and poses yet another barrier to the availability of working labour in agricultural activities.

Furthermore, my findings show that the lack of available workforce (Human Capital) experienced by smallholder farmers is topped with an issue of lack of Financial Capital in order to pay for it. This confirms a strong dependency between the various Livelihood Assets and the importance of temporality with regards to asset accumulation.

“Sometimes you manage to find workers but you cannot pay them on that day, so you have to wait until you have enough cash to pay them. [...] Sometimes you have enough cash to pay them but you don’t manage to find them – sometimes you find them but you don’t have the money to pay them.” (Farmer 23, 29.11.17)

It is important to take into account the timeline and stress that my data collection was carried out during the main cocoa harvesting season, which probably affects farmers’ responses with regards to their need for working labour. It has been suggested by an expert’s interview that the lack of available workforce is solely endured by farmers during the main harvesting seasons; leaving on the contrary a reserve of untapped workforce throughout the rest of the year (Cargill, 2018). This is one of the main argument to explain how farmers may benefit from crop-diversification as the combination of multiple crops with various harvests optimises the workforce use & improves income distribution throughout the calendar. One criticism can here be raised against the Sustainable Livelihoods Framework (DFID, 1999), as it fails to take into account seasonality as a factor influencing the availability of the Livelihood Assets. My findings show that the Livelihood Assets distribution is dynamic and follows various fluctuations throughout the year.

Photograph 4.2: Migrant worker unloading cocoa bags (taken by the author)



With regards to Structures & Processes, relatively little direct institutional support to mitigate the lack of working force was witnessed; with the exception of the institution of the family widely present in all interviews.

On a top-down level, I did not expect formal structures such as the State, Private Sector organisations or NGOS to (be able to) provide direct support for the availability of physical labour – and was therefore not surprised to not find any. Yet indirect support could be provided through the Transforming Structures & Processes such as farmers’ cooperatives or village organisations by facilitating and supporting farmer’s ability to associate.

In this matter, can there be trade-offs between different Livelihood Assets? In other words, can a lack of Human Capital be balanced out by an investment in Social Capital?

I came with the expectation that cocoa farmers would use their Social Capital resources via the enabling Structures & Processes of the cooperative/village in order to team up and constitute farmers groups/associations to counterbalance the lack of Human Capital. Going even further, it is precisely the investment in Social Capital (combined with an enabling institutional background) that leads to the creation of new Structures & Processes: an association of people with common objectives, when sustaining in time, eventually goes through an institutionalisation process and becomes a form of structure with its own regulations. In my view, the accumulation of Social Capital can lead to the creation of Transforming Structures & Processes in order to facilitate access to Human Capital. Few examples of farmer’s collaboration to balance out their needs in working force were witnessed;

“Between cocoa-producers we help each-other. If you have 5 hectares you cannot harvest and transport everything by yourself. If we help each other it can be finished within 2 days. I am asking for the support of the farmers and I am also going on their farms to help. It is better than the groups of migrant workers because they are asking to get payed – whereas between us there’s no problems.” (Farmer 13, 21.11.17)

In some cases, farmers constitute support groups of acquainted farmers in order to perform physical tasks on each-other’s plots. Nonetheless, my overall observations point to a rather strong sense of individualism and a preferred reliance on contract farming (when households can afford it). My general impression was later on confirmed by Francois Ruf – who attributes farmers individualism to a certain ethnical heritage (pointing out that there might be a difference in peer support depending per region and ethnic group).

The EMC income study (2017) here-above shows that 75% of farmers interviewed rely occasionally on peer support – nonetheless these statistics do not show that such support is confined to very specific occasions. According to the interview with Francois Ruf, the main ‘institutionalised’ peer support is during the harvest and opening of the pods: the household invites friends, neighbours & family on farm in order to open all the cocoa pods and start the beans fermentation process. At this occasion, the household invests in its Social Capital as a means to accumulate Human Capital. This type of peer-support is granted against the tradition of receiving a large lunch offered by the hosting household. – this example demonstrates that some trade-offs between Livelihood Assets can indeed take place.

Photograph 4.3: An open cocoa-pod (taken by the author)



All in all, smallholder cocoa farmers rely on a large diversity of farming agreements that combine family workforce, contractual farming and sharecropping schemes. My findings reveal recent issues of access & mobilisation of working labour, which can be explained by structural changes such as urban migration and environmental degradation. Yet, alternative practices such as farmers associations and shared labour schemes haven't been much witnessed during the field research.

4.3.2. How do farmers access & mobilise knowledge?

'Knowledge' as mentioned here above refers to the skills & know-how that farmers deploy in order to successfully undertake their cocoa-cultivation and the introduction of an additional crop to their agricultural activities.

My findings reveal that there are 2 main channels of farming knowledge acquisition among smallholder farmers: social interactions with family/peers (Social Capital) and educational trainings as provided by external organisations/extension services (Transforming Structures & Processes.). It is interesting to notice that such channels of knowledge acquisition differ per crop.

A. Knowledge acquisition through social interactions with family/peers:

Firstly, all smallholder cocoa farmers interviewed acquire their know-how & agricultural skills of cocoa cultivation as part of an inter-generational knowledge transfer within the family. This knowledge inheritance usually only concerns cocoa & coffee crops as they were historically introduced earlier-on in the agricultural landscape of Cote d'Ivoire – and therefore cultivated by multiple generations over time. One of the reasons why some farmers do not undertake diversification strategies is due to their cultural & knowledge heritage of the cocoa crop, leading to a social reproduction of the activities performed by the previous generation:

“At that time, our parents didn't know about palm trees. So we are now taking over the same crops as the ones of our parents. Our parents didn't do anything else, hence we do the same. I chose cocoa because this is the crop that our parents taught us, so we know cocoa better; that's the reason why we do cocoa. Here at the village it's only cocoa. Others say that they will introduce something else but they haven't done it yet.” (Farmer 13, 21.11.17)

“We chose those cultures because our parents were already doing it. It was easier for us to do those crops because we already knew how to cultivate them. Whereas with teakwood, pineapple or else, we don't have any notions.” (Farmer 3, 08.11.17)

“I prefer to plant cocoa because it's cultivation is easier than hevea. For the rubber-tapping I need to attend a training course, it is difficult for me. I would need to employ someone to do it. Whereas with cocoa I was born in it, I know how to cultivate it – it's more convenient for me.” (Farmer 19, 28.11.17)

Here-above, both farmer express their preference for cocoa cultivation as it relates to the farming skills & education they inherited from their parents. The first quote also reveals that some farmers decide to not undertake certain livelihood strategies such as crop-diversification due to a perceived lack of Human Capital. In this case, there is also a phenomenon of social reproduction as the farmer takes over the agricultural activities of the previous generation without challenging their land use decisions. Nevertheless, a majority of farmers undertake new farming activities with the introduction of rubber/palm in spite of a lower level of knowledge of those newer crops (this is the case with the third quotes). Despite a generational switch in farming landscape composition, the smallholder farmers interviewed continue to nurture a very special bond with the cocoa-culture as part of their identity as a person.

In his version of the Sustainable Livelihoods Framework, Bebbington (1999) introduces another type of Livelihood Asset which he refers to as Cultural Capital: ‘[...] *a range of cultural practices that are valued for their meaningfulness*’. (Bebbington, 1999: 2034). During the course of my fieldtrip, I discovered that a large majority of farmers are fundamentally proud of being cocoa-farmers for it is part of their cultural & family heritage.

“Cocoa is good so I won't abandon. It is the first culture of the country. We are never going to abandon cocoa, even if it's difficult.”
(Farmer 10, 14.11.17)

“Cocoa is untouchable, because it suits us. [...] There's also the fact that our country is the first cocoa producer, so we do not wish to tear off the seedlings, regardless of the difficulties. [...] Out of principle, an Ivorian has it in the blood. If the soil is suitable, you have to plant cocoa or coffee – it's been this way since our grandparents.”
(Farmer 12, 14.11.17)

Such discourses are representative of most farmers interviews and show how cocoa-cultivation of has become *meaningful* for its practitioners over the course of a few generations. Furthermore, the term “planteur” (cocoa farmer) conveys a prestigious social status in Côte d’Ivoire, which was strongly encouraged by President Houphouët Boigny, cocoa ‘planteur’ himself. From Bebbington’s perspective, the knowledge accumulation (Human Capital) of cocoa-cultivation confers to its owners its share of Cultural Capital, rendered possible via the social interactions within the family (Social Capital). Of course interactions with actors outside of the family circle also participate to the capacity-building.

I have thus so far focussed on the inter-generational knowledge transmission around cocoa-cultivation. When it comes to the introduction of new perennial tree-crops as part of the diversification strategies, smallholder farmers also draw on their Social Capital resources to access and mobilise new farming skills/knowledge. This knowledge exchange takes place within the Transforming Structures & Processes at the scale of the family & friends circles, the village, and the cooperative:

“My brothers and my friends advised me to start hevea-culture – they said it pays well. They also showed me how to plant it.”
(Farmer 17, 22.11.17)

“Some elders at the village did it. You saw the fields of hevea – the cocoa regeneration didn’t work hence they tried with hevea and it worked. I told myself why not [...] I copied off the people at the village that tried it before me. Some people received a training so I approached them to see how it worked and they showed me, they helped me.”
(Farmer 23, 29.11.17)

“For the papaya, it started in the region of Divo. A youngster from our village went there and got us some seeds; so we experimented it as well and it worked. [...] For this, mutual support is quite strong at the village. If someone went somewhere and saw a new culture that may be useful to everyone, we organise a village reunion and share the seeds.”
(Farmer 12, 14.11.17)

These quotes show that social relationships play a critical role in the exchange of knowledge about the introduction of additional tree-crops. Farmer’s social capital assets enable the accumulation of human capital in the pursuing of diversification Livelihood Strategies. Most of the time family & kinship relations also provide for the plant material (Physical Capital); in this manner, smallholder farmers receive at once the required knowledge & inputs to pursue a diversification strategy.

One can also observe the importance of the village unit when it comes to knowledge transfer. What’s more, there is a phenomenon of social reproduction within and between villages – for instance many farmers mentioned an overheard ‘success story’ of *x* and *y* villages in another region, motivating the whole community to undertake diversification strategies as well;

“We witnessed that rubber-cultivation was working well for other villages, so we decided to do the same in order to make ends meet. It was the year when coffee prices dropped. We imitated the other villages because there was a good feedback.”
(Focus group, 02.11.17)

In this sense, there is also an influence of the regional farming landscape as a factor for diversification. Due to an earlier diversification process, smallholder farmers from the East region

have stronger incentives (social incitation, knowledge exchange, infrastructure) and opportunities to diversify compared to farmers of the West where cocoa-cultivation remains the norm. Nonetheless, knowledge on rubber/palm cultivation spreads fast across the country and is reaching the Western region as well - encouraged by the spread of pests & diseases that affect the cocoa-crop.

B. Knowledge acquisition through educational trainings:

Beyond this 'community based knowledge', various organisations of the Transforming Structures & Processes propose educational trainings on Good Agricultural Practices (GAP) to strengthen farmers' Human Capital assets with the final objective of improving farmers' productivity. Improved productivity - when not relying on excessive expenses & dependency over fertilizers - usually results in an accumulation of Financial Capital. In this matter, accessing knowledge through capacity building programmes is directly combined with practical knowledge mobilisation. Market, State, and Civil Society stakeholders of the cocoa sector collaborate & compete in providing those capacity building programs to smallholder farmers.

My findings show a similar path for all farmers interviews; it is therefore important to keep in mind that my sample selection was performed solely within farmers cooperatives supplying the Cargill company - which is why my analysis of the institutional support received by the farmers isn't necessarily representative of the institutional support received by *all* smallholder cocoa farmers of Cote d'Ivoire.

For the cocoa-crop, my findings point to a strong institutional support on educational trainings provided by various organisations of the State & Civil Society and largely (co)-financed by the Private Sector. This institutional support is solely provided through the enabling structure of the cocoa cooperatives that act as a gateway between external stakeholders and smallholder farmers.

"When you are a cooperative member, you benefit from a strong support. There are always visits in your field to see if you don't have too much difficulties. If there are difficulties, we see together which solutions to apply to have a better productivity."
(Farmer 3, 08.11.17)

Firstly, all cooperative members benefit from the "Formation Champs Ecole" (Farmers Field Schools), which consist in various trainings on Good Agricultural Practices. This training supports farmers on cocoa production methods and how to handle inputs safely and in good measure (e.g. fertilizer, pesticide, fungicide). These extension services are provided by the ANADER (Côte d'Ivoire's national agency for rural development) and financed by Cargill itself as part of its "Cargill Cocoa Promise" sustainability programme; which shows a partnership State-Private Sector. To a certain extent, ANADER's agents can also be called on site in order to advise on production issues.

Generally speaking I collected good feedbacks on the trainings provided at the Field Schools - nonetheless my results cannot be conclusive for my ties with Cargill may have triggered a bias in the farmers responses. In a personal interview with Francois Ruf, he expressed strong doubts about the current efficiency of extension services in the cocoa industry; for him, cocoa-farming practices accumulated over the course of multiple generations cannot be modified by external trainings. Plus, many practices preached at the Field School notably on how to handle inputs cannot be applied correctly by the farmers for lack of means/materials.

Photograph 4.4 : Farmers Field School benches. (taken by the author)



Since farmers' attendance to Field Schools is decreasing over the years, Cargill has recently launched a personalised farmers 'coaching programme'. Some 'lead farmers' are voluntarily chosen to receive deeper trainings on Good Agricultural Practices – and are commissioned to assist their village/community on cocoa production. Each cooperative member is supposed to receive a bi-yearly visit from the 'coach' (lead farmer) to design together a personalised roadmap of the next steps to take in order to improve production. The research organisation ICRAF is commissioned by Cargill to ensure the lead farmers trainings. This personalised coaching is a fairly recent programme and my findings show that smallholder cocoa farmers do not tend to naturally mention it when asked about external support.

Over the course of my cooperatives visits, I noted down many multi-stakeholders initiatives around capacity building programs for smallholder cocoa farmers; not only for Good Agricultural Practices trainings (ANADER – ICRAF – IDH – Cargill), but also for food security & women empowerment (CARE International, Ministry of Agriculture, World Cocoa Foundation, Private Sector companies), child labour remediation (International Cocoa Initiative, State, private sector companies), agricultural diversification (GIZ – ICRAF – ANADER – Vétérinaires Sans Frontières). Some financial & management trainings are also offered to cooperative staff members to support them with the growth and professionalisation of their cooperative (International Finance Corporation, Cargill).

These initiatives show a strong collaboration between the various spheres of State – Civil Society – Private Sector in order to support smallholder cocoa farmers access Human Capital assets.

Newer industries such as rubber & palm also feature a portfolio of educational trainings and extension services; as opposed to the cocoa industry, the trainings are not necessarily meant to

improve production yields but rather to encourage farmers to initiate new plantation projects starting from ground zero;

“Hevea-culture at first wasn’t located here, it was more towards Dabou. Thus, some youngsters of the village went there to become rubber-tappers; they were taught by the SAPH instructors how to graft hevea seedlings and how to tap rubber. When they came back from their training they also taught us how to do it.”

(Focus Group, 03.11.17)

“For rubber... it wasn’t difficult, no. We’re being taught, we’re being shown how to do it and we need to observe. In the beginning, some extension workers come to our plantations; they are sent by the company to whom I am selling the rubber: SAPH. The instructors come to train and advise us. All of us are now doing it without their help. [...] For palm it was the same, there was also some instructors sent by PalmCi. It was for free – nowadays we can still call them when we need advice”.

(Farmer 2, 08.11.17)

The quotes here-above reveal that the rubber/palm industries provide their own networks of agricultural extension workers – employed directly by the companies – without relying on a collaboration with State/Civil Society organisations. The supply chain of rubber/palm isn’t merely structured around farmers cooperatives as much as the cocoa supply chain is. For starters, most of their supply comes from industrial large-scale plantations – when cocoa comes at 90% from family farming, which explains better its reliance on small-organisations. There is a more direct contact between smallholder farmers and the rubber/palm companies; for instance, farmers have to organise themselves in order to bring their products directly to the rubber/palm factory. On the contrary, transportation aspects are usually taken care of by the cocoa-cooperatives that act as a first gathering point of cocoa beans before sending them further down the line.

From my perspective, extension services of the rubber and palm sectors are doubled with an objective of aggressive recruitment process to ‘convert’ cocoa farmers into rubber/palm farmers. The interviews show that i) either the villages send their designated members directly to the rubber/palm factories to receive a training; or ii) the rubber/palm companies send their extension workers directly within the villages to provide the trainings.

Ruf argues that the extension services provided by the rubber/palm industry played an important role in the successful introduction of those crops in the late 1980’s in Cote d’Ivoire as farmers were accompanied with Good Agricultural Practices trainings from the very beginning, together with the distribution of improved plant material. (Interview with Francois Ruf, 15.11.17)

Finally, it is important to state that a vast majority of farmers do not perform rubber-tapping by themselves, but employ what is called a ‘saigneur’ (from the word ‘sang’: literally a bleeder – or a rubber-tapper). Those rubber-tappers are most likely the same ‘youngsters of the village’ trained by the SAPH and mentioned in the above quotes.

“The rubber-tapper knows how to do it, and I go with him to help. I employed a rubber-tapper and he’s the one to know, he is going to teach me a bit”

(Farmer 24, 29.11.17)

Since rubber-trees need to be tapped very regularly and throughout the year, most farmers employ a specialised ‘rubber-tapper’ to perform the job; he is being payed per kg of rubber collected. The rubber production yield eventually depends largely on the knowledge & skills of the tapper employed, required to perform the cuts properly. In this sense, the absence of

knowledge (e.g. to graft or tap rubber-trees) can be balanced out by the employment of specialised workforce. This also means that different aspects of Human Capital can compete and support each-other.

It is important to stress that capacity building trainings provided by external stakeholders usually combine knowledge-mobilisation and facilitated access to agricultural inputs (Physical Capital) that are at the core of such formations.

As a conclusion, Social Capital in the sense of access to others & social relationships is a condition sine qua non for reaching Human Capital resources. This knowledge exchange is performed both within family/peers circles and through educational trainings provided by the Transforming Structures & Processes. Finally, knowledge acquisition can also impact other areas such as (human) health & safety, soil diagnosis, crop productivity & income increase, crop-protection measures, etc. Human Capital resource allocation therefore affects all other Livelihood Assets at once, which reveals a strong interdependency between capital assets.

4.4. The *Physical Capital* asset: Agricultural inputs.

According to our framework of analysis, Physical Capital “*comprises the basic infrastructure and physical goods that support livelihoods*”. (DFID, 1999). This refers to both ‘public’ infrastructure such as water supply, shelter, energy, [etc.], and producer goods such as tools, agricultural material, [etc.], to support farmers livelihoods. In this section I chose to mainly focus on the producer goods that enable the agricultural exploitation of cocoa & other additional crops introduced on farm. This refers to agricultural inputs (fungicides, pesticides, fertilizers), agricultural material (tools & machinery) and [improved] plant material (seedlings). Generally speaking, one may use the term ‘inputs’ to refer to all producer goods categories mentioned here-above. This section is dedicated to understand how farmers access & mobilise their agricultural inputs.

Within this introduction, it is important to stress that the growing needs for agricultural inputs & improved plant material directly relate to the ‘exhaustion of the forest rent’. (Schroth & Ruf, 2014). Indeed, the replacement of the virgin forest with decades of cocoa monoculture led to a depletion of the soil nutrients and an increase in pests & diseases. This general environmental degradation explains the cocoa-regeneration issues as experienced by a vast majority of farmers in Côte d’Ivoire and generates a growing need in chemical inputs and crop-protection products.

There are strong differences in how smallholder farmers access & mobilise inputs according to which perennial tree-crop they produce. My questionnaire was purposely focussed on farmers opportunities & issues with the cocoa-crop (also used to understand their motivations to diversify), hence my analysis is more extensively focussed on the cocoa crop. I am nonetheless also going to introduce some elements of comparison with the additional crops as well.

4.4.1. How do farmers access *Physical Capital* assets?

First and foremost, access to Physical Capital and Financial Capital are fundamentally intertwined, for a farmer with sufficient financial means can afford to invest in physical goods for the production. In this matter, when farmers mention lack of inputs, it inevitably brings us back to a lack of Financial Capital. In many cases, farmers access to agricultural inputs does involve a purchase through the cocoa cooperative – nonetheless I am mostly going to focus this section on the institutional support lying behind this system.

Based on the sample selection which comprises solely cocoa-cooperative members, my findings for the cocoa crop show that farmers’ access to inputs largely relies on the institutional support provided by the Transforming Structures & Processes⁹. This institutional support is organised around the structure of the cooperative, which acts as a gateway between Private Sector/State/Civil Society organisations and smallholder farmers. Many farmers consider the cooperative as their direct and only source of material support – but the reality is more complex as cooperatives often act as the carriers of support programmes organised & financed by external stakeholders. My findings show that companies of the private sector play a key role in facilitating access to inputs through the implementation their sustainability programmes with the

⁹ ‘*Transforming Structures & Processes*’ as referred in the SLF comprises both institutions & organisations and their processes of action/support.

cooperatives. In this case, all cooperatives encountered for the purpose of this research are direct suppliers of Cargill and thus benefit from the '*Cargill Cocoa Promise*'; a set of sustainability projects dedicated to support cocoa farmers productivity & local communities issues.

Furthermore, cocoa cooperatives that are sustainable certified (Fairtrade, UTZ, Rainforest Alliance) also carry out support projects for their farmer members. Indeed, all 10 cooperatives met were certified and therefore benefitted from the reallocation of a sustainability premium. This additional income enables them to invest in basic infrastructure (purchasing trucks for the cocoa beans collection, rehabilitation of school buildings & health centres) or to support members through the financing of agricultural inputs.

Generally speaking, institutional support for Physical Capital often consists in the direct provision (for free or at reduced price) of producer goods to smallholder farmers:

A. Access to agricultural inputs: fertilizer & phytosanitary products.

A majority of cocoa cooperatives facilitate farmers' access to agricultural inputs with a credit system: farmers can order inputs (at preferential price) directly at the cooperative and reimburse it a few months later upon delivery of their cocoa beans harvest:

"We pay for the inputs at a reduced price and at our own pace. After each harvest we reimburse little by little. That is why we became cooperative members, before we didn't have inputs."

(Farmer 3, 08.11.17)

"We bought fertilizer and phytosanitary products at the cooperative. The cooperative orders the products at the factory and we pay to the cooperative. It is a credit system, we actually reimburse it on our production. Also the Conseil Café Cacao gives us boxes for 2 hectares."

(Farmer 26, 30.11.17)

During the expert's interviews, it was understood that Cargill acts as a facilitator to enable a credit system between the cooperatives and the agricultural inputs companies. This system is much appreciated by smallholder farmers that are often faced with a cash liquidity issue – and can yet invest in their cocoa-productivity.

As shown in the previous quote, the Conseil Café-Cacao (CCC) – provides up to 2 boxes of phytosanitary products per smallholder farmer per year to encourage the treatment of cocoa plantations against pests & diseases. (1box = 1 hectare). Many farmers complained that the amount distributed by the CCC isn't sufficient to entirely cover their land surface – which triggers them into either spending money to apply the treatment thoroughly or leave a part of their plot untreated. In some cases, the cooperative & Cargill together finance additional phytosanitary products to complete the donation of the CCC.

"They give it once per year, for 2 hectares. Each of us here receives for at least 2 hectares. For the rest we pay ourselves – if you have available liquidity you pay in cash, otherwise you reimburse on the production" (Farmer 23, 29.11.17)

In spite of such institutional support, a majority of farmers expressed their difficulties to invest in fertilizers and crop-protection products and claimed for more financial/material support from the various Transforming Structures & Processes.

The agricultural inputs distribution is organised via the cooperative, with the support of a Cargill programme (Yiri+) to train & equip specialised people in order to safely apply the crop-protection products on plantation. This is one of the mandatory requirements for cooperatives to become sustainable certified.

Farmers do not seem to benefit from such institutional support in the provision of crop-protection products for palm & rubber.

B. Access to agricultural material:

Depending on the cooperatives, agricultural material such as machetes, gloves and boots are sometimes directly provided by the partner company or the cooperative itself. Generally speaking there are no machines used on cocoa-plantations, which explains why the cocoa-crop is so labour-intensive and how workforce is lacking during the critical periods of land preparation and harvest. With regards to the SLF, it means that a lack of Physical Capital (machines) needs to be compensated by an investment in Human Capital (workforce).

Rubber cultivation requires a higher investment in agricultural material, notably for the collecting cups to place around each tree. Multiple cocoa farmers actually mentioned this financial investment as a barrier to diversify with rubber. I did not witness much material support from private companies of the rubber/palm sector as to the provision of agricultural material.

Photograph 4.5: Rubber tapping cup placed on hevea tree (Source: Wageningen University)



C. Access to (improved) planting material:

Farmers' access to cocoa planting material relies mainly on the *Transforming Structures and Processes*. With the objective of enhancing the process of orchards regeneration, companies of the cocoa & chocolate industry and the Conseil Café Cacao subsidize the distribution of cocoa plant material through the cooperatives – often in combination with trainings on Good Agricultural Practices. In some cases of course farmers have to finance cocoa seedlings themselves, as all cooperatives do not receive the same donations, neither do they receive it on a constant basis.

Cocoa nursery initiatives are usually undertaken at cooperative level – but educational trainings on GAP also provide farmers with knowledge to continue nursery projects at their own individual scale. Many farmers also collect cocoa seeds from their plantation to grow cocoa seedlings.

Beyond the support programmes from exporters such as Cargill, cooperatives also benefit from sustainability programmes of the next link in the cocoa supply chain, which are chocolate manufacturers such as Nestlé and Mars Incorporated. My findings show that Nestlé plays a key role in the provision of plant material for both coffee & cocoa through its programme '*Nestlé Cocoa Plan*'. All the same, Mars combines educational trainings and plant material distribution through its '*Vision For Change*' project, implemented at cooperative level with the collaboration of ICRAF. Multiple layers of stakeholders within the Private Sector are therefore able to reach smallholder cocoa farmers via the cooperatives.

Photograph 4.6: Cocoa nursery project (taken by the author)



Institutional subventions are generally focused on the improved variety “Mercedes” developed by the CNRA (Centre National de Recherche Agronomique). In theory, this improved variety (when handled with Good Agricultural Practices) can generate cocoa year-round and result in higher production yields. In reality, a dozen interviewees questioned the efficiency of this new cocoa variety for an observed lower resistance to drought and sun, and a shorter life-span of the cocoa-tree.

“The fact is that the new variety ‘Mercedes’ dies a lot more because it cannot handle the heat. It is more drought-sensitive than the conventional variety ‘tout-venant’. At my dad’s time, there were already drought periods but the ‘tout-venant’ seedlings would resist. With the Mercedes variety, one month of drought and it is already dying. The problem is that we don’t use ‘tout-venant’ seedlings anymore because we don’t know whether the swollen shoot disease is already in the pods. So we would rather plant Mercedes.”
(Farmer 23, 19.11.17)

The difficulties herewith encountered with the Mercedes variety are experienced during the re-planting phase of new cocoa seedlings, in the attempt of regenerating cocoa orchards. The variety type may not be the only explanation for this crop-failure, as it may be combined with a general soil quality degradation and the displacement of the forest/savannah boundary.

For the introduction of other crops such as rubber, palm and cashew, farmers can gain access to plant material through their Social Capital assets for their first trial. The knowledge transmission between peers, friends & family (Section 4.2.2) is usually combined with a donation of seedlings in order to launch the introduction of a new crop;

“I got the advice from my older brother that was already doing teakwood. He came to me and showed me how to do it. He also gave me the teak seedlings coming from his nursery.”
(Farmer 10, 13.11.17)

“A comrade brought me cashew seedlings from his dad’s exploitation in Burkina Faso”
(Farmer 25, 29.11.17)

Social relations encourage diversification decisions by providing plant material for a first trial phase & up to a certain land surface. When farmers do decide to dedicate a (larger) plot for the introduction of a new crop, they usually have to complete such donations by purchasing seedlings at the nearest factory. The purchase of plant material & agricultural material to start a new perennial tree crop represents an important investment for the farmers that can afford it. It is not uncommon to see farmers adopt a phased approach with a gradual introduction of the secondary cash crop over time.

As a conclusion to this section on access of Physical Capital assets, I would like to stress the following points:

- ✓ There is an important institutional support from Public-Private Partnerships of the cocoa & chocolate sector that consists in the direct provision of producer goods to smallholder cocoa farmers. Replanting issues are a direct threat to the cocoa & chocolate supply chain – which explains why the Private Sector plays such an overarching role in facilitating the provision of agricultural inputs & plant material at reduced price;
- ✓ This institutional support is mainly organised around the structure of the cooperative, that acts as a gateway between State/Private Sector/Civil Society and smallholder farmers;
- ✓ Stakeholders of the palm & rubber sectors are visibly less involved in the direct provision of producer goods to farmers’ communities; despite a gradual adoption of those crops by smallholder cocoa farmers. In this matter, the advantages of rubber/palm cultivation seem to out-run the material support provided by the cocoa industry.

4.4.2. How do farmers mobilise *Physical Capital* assets?

The mobilisation of Physical Capital assets is closely related to the presence (or lack of) three other assets: Natural Capital, Financial Capital, and Human Capital;

First and foremost, the gradual need for chemical inputs (fertilizers, phytosanitary products) is directly related to the exhaustion of the soil as a consequence of decades of monoculture;

“My main difficulty is the lack of inputs for the soil. Since there is a lack of inputs, it is difficult for the plant to evolve properly. Five years after planting, I notice that the

seedlings don't evolve. Currently the soil is exhausted, everything has been pumped out. It is a plot that has been exploited for years."
(Farmer 2, 08.11.17)

When setting their farms in forest areas in the 1980's, smallholder farmers took possession of a certain amount of Natural Capital; it combined rich soils and favourable micro-climates for cocoa-culture. 40 years of deforestation & monoculture with the cocoa-crop led to a depletion of the Natural Capital resources available. The weakening of Natural Capital assets now needs to be compensated by an investment in Physical Capital in order to maintain productivity.

Second, the availability of Financial Capital resources constrains farmers access & mobilisation of Physical Capital. Throughout the farmers interviews it became evident that the cost of agricultural inputs consists the main barrier to its thorough application;

"I need financial support to finance the inputs. Fertilizer, medicines. It costs very very expensive and this is what worries me."
(Farmer 10, 13.11.17)

"It's a question of money. Today when we replant cocoa seedlings it doesn't always work because we cannot afford to use fertilizer."
(Farmer 10, 13.11.17)

Most smallholder cocoa farmers interviewed apply the free agricultural inputs distributed by the cooperatives but are not willing/able to finance complementary boxes. This MSc Thesis started with the assumption that crop-diversification and economic resilience it brings would enable farmers to invest in agricultural products in order to maintain/increase their cocoa productivity. This is yet an assumption that needs to be proven with quantitative analyses.

Finally, the mobilisation of Physical Capital assets is strongly inter-related with the accumulation of Human Capital resources – in the sense of skills & knowledge. From this perspective, the practice of fertilizer application is constituted by...

- a) the knowledge, skills, and technique;
- b) the product(s), tool(s) and equipment;

... required to apply fertilizer on plantation¹⁰.

This combination Human Capital/Physical Capital assets is at the core principle of the Farmers Field Schools programmes run by various extension services within the cocoa industry. Good Agricultural Practices trainings have the main objective to support and train farmers on the appropriate use of agricultural inputs as provided by the cocoa sector, in order to enhance levels of productivity & cocoa-orchards regeneration.

As a conclusion to this section on access & mobilisation of Physical Capital assets, I would like to quote a reflection found in the Sustainable Livelihoods Guidance Sheets (DFID, 1999). Although companies of the Private Sector usually demand a financial participation for the provision of

¹⁰ For the sake of our interest, I decide to leave out the 'meaning' element of practice.

agricultural inputs, the Conseil Café Cacao distributes crop protection products and agricultural material for free. This quote reveals the potential (negative) impacts of the direct provision of producer goods:

“Many producer goods are private goods – direct provision through an external agency entails favouring one set of potential recipients over another. This can be divisive and counter-productive. In addition, when goods are ‘rationed’, the rich often manage to gain access at the expense of the poor, for whom the goods were intended.”

(DFID, 1999: Section 2.3.4)

The direct provision of producer goods creates inequalities of resource distribution due to an unequal distribution of Social Capital between households/individuals. Indeed, it became evident during the field research that social relations have a strong influence on resources distribution;

“I am used to borrowing the cooperative machinery to plough the savannah ground. Not everyone can do this, it is because I am good friends with them.”

(Farmer 12, 14.11.17)

In this case, the farmers nurturing strong ties with cooperative staff/board members benefit from more Physical Capital support than the farmers that do not sustain such social relations; they can obtain more fertilizer boxes or borrow the cooperative agricultural material for their own use. In this regards, access to Social Capital is the first step to negotiate resources distribution.

4.5. The *Financial Capital* asset: Start-up investment

As explained in the previous chapter, farmers main objective to diversify is to increase and stabilise their *Financial Capital* base throughout the year. Nonetheless, crop-diversification comes with considerable investment costs that constitute the main barrier for smallholder farmers to engage in such livelihood strategies.

The following sections presents how farmers access & mobilise *Financial Capital* in order to introduce a new crop on farm. I am going to support my personal findings with an income study performed by EMC for Cargill on 48 farmers households from several regions of Côte d'Ivoire (EMC, 2017). Due to similarities in the sampling methods, I assume that the EMC study provides insights on the same type of research subjects as my own selection.

4.5.1. How do farmers access *Financial Capital*?

My findings show that smallholder farmers access *Financial Capital* through the income generation from their agricultural activities, non-agricultural activities and the external support from which they benefit;

First, the main source of revenues for farmers households comes from their agricultural activities; it comprises cash crop(s), food crops and livestock farming.

Cocoa-culture remains the main money maker as it represents 61.8% of the total revenues made by the smallholder cocoa farmers interviewed by EMC (2017). Surprisingly, the same study shows that additional cash-crops only represent 5.1% of farmers' total income. Since only half of the respondents interviewed are actually diversified with cash-crops, this additional revenue represents more towards 10% of the total income for the diversified farmers. Nonetheless, these quantitative conclusions come in contradiction with the general perceived importance of secondary cash-crop income as highlighted by the findings of my qualitative interviews.

Figure 4.2: Farmers households total net revenues (EMC, 2017)

Synthesis on households income	percentage
Net revenues generated from cocoa-culture	61,8 %
Net revenues generated from other cash-crops	5,1 %
Net revenues generated from food-crops	25 %
Net revenues generated from livestock farming	2,7 %
Net revenues generated from other profesional activities	3,7 %
Other forms of revenues	1,9 %
Households total net revenues	100%

As mentioned in Chapter 3, a vast majority of households (94%) diversify with food-crops in order to feed their family and sell surpluses on market. The EMC study reveals that 25% of farmers total income comes from their food-crops production. In reality this number includes the equivalent market value of the food consumed by the household – hence not spent on the market for food supplies. Households self-consumption of the food crops produced represents 65% of the value, whereas the income generated by the sales of the food surpluses only represents 20.3% of the total value. In this matter, households' main objective to diversify with food crops is to ensure their food-security, more than to generate additional income.

Eggplant, peppers, gombo, maize and manioc are the food crops most commonly cultivated whereas peanuts, plantain and chili-peppers are the ones most commonly sold on market. This production is marketed at 60% on large urban markets to feed the needs of a growing population and 40% locally.

It is important to stress that only 40% of the household interviewed dispose of remaining plots to plant food crops, which represents a main barrier to their food security. My previous findings show that households intercrop their perennial tree-crop seedlings with food crops during the first few years after the introduction of a new cash-crop. When the perennial tree-crop reaches its mature age, farmers are forced to displace their food-production onto another plot. For 60% of the households that lack of available land plots, this can translate into a trade-off between cash-crop diversification and food security.

Other than this, the EMC study (2017) shows that 54% of farmers households also undertake livestock farming activities, with a majority of chicken production. Like with food-crops, livestock farming is firstly destined for self-consumption and secondly for additional income generation.

When it comes to non-agricultural activities, the EMC study shows that less than 20% of household head and 35% of other household members undertake off-farm activities. From my personal observation, commerce (beverages, textiles) consists in the main off-farm activity.

All in all, farmers tend to rely on their own savings from various on & off-farm activities in order to build a start-up capital and invest in the introduction of a new cash-crop.

“I am going to finance the rubber collecting-cups with the money I earn from my cocoa-culture.”
(Farmer 21, 28.11.17)

“I financed it with my own savings, solely with the money I make from vegetable gardening.”
(Farmer 25, 29.11.17)

My findings show little presence of external (micro) credit organisations in the implementation of diversification strategies at farmers level. Nonetheless, the cooperative often acts as a credit institution – and sometimes collaborates with micro-credit organisations – in order to facilitate farmer's access to agricultural inputs. This is rendered possible for cooperatives that receive a sustainable cocoa premium. Some cooperatives also grant farmers with credits for other types of expenses such as school tuition fees or health and funeral expenses. Throughout the interviews, I noticed how credit allowance can be influenced by farmers social relations with the coop' staff members. In this matter, the accumulation of Social Capital can facilitate access to Financial Capital.

4.5.2. How do farmers mobilise their *Financial Capital*?

First and foremost, Financial Capital plays a critical role as it enables access to all other Livelihoods Assets within our framework of analysis. This observation is particularly accurate for assets that can be bought such as agricultural inputs and tools (Physical Capital), workforce (Human Capital) and land (Natural Capital).

“If I have money, I take people to work for me – they cannot work for free. So it is not easy to find workforce. If there is money then they directly accept to work, but if you are out of cash and you ask to pay them later, then they will refuse to work.”

(Farmer 16, 22.11.17)

“My only issue is the financial problem – how to pay the people that are going to work on my land. I need them to prepare the plot, plant the seedlings and start the nursery. I need to pay other people to do that.”

(Farmer 24, 29.11.17)

“If only we had material – machetes, machines, fertilizer – to help us a little. If you don’t have it you cannot work. Fertilizer mostly because if you don’t have money you cannot find it.”

(Farmer 4, 08.11.17)

To support this argument, the EMC study (2017) shows that the largest expenses in cocoa-culture are spent on workforce, agricultural inputs and transportation. Although more than 80% of smallholder farmers work with family members, workforce represents over 60% of the production expenses. In this matter, the availability of Financial Capital is critical to finance production expenses.

The introduction of a new perennial tree-crop on farm involves significant investment in labour force, seedlings, inputs & tools, and sometimes in land purchase. A majority of farmers interviewed experience difficulties to finance the workforce for the land preparation and the purchase of the seedlings and rubber cups (when introducing rubber). It seems that the introduction of rubber and fish-farming require a larger start-up investment whereas the introduction of palm requires a larger land availability.

As a conclusion, I would like to draw attention to the fact that farmers are constrained by the investment-capital required to introduce additional cash-crops. In other words, diversification strategies require a pre-existent Financial Capital base in order to cover for the implementation costs on farm. For many farmers, cash-crop diversification represents a financial risk; hence the importance of accessing affordable credit and being well informed and assisted on market, environmental, and price trends before engaging in such strategies (Schroth & Ruf, 2014). Transforming Structures & Processes can thus provide further support on facilitating access to credit in order to encourage farmers entrepreneurship in implementing livelihood strategies.

4.6. The *Social Capital* asset: Access to Others.

Many authors of the sociological literature body debated over the years on how to define and measure 'Social Capital'. (Bebbington, 1999; Putnam, 1993; Woolcock, 1998). The Sustainable Livelihoods Framework apprehends it in the meaning of "*the social resources upon which people draw in pursuit of their livelihood objectives*". Such social relations are developed through 'networks and connectedness', 'membership of more formalised groups' and 'relationships of trust'. (DFID, 1999, Section 2.3.2.).

The participatory observation and qualitative interviews carried out throughout the field research show how farmers continuously draw on their social resources in order to gain access to other types of assets. The following section explores the various structures through which farmers households build their Social Capital and how they mobilise it in order to achieve their diversification strategies.

4.6.1. How do farmers build their Social Capital Assets?

Of all the Livelihood Assets, Social Capital is the one most intrinsically related to the Transforming Structures and Processes. For instance, Putnam (1993) measures social capital by counting the number of civil society organisations in a selected region. Social Capital and Organisations & Institutions are inter-related in two ways, through '*inside-out*' and '*outside-in*' mechanisms (Bebbington, 1999: pp2037).

In principle, any type of formal or informal civic organisation is founded by the association of inter-related individuals that share common traits, norms, or pursue common goals. In this regard, an accumulation of Social Capital between individuals may lead to the creation of Transforming Structures & Processes in order to support the pursuit of *access*. Bebbington refers to it as '*inside-out mechanisms*', where community members start to form more or less formalised groups in order to gain influence on existing structures and policies and negotiate resources distribution. (Bebbington, 1999). In the context of this research, such *inside-out mechanisms* are observed over the past 15 years in Côte d'Ivoire with the regrouping of smallholder cocoa farmers into producers organisations. This network of cocoa cooperatives enables rural farmers to connect with market stakeholders (Cargill) and increases their opportunities to access Livelihood Assets and transform them into revenue flows. Networks of civic organisations thus help farmers defend their interests in external spheres governed by the logics of Market, State, and Civil Society (Bebbington, 1999; DFID, 1999).

Throughout the interviews, I have identified that smallholder cocoa farmers respond to the rules and norms of three main formalised forms of Organisations & Institutions:

- the village
- the cooperative
- the community (e.g. women associations)
- the family

Farmers households also respond to the logics of other less formalised institutions such as kinship, ethnicity, religion and so on. Such aspects of less formalised memberships are more difficult to seize as they tend to blend with farmers personal characteristics.

On the other side, Bebbington (1999) also refers to *outside-in mechanisms*; Organisations and Institutions create an enabling environment for Social Capital accumulation, where individuals can easily access others. In this setting, Social Capital is considered as a product of the Transforming Structures & Processes (DFID, 1999). For instance, smallholder farmers that are members of a cooperative are more likely to develop relationships of trust with their peer members.

Photograph 4.7: Gathering of farmers around a cup of tea outside of the cooperative premises (taken by the author)



Outside-in mechanisms were often observed during the interviews, as farmers continuously draw on social relations established within such structures (village, cooperative, community) in order to gain access to other resources. Farmers equally draw on social relations established in less formalised structures such as through friendship ties.

All in all, *inside-out* and *outside-in* mechanisms are complementary and self-reinforcing. In this regard, external stakeholders can support Social Capital accumulation within rural communities in two different manners (DFID, 1999):

1. The direct support of local institutions through service provision, capacity building or direct financial/material support;

2. The strengthening of good governance mechanisms in order to create an enabling environment for the local institutions to flourish and defend farmers interest in the spheres of the Market, State, and Civil Society.

Observations gathered during fieldwork show that private stakeholders tend to opt for the first option with the direct support of cocoa cooperative networks. This is carried out through material support but also capacity building to strengthen their professionalization. In a certain measure, cocoa companies also introduce a dialogue with producers organisations about the eradication of corruption and the promotion of good governance mechanisms as they try to establish long-term commercial relationships.

This dialogue is nonetheless a lot harder to open with other local or national institutions with whom they do not sustain such relationships. Good governance mechanisms should be promoted at all level by the national State, but as Narayan states, “*corruption is both the symptom and the cause of poor governance.*” (Narayan, 2002)

4.6.2. How do farmers mobilise their Social Capital assets?

Social Capital in the sense of access to others is at the core of assets distribution, for farmers can only access resources through their interactions with other stakeholders;

“Indeed access to other actors is conceptually prior to access to material resources in the determination of livelihood strategies, for such relationships become almost *sine qua non* mechanisms through which resources are distributed and claimed, and through which the broader social, political, and market logics governing the control, use and transformation of resources are either reproduced or changed.” (Bebbington, 1999: 2023)

Households accumulation of Social Capital assets – through their interactions with other actors within the Transforming Structures & Processes – directly impacts their access to all other types of Livelihood Assets.

Each Livelihood Asset here-above features important social relations dynamics; in the problematics of land tenure systems (Natural Capital), working arrangements, knowledge sharing (Human Capital), material assets distribution (Physical Capital), income streams and credit arrangements (Financial Capital). More than securing access to resources, relationships of trust can also lower the costs of credit and of working together, improve common resources management, encourage capacity building and facilitate innovation. (DFID, 1999). Transactions between inter-related individuals take place within the structure of the village, the cooperative, the community or the family as regulated by the logics of Market, State and Civil Society.

All in all, Social Capital is at the core of farmers and communities’ empowerment as it determines access to resources and the ability to transform assets into a livelihood.

4.7. The Transforming Structures & Processes: institutional support for households' diversification strategies.

The following section explores the external forms of support provided to cocoa farmers by the various organisations of the cocoa value chain – represented as the Transforming Structures & Processes in the theoretical framework. I am hereunder going to answer to the last sub-research question:

How do Organisations & Institutions currently support smallholder cocoa farmers in their diversification strategies?

The previous sections already established that the Transforming Structures & Processes play a critical role in determining farmers' access to resources. Further clarity is herewith provided with a mapping of the stakeholders involved, their discourse and their modus of action with regards to farmers' diversification strategies.

4.7.1. Key stakeholders of the cocoa value chain:

According to Bebbington (1999), farmers relationships with the Transforming Structures & Processes – in the pursuit of access to resources – are regulated by the logics of the Market, State, and Civil Society. The same categorisation is applied hereunder in order to map out the key stakeholders of the cocoa value chain:

- State regulated stakeholders:

The cocoa value chain in Côte d'Ivoire is marked by a strong presence of the Conseil Café-Cacao (CCC), a governmental council that sets yearly fixed farm-gate prices and regulates taxation policies around cocoa production and commercialisation. This organ is supported by a partnership with the national extension services organisation (ANADER) and the national agronomic research centre (CNRA) that provides the licensed improved planting material. Both organisations take their directives directly from the CCC.

The CCC also grants licenses to a few exporters and processors of the Private Sector authorised to purchase, process and export pre-defined quantities of Ivorian cocoa beans. Changes in governmental pricing policies have a direct influence on farmer's diversification decisions.

- Market regulated stakeholders:

Companies of the Private Sector play a critical role in the cocoa value chain as they create a supply chain in order to connect rural cocoa farmers with international market demand. Only a few companies yet in fierce competition are authorised to source cocoa beans in Côte d'Ivoire, which all the same enables them to have a considerable influence on the decision-making processes within the sector regulation. The main companies encountered during fieldwork were the cocoa processors Cargill, Barry Callebaut and Olam International; and the chocolate manufacturers Mars Inc. and Nestlé. The cocoa sector also fuels other types of companies such as chemical industrials that act as crop-protection and fertiliser providers (Bayer, Callivoire), micro-finance organisations (Advans), banks and insurance companies.

In the past, cocoa companies aligned with certification standards such as ISO, Fairtrade, Rainforest Alliance and UTZ in order to label the cocoa that respects a certain amount of requirements as 'sustainable'. In recent years, a range of companies from the cocoa industry have decided to go

beyond certification by integrating sustainability commitments within their own code of conduct. Some cocoa companies hence define their own standards for sustainable cocoa. Opposite to what one may think – those private standards tend to be stricter than the ones defined by labelling/certification organisations. This is the case for Lindt, Nestlé, Mondelez International, Mars and others.

- Civil Society

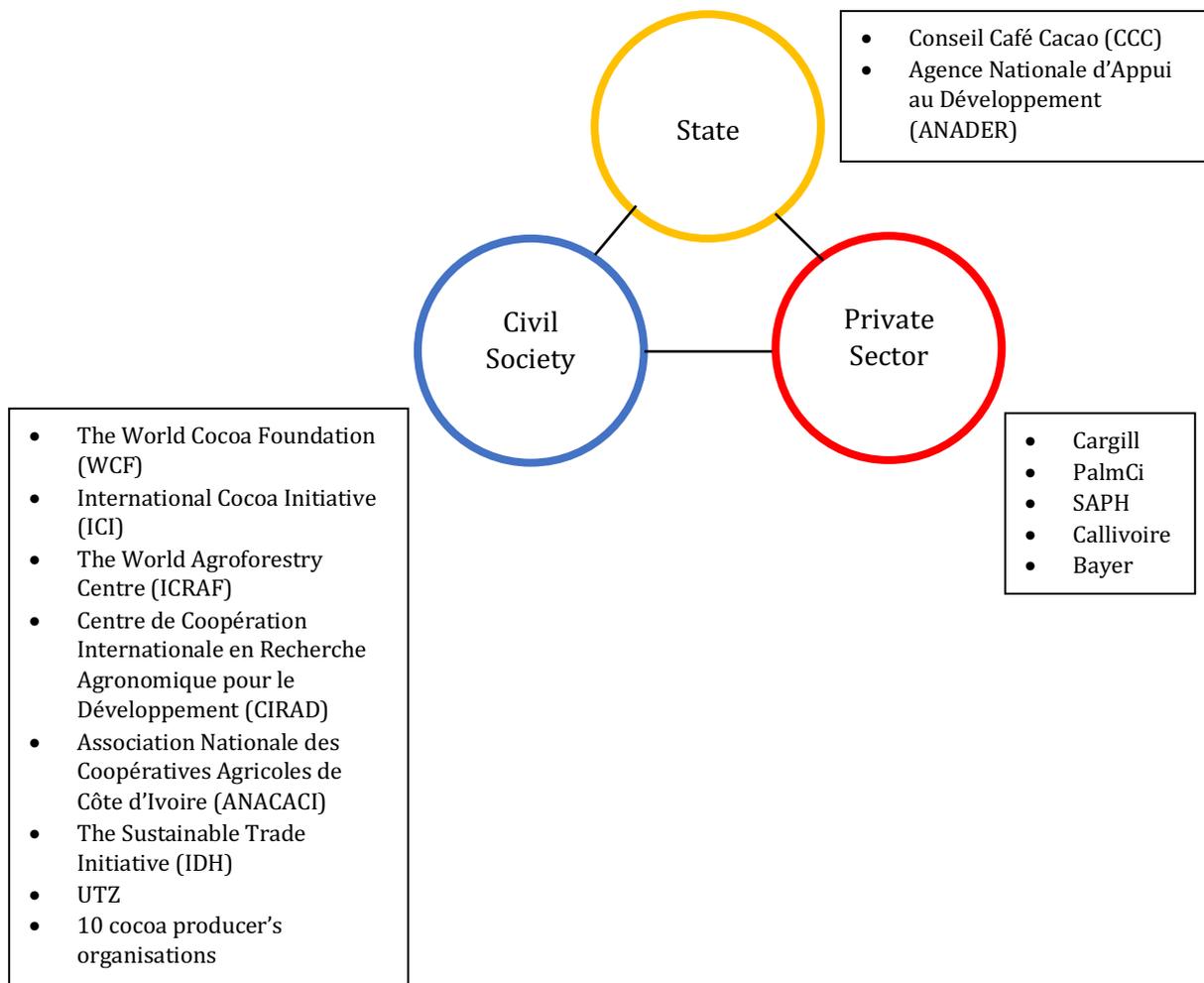
Non-governmental stakeholders such as NGOs, development agencies, certification labels, research institutes and foundations participate to the elaboration of industry norms and the support of service delivery processes. During the fieldwork, all cooperatives selected were sustainable certified by either Fairtrade, Rainforest Alliance or UTZ. Other non-governmental organisations encountered were the German development agency GIZ, the NGO CARE International and the research institute ICRAF that acted as an extension service organisation for both Cargill and Mars Inc. The observation was made that NGOs are directly mandated and co-financed by governmental and/or private sector stakeholders to implement capacity building programmes.

- Multi-stakeholder initiatives

In recent years, the spheres of the Market, State and Civil Society joined efforts to create new forms of governance through multi-stakeholder's initiatives in order to enhance the sustainable transition of the cocoa sector. Key issues such as deforestation, poverty, slavery and child labour are being addressed. For instance, the Abidjan Cocoa Declaration of 2012 reunites governments of the producer countries, civil society organisations and multinational companies that commit on supporting cocoa farmers to get out of poverty. Although more industry-driven, the initiative 'Cocoa Action' carried out by the World Cocoa Foundation also gathers the largest cocoa and chocolate companies and governmental organisations in order to reach 'a thriving cocoa sector'. (Balineau et al., 2016). Such governance arrangements can directly relate to farmers diversification strategies: for instance, the World Cocoa Foundation integrates diversification in its 'Cocoa Action' programme as a way to increase household's economic resilience.

Figure 4.3 provides a mapping of the organisations interviewed for this research. On top of the key stakeholders of the cocoa value chain, two providers of agricultural inputs (Callivoire, Bayer) and the leading palm and rubber companies of Côte d'Ivoire (PalmCi, SAPH) were also interviewed on the subject of crop diversification.

Figure 4.3: Key stakeholders interviewed for the institutional analysis



4.7.2. General institutional support within the cocoa industry:

Two main pillars drive the sustainability initiatives of the cocoa industry: farmers' productivity and community empowerment.

4.7.2.1. Institutional support: Farmer's productivity

Companies of the cocoa & chocolate sector, the Conseil Café-Cacao, government extension services (ANADER) and selected NGOs collaborate in order to improve smallholder cocoa farmer's productivity. The various forms of support are articulated as such:

- *Capacity building services:* Good Agricultural Practices (GAP) trainings are provided through Farmers Field Schools in order to strengthen farmer's Human Capital base and increase production yields on smaller land surfaces. Such trainings focus on good agricultural practices and correct use of inputs. They are often carried out within the context of sustainable certification requirements and are thus financed by the private

sector.

The attendance rate to Farmers Field School has been decreasing over the past years, thus cocoa companies now attempt to tailor capacity building services according to farmer's characteristics with the elaboration of personalised coaching services. In the case of Cargill, lead farmers (or 'coaches') are trained by ICRAF (mandated by Cargill) and pay a bi-yearly visit to all members of the farmers' cooperative. Together with the farmer, they establish a first diagnosis of the state of the cocoa plantation according to Cargill's theory of change and define an action plan accordingly. The second visit is meant to verify the progress of action plan implementation and provide further support. During the field visits, the coaches are required to carry out a questionnaire and register information on both plantations and farmers in their tablets – which feeds Cargill's data-set. This is what is referred to as 'farmers segmentation' in this research project.

Such coaching services have been observed with Cargill and Barry Callebaut. Other types capacity building services are also provided for the producer's organisations themselves in order to increase their professionalization (Cargill's Coop Academy).

- *Facilitated access to agricultural inputs:* Public-Private Partnerships usually provide 'productivity packages' which combine Good Agricultural Practices trainings and facilitated access to high-quality hybrid planting material and agricultural inputs (crop-protection products and fertilisers). (Pye-Smith, Kouame, Yossi; 2016). Such arrangements often involve a chocolate manufacturer such as Nestlé with its 'Nestlé Cocoa Plan'. Behind the scenes, the arrangements observed during fieldwork also involve the CCC, ANADER, Cargill and an agricultural input provider. The Private Sector usually require a financial participation from the farmers in order to ensure their motivation in the successful completion of the investment.
- *Facilitated access to Financial Services:* farmers often access to financial services at the level of the cocoa cooperatives. Producer's organisations receive a yearly premium payment for the sales of sustainable certified cocoa; which they often use to offer loan services to members in need of liquidity. Loans are reimbursed by retaining a percentage of farmers cocoa production delivery. These credit systems can also be backed up by micro-finances organisations (Advans), where the cocoa company acts as a guarantor.

4.7.2.2. Institutional support: Community empowerment

Secondly, efforts are also directed towards community empowerment by supporting the creation of enabling Structures & Processes and enhancing good governance mechanisms. Community support programmes usually focus on the key issues of living income, education and health, food security, women empowerment and child labour. Institutional support on diversification strategies is often framed within the community empowerment debate.

4.7.3. Institutional support for households' diversification strategies:

4.7.3.1. Diversification and agricultural intensification

Diversification as a livelihood strategy is framed by the stakeholders of the cocoa industry within the new theory of change around agricultural intensification;

Decades of extensive agriculture with a pioneer front logic as adopted by smallholder cocoa farmers have led to a pressure on land and a depletion of the natural resource base. Hence, the cocoa sector is currently attempting to switch to an intensification model which consists in increasing production yields per hectare. In this theory of change, the cocoa farmer can reduce the land surface dedicated for cocoa production [whilst stabilising or even increasing production yields] and allocate the land that was gained to other food or cash crops. For instance, the Vision 4 Change project carried out by ICRAF in partnership with the chocolate giant MARS Incorporated aims at tripling production yields on the halve of land surface. (Pye-Smith, Kouame, Yossi; 2016)

This agricultural intensification model comes together with the need to rehabilitate old cocoa plantations with improved planting material. In this regard, diversification strategies emerge during the cocoa orchards regeneration process;

- *Diversification with food crops*: Smallholder farmers replace their old cocoa plantation with new cocoa seedlings in mixed planting with food crops before the trees come into production. (Schroth & Ruf, 2014)
- *Diversification with cash-crops*: Smallholder farmers replace their old cocoa plantation with a new type of perennial tree crop [rubber, palm, cashew, coffee] – and establish the new tropical-tree seedlings in mixed planting with food crops before the trees come into production.

A range of actors from the cocoa industry were interrogated for the purpose of this research, and the main findings are detailed in APPENDIX 1. In sum, stakeholder's discourses and processes of support on farmers livelihood strategies are divided between two types of diversification strategies: diversification with food crops (section 4.7.3.2) and diversification with cash crops (section 4.7.3.3).

4.7.3.2. Diversification with food crops: stakeholders discourses & support mechanisms

First and foremost, diversification with food crop has penetrated stakeholder's discourses and support mechanisms to a much larger extent than diversification with cash [perennial tree] crops.

Stakeholder's discourse on diversification with food crops is unanimously framed within the core objectives of food/nutritional security and women empowerment; as it enables households to reach food security through the consumption of their own production. Furthermore, this type of diversification leads to further gender equity as women produce most food crops and are therefore able to increase their negotiation power within the household income distribution. Finally, diversification with food crops is also framed in the debate around living income as the sales of surpluses generates additional revenues. Few women interrogated mentioned the ANADER, GIZ and CARE International as organisations that encourage women associations to launch food-crop production projects at the scale of the village.

Photograph 4.8 : Amani Ahou, female cocoa producer and member of the women association supported by the ANADER (taken by the author)



Food-crops diversification projects can also be carried out in the context of cocoa orchards regeneration and hence benefit of a large support from the cocoa industry. This was observed with the programme 'Vision 4 Change' with the collaboration MARS/ICRAF (Pye-Smith, Kouame, Yossi; 2016), but also in the discourses of Barry Callebaut (Balineau et al., 2016) and Cargill. Intercropping young cocoa seedlings with food crops (plantain) has the advantage of bringing the right shadow exposure for young trees and having direct returns on food production and additional revenue streams. Food crop surpluses are nonetheless more difficult to ship out and benefit from lesser marketing options than tropical tree crops.

A wide range of support mechanisms are already brought both at households, villages, and producers organisations scale. It starts with raising community awareness on the benefits of food security and diversification of income. Interviews show that a range of stakeholders also engage in the direct provision of a 'food crop toolkit' for women associations or producers organisations, comprising (improved) food crops seeds, agricultural inputs and technical assistance (WCF, ANACACI, Callivoire). If combined with an irrigation system, such initiatives can provide year-round food production for local communities. Other stakeholders such as the International Cocoa Initiative directly address women right to access land by negotiating directly with village chiefs. Finally, two of the producer's organisations visited (CAYAT and SOCODD) showed early stages of

common land use schemes for food crop cultivation by women associations.

4.7.3.3. Diversification with perennial tree crops: stakeholders discourses & support mechanisms

Stakeholder's discourse on diversification with cash [perennial tree] crops is framed within the objectives of increasing household's economic resilience to external shocks and stresses such as price volatility, pests and diseases, policy shocks. All stakeholders of the cocoa industry agree to recognise the importance of a diversification of income for cocoa farmers households (see APPENDIX 1). In recent years, cash crop diversification has also been discussed as a risk mitigation against the spread of the swollen shoot disease. Cash-crop diversification has the advantage of creating considerable additional revenues at household or community level, nonetheless it represents important investments which takes years to result into tangible income streams.

Cash-crops diversification strategies receive a mitigated support from the actors of the cocoa value chain. The living income debate recently triggered industrials to reflect on the importance of diversification of income generating activities. This can be reached with perennial tree crop diversification, but also with livestock breeding or non-agricultural activities. Most support mechanisms to cash-crop diversification are nonetheless solely focussed on raising community awareness. The introduction of a new tree-crop on farm requires important investments for farmers households. The findings show a lack of support for farmers to accede affordable financial services and technical assistance on other crops to successfully implement diversification strategies.

State actors (CCC and ANADER) claim that they encourage cash-crop diversification in the Farmers Fields Schools trainings; although the findings point to a lack of homogeneity in the training programmes. This can be explained by a lack of clear policy guidance on technical farming models available according to the soil types present on plantations. Further support shall be provided by the State regulated actors (CCC, ANADER, CNRA) to map out the various soil types in Côte d'Ivoire and formulate corresponding technical recommendations.

Finally, some companies of the Private Sector (e.g. MARS; Barry Callebaut) do integrate some perennial tree-crop diversification within their cocoa orchards rehabilitation programmes. This approach is combined with the emergence of a discourse on agroforestry models; it features mixed planting with food crops in early stages of cocoa orchards rehabilitation and the introduction of added-value shade trees (fruit trees or timber trees) on plantations. Such schemes allow farmers households to generate additional revenues during the whole life-span of the cocoa plantation and beyond. Nevertheless, none of those companies directly support other types of diversification; e.g. with palm or rubber.

4.8. Conclusion to Chapter 4

The preceding chapter exposes how farmers access and mobilise Livelihood Assets to implement crop-diversification strategies on farm. The analysis reveals that *access to resources* determines household's constraints and opportunities to pursue diversification strategies.

- ✓ sufficient and secure land (Natural Capital)
- ✓ affordable working force (Human Capital)
- ✓ knowledge and information (Human Capital)
- ✓ agricultural inputs and infrastructures (Physical Capital)
- ✓ affordable credit schemes and/or constant revenue streams (Financial Capital)

The availability of the preceding assets is required to introduce a secondary cash-crop on farm. Nonetheless some trade-off mechanisms are at play, and households can invest in a Capital Asset in order to compensate for the absence of another one. Furthermore, *access to others* is a condition *sine qua non* to access resources – hence the accumulation of Social Capital comes as a prior condition to the composing of livelihood strategies. (Bebbington, 1999)

Institutional mechanisms as mobilised by the Transforming Structures and Processes also open-up and close household's opportunities to access resources – hence their opportunities to undertake diversification strategies. Results show that the Transforming Structures and Processes grant a larger support to diversification with food crops than to diversification with cash-crops.

Based on the preceding, this intermediate conclusion points to the fact that *not all farmers can diversify* as they need prior access to a sufficient Capital Assets base. Since assets are “*the basis of agent's power to act*” (Bebbington, 1999: 2022), a lack of capital assets may result into barriers to undertake Livelihood Strategies. In this regard, I assume that households that position themselves very poorly in the resource distribution are faced with greater challenges to initiate diversification strategies. This conclusion also confirms the assumption that the research subjects sample is composed by a majority of diversified farmers that benefit from a larger Capital base than average smallholder cocoa farmers in Côte d'Ivoire.

5. Discussion

The following chapter provides various reflection points divided into two main sections: reflections on the theoretical framework (Section 5.1) and reflections on the answer to the main research question (Section 5.2).

5.1. Critical reflections on the theoretical framework.

The purpose of this discussion is to explore the contradictions and similarities revealed in the core findings and underline the complexity of the relationships between the different elements of the theoretical framework. Furthermore, this thesis also aims at bringing further theoretical debate around the Sustainable Livelihoods approach and how it could be improved in its use or design.

5.1.1. Seasonality and time within the assets distribution.

The first element of reflection relates to the importance to further integrate **seasonality and time** within all elements of the theoretical framework. Seasonality is indeed included under the 'Vulnerability Context': a shift in prices, production, or employment opportunities can widely affect people's livelihoods. Nonetheless, it is also critical to include a time dimension within the analysis of the Livelihood Assets distribution:

"Assets endowments are constantly changing, therefore pentagons are constantly shifting. A three-dimensional framework, with the third dimension representing time, would enable this change to be visualised. A two-dimensional framework does not. However, it is imperative to incorporate a time dimension into any analysis of assets." (DFID, 1999: Section 2.3.)

Two examples from the empirical results show the dynamics of assets fluctuations:

First, many cocoa farmers decide to diversify in order to spread their revenue streams throughout the year. Some farmers opt for a diversification scheme that combines multiple crops with different harvest periods, whilst others opt for the introduction of a secondary crop that features year-round production such as rubber or palm. Thus, farmer do not solely seek for Financial Capital accumulation, but also for its stable distribution over time.

Second, smallholder farmers face a lack of working force (Human Capital) during the peak months of the cocoa harvesting seasons – whereas they have a reserve of unused working labour during the rest of the year. This time dimension also implies that a range of Livelihood Strategies can be combined throughout the year according to the seasonal availability of Livelihood Assets.

In line with Niehof, "*We have to reckon with the fact that households have histories. Events and decisions in the past will bear on decision-making in the present.*" (Niehof, 2004: 324). Some interviews show that some cocoa farmers consider their family to be too deeply and historically rooted into cocoa-culture to diversify; whereas others decide to diversify after their cocoa orchards have been hit by the swollen shoot disease, in order to correct the past mistakes of their parents to rely on a single crop specie. The time dimension is also intrinsically related to the very core concept of Livelihood Strategy, as a strategy in itself is a projection into the future.

In this regard, the Livelihoods Assets are subject to fluctuation patterns that are determined by i) seasonality within the year and ii) temporality between years. 'Historical time' also determines the economic, social and political context in which households evolve (Niehof, 2004). In my view, Sustainable Livelihoods Framework doesn't stress enough the dynamics of assets fluctuations in its visual representation. This criticism is addressed in Section 5.1.6 with a conceptual recommendation for the theoretical framework.

5.1.2. Trade off mechanisms & gender considerations within the Livelihood Outcomes.

The second reflection point focusses on the **trade-off mechanisms** observed between the Livelihoods Outcomes. Farmers households choose a portfolio of Livelihood Strategies to pursue in order to reach their livelihood objectives, nonetheless the different Livelihood Outcomes are not necessarily compatible with each other;

The history of cocoa production in Côte d'Ivoire demonstrates that smallholder farmers chose to increase their personal well-being at the expense of the natural resource base by implementing intensive cocoa mono-cropping practices in recently cleared forest areas (Ruf, 1995). Here again, temporality matters as an investment/exploitation in the present may affect the resources of the future. The cocoa industry – that benefitted from these dynamics for decades – is currently trying to address such trade-offs mechanisms with the progressive adoption of agroforestry practices and the re-introduction of shade trees in cocoa orchards as a requirement for sustainable certification.

In my view, the same trade-off mechanisms between revenue streams/sustainable use of natural resources can also apply to some diversification practices with rubber and palm;

I started this MSc thesis with the assumption that perennial tree-crop diversification enables smallholder farmers to increase their economic resilience and reach the Livelihood Outcomes of increased income, increased well-being or reduced vulnerability. Little attention was brought to the livelihood outcome of 'sustainable use of Natural Resource base' as it was almost taken for granted that diversification strategies would necessarily break with decades of mono-cropping practices and improve the management of natural resources. Much of the experts interviewed considered diversification as an opportunity to restore biodiversity at the scale of the landscape. Nevertheless, a few interviewed experts in agronomy raised the question whether the replacement of old cocoa orchards with rubber/palm would participate to a depletion of the soil resources. (Interviews with representatives of Callivoire, Cargill, CIRAD). A same Livelihood Strategy hence doesn't necessarily results into the same Livelihood Outcomes.

As revealed in the empirical chapters, some diversification strategies are adopted as the result of an 'exhaustion of the forest rent' (Ruf, 1995; 2013). Smallholder farmers experience increasing difficulties to regenerate their aging cocoa orchards and feel *constrained* to diversify with less demanding crops such as rubber and palm. When diversification strategies with rubber/palm are the result of an adaptation to environmental degradation – *aren't they responding to the same 'pioneer front' logic as the previous cocoa crop, leading to an even further depletion of the soil resources?*

By replanting perennial tree-crops that are able to pump nutrients even deeper in the soil, farmers do not directly address the soil fertility issue; they are rather postponing it for the generations of farmers to come. In this setting, shouldn't institutional efforts rather focus on proposing

alternative Livelihood Strategies options in order to durably maintain/increase the Natural Capital base? For instance, by proposing economic incentives for farmers to restore the forest-cover, or by enabling access to inputs, services and knowledge in order to rebalance soil fertility. Depending on the land use history, there are large difference in implementation of what appears to be a same Livelihood Strategy.

A second example of trade-off mechanisms between Livelihood Outcomes lies within households composition; household members do not necessarily pursue the same livelihood objectives. (Levine, 2014). The Sustainable Livelihoods Framework usually takes the household as a unit of analysis, which generally fails to integrate **gender** as a determinant of the livelihood objectives. For instance, women that are mainly in charge of the well-being of the children may give preference to the objective of 'increased food security', whereas men that more commonly in charge of money aspects may give preference to the objective of 'increased income'. In this regard, households with a higher amount of women tend to have a higher diversification rate into food crops. (Temple & Nzié, 2013).

My findings show that gender considerations within households livelihood strategies determine [to a certain extent] the livelihood outcomes and the Capital Assets distribution; [Generally speaking] Women benefit from a greater resources allocation during the first years after the introduction of a secondary cash-crop on plantation: they are then able to intercrop the perennial tree-crop seedlings with annual food crops, which enables them to increase their food security and empowerment through the sales of food surpluses on market. This analysis concerns the individual scale of the woman only, as the general household empowerment is usually rather low during the first years following the diversification decision due to a lack of Financial Capital resources. When the perennial trees are mature enough to enter into production, the annual food crops have to be removed to another plot. The men of the household then benefit from a higher resource allocation with an increased revenue generated by this new activity. Hence, the same household Livelihood Strategy engenders different Livelihood Outcomes and assets fluctuations per household member as determined by gender differences and temporality. It is important to stress that the practice of mixing young tree-crops/food-crops takes place both with the introduction of a new perennial tree-crop on farm and/or the regeneration process of old cocoa orchards. Trade-off mechanisms between Livelihood Outcomes can also be determined by other factors; some cases of perennial tree-crop diversification combined with a lack of available land may create trade-off mechanisms between increased income and reduced food security. (Schroth & Ruf, 2014)

All in all, the household itself can be considered as an arena of negotiation for access to resources, where power relations also regulate the interactions. Nonetheless the gender question cannot only be confined to power relations within the boundaries of the household as it also defines much of the power relation with the institutional background that determines access to resources.

5.1.3. Individual characteristics and farmers segmentation

Gender is not the only element determining the competing livelihood outcomes; the Sustainable Livelihoods Framework more generally fails to take **individuals characteristics and identity** into account. This relates to gender but also ethnicity, religion, education level, social class, political views and others. (Levine, 2014). Some characteristics can be studied through the lenses

of the capital assets pentagon such as education level (Human Capital) and class (Social Capital), yet many other aspects of identity are left out. Although the Livelihoods Approach aims at combining the opposite logics of actor-based analysis and political economy, it considers little individual differences between people themselves as compared to their power relations with external Organisations and Institutions.

Due to a constraint in time and resources, this MSc Thesis did not aim at analysing identity as a determinant of livelihood strategies. Other authors have nonetheless attempted to integrate individual characteristics within their own framework; this is the case for Schroth & Ruf (2014) that consider 4 aspects of farmer's characteristics in their analysis of the diversification decisions;

- Farmer age
- Rural-urban migration
- Generational change
- Farm size and household composition

Schroth and Ruf (2014) point to a large array of opposite dynamics that show that although farmers characteristics do play a decisive role in diversification decisions, it is not possible to draw simple causal relations between them, as there are too many complex factors that come into play.

On the contrary, Robin (2013) attempts to categorise smallholder cocoa farmers between innovators, adopters and non-adopters of diversification strategies with rubber; based on their cocoa yields, education level, farm size, the presence of non-agricultural additional revenues and the geographical proximity of rubber companies. His conclusions point to a critical importance of the cocoa production yields in farmers diversification decisions with rubber (Robin, 2013). From an academic perspective, this type of approach is far from new as it draws back to the 'Diffusion of Innovation theory' by E. Rogers (1962), which is one of the oldest social sciences theories. Rogers categorises people in five categories (innovators, early adopters, early majority, late majority, laggards) to explain the adoption of new ideas, behaviours or products within a social system.

This type of categorisation process has been adopted in recent years by the stakeholders of the cocoa sector and used to tailor their service delivery models according to farmer's characteristics. 'Farmers segmentation' processes were observed within Cargill and Barry Callebaut operations and extensively discussed in the interview with IDH. Based on their individual traits [e.g. education level, social class, ethnicity, etc.] and site characteristics, farmers are categorised into different 'buckets' [e.g. innovators, adopters, non-adopters] and thus benefit from targeted support mechanisms. For instance, households that are identified as 'fertilizer ready' may benefit from tailored support on financial assistance in order to enable them to perform this transition. On the other hand, households that are identified as having very low cocoa production and low retention rate on the GAP trainings over multiple sessions may be assisted into introducing other income generating activities to complement their revenues.

It is interesting to notice how the academic debate sees Roger's Diffusion of Innovation Theory (1962) as a rather old fashion way of approaching change; whereas in practice companies of the cocoa industry consider farmers segmentation as a very forward thinking way of approaching service delivery models.

Farmers segmentation triggers many debates as it leads to the question whether the cocoa industry should support *all* farmers or target their support to '*the good farmer*' that shows both willingness and capabilities to succeed in making a decent living. As revealed during the

interviews with IDH and Cargill, one of the reasons why cocoa farmers fall into poverty is due to an uncontrolled flow of migrant households that are attracted by this professional opportunity and improvise themselves as cocoa farmers, very often reaching extremely low production yields. Cocoa farmers are not necessarily farmers out of choice; they may be better pruners, grafters, merchants or artisans. Targeting the institutional support on promising farmers to enable them to reach better livelihoods – *whilst proposing alternative income generating activities to the least performant farmers* may be a sensible solution to alleviate poverty in rural areas and support the entire economic system. In this regard, it seems rather logical that [profit-driven] Private Sector stakeholders do not seek to support *all* farmers but rather focus their efforts on the households where the provided support can make a difference. It is nonetheless important for Public Sector stakeholders (State, NGOs) to take up the torch and provide their support to the households left out of this selection by proposing alternative Livelihood Strategies.

Farmer's segmentation as currently performed by cocoa industrials is based on a linear Theory of Change that defines a logical sequencing of phases in a singular process of farm transformation. The idea of personalised coaching services is to take into account individual households and farm characteristics in order to set individual goals with regards to the defined Theory of Change. Nonetheless, the findings show that farmers households have differences of access to the Capital Assets – which determines their ability to undertake a set of Livelihood Strategies.

In this regard, although institutional support mechanisms make great efforts in taking individual characteristics into account, it does not necessarily make sense to track farmer's progress based on a linear process of farm transformation since not all households are set to follow the same Livelihood Strategy. Taking individual and farm characteristics into account should on the contrary help to understand the range of Livelihood Strategies that come available according to households' resources.

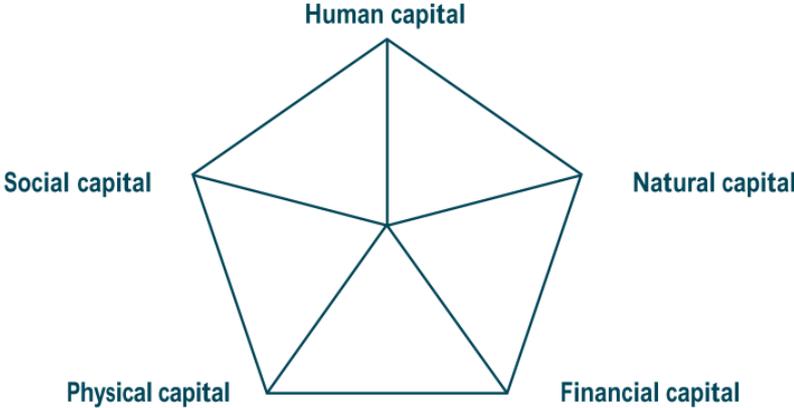
Finally, it is critical to consider farmers households as capable agents that have the **agency** to make their own rational choices, and in this sense it is also critical to consider people's identity, characteristics, and perceptions as determinants of the Livelihood Strategies that they are likely to pursue. Livelihood Strategies are indeed shaped by the Vulnerability Context and the Transforming Structures & Processes – yet farmers decisions are based on *how they perceive* this contextual background in which they evolve and the Livelihood Strategies that seem available at that moment in time. Households agency evolves within the boundaries of what is feasible with the available Capital Assets.

5.1.4. Inter-relations between Capital Assets

The following reflection point focusses on the trade-off mechanisms between the Capital Assets: which can also be referred to as '**substitution**' **mechanisms**. Indeed much of the empirical analysis focussed on how farmers access and mobilise their capital asset base in order to implement diversification strategies. There are strong inter-relations between the Capital Assets, and substitution mechanisms happen when the presence of one Capital Asset can compensate for the absence of another one. Since not all assets can replace others, I am now going to draw bridges between the various capitals that can indeed be traded-off.

The following 'Asset Pentagon' can help to picture the substitution mechanisms; the centre of the pentagon represents zero access to capital assets whereas the outer extremity represents the maximum access to assets.

Figure 5.1: The Asset Pentagon (DFID, 1999: Section 2.3.)



First, the findings show a strong and complex relationship between Human Capital and Physical Capital. On the one hand, they can replace each other: an investment in machinery (Physical Capital) reduces the need for labour force (Human Capital). In this study case, cocoa production relies strongly on traditional farming practices with little use and availability of machinery. (World Cocoa Foundation, 2014) This can explain farmers' strong dependence on available working force during the harvest seasons. In this regard, a lack of available labour force directly translates into a reduction of the Natural Capital base – as the cocoa production is labour intensive.

On the other hand, the combined presence of Human Capital and Physical Capital triggers a virtuous dynamic of self-reinforcement. For instance, the efficient use of agricultural inputs (Physical Capital) largely depends on smallholder farmers *know-how* (Human Capital). It has been observed within Cargill's dataset that a lack of knowledge triggers an over-use of agricultural inputs – which in turn negatively affects the Natural Capital base. Thus extension services programmes generally combine capacity building trainings and facilitated access to agricultural inputs to increase production yields.

The industry discourse argues that a combined investment in Human and Physical Capital leads to an increase in cocoa production (Natural Capital) which creates additional revenue streams (Financial Capital). There are important trade-off mechanisms at play between farmers financial investment (Financial Capital) in agricultural inputs (Physical Capital) and the expected increase in production yields (Natural Capital) and return on investments (Financial Capital). Development studies often focus on the 'break-even point' analysis, point at which a farmers' investment in agricultural inputs exactly equals the equivalent revenue created by this initial investment.

Whether they can be substituted or not, Human Capital – in the sense of labour and knowledge – and Physical Capital are tightly inter-related and are both determinants of the Natural Capital base.

A logical bridge can also be drawn between Natural Capital and Financial Capital; smallholder cocoa farmers work and invest on their land in order to generate revenues. Access to secure land

generates income through farming production or land loans. Land security also encourages for Financial investment in the Natural Capital base. The possession of livestock can also create income or be used as a social status marker in order to increase Social Capital assets. (DFID, 1999) – this is of course widely depending on the prevailing Structures & Processes.

Finally, Social Capital and Financial Capital have a critical liaison function and can enable access to all other Capital Assets;

Bebbington (1999) argues that access to others (Social Capital) is prior to access to all other kind of resources. This research clearly reveals how farmers constantly draw on their social relationships to gain access to the Livelihood Capitals; smallholder farmers access knowledge (Human Capital) and seedlings of new promising cash-crops (Physical Capital) through their social relationships. Social Capital also enables the formations of groups such as producer organisations, group-based micro finance schemes or shared work groups that facilitate access to agricultural inputs, financial services and working labour. Finally access to land is most commonly granted through kinship relations.

All the same, Financial Capital can be traded-off against all other capital assets; as farmers can purchase land (Natural Capital), agricultural inputs and machinery (Physical Capital), hire trainers and contractual workers (Human Capital) and even accede higher ranges of social spheres (Social Capital) with money.

The Capital Asset base fluctuates according to seasonality and is determined by the Vulnerability Context and the Transforming Structures and Processes. Based on the resources distribution, farmers household are meant to take trade-off decisions between their Capital Assets in order to carry out their Livelihood Strategies.

5.1.5. Livelihood Strategies and the Transforming Structures & Processes

One cannot reflect about the Sustainable Livelihoods Framework without mentioning the critical importance of the Transforming Structures and Processes in the determination of farmers' Livelihood Strategies. Policies and Institutions define farmers opportunities to access, create, and transform assets into resources. (DFID, 1999). It is in this sense that Collison (2003) makes the link between the Livelihoods Approach and Political Economy, as both theories consider societal structures as determinants of power relations and resources distribution.

In this research, the relationship between the Transforming Structures & Processes and the Capital Assets distribution is for instance revealed in the presence of local institutions such as farmers cooperatives that reinforce social relations and enable access to all sorts of assets. Producers organisations play a capital role in bringing the *outside-in* [through various service and material goods provision] and the *inside-out* [by enabling rural cocoa communities to connect with external stakeholders]. Nonetheless, more than acting as a gateway between farmers communities and external stakeholders, producers cooperatives have a larger role to play in the decision-making processes shaping the transition of the cocoa industry towards a more sustainable use of the natural resources.

The analysis also unveiled complex dynamics within the Transforming Structures & Processes in the confrontation of farmer's ownership rights between modern and customary law – that have led to several land conflicts between indigenous and migrant communities. In this sense, Structures and Processes are not homogeneous as they respond to different and sometimes

conflicting logics. Other institutional arrangements such as the sharecropping contracts *aboussan* affect land security and can act as a barrier to perennial tree-crop diversification. All the same, pricing and taxation policies on raw ingredients such as cocoa and rubber directly influence the Livelihoods Assets distribution and consequently farmers' livelihood strategies.

The Framework shows a feedback loop between the Transforming Structures & Processes and the Vulnerability Context; the institutional background (e.g. policies) directly affect the societal environment in which people evolve and their opportunities to capitalise assets into resources in order to increase their resilience to the Vulnerability Context. Furthermore, Malézieux and Moustier (2005) identify sudden changes in policy as a source of vulnerability.

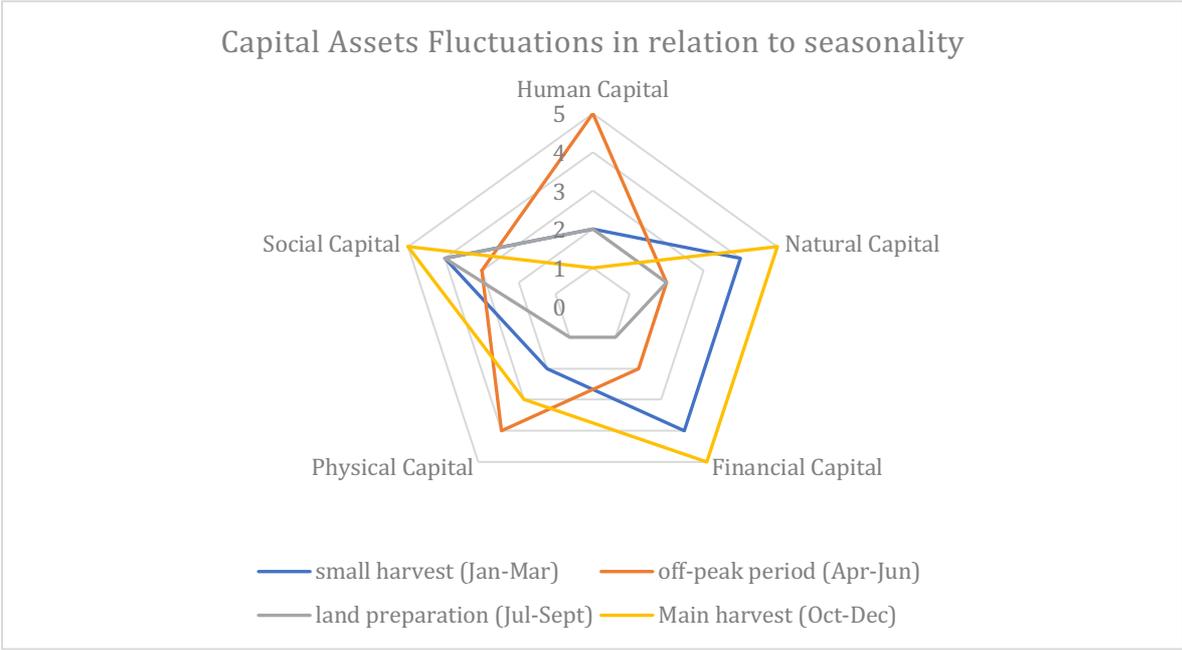
All in all, institutional dynamics profoundly affect farmer's livelihood strategies and assets distribution. Nonetheless this is not a one-way relationship as farmers with a strong asset base tend to have more influence over the Transforming Structures & Processes. In this regard, one way to enhance community **empowerment** is to support people to strengthen their asset base. (DFID, 1999).

5.1.6. Conceptual suggestions for the Sustainable Livelihoods Framework

The preceding discussion brings forward two main criticisms on the theoretical framework: i) the lack of visual representation of the Assets fluctuations in relation to the time dimension and ii) the lack of gender considerations within households composition. To address these, two conceptual suggestions are formulated:

Firstly, instead of using the 'Asset Pentagon' (refer to Figure 5.1) as a singular representation of the Livelihood Assets at a set moment t in time, one can think of superimposing multiple Asset Pentagons, each representing a different period of time within the year. Since 12 monthly pentagons are difficult to read on a single chart, I have divided the calendar year into 4 main seasons according to farmer's schedule: small harvest, off peak season, land preparation and main harvest. This separate figure includes the main agricultural dynamics (e.g. harvesting seasons; employment opportunities) as well as the key socio-cultural dynamics (e.g. largest expenditures and earnings, yearly cultural celebrations, etc.).

Figure 5.2: Capital Assets fluctuations in relation to seasonality (created by the author)



This type of representation gives a better overview of the dynamics that regulate assets fluctuations throughout the year. For instance, the fieldtrip period (October 2017 – December 2017) corresponds to the main cocoa harvest (in yellow): this season is characterised by an investment in working labour (Human Capital) and agricultural inputs (Physical Capital), leading to an increase in Natural Capital and Financial Capital. The opening of the cocoa pods and weekly contact with the farmers cooperatives also participate to an increase in Social Capital. This figure has to be completed in direct collaboration with household members, just as recommended by the DFID for the Asset Pentagon. In order to represent ‘historical time’ and retrace generational history (Niehof, 2004), the scale of the periods can be adapted to years or even decades.

Secondly, a single household is composed by a range of household members that have their own individual traits and identity, such as age, gender, political views, etc. Based on this duality, should the Sustainable Livelihoods Approach continue to use the household as a single unit of analysis, or should I argue for an individualised Livelihoods Framework?

On the one hand, the household should be considered as an arena of negotiation where gender [among other characteristics] affects power relations. Considering a household as a homogeneous unit of analysis fails to consider intra-household inequalities. This is applicable for gender but also generational confrontations. An individualised Livelihoods Approach would shed light on gender differences in the resources distribution and pursued livelihood objectives. This individualised approach poses a practical research issue as it requires multiple face-to-face interviews to be able to draw conclusions on a single household.

On the other hand, the household has for primary function the provision of basic needs and joint management of resources (Rudie, 1995; in Niehof, 2004). Household members share daily activities and resources, and in this regard one cannot simply ignore the household structure in a Livelihoods Approach. It is argued that the Sustainable Livelihoods Framework therefore should keep the household as a main unit of analysis; and yet look into intra-household organisation

dynamics to unravel the existing power relations and resource distribution patterns. One suggestion is to select mixed genders in the respondents sample to represent their household; this way one can keep the household as a unit of analysis and yet collect data representing both male and female views.

5.2. Critical reflection on the main research question

The previous empirical analysis answered to three sub-questions on households' diversification strategies and underpinned a logical sequence of arguments in order to answer to the main research question:

What do the diversification strategies of smallholder cocoa farmers in Côte d'Ivoire tell us about how Organisations and Institutions can more effectively support the ways in which cocoa farmers make a living ?

There are several ways in which the institutional support to diversification strategies can be improved, yet this research also reveals a higher level question: *whether diversification is the right strategy to increase smallholder farmer's livelihoods.*

This will be addressed separately in the following two sub-sections: how to support households' *diversification* strategies (Section 5.2.1) and how to support households' *livelihood* strategies (Section 5.2.2.).

5.2.1. How to support households diversification strategies?

The empirical analysis showed that the introduction of a secondary tree-crop on farm requires an important investment of Capital Assets, which smallholder cocoa farmers are sometimes not able to provide. In order to support farmers households diversification strategies, the following key issues must be addressed:

First, the cocoa sector needs a transformation from the current monoculture 'full sun grown' cocoa towards other more diverse and resilient models – but it requires an important financial investment and smallholder cocoa farmers are constrained by their lack of Financial Capital. In this regard, access to finance and insurance services is critical to reform the cocoa sector. Cocoa farmers are faced with a problem of liquidity as they receive twice a year a large amount of income, which 'evaporates' into various spending and donations only a couple of weeks after receiving it. Access to financial and insurance products such as savings account, crop-insurance and life-insurance is deemed necessary for households to invest in new livelihood strategies.

Second, in line with Schroth & Ruf (2014), farmers must have access to good information in order to take well-informed investment decisions. On an agronomic level, further clarity is to be provided by the State regulated actors (CCC, ANADER, CNRA) on technical diversification models available per specific regions and soil types – with the possibility to adapt such advices to farmer's specific site conditions. Farmer's segmentation methods and the consequential personalised coaching services have the potential to integrate soil diagnosis at an individual farm level, which can be integrated to the current sustainability programmes of the Private Sector. On a marketing level, farmers shall be able to access information on market trends and forecasted demand and understand the risks involved with each alternative crop: this includes environmental trends as well. Further technical and marketing assistance is to be provided to ensure successful investment decisions. This type of support can be carried out through Public/Private Partnerships – nonetheless, the Ivorian State remains the best positioned to embrace diversification within its agricultural and development policy.

Land tenure issues with the tension between modern and customary law act as a barrier to rural development and can be addressed at national and regional level by opening a dialogue between

migrants and local communities.. All the same, *aboussan* working arrangement do not provide sufficient land security to invest in diversification strategies – hence the need to address such land rights issues. Here as well, there is an emphasis on the role of the State to soothe the territorial disagreements and land security issues.

Finally access to improved high-quality planting material can contribute to an agricultural intensification and alleviate the pressure on land availability. In combination with a follow up on Good Agricultural Practices and access to agricultural inputs, it can ensure a high quality and proliferous production to help cocoa farmers get out of poverty. For this, the planting material has to be yet identified as ‘improved’ by the farmers themselves.

5.2.2. How to support households livelihood strategies?

I started this MSc thesis with the assumption that Organisations & Institutions of the cocoa sector could improve household’s livelihoods by supporting smallholder farmers to engage in tree-crop diversification strategies as it enables them to increase their economic resilience in a vulnerable environment. The research findings point to a different approach than my initial expectations;

A first point of reflection is whether institutional support should focus on environmental rehabilitation via perennial tree-crop diversification or via cocoa regeneration.

One of the findings shows that perennial tree crop diversification is the consequence of a cocoa production crisis with the depletion of soil resources. Many cocoa farmers are constrained to diversify due to cocoa regeneration issues. In this regard, should institutional efforts really support perennial tree-crop diversification during a cocoa crisis time – with the risk of encouraging cocoa farmers to entirely switch to rubber/palm and lose the very core principle and benefits of diversification? Shouldn’t the cocoa industry focus on supporting farmers with their cocoa replanting issues, leaving them the agency to choose whether or not they want to diversify? This may explain why the cocoa sector is more inclined to directly support food crops diversification in combination with cocoa rehabilitation programmes.

The research findings also differ from the initial assumption in the sense that supporting farmers household’s livelihoods does not necessarily boil down to supporting diversification strategies – especially when diversification options are reduced to perennial tree crops;

The perfect model does not exist – hence there is no “one size fits all” type of Livelihood Strategy to promote with top down mechanisms. Farmers households can choose to undertake many different Livelihood Strategies in order to improve their livelihoods. Crop-diversification is one, and can be derived in many models: with food crops, perennial-tree crops, in intercropping or on separate parcels, for own consumption or for marketing purposes, at individual farm scale or at local landscape scale, etc. Diversification of revenue sources also features livestock breeding and non-agricultural activities. There are also other strategies with for instance migration, agricultural intensification and cocoa orchards rehabilitation.

All in all, farmers households have the agency and the freedom to choose a combination of strategies in order to secure their livelihoods. The Transforming Structures & Processes can only support by providing farmers with good information for their choices and enabling their access to the Capital Assets required to undertake such Livelihood Strategies.

6. Conclusion

This concluding chapter presents an overview of the key findings revealed through the empirical analysis chapters and the discussion. It is divided in two sections: the key insights and take-aways that build towards an answer to the main research question (Section 6.1) and the identified limitations and recommendations for future research (Section 6.2).

6.1. Key insights to the research questions

Diversification can be defined as “*the process by which households construct increasingly diverse livelihood portfolios, making use of increasingly diverse combinations of resources and assets*” (Niehof, 2004: 321). This MSc Thesis focussed on a specific type of diversification with perennial tree-crops at smallholder cocoa farmers level in Côte d’Ivoire. Throughout the analysis I explored the various factors that motivate farmers to diversify as well as their implementation mechanisms and the institutional support from which they benefit.

- *Why do smallholder cocoa farmers decide to diversify?*

Smallholder cocoa farmers adopt various diversification strategies in order to reach expected Livelihood Outcomes:

They first decide to diversify to increase their revenues, based on a price ratio calculation between crops. As such, the volatility of commodity prices can explain the changes in the Ivorian farming landscape over the past four decades.

Secondly, farmers diversify in order to stabilise their income and increase their general well-being: diversification enables them to combine various crops with different harvesting seasons in order to ensure constant revenue streams throughout the calendar. This finding shows the importance of taking temporality and time into consideration in the theoretical framework.

At last – and more importantly – smallholder cocoa farmers diversify to increase their economic resilience and reduce their vulnerability to the external shocks and stresses. Such risks comprise international market price volatility, pests and diseases, climate change and policy shocks. (Malézieux and Moustier, 2005). Since different risks “tend to affect different crops differently”, diversified farmers tend to reduce those risks by spreading them over multiple crops (Ruf & Schroth, 2014: 140). In line with Ruf & Schroth (2013), it is observed that general environmental degradation caused by decades of monoculture in freshly deforested grounds leads to important replanting issues with the cocoa crop and affects farmer’s decisions to diversify with other less demanding tree-crops such as rubber and palm.

- *How are the diversification processes operated at farm level?*

Farmers households draw on complex and ever-fluctuating combinations of Capital Assets in order to implement diversification strategies on farm. Smallholder cocoa farmers are constrained by their access to resources: secure and sufficient land, working labour, skills and know-how, agricultural inputs, start-up capital and social relationships. It is nonetheless difficult to establish a clear sequencing of the resources required to undertake diversification strategies as there are various trade-off mechanisms at play between the Capital Assets. For instance, the presence of Financial Capital and/or Social Capital appears to be a *condition sine qua non* to a successful implementation of diversification strategies as they can compensate for the lack of any other Capital Assets.

The findings also reveal how the Transforming Structures & Processes largely determine farmers access to the Capital Assets and their ability to transform assets into revenue streams. Indeed, households continuously engage with Organisations and Institutions to negotiate the resources distribution within the spheres of the Market, the State and the Civil Society.

The Transforming Structures and Processes provide strong incentives for smallholder farmers to pursue cocoa orchards rehabilitation strategies. This support is brought via the structure of the cooperative [or producers organisation] with a facilitated access to agricultural inputs, Good Agricultural Practices trainings and financial services.

- *How do Organisations & Institutions currently support smallholder cocoa farmers in their diversification strategies?*

Perennial tree-crop diversification strategies benefit from a rather mitigated institutional support. The cocoa sector is currently going away from the 'full sun grown' mono-cropping model towards an inclusion of more resilient and diverse agroforestry models. In this regard, stakeholders of the cocoa industry are changing their discourses on the 'competing crops' and show an increasing interest and support of diversification strategies as a way to strengthen household's economic resilience. Industry efforts focus on raising community awareness about the importance of maintaining diversified revenues, without necessarily referring to a specific diversification model. This message is carried via extension services and Farmers Field Schools.

Nonetheless, beyond efforts on community awareness there is little to no material or technical support proposed to help households implement diversification strategies with perennial tree-crops.

Diversification strategies with food-crops benefit from a much wider institutional support within the cocoa sector; for they are easily combinable with cocoa orchards regeneration strategies, all the same enhancing households' food security, economic resilience, and women empowerment. Further material and technical assistance is being provided for households that undertake food-crops diversification strategies.

The preceding sub-questions built up a logical argumentation towards the main research question:

- *What do the diversification strategies of smallholder cocoa farmers in Côte d'Ivoire tell us about how Organisations and Institutions can more effectively support the ways in which cocoa farmers make a living?*

This MSc thesis eventually points to the conclusion that farmers households should be considered as capable agents that have the agency to choose from a portfolio of Livelihood Strategies in order to secure their livelihoods. Nonetheless, households operate in a specific context and their agency to choose from the available Livelihood Strategies is limited by the resources distribution; as they are only able to mobilise the capital assets to which they have access to, within an existing institutional environment.

Unlike the initial expectations, perennial tree-crop diversification is not a '*one size fits all*' type of solution to farmer's poverty and should not be promoted as such. The most efficient way in which Organisations and Institutions can support smallholder cocoa farmers to make a living is to facilitate their access to good information, affordable financial services, and secure land in order to enable households to undertake their preferred Livelihood Strategies – regardless of which type it may be. It is not the role of the Organisations and Institutions to impose a top-down specific model.

Since *not all farmers can diversify* – as not all farmers have the necessary resources to do so – it is also important that Organisations and Institutions develop alternative Livelihood Strategies for those who cannot diversify, even if it leads some households to abandon agriculture.

6.2. Limitations to the research & Future Recommendations

A first limitation regarding the sampling method was exposed in Chapter 2 as part of the methodology, nonetheless such limitations were already taken into consideration during the results interpretation.

A second limitation relates to the theoretical framework chosen for this research; a general critique against the Sustainable Livelihoods Framework is that it is too wide and too complex to be really useful (Levine, 2014). And indeed, understanding how people choose to secure their livelihoods is a complex subject. This is a limitation I have experienced as the SLF provided me with useful conceptual lenses to analyse farmers livelihoods but without applicable research tools to conduct my research. Furthermore, the various elements of the framework and notably the Vulnerability Context and the Transforming Structures & Processes can never be fully explained or even understood within the frame of a single research. This leads to an inevitable approximate description of some elements of the framework that the researcher judges important to bring up.

Future research should focus on quantitative methods with a larger and more diverse sample to establish statistically relevant models to further understand diversification strategies. For instance, it would be very useful to establish a minimum threshold level (in terms of land or production yields) from which a specific type of diversification becomes profitable at individual household scale or at producer's organisation scale. Other than this, quantitative/mixed methods research is to be conducted on farmer's segmentation to unravel the dynamics between household's characteristics, site conditions, and diversification strategies.

Finally, the wide angle focus of this MSc research project didn't allow me to deep dive into certain points of interests that arose during the analysis. In this sense, further qualitative research shall be conducted on the impact of land tenure and working arrangement (*aboussan*) systems with regards to farmers Livelihood Strategies. Another interesting research is to explore the role of producer's organisations in enhancing diversification at regional scale, by transforming local landscapes into a patchwork of different crops, as a couple of examples were witnessed during fieldwork.

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Appendices

Appendix 1: List of interviewees for the institutional analysis.

Name of Organization	Name of Interviewee	Position of Interviewee	Date of interview
Cargill	Mr. Jean-Marie Delon	West Africa Sustainability Program Manager	unstructured interview, Sept 2017
Cargill	Mr. Ywe Francken	Data Analyst	unstructured interview, Sept 2017
Cargill	Mr. Antoine LeGrand	Crop Analyst	unstructured interview, Sept 2017
Cargill	Mrs. Ella Frankel	Policy Advisor	unstructured interview, Sept 2017
World Cocoa Foundation (WCF)	Mrs. Suzanne Ngoeyok	WCF West Africa Director	15.09.17
ICRAF (The World Agroforestry Centre)	Mr. Thomas d'Aquin Kouakou	Operations Manager	24.10.17
Coopérative CAYAT	Mrs. Bama Aya	Director	03.11.17
Coopérative KGS	Mr. Konan Kouassi Alfred	Lead Farmer	08.11.17
Coopérative COOPEBIA	Mr. Koné Oumar	President	09.11.17
Coopérative SOCAS	Mr. N'gouan Kassi Mathias	Director	09.11.17
BAYER	Ms. Pascale Dulioust	Grower Marketing Manager	10.11.17
Coopérative SOCODD	Mr. Ouedraogo Moucadas	President	13.11.17 and 14.11.17
Agence Nationale d'Appui au Développement Rural (ANADER)	Mr. Ndoli Oi Ndoli	Regional Manager	14.11.17
Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)	Mr. François Ruf	Economist	15.11.17
Coopérative COOPALO	Mr. Akpoue Kouassi Abadi	Director	21.11.17
Coopérative COOPAKOF	Mr. Bakaioko Amadouf	Director	22.11.17
International Cocoa Initiative (ICI)	Mr. Allatin Brou Ernest	Deputy National Coordinator	23.11.17
Coopérative Benkadi	Mr. Davou Sidiki	Director	28.11.17
Coopérative SCAPB	Mr. Yao Charles	Director	29.11.17
Coopérative SOCANC	Mr. Tano Tioman George, Ms. Piri	President and Director	30.11.17
Association Nationale des Coopératives Agricoles de Côte d'Ivoire (ANACACI)	Mr. Soro	President	04.12.17
Callivoire	Mr. Florent Clair	Cocoa Lead	08.12.17
UTZ	Mr. Siriki Diakité	Regional Representative for West Africa	11.12.17
World Cocoa Foundation (WCF)	Mr. Tehua Koffi	Programme Manager	11.12.17
PalmCi	Mr. Tagouya Raymond	Agricultural Operations Director	12.12.17
Conseil Café Cacao (CCC)	Mr. Couloud	Public-Private Partnership Secretary	13.12.17
IDH, The Sustainable Trade Initiative	Mrs. Renske Aarnoudse	Country Manager IVC	14.12.17
SAPH	Mr. Eric Cavaloc	Agricultural Operations Director	14.12.17

Appendix 2: Summary of stakeholder's discourses and support mechanisms on diversification strategies.

Stakeholders		Type of organisation	General engagement with cocoa farmers	Discourse on diversification	Support on diversification
State Organisations	Conseil Café Cacao (CCC)	Regulating State Council	<ul style="list-style-type: none"> • Farm gate price regulation • Policy making for cocoa sector • Public Partnership between CCC, ANADER and CNRA to provide technical support for cocoa farmers. • direct provision of agricultural inputs (improved planting material, crop-protection products, fertilizer, machinery) • Co-financing various multi-stakeholders initiatives and programmes such as cocoa regeneration programme in the context of swollen shoot remediation • Mapping of soil quality to provide adapted fertilizer solutions - in partnership with Centre National de Recherche Agricole (CNRA) 	<ul style="list-style-type: none"> • favourable to diversification as long as it can improve farmer's economic resilience and participate to the sustainability and strength of the cocoa sector • Combine diversification and cocoa orchards regeneration/intensification • encourage farmers to intensify their cocoa production on a smaller land surface and cultivate other crops on the land surface that came available in order to generate additional revenues • CCC reflects governmental discourse on diversification 	<ul style="list-style-type: none"> • encourage diversification in the context of cocoa orchards regeneration • direct provision of planting material (food crops and coffee seedlings) • Supporting multi-stakeholders initiative such as WCF (food crops diversification)
	Agence Nationale d'Appui au Développement (ANADER)	National Agricultural Development Agency	<ul style="list-style-type: none"> • extension services • Good Agricultural Practices trainings for cocoa and coffee crop only • soil diagnosis • facilitating access to improved planting material 	<ul style="list-style-type: none"> • Necessary to adapt cultivated crops to soil quality • Diversification with cash-crops for economic resilience • Diversification with food crops for food security and economic resilience 	<ul style="list-style-type: none"> • capacity building & raising awareness among women for diversification with food crops. Specific programmes for food security/economic resilience with manioc, plantain, chicken. • capacity building & raising awareness among men for diversification with cash-crops • soil diagnosis to redirect producers to adapted crops
Civil Society Organisations	World Cocoa Foundation (WCF)	Multistakeholder Initiative (convening Private Sector actors)	<p>Multiple areas of engagement. Main objective of poverty alleviation (increasing revenues via farm productivity), food security, women empowerment, child labour remediation, professionalisation of producers organisations</p> <p>The WCF Cocoa Livelihoods Program (CLP) addresses 3 objectives:</p> <ul style="list-style-type: none"> • increase farm level cocoa productivity • improve service delivery efficiency • improve farmer resiliency 	<ul style="list-style-type: none"> • Favourable to diversification with food crops to improve food/nutritional security, women empowerment as women produce most food crops. • Favourable to diversification of income, including diversification with cash-crops to improve economic resilience. • Cash-crop diversification is subject to price volatility. Farmers face problems of investment, availability of land and labour, and lack of technical knowledge. • State, CCC and ANADER responsibility to promote further diversification measures. • Need for further support on establishing a national price regulation system that would better benefit cocoa farmers and prevent price shocks, a national policy on land/soil utilisation to promote diversification, the development of technical models on how to combine secondary cash crops with cocoa, homogeneous GAPs and provide further technical assistance. 	<ul style="list-style-type: none"> • Raising awareness on the benefits of alternative income generating activities through Good Agricultural Practices trainings. • Raising community awareness on food crops diversification combined with cocoa orchards regeneration measures. • Direct provision of food crops seedlings to communities (plantain, manioc, maize, igname) • Raising community awareness on cash-crop diversification as a mitigation measure to the spread of the swollen shoot disease. No direct provision of seedlings. • Integration of shade trees with economic value on cocoa plantations

International Cocoa Initiative (ICI)	Multistakeholder Initiative	<ul style="list-style-type: none"> • children rights & child labour • community rights & women empowerment • raising community awareness on benefits of children's education • Supporting women to launch income generating activities (food crops and off farm activities) 	<ul style="list-style-type: none"> • Poverty is the root cause of child labour, and diversification generates additional revenues that help farmers households to get out of poverty • Institutional support targeted for women: diversification with food crops (food security) and diversification with off-farm activities (income generation) 	<ul style="list-style-type: none"> • raising community awareness on benefits of diversification • Negotiation with community leaders for women's access to land • Donations of planting material (food crops) • Technical training/support on diversification with food crops • Enabling creation and material support of shared work groups of men
The World Agroforestry Centre (ICRAF)	Research Centre & Extension Services	<ul style="list-style-type: none"> • General mission of developing knowledge practice in order to improve food security, poverty reduction, and natural resources systems. This is achieved through the use of trees for sustainable landscapes and livelihoods. 	<ul style="list-style-type: none"> • The focus is not only cash-crop diversification but also explores other agroforestry models with the use of citrus or timber trees on cocoa plantations. 	<ul style="list-style-type: none"> • Development of technical models for multi-cash crop farming schemes. Research is prior to policy decision making processes. • extension services including raising awareness and technical assistance on diversification as part of the Mars Inc. Vision 4 Change programme.
Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)	Research Centre	<ul style="list-style-type: none"> • research influences decision making processes in the cocoa sector and supports new service delivery models 	<ul style="list-style-type: none"> • Interview with François Ruf, expert in perennial tree-crop diversification. • Diversification happens as a consequence of 'the exhaustion of the forest rent' and improves households resilience to external shocks and stresses. • Farmers are constrained by their personal resources, site characteristics and institutional background. • Further support shall be provided on key issues such as land tenure schemes, access to financial services, technical support. 	<ul style="list-style-type: none"> • Development of technical models for multi-cash crop farming schemes. Research is prior to policy decision making processes.
Association Nationale des Coopératives Agricoles de Côte d'Ivoire (ANACACI)	Association of producer's organisations	<ul style="list-style-type: none"> • The objective is to create a space for producer's organisations to meet up, exchange experiences and create new partnerships. • strengthen professionalisation of producer's organisations 	<ul style="list-style-type: none"> • There is an interest to have multi cash-crops cooperatives, but there are important barriers such as initial investment in infrastructures. • A cooperative can diversify only if there is a minimum amount of supply = a considerable portion of members are themselves diversified • Diversification important to mitigate climate change risks. • core issue of selling and transporting food crops production on time • diversification itself is not a danger for the cocoa crop, only the volatility of prices is dangerous 	<ul style="list-style-type: none"> • raising awareness on the importance of diversification to increase economic resilience, especially with cotton/cashew model. • promotion of diversification of activities at cooperative level, focussing on food crops. Development of a cocoa/food crops model with integrated irrigation system. • projects for food crops at cooperative level with common land scheme. • partnership with NGO (agronomes sans frontières) to transform locally food crops production.

	The Sustainable Trade Initiative (IDH)	Multistakeholder platform / NGO	<ul style="list-style-type: none"> Facilitating multi-stakeholders initiatives between State, Civil Society and Private Sector organisations and convincing stakeholders to step into financial services to cooperatives and farmers Service delivery Landscape programme convening private sector organisations together to find balance between forest preservation and productivity Co-funding programmes with business partners Learning and innovation - documenting and understanding business cases 	<ul style="list-style-type: none"> The cocoa sector needs transformation from current cocoa production model (full sun grown cocoa) to a more sustainable and resilient model. There is not a single solution model to apply, there are multiple models that farmers should have the agency to choose from, based on good information. Diversification can be one of these models but should not be promoted as a single solution model. Farmers segmentation: tailoring of service provision. Identifying and understanding different segments of farmers. Target support to farmers that have capacity and willingness to invest. 	<ul style="list-style-type: none"> Facilitating multi-stakeholders initiatives between State, Civil Society and Private Sector organisations in order to step into financial services for cooperatives and farmers. Facilitating farmers/cooperatives access to credit, financial services & financial products, crop insurances and life insurances. multi-crop service delivery; expanding of the services beyond the key cash or food crop to support the farming system Partnership service delivery: partnering with an external market actor for provision of additional services like an input provider, financial institution, insurance provider.
	UTZ	Certification Scheme / NGO	<ul style="list-style-type: none"> sustainable certification of cocoa farms based on the successful implementation of the UTZ standards and code of conduct some technical assistance (Good Agricultural Trainings) to support farmers and cooperatives in certification process 	<ul style="list-style-type: none"> diversification as a way to improve households economic resilience. Resonates on core issues such as deforestation, child labour, resilience to climate change, access to inputs and planting material. cocoa culture is not suitable for all soil types. Farmers must diversify on soils that are not suitable for cocoa production, to ensure their resilience to climate change No specific recommendation on the type of diversification to adopt. Should be based on risk evaluation. Take farmers needs in consideration. Shade trees in cocoa plantations such as plantain, fruit trees and timber trees can also participate to crop diversification 	<ul style="list-style-type: none"> crop diversification integrated in the UTZ code of conduct as a criterion verified for sustainable certification (control points on GAP trainings including diversification measures, intercropping on farm, presence of shade trees on cocoa plantations...) direct influence on content of GAP trainings
	Producers Organisations (cooperatives)	association of cocoa producers	<ul style="list-style-type: none"> Gateway between smallholder cocoa farmers and market actors Defending interests of smallholder cocoa farmers For the cooperatives that are certified sustainable, re-investment of the sustainable premium in community projects Facilitating access to planting material, agricultural inputs, machinery and transportation, credit services, educational trainings. Facilitating exchanges of information, knowledge, social interactions. 	<ul style="list-style-type: none"> A majority of cooperatives are favourable to cash-crops diversification as an adaptation to the farming practices of their members. (Almost) none of the cooperatives have yet attempted to diversify their activities. Further research on profit threshold required. Barrier of initial investment and linking new supply to market demand. Few cooperatives feel threatened by cash-crop diversification. 	<ul style="list-style-type: none"> Little to no projects on cash-crops diversification Some food-crops diversification projects (rice, maize, vegetables) at cooperative level featuring common land use schemes. Some cocoa/coffee cooperatives as remains of the past. One case of cocoa/cashew cooperative as a success story of diversified cooperatives. One diversification project with chicken production at cooperative level
Private Sector Organisations	Cargill	Private Company, cocoa sector	<ul style="list-style-type: none"> Engagement in and financing of various sustainability programmes and multistakeholders initiatives. (e.g. child labour remediation, professionalisation of producer's organisation, forest preservation, etc.) Through the structure of the cooperative Cargill facilitates and finances access to; credit, sustainable certification, Good Agricultural Practices trainings and personalised coaching services, (improved) planting material, agricultural inputs, machinery and transportation. 	<ul style="list-style-type: none"> Diversification as a way to increase farmers economic resilience. No official discourse on cash-crops diversification. Framing food crops diversification discourse as part of women empowerment programmes and cocoa-orchards regeneration projects. Internally, emergence of a theory of change around cocoa intensification on smaller land surface, enabling farmers to diversify with other crops on remaining available land. 	<ul style="list-style-type: none"> Indirect participation and financing of multi-stakeholder's initiatives (ICI, WCF) implementing diversification projects with food crops, and raising awareness on the benefits of diversification of revenues.

PalmCi	Private Company, palm sector	<ul style="list-style-type: none"> aggressive recruitment process with cocoa communities to encourage them to switch to palm production 	none	none
SAPH	Private Company, rubber sector	<ul style="list-style-type: none"> aggressive recruitment process with cocoa communities to encourage them to switch to rubber production 	none	none
Callivoire	Private Company, agricultural inputs	<ul style="list-style-type: none"> agricultural input provider including technical assistance to farmers and cooperatives 	<ul style="list-style-type: none"> Emergence of new business opportunities around diversification with food crops, in combination with cocoa orchards regeneration. Development of new technical models of intercropping cocoa/maize. No current demand from cocoa sector for cash-crop diversification projects. As personal view, questioning sustainability of diversification with rubber as a consequence of the 'exhaustion of the forest rent'. Prior need to rebalance soil fertility 	<ul style="list-style-type: none"> Starting to work on the idea of a food-crops diversification package - at level of farmer or cooperative - including seeds, agricultural inputs, and technical assistance. In collaboration with cocoa & chocolate companies as part of their sustainability programmes.
Bayer	Private Company, agricultural inputs	<ul style="list-style-type: none"> agricultural input provider. 	<ul style="list-style-type: none"> Emergence of new business opportunities around diversification with food crops, in combination with cocoa orchards regeneration. 	<ul style="list-style-type: none"> Previously working on project of food-crops diversification package - failed for various reasons.

Appendix 3 : Questionnaire for cocoa farmers

Individual & Site Characteristics :

- 1) Quelles sont les cultures que vous faites, et sur combien d'hectares ?
- 2) Quel est le tonnage par année ?
- 3) Quel prix recevez-vous par culture au kg ?
- 4) Est-ce que vous mixez les cultures sur la même parcelle ou est-ce que ce sont des parcelles séparées ?
- 5) En quelle année ont-elles été plantées?
 - a. Est-ce que c'est vous qui avez planté les cultures secondaires ?
- 6) Avant de cultiver cette culture secondaire, quelle était l'utilisation de ces terres ?
 - a. Plantation café/cacao
 - b. Forêt
 - c. Autre
- 7) Est-ce que vous êtes propriétaire terrien ? Par quel moyen avez-vous accédé à la propriété ?
 - a. Possédez-vous un titre légal de propriété ?
- 8) Vous reste-t-il des terres en jachère/non utilisées ?
- 9) Louez-vous des parcelles? Avez-vous un système de métayage (aboussan)? Quel est l'arrangement ?
- 10) Avez-vous des difficultés à replanter le cacao ?
- 11) Aujourd'hui est ce que vous faites de la régénération du cacao ? (Quand est-ce que vous avez planté du cacao pour la dernière fois ?)
- 12) Est-ce que vous avez déjà essayé la nouvelle variété Mercedes ? En êtes-vous satisfait ?
- 13) Avez-vous remplacé le café/cacao par d' autres cultures ?
- 14) Est-ce que c'est vous qui cultivez ?
- 15) Est-ce que vous employez des salariés pour aider ? combien ?
- 16) Est-ce difficile de trouver la main d'œuvre ? et pour les payer ?
- 17) Est-ce que votre femme, ou votre famille vous aide au champs ?
- 18) Avez-vous (et votre femme) d'autres activités en dehors de l'agriculture ?

Livelihood Objectives : (why)

- 19) Pourquoi est-ce que vous avez choisi de diversifier tes cultures ?
- 20) Quels étaient vos objectifs ?
- 21) Quelles étaient vos difficultés avant de diversifier ?
- 22) Pourquoi avez-vous choisi de planter spécifiquement du [anacarde, café, hévéa, palmier, teck...] et pourquoi pas une autre culture ?
- 23) Aujourd'hui est-ce que vous êtes satisfait des résultats d'avoir planté une ces autres cultures?
 - a. Qu'est-ce que cette 2ème culture vous apporte en particulier ?
- 24) Si vous pouvez comparer votre situation : Comment c'était avant, et comment c'est maintenant ?
- 25) Est-ce que vous avez de la fierté à produire du cacao ? Des autres cultures ?

26) Est-ce que vous vous voyiez comme un planteur de cacao ? comme un agriculteur ?
comme un entrepreneur ?

27) Dans votre vision du futur :

- a. Est-ce que vous avez des projets pour le futur ?
- b. Est-ce que vous voulez garder la même disposition sur tes parcelles ? Ou est-ce que vous voulez augmenter les surfaces pour le cacao/autre culture ?
- c. Est-ce que vous allez abandonner le cacao ?

28) Si vous n'aviez pas de contrainte financière, dans quoi est-ce que vous voudriez investir afin de mieux réussir ?

Diversification process & external support (how)

29) Comment avez-vous eu l'idée de planter d'autres cultures (pérennes) que le cacao ?
a. Est-ce que quelqu'un vous en a parlé ou était-ce une initiative personnelle ?

30) Quelles ont été /quelles sont pour vous les plus grosses difficultés liées à cette culture secondaire ?

31) Cacao et autre : Comment avez-vous acquis le matériel de semis et de plantation ?

- a. Est-ce que quelqu'un qui vous l'a donné ? qui ?
- b. Est-ce que vous l'avez acheté ? A qui ?
- c. Est-ce que c'était difficile à trouver et financer ?

32) Préparation du terrain :

- a. Est-ce que vous avez reçu de l'aide ?
- b. Est-ce que vous avez employé de la main d'œuvre ?
- c. Est-ce que vous utilisez des machines ?

33) Est-ce que votre/vos culture secondaire(s) ont marché dès le premier essai ? Est-ce que vous avez eu des tentatives ratées ?

- a. Avec quelles cultures ?
- b. Pourquoi est-ce que ça a échoué ?

34) Comment avez-vous fait pour vivre durant le temps d'attente avant la première production ?

35) Comment avez-vous appris à cultiver cette seconde culture ?

- a. Qui vous l'a appris ? est-ce que quelqu'un vous a aidé ?
- b. Avez-vous reçu une formation ?

36) Est-ce que vous faites des premiers traitements post-récolte ? (optionnel)

37) Comment est-ce que vous évacuez les produits de ta plantation ? (optionnel)

38) Ou et a qui vendez-vous la culture secondaire ?

- a. Est-ce que vous réussissez toujours à vendre la récolte ?

- 39) Est-ce que vous êtes membre d'une coopérative pour vos autres cultures ?
- Si oui, est-ce que vous recevez de leur part ?

Difficulties :

- 40) Est-ce que vous avez reçu du soutien de la part de...
- De vos voisins/la communauté
 - De la coopérative
 - D'une entreprise (Cargill, cafe, hévéa)
 - De l'État (CCC, De l'ANADER)
 - D'une ONG

Revenues :

- 41) Aujourd'hui êtes-vous satisfaits de vos rendements ?
- Pour le cacao
 - Pour les autres cultures
- 42) Est-ce que vous êtes satisfait du revenu que les cultures t'apportent ?
- Pour le cacao
 - Pour les autres cultures
- 43) Savez-vous qui décide du prix du cacao ?
- 44) Est-ce que vous utilisez ces revenus afin de réinvestir dans la plantation ?
- 45) de quoi auriez-vous besoin pour vous aider ?
- Pour le cacao
 - Pour les autres cultures

Appendix 4 : Questionnaire for cocoa coopératives

- 1) En quelle année a été créé la coopérative ? Combien de planteurs font partie de la coopérative?
- 2) Quel est le tonnage par année ?
- 3) Depuis quelle année occupez-vous votre poste au sein de la coopérative ?
- 4) Quelles sont les activités de la coopérative ? Faites-vous commerce d'autres commodités que le cacao ?
- 5) Est-ce que la coopérative est certifiée pour le cacao/autres? Selon quels standards ?
- 6) Est-ce que la coopérative est en partenariat avec d'autres entreprises que Cargill ?
- 7) Est-ce que la coopérative bénéficie d'un partenariat direct avec un programme durabilité d'un chocolatier (Nestlé, Mars, Mondelez, autre ?)

Diversification des planteurs:

- 8) Observez-vous une diversification de vos planteurs de cacao avec d'autres cultures pérennes ?
 - a. Depuis combien de temps ?
 - b. Avec quelles cultures ?
 - c. Selon vous, quel pourcentage de planteurs de la coopérative sont diversifiés ?
- 9) En tant que coopérative, quel est votre discours sur la diversification des planteurs de cacao ?
 - a. Y êtes-vous favorable ?
 - b. Est-ce une menace pour l'avenir du cacao ?
- 10) Selon vous quelles sont leurs difficultés principales pour se diversifier ?
- 11) Comment peut-on aider les planteurs dans leur démarche de diversification ?
- 12) Est-ce que la coopérative incite les planteurs à se diversifier ? Si oui, comment ?
- 13) Y a-t-il des compagnies de (palme, hévéa, café, autre) dans le secteur ?

Diversification de la coopérative :

- 14) Voyez-vous un intérêt économique pour une coopérative de cacao de commencer à faire commerce d'une autre commodité ?
 - a. Est-ce un projet qui actuellement stimule l'intérêt des membres de la coopérative ?
 - b. Cela vous paraît-il important que la coopérative se diversifie elle aussi ? Pourquoi ?
 - c. Quelle culture vous paraît la plus intéressante ?
 - d. Quelle serait la taille minimale de production des planteurs pour que cela devienne économiquement intéressant pour la coop ?
 - e. Le prix minimal de marche ?
- 15) Quelles sont les principales difficultés d'une coopérative pour commencer à se diversifier ?
- 16) Qu'est-ce qui vous manque pour commencer ? De quel soutien auriez-vous besoin ?

- 17) Selon vous, quel acteur de la société doit soutenir cette diversification ? (état, société civile, compagnies privées).
- a. Comment ?

Services apporté par la coopérative aux planteurs :

- 18) Quels sont les services apportés aux planteurs par la coopérative ?
- a. Moyens de transports
 - i. comment les planteurs acheminent-ils le cacao jusqu'à vous ?
 - b. Access aux plants/semis
 - i. Quel est le système en place ? Y a-t-il une collaboration avec [nom de compagnie] pour les pépinières ?
 - ii. Est-ce gratuitement distribué ou payant ?
 - c. Accès aux intrants (produits phyto + engrais)
 - i. Est-ce gratuitement distribué ou payant ?
 - d. Machinerie pour la préparation du champs + applicateurs pour pomper/traiter
 - i. La coopérative a-t-elle des machines mises à la disposition des planteurs ?
 - e. Accès au crédit
 - i. La coopérative accorde-t-elle des crédits aux planteurs ? quelle sorte de crédit (prêt scolaire achat d'intrants)?
 - f. Accès à l'information :
 - i. Le planteur est-il renseigné sur le diagnostic de son sol ?
 - ii. Le planteur a-t-il accès aux informations de marché pour les autres cultures secondaires ?
 - g. Accès aux formations pour planteur
 - i. Sur quelles commodités se focalisent les formations ?
 - ii. Est-ce dans le cadre de la certification ?
 - h. Accès à l'éducation pour enfants
 - i. Autres projets ?
- 19) Ces programmes sont-ils tous financés avec la prime de certification ?
- 20) Quels sont les partenaires qui vous aident pour ces programmes ? (État, compagnies privées, société civile)
- 21) De quel autre soutien supplémentaire les planteurs aurait ils besoin ?
- 22) Quels sont les futurs projets de la coopérative ?

Appendix 5 : Questionnaire for expert's interviews

- 1) Quelle est la mission de votre organisation ?
- 2) Comment cette mission est-elle concrètement menée en Côte d'Ivoire ?
- 3) Quels sont vos partenaires ?
- 4) Selon vous, quelles sont les plus grosses difficultés auxquelles les planteurs de cacao doivent faire face aujourd'hui ?
- 5) Comment votre organisation soutient-elle les planteurs dans ces difficultés ?
- 6) Quelle est la position de votre organisation sur la diversification des planteurs de cacao avec l'introduction d'autres cultures pérennes? (type hévéa/palmier/anacarde)?
 - a. Y êtes-vous favorable ?
 - b. Pensez-vous qu'elle puisse représenter une menace pour l'avenir du cacao ?
 - c. Pensez-vous que la diversification des cultures pérennes est nécessairement bénéfique aux planteurs de cacao ?
 - d. Pensez-vous que la diversification des cultures pérennes est nécessairement bénéfique pour l'utilisation des ressources naturelles ?
 - e. Pensez-vous que le secteur du cacao doit inciter les planteurs à se diversifier ?
 - f. Avez-vous des critiques à faire sur ce processus de diversification ?
- 7) A votre avis, quelles sont les barrières a cette diversification ?
 - a. au niveau du planteur ?
 - b. au niveau national ?
- 8) Votre organisation incite-t-elle/soutient elle les planteurs à se diversifier ?
- 9) Pensez-vous que votre organisation doive jouer un rôle plus important dans le soutien ou la promotion de la diversification des cultures (pérennes)?
- 10) Selon vous, quels sont les organismes qui devraient promouvoir et inciter à la diversification des cultures pérennes ?

