

Forest plantations and livelihoods in Ghana's High Forest Zone



A temporary hamlet in a commercial forest plantation with maize planted between the teak trees (Asubima Forest Reserve in Offinso Forest District). [Photo taken in March 2010]

Lucien Hoogenbosch

Human Geography, University of Amsterdam

Supervisor: Dr. Mirjam A.F. Ros-Tonen

Local Supervisor: Thomas F. G. Insaadoo, MSc

Second reader: Dr. Nicky Pouw

Location: Offinso District, Ghana

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Abstract

Ghana has faced major deforestation problems in its past history. Large tracts of forest were lost due to intensive exploitation. In the last decade several attempts were made to reverse deforestation and replant forests. The Ghanaian government launched the National Forest Plantation Development Programme in 2001, to recover degraded forest areas, improve employment opportunities and improve environmental quality, while at the same time increasing timber stocks for the national market. This thesis focuses on the establishment of commercial and government-managed forest plantations financed with HIPC (Highly Indebted Poor Countries) funds. It looks at the livelihood opportunities of the plantation workers and the potential of plantations to engage in PES (payments for environmental services) and REDD (reducing emissions from deforestation and degradation) schemes. This study is part of a cooperative programme between the University of Amsterdam (Amsterdam Institute for Social Science Research), Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi, Ghana, and Tropenbos International. This programme aims to generate insight into and formulate recommendations on governance arrangements that enhance forest-related livelihoods so that they contribute to sustainable forest management and poverty alleviation.

The research presents the perspective of the plantation workers and private investors who are involved in private and public forest plantation development. The study was carried out in three forest plantations in the Offinso Forest District in the Ashanti Region, two of which are commercially managed and one is a public forest plantation financed through the HIPC-funds. Data was gathered from interviews with private investors and government officials. Besides this a questionnaire was used to collect data about the livelihood portfolios of the forest plantation workers, which was complemented with the application of an element from the PROFOR toolkit.

The results show that the plantations offer workers a stable livelihood, thanks to permanent wage labour and the ability to grow food crops between the trees. The plantations are managed in different ways, and therefore represent different strategies to contribute to the workers' livelihoods.

Plantation developers need to earn money to overcome the time gap between investment and the revenues from the sale of timber. This gap can be overcome by introducing compensation payments for carbon sequestration and other ecosystem services in the form of PES. The plantations supply environmental services for which private plantation developers could be paid. These payments can also reduce the costs of plantation development and make it more interesting for future investors.

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List of Acronyms

CCU	Climate Change Unit of the Forestry Commission
CDM	Clean Development Mechanism
CFPD	Commercial Forest Plantations Development
CO ₂	Carbon Dioxide
FBPA	Forest-based poverty alleviation
FC	Forestry Commission
FSD	Forestry Services Division
HIPC	Highly Indebted Poor Countries
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
KNUST	Kwame Nkrumah University of Science and Technology
MTS	Modified Taungya System
NFPDP	National Forest Plantation Development Programme
NGO	Non Governmental Organization
ODA	Official Development Assistance
PADO	Private Afforestation Developers Organization
REDD	Reducing emissions from deforestation and forest degradation
PES	Payments for Environmental Services
PROFOR	Program on Forests
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihoods Framework
TBI	Tropenbos International
TUC	Timber Utilization Contract
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

Ghana has faced major deforestation problems in its past history. Large tracts of forest were lost due to intensive exploitation. “It is estimated that more than 90 per cent of Ghana’s forests have been logged since the 1940s and that primary forest in the country all but disappeared in the 1980s” (Kufour 2000: 52). The intensive logging has several causes. Kufour (2000) mentions that the non-transparency of rules and regulations and reckless harvesting led to over-exploitation. Unsustainable use of forests was common because of inefficient management. This caused an almost extinction of some indigenous tree species. Another reason explaining the deforestation is the Ghanaian economic crisis in the 1980s. Debts were repaid by timber exploitation (Kufour 2000). Also expansion of small scale farming contributed to deforestation. The consequences included climatic change, soil erosion and desertification. Deforestation led to a reduction in rain volume by as much as 60 per cent (Kufour 2000). The occurrence of bushfires which intensified since 1983 is also a major cause of deforestation in Ghana. The re-establishment of the tree cover can be done in several ways, for example through the development of forest plantations. Even though plantations appear to be more beneficial (from the perspective of a private investor) than natural forests due to the full ownership rights available, management control and reduced bureaucracy, plantations have disadvantages too, the most important of which are related to plantations being monoculture with poor biodiversity and high need for pest control. It is therefore prudent to maintain the natural forests, and not to degrade them with idea that plantations will provide a remedy (FC 2008).

1.1 Forest plantation development in Ghana

Forests are important from an environmental perspective but also as a source of livelihood for many Ghanaians. Reforestation of large parts of Ghana is not only important to restore the forests and tree cover but also for economic and social reasons. The National Forest Plantation Development Programme (NFPDP), which was launched in 2001, contains different reforestation strategies. Unfortunately, this will not lead to a decrease in deforestation of natural forests. The main goal of the programme is to expand the supply of industrial timber by developing forest plantations. Secondly, it contributes to the greening of the country. It also hoped to reduce the pressure on timber extraction from natural forests. The programme includes four objectives: reducing rural poverty by creating employment, restoring the degraded forest area of Ghana, reducing wood shortage and improving environmental quality. The government focuses on five different ways to achieve the goal of the NFPDP by (1) the establishment of forest plantations, (2) the planting of fruit trees on farming land, (3) the rehabilitation of mangrove forest, (4) urban forestry, and (5) the management of fire (FC, 2008). This study will focus on the establishment of forest plantations, especially on forest plantations established by public and private developers. This study looks specifically at the characteristics of the plantations and their livelihood effects on the workers. It thereby also touches upon the question of whether the plantations offer scope for carbon payments. As such, this thesis is relevant for the climate change debate in Ghana.

“In 2007, the Intergovernmental Panel on Climate Change (IPCC) concluded that reducing deforestation would have a large and rapid effect on reducing global carbon emissions (Wollenberg and Springate-Baginski 2010:1). The 13th Conference of Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Bali, Indonesia, in December 2007, therefore adopted the Bali action plan which comprises policies and financial incentives to reduce deforestation and promote sustainable forest management. Reducing emissions from deforestation and forest degradation (REDD) programs are designed to reduce the amount of deforestation. The basic idea of REDD is the reduction of deforestation by financial compensation. It is not clear yet whether REDD is going to be implemented at the national or subnational level. Implementation at national level has the advantage of coordinated policies and avoidance of ‘leakage’ (increased deforestation elsewhere). Angelsen (2008) argues for a nested approach that integrates national approaches with payments to households, communities, local government and the timber industry. Payments to households, families and communities can compensate the logging of timber. Here income substitution takes place to reduce deforestation. Payments can motivate local governments to target conservation measures within the framework of reducing deforestation. Timber logging companies can be compensated for shifting into plantation establishment (Wollenberg and Springate-Baginski 2010). The establishment of forest plantations can also be part of REDD-related incentives as it contributes to restoring the carbon balance through carbon sequestration. Not only timber companies could invest into forest plantations, it also provides opportunities to households, families and communities. Those who provide environmental services by conserving natural ecosystems should be financially compensated; therefore payments for environmental services, like those provided through the planting of trees, can support private investors financially. In the next chapter we will address the question of whether the development of forest plantations can contribute to REDD and/or PES objectives and provide opportunities to Ghanaian investors to receive PES by establishing forest plantations.

This study is part of a cooperative programme between the University of Amsterdam (Amsterdam Institute for Social Science Research), Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi and Tropenbos International. This programme aims to generate insight into and formulate recommendations on governance arrangements that enhance forest-related livelihoods so that they contribute to sustainable forest management and poverty alleviation.

1.2 Research objectives and questions

This research focuses on the establishment of forest plantations, in particular the private ones established under the Commercial Forest Plantations Development (CFPD) scheme and the public forest plantations funded by the Highly Indebted Poor Countries (HIPC) fund. The focus is on how forest plantation workers shape their livelihood and how the commercial forest plantation developers cope with the investment in tree planting and its future benefits. This study

will compare public and private forest plantations. The following question is the basis for this research.

What are the characteristics of forest plantations in Ghana's High Forest Zone and what do they contribute to the livelihoods of plantation workers?

In order to answer the main question, the following sub-questions were addressed:

- What are the characteristics of the HIPC-funded scheme?
- What are the characteristics of the CFPD scheme?
- What are the basic components of the workers livelihoods?
- What are the motives for investors to step into forest plantation development?
- How does forest plantation development relate to the climate change debate?

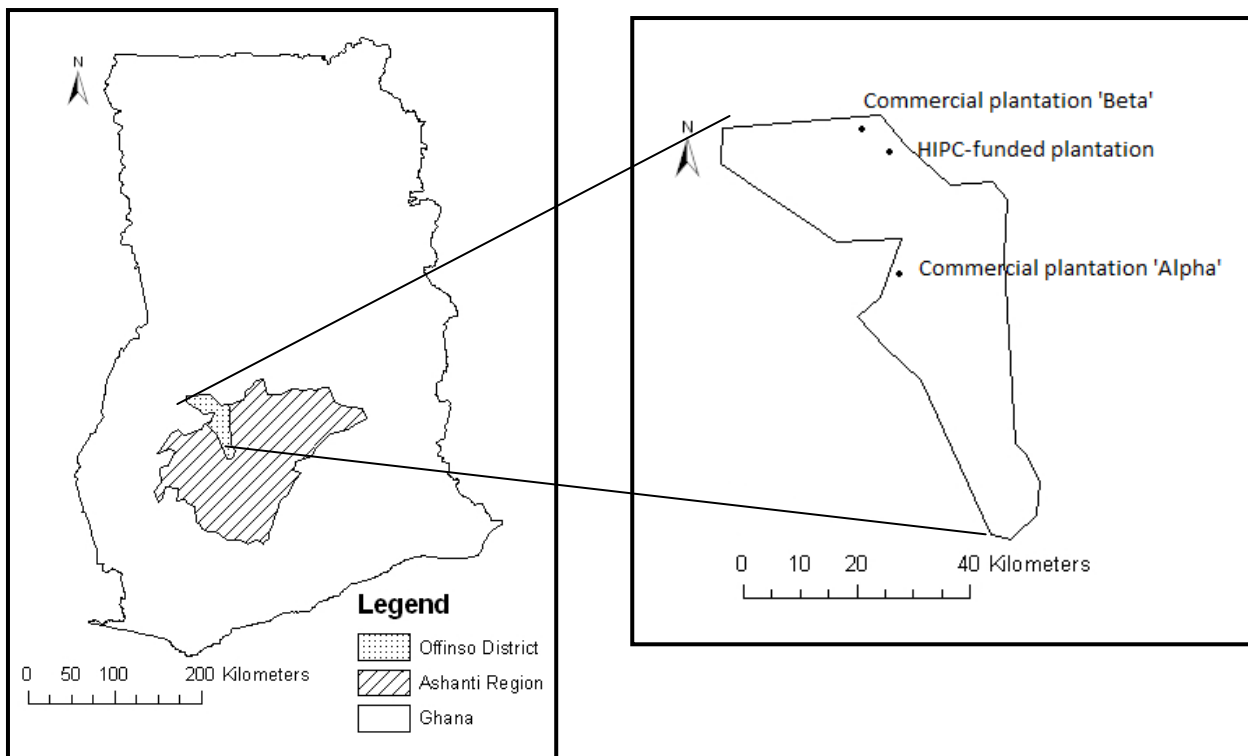
1.3 Study area

The development of forest plantations occurs mainly in Ghana's High Forest Zone. The Offinso Forest District is part of this High Forest Zone. This district is located in the Ashanti and Brong Ahafo Regions (Figure 1) and has a total land area of 1,255 square kilometres. The district is located in the moist semi-deciduous forest zone which is alternated with a thick vegetation cover. However, there is a vast emergence of savannah. This occurred by the specific farming practice of slash and burn and thus has rapidly destroyed the natural vegetation of the district. Also the occurrence of bushfires contributes to the expansion of grassland and savannah, which mainly occurs in the northern parts. Many households (85%) depend on wood and charcoal for cooking, so reforestation is needed in order to secure the supply of wood (ISSER 2007).

All visited forest plantations are situated in the Offinso forest district (Figure 1.1) and are all located in degraded parts of forest reserves. Figure 1 shows the location of the forest plantations in the district. The district is home to eight main forest reserves with a total area of 728.55 square kilometres (ISSER 2007). With a total area of 1,255 square kilometres, 58% of the district is covered with the following forest reserves:

- Afram Head Waters Forest Reserve – (190 km²)
- Afrensu-Brohoma Forest Reserve – (89 km²)
- Asufu East and West Forest Reserve – (25 km²)
- Gianoma Forest Reserve – (16 km²)
- Asubima Forest Reserve – (79 km²)
- Mankrang Forest Reserve – (92 km²)
- Kwamisa Forest Reserve – (135 km²)
- Opra River Forest Reserve – (104 km²)

Figure 1.1: Location of study area.



Source: Adapted from Africa data Dissemination Service¹

The plantations are located in forest reserves, also called ‘on-reserve’ areas, and have different sizes. The HIPC-funded forest plantation is located in the Asubima Forest Reserve neighbouring one of the commercial forest plantations. The other commercial forest plantation is located in the Kwamisa Forest Reserve. The forest reserves are divided into compartments, and each compartment has an area of 128 hectare, which equals to 1.28 square kilometres. When visited in 2010, the commercial forest plantation that is subject to this study in the Asubima Forest Reserve had an area of 10.24 square kilometres (8 compartments). The HIPC-funded forest plantation in this forest reserve had an area of 2 square kilometres (200 hectares). The other commercial forest plantation studied is located in the Kwamisa Forest Reserve and had a size of 2.56 square kilometres. Plantation development occurs only in the degraded parts of the forest reserves.

The district and the wider region have two rainfall seasons, with the major rain season running from April to July and the minor from September to November. Annual rainfall ranges from 1,500 mm in the north to 1,700 mm in the south. Relative humidity is high during the major rainy season, reaching its peak of 90% between May and June. A maximum temperature of 30°C occurs between March and April. The average monthly temperature is about 27°C (ISSER 2007).

The population census in 1984 counted 104,815 people in the Offinso Forest District, which had increased to 138,190 (32%) by the next census in 2000. The population increase during this

¹ <http://igskmncnwb015.cr.usgs.gov/adds/index.php> (accessed 10-9-10)

period is mainly due to migrant farmers coming mostly from Northern regions and an improved health system. In 2007, it was estimated that about a quarter of the district's population was not born at their place of residence. Most of the migrant population had moved to the Offinso district for employment reasons (ISSER 2007). This population increase could lead to more pressure on the land and its forests. The increase of the population and settlement of migrants in the district makes it clear that there are enough job opportunities, for example in plantation development. The major economic activity in the district is agriculture with 64% of the total population involved, followed by commerce with 16%, service (12%) and industry (8%) (ISSER 2007).

1.4 Thesis outline

The next chapter presents the theoretical framework that guides this research. Chapter three describes the methodology; the conceptual framework and the research methods employed. Chapter four looks at the different governance arrangements related to plantation development and the link to REDD programmes. The chapters five, six and seven describe commercial and public plantation development and its implications for the workers' livelihoods, respectively. Chapter eight compares the two different types of forest plantation development and Chapter nine presents the conclusions and recommendations for policy improvement and further research.

2 Theoretical Framework

This chapter reviews the literature which is used for this study. One of the central theoretical strands in this study is the livelihoods framework, which is used to analyse how the plantation workers build their livelihood. It then discusses the opportunities for sustainable forest management and the contribution to REDD in light of forest plantation development.

2.1 Livelihoods framework

This study analyses the benefits from CFPD and HIPC-funded forest plantation development to the plantation workers. Since a people-centred approach is useful in this kind of research, this study adopts the sustainable livelihoods approach (SLA). This approach presents the main factors that affect people's livelihoods, and the typical relationships between these factors (DFID 1999). Rakodi (2002: 3) defines a livelihood as "*comprising the capabilities, assets and activities required for a means of living*". This framework has the following elements: assets, vulnerability context, and structures and processes.

The SLA identifies five types of assets, which are also known as capitals or livelihood building blocks. These five assets form a pentagon, in which people's assets and the inter-relationships between the assets are presented. First – **human capital** – “represents the skills, knowledge, ability to labour and good health which are acquired in their live” (DFID 1999). The second – **social capital** – is harder to define. It encompasses social resources which people can use to derive their livelihood. This could be developed through social networks based on people's trust, social ties and community contacts or from membership of formal groups. **Natural capital** – the third one – includes all kind of natural resources such as land, forest and water. Fourth – **physical capital** – includes infrastructure, both for transport, communication and water supply, and tools and equipment. The last – **financial capital** – consists of the financial resources needed to build a livelihood. Financial capital can be acquired in several ways, through selling of products and employment. Other examples are savings in cash, bank deposits or as livestock or jewellery. Credits are also a source of financial capital.

For some capitals, a certain asset is needed to make use of other assets. This explains the inter-relationship between the assets in the pentagon. As Bebbington (1999: 2035) says, “Peoples' ability to gain access to those spheres is in turn greatly affected by the capabilities they have as a result of their initial endowments of the different types of capital asset.”

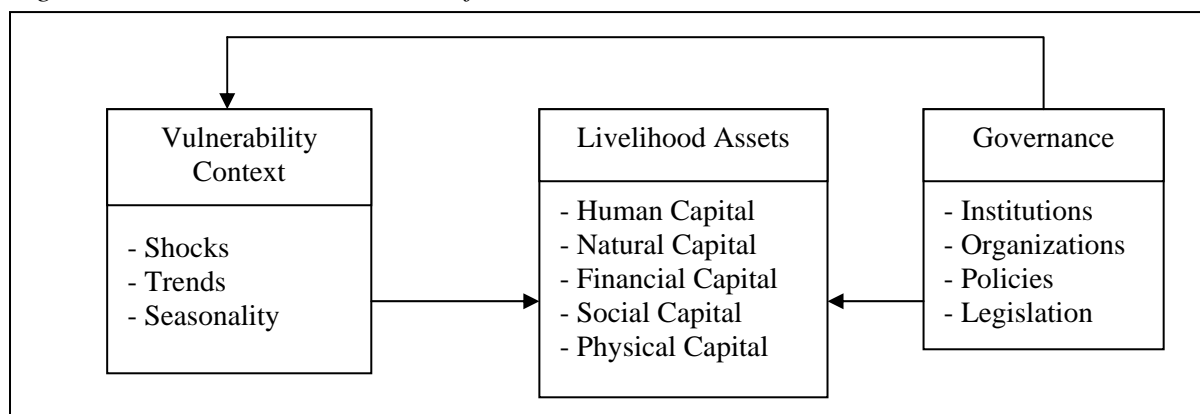
The second element of the SLA consists of the **vulnerability context**. This concept is related to the ability – or the lack thereof to secure one's livelihood. Three factors influence the degree of livelihood security: shocks, trends and seasonal shifts. When people are able to overcome these three factors, then their livelihood is sustainable. Chambers and Conway (1992) say that ‘A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base’ (Scoones

2009). *Shocks* can be divided into health, natural (flood, drought, and deforestation), economic (loss of markets) and social (conflict) shocks. Shocks can both directly and indirectly influence the amount of assets negatively, and always happen on short term. *Trends* are based on population growth trends, natural resource availability, economic and political trends which all can have positive and negative effects on people's livelihood. *Seasonal shifts* in prices (a decrease in wood prices), employment opportunities and food availability are difficult circumstances in which people need to gain their livelihood.

The third element of the Sustainable Livelihood Framework is a set of **structures and processes**. The structures can also be labelled as institutions. Institutions include a range of arrangements, behaviour and organizations placed in a community which may influence both the choices that households make about using their assets and the types and amount of assets that they are able to access (Messer & Townsley 2003:15). Livelihoods are shaped by institutions, organizations, policies and legislation – aspects that in more recent literature is commonly referred to as governance – ‘the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes’ (Lemos and Agrawal 2006: 298).

CFPD and HIPC-funded plantation development can be considered as an aspect of forest governance and more specific as a mechanism to reduce pressure on the natural forest. Macqueen and Bila (2004, cited in Ros-Tonen *et al.* 2008: 1483) define forest governance as “the process of policymaking, implementation and monitoring the allocation and use of scarce forest resources. It deals with the politics of control, regulation and management and about who has a say in the decision-making process (*ibid.* cited from Bila 2004).” *Sustainable forest management* encompasses the stewardship and use of forests for economic, ecological and social ends, at local, national, and global levels (SMCPF, 1993 cited in Ros-Tonen *et al.*, 2008). Forest governance thus is a broader concept, creating the conditions in which sustainable forest management can thrive (*ibid.*: 1483). For example access to forest resources can be restricted in some areas because of the allocation of a tract of forest as a National Park or a protected forest reserve. In that way institutions have effects on people's livelihoods, for example by reducing access to forest products. “Poverty is the result of ‘unsatisfactory’ livelihood strategies, because the strategies are based on insufficient livelihood assets, they are vulnerable to shocks and changes, and/or the policies, institutions and processes do not support effectively” (Messer & Townsley, 2003: 15). Mayers (2006) says that poverty is not just a lack of money and jobs, but of assets, services, civil and political rights, voice and the rule of law. Forestry can contribute to all of these – potentially more than many other sectors – but often it does not. So in order to completely analyse livelihoods, attention needs to be paid to all three described elements. The total framework of the aforementioned elements is shown in Figure 2.1.

Figure 2.1: Sustainable livelihoods framework.



Source: Adapted from DFID Sustainable Livelihoods Guidance Sheets (1999).

Forest plantations can be managed by the government as a common pool resource to be used by communities and community-based organizations and managed by private investors. Forest plantations are also managed by local farmer groups working under the Modified Taungya System.² The HIPC-funded scheme is plantation development led by the government, to create employment at all levels. People involved in HIPC-funded plantations are paid labourers, controlled by supervisors. These people don't share in the benefits, but get paid a wage. Commercial plantations, in contrast, are led by private investors who employ labourers under different conditions as we will see in Chapter 5 and 6.

Single activities do not raise enough money or products for a livelihood, so multiple activities should be undertaken to build one's livelihood. In this case diversity is important, because people make a living through a complex web of activities. This may cut across the boundaries of more conventional approaches of looking at rural development which focus on defined activities: agriculture, wage employment, farm labour, small-scale enterprise and so on. In reality people combine different activities in a complex bricolage or portfolio of activities (Scoones 2009: 2).

Attention to securing of livelihoods in the long term is important as well. Relevant questions in this respect are: What are the expectations for the future? Are there changing conditions in the future?

The term sustainable livelihood implies that livelihoods are stable, durable, resilient and robust in the face of both external shocks and internal stresses (Scoones 2009). The focus instead has often been on coping and short-term adaptation. Livelihoods analysis that identifies different future strategies or pathways provides one way of thinking about longer-term change (Scoones 2009). In this thesis this is done by analysing plantation workers' perspectives on the durability of

² See MSc thesis on the MTS by Jennie Ledger of the University of Amsterdam and the policy brief written on the basis of that thesis on <http://home.staff.uva.nl/m.a.f.ros-tonen/page3.html>.

plantation benefits and by linking plantation development to potential benefits from REDD schemes.

2.2 Forest- and tree-based livelihoods

This section describes in which way forests can potentially contribute to poverty alleviation. Attention will be paid to different categories of people dependent on forests and situations in which people gain a livelihood from forests as a way to alleviate poverty.

There are many different situations in which people depend on forests. Some do extract their livelihood completely from forests while others do so only partially. To understand poverty, attention needs to be paid to the different categories of forest users, which are dependent on forests outputs for livelihood inputs. Arnold (2002: 232) defines four categories:

- Forest dwellers heavily dependent on forests at present, but more likely to rely on agricultural pathways out of poverty; encompasses relatively small numbers of people.
- Predominantly agricultural populations drawing on nearby forests, woodland, etc., for some livelihood inputs; very large numbers of people;
- Farm households drawing on trees on their own land for some livelihood inputs; large numbers of people;
- Those processing and trading forest products either part or full time; this can include substantial numbers of people, ranging from farm households and the landless (the rural poor) to the urban poor.

Forest plantations can substitute natural forests as a source of livelihood for local communities. Mostly agricultural populations could partly benefit from forest plantations because it is not their primary source of income.

Forest-based poverty alleviation (FBPA) can be defined as the use of forest resources for the purpose of lessening deprivation of well-being on either a temporary or lasting basis (Sunderlin *et al.* 2005). Sunderlin *et al.* (2005: 1386) specify two types of poverty alleviation, applied at the household level, in association with forest resources. These are:

- Poverty mitigation or avoidance, that is, the use of forest resources to meet household subsistence needs, to fulfil a safety net function in times of emergency, or to serve as a 'gap filler' in seasonal periods of low income, in order to lessen the degree of poverty experienced or to avoid falling into poverty; and
- Poverty elimination, that is, the use of forest resources to help lift the household out of poverty by functioning as a source of savings, investment, accumulation, asset building, and lasting increases in income and well-being.

Poverty elimination can be temporary, for example when poverty is eliminated in certain seasons when there are enough opportunities to earn money.

The forests can be exploited in three different ways as shown in Table 2.1 which is adapted from Sunderlin *et.al.* (2005). This typology is made on the basis of some variables like the type of forest use, forest density, mode of use of forest products, and the extent to which people are dependent on forest products. The main type of forest use, in hunting and gathering populations, is the capture and collection of food. With regard to swidden cultivation, forest lands are converted to agricultural lands whose fertility is maintained and restored by forest ecosystems in a system of rotational fallow. As far as permanent agriculture at the forest frontier is concerned, forest lands tend to serve as a source of new agricultural lands that are not part of forest fallow systems. In all three types the use of timber is common. Especially in the latter two types, timber is sold for cash income. The great majority of the world's forest-based populations are concentrated in categories B and C (Sunderlin *et al.* 2005: 1387).

Table 2.1: Types of forest based livelihoods from natural forests.

Type of livelihood		Associated attributes of forest use			
		Main type of forest use	Density of forests	Mode of forest use	Forest product income as share of total income
A	Hunting and gathering	Food: capture and collection of forest fauna and flora	High	Use value: high Exchange value: low	High
B	Swidden cultivation	Source of agricultural land restored by forest fallows Use and marketing of forest products	Medium	Use value: medium Exchange value: medium	Medium
C	Sedentary agriculture at forest frontier	Source of new agricultural land Marketing of forest products	Low	Use value: low Exchange value: low	Low

Source: Adapted from Sunderlin et al. (2005).

However, this table can only be applied to the livelihoods based on natural forests. Forest plantation development contributes to tree-based livelihoods. Therefore Table 2.1 can be extended with two additional types of livelihood, based on involvement in anthropogenic forested landscapes. People who derive their livelihood from agroforestry both cultivate food crops and use forest products. Livelihoods derived from a forest plantation are mainly based on the planting, maintenance and harvesting of one or two timber tree species. This monoculture is ideal to obtain a maximum production of wood, and therefore can generate high incomes for the investors.

Table 2.2: Types of livelihoods based on anthropogenic forested landscapes.

Type of livelihood	Associated attributes of anthropogenic forest use			
	Main type of anthropogenic forest use	Tree density	Mode of anthropogenic forest use	Anthropogenic forest product income as share of total income
D Agroforestry	Use and marketing of farming and tree products	Medium	Use value: high Exchange value: high	High
E Forest plantations	Use and marketing of tree products	Medium	Use value: low Exchange value: high	High

There are four situations describing the relation between forest cover and livelihoods as is illustrated in the diagram in Table 2.3. This diagram can be used to understand in which different ways poverty could be alleviated. However, some situations do not alleviate poverty but rather enlarge poverty. See Table 2.3 for the four situations.

Table 2.3: Classification model for poverty alleviation.

		Forest/tree cover	
		+	-
Human Well-Being	+	WIN-WIN	WIN-LOSE
	-	LOSE-WIN	LOSE-LOSE

Source: Adapted from Sunderlin et al. (2005).

Win-win: In this situation forest-dependent people gain a livelihood from the forest without degrading the forest. This is the most sustainable way in which both the people and the forest benefit, although forest-based production is rather a gap filler than able to lift people out of poverty (Sunderlin *et al.* 2005: 1395).

Win-lose: This category is accompanied by a history of agricultural and rural development. In order to meet the need for the expansion of farming land, forests were felled in favour of agriculture. The transition from hunting and gathering to swidden agriculture and then to sedentary agriculture has often meant an increased consumption of natural resources and level of income (win) but at the cost of forest cover (lose) (Sunderlin *et al.* 2005: 1395).

Lose-win: Declining well-being and an increase in poverty can occur in two ways: the first situation is the exclusion of the community from the forest, as is often the case in forest conservation programmes; and second a situation in which people are unable to gain from forest products due to war and conflicts. This lose situation in terms of well-being implies a win situation for the forest which is able to restore, although not necessarily in a situation of war and conflict.

Lose-lose: This is the worst case scenario in which both forests and livelihoods decline. These outcomes are known as “the downward spiral of poverty and environmental degradation”, or as the “vicious circle”. Under these circumstances, there is a causal, reciprocal relationship between worsening social and environmental conditions (Sunderlin *et al.* 2005:1396).

The commercial and HIPC-funded forest plantation development schemes can be put in the win-win and lose-win part of the diagram. As far as biodiversity is concerned, there are considerable differences between natural forests and forest plantations. Forest plantations can hardly reach a high environmental value, because of the use of one or two single tree species and hence poor biodiversity. Only in terms of a gain in tree cover, plantation development can be regarded as positive and be denoted as a win situation. The ideal case is that local communities benefit from the forest plantations, for example by working on the plantation. As plantations are a long term business and local people have the opportunity to work on the plantation for a longer time, their livelihood seems to be sustainable for at least a longer time than most people are used to. But in the lose-win situation people's access to the plantation is restricted, so that they can not derive an income from the plantation. The third option, the win-lose situation, occurs when trees are old enough to be felled. If this felling is done without replanting, the local people benefit (in the short term) because of temporary opportunities for wage labour, but the tree cover is then heavily destroyed. A lose-lose situation occurs if people do not benefit from plantation development and if tree cover is not maintained in the long term.

2.3 Sustainable forest management

Forest management is important for people who gain a livelihood from the forest because people can only have a stable source of livelihood if forests are sustainably managed. In that way people can overcome their vulnerability based on forests. In case of severe deforestation and forest degradation, reforestation programmes are important to restore the tree cover. When plantations are established, they can provide a sustainable tree cover, but looking at the biodiversity and environmental services compared to natural forest, the plantations are poor in supplying them³. In this case forest plantations do have fewer opportunities for people to overcome their vulnerability. Forest plantations have more potential to grow food crops, as the space between the trees can be used to grow food crops during the first years of plantation establishment⁴. This could be beneficial for the people who live and work in forest plantations. So plantation development can be seen as a part of agriculture, more specifically as a specific type agroforestry, namely an agrosylvicultural system (Nair 1985: 104).

“Successful forests appear to have a significant role in the restoration of soil fertility, species composition and forest biomass in deforested tropical lands. A key decision for land managers who must restore the productivity of damaged tropical forest lands is whether to let natural

³ Shortly before printing this thesis, Earthscan announced a new book, entitled ‘Ecosystem Goods and Services from Plantation Services’, edited by Jürgen Bauhus, Peter van der Meer and Markku Kanninen (2010). The authors argue that the role of plantation forests in providing ecosystem services is often underestimated. Although they provide less environmental services than natural forests in terms of biodiversity conservation, carbon storage, provision of clean drinking water and other non-timber goods and services, they can play a vital role in providing such services compared to agriculture and other forms of land use and in situations where natural forests are severally degraded. In addition, they also contribute (as will be seen later in this thesis) to the provision of local livelihoods (www.earthscan.co.uk).

⁴ This opportunity disappears once the canopy has closed.

processes do the restoration job or intervene with management action that have the potential to be costly” (Lugo 1992: 248). The decision is with the land manager to accelerate the natural recovery of the forest. In many forests human intervention to restore the forest is necessary because the former forest lands were too heavily degraded. Rehabilitating forest cover can be done in different ways. First, by stimulating the natural recovery of plants and species and secondly by planting trees – although planting trees does not make a forest, because a plantation mostly consists of just one or two species. Tree planting is a faster but a more costly way of restoring forest cover. Forest recovery is a slow process, and when time is important forest plantations are an economically and ecologically good alternative. To recuperate tree cover, three different kinds of plantations are possible. First the plantation with only exotic plants, mostly applied to heavily damaged lands, where native plants aren’t able to grow. The second option is the recovery with native plants and trees in less damaged areas. The last option is a combination of both native and exotic trees and plant species (Lugo 1992).

With the establishment of commercial timber plantations, is it uncertain whether natural forests can be saved from felling. One could assume that extracting timber from forest plantations will reduce timber harvesting from natural forests. In this way plantations could indirectly contribute to natural forest recovery, by providing an alternative to timber production. In practice many plantations are planted with fast-growing trees with a low wood density and short growth cycle, in order to generate the best possible income. The result is two kinds of timber supply with different qualities and dimensions and therefore used for different ends. The development of timber plantations will therefore not substitute the logging of trees from natural forests.

2.4 Forest plantation development and climate change

2.4.1 Payments for Environmental Services

Natural forests and, to a more limited extent, forest plantations provide environmental services. According to the Millennium Ecosystem Assessment⁵, there are four major categories of environmental services: the supporting services (e.g. soil formation and nutrient cycling), the provisioning services (supply of goods), the regulating environmental services (e.g. climate and food regulation), and the cultural services (e.g. the aesthetic, educational and spiritual services). In order to conserve natural ecosystems a financial market mechanism was created called payments for environmental services (PES). The basic idea is that those who “provide” environmental services by conserving natural ecosystems should be financially compensated. According to Wunder (2005:9), payments for environmental services are defined as:

“A voluntary transaction where a well-defined environmental service (or land-use likely to secure that service) is being “bought” by a (minimum one) service buyer from a (minimum one) service provider.”

⁵ <http://www.millenniumassessment.org/en/index.aspx> (accessed 15-9-10).

The idea behind PES is that forest owners, private plantation developers or communities are paid for the environmental service that their natural forest or forest plantation provide.

There is a lot of attention for PES for forest conservation as a means to mitigate climate change through the reduction of carbon emissions from deforestation (estimated at 20% of total global greenhouse gas emissions). In the case of plantation development, private developers and communities would be paid for carbon sequestration⁶ by selling carbon credits based on the number of planted trees. In addition to the future timber benefits, plantation development can thus be stimulated by additional benefits from the trade in carbon credits. This is known as the climate change or carbon payment scheme (Asare 2010).

“Carbon is a naturally occurring element that flows between the atmosphere – mainly as carbon dioxide (CO₂) – and terrestrial ecosystems. The economic value of carbon will increase when it is sequestered in woody biomass, soils, and sediments.”

Carbon credits represent a unit of a certain amount of carbon dioxide reduced or removed from the atmosphere into biomass (Asare 2010). For example every planted mature tree sequesters a certain amount of carbon which equals a certain economic value. On the basis of this principle, forest plantation development could be involved in PES schemes, as is the case in Costa Rica where the government pays plantation developers for environmental services provided (Pagiola 2008).

Attention for the role of forests and plantation in climate change has resulted in new efforts to formulate global standards for forest carbon management and climate change payments (Wiersum 2009). When in the 1990s the idea of payments for environmental services (PES) emerged, this option was quickly embraced as a promising way forward to stimulate a combined conservation and development approach in community forestry (Wiersum 2009).

There are, however, several challenges that need to be addressed. First, as Asare (2010) warns:

“Terrestrial storage, however, is not permanent because when trees are burned or allowed to rot, or when the soil is substantially disrupted, carbon is emitted back into the atmosphere in the form of greenhouse gases that contribute to climate change” (Asare 2010: 11).

Secondly, in order to be able to compensate tree planters for carbon sequestration, the ownership and benefit rights should be made clear. In the words of Asare (2010: 17):

⁶ Carbon sequestration is a process by which carbon is removed from the atmosphere. This can be enabled by tree planting or enhancing natural regeneration (Asare 2010).

“Regardless of how carbon rights and ownership discussions are resolved, benefit-sharing mechanisms must be able to provide individuals and communities with real and tangible incentives. The question of who owns the carbon may be less important than considering how rural farmers, plantation developers and resource users will be compensated for their efforts to sequester or maintain carbon stocks”.

Tree tenure is important in order to be able to compensate the right person, company or community and involve them in carbon credit trading. In Ghana, questions of ownership and user rights to land and trees are complex and widely contested. Therefore Asare (2010: p. 13) makes it clear that:

“Land and tree tenure are neither congruent nor clear-cut issues, because land and forest resources are allocated within a legally pluralistic system in which ‘bundles of rights’ are claimed both ‘legally’ and ‘illegally’ by multiple stakeholders for the same overlapping resources. For example, it is unclear whether carbon credits from carbon sequestration, carbon storage (stocks), or even potential sequestration should derive from ties to the land, economic rights to trees, or an entirely new entity that links credits to the specific parameters of REDD, or ‘REDD-like’ activities, which might pertain to soils or other types of terrestrial systems in the near future”.⁷

Thirdly, policy and institutional approaches are essential for addressing the underlying drivers of deforestation, including issues around agricultural productivity and expansion, land and tree tenure, forest governance, land-use planning and subsidies (Richards 2010). The strengthening of governance is important, because currently poor governance is a big driver of deforestation and forest degradation. This includes a say for forest communities in how compensation payments are designed and implemented. Decentralization of decisions to local government or community-based forestry projects has created better opportunities for community input (Springate-Baginski 2010).

2.4.2 The Clean Development Mechanism

Under the Kyoto protocol, the Clean Development Mechanism (CDM) was formulated as a means to form official partnerships for funding reforestation as a way of sequestering carbon dioxide. Therefore developed countries were allowed to meet a part of their committed reduction of CO₂ emissions by supporting projects for emission reductions in developing countries. This agreement heralded the formal start of payment systems for reforestation as a means for carbon sequestration (Wiersum 2009). Because Ghana’s forestry development programmes antedate the country’s accession to the Kyoto Protocol, the CDM project activities already carried out under these programmes are considered to be non-additional and hence do not qualify for the CDM. For new projects, the CDM is seen as a potentially important source of extra funding for

⁷ See Section 2.4.3 for REDD.

reforestation projects (Abaidoo 2005:1). The government of Ghana will need such funds and other donor funding to proceed with the implementation of reforestation schemes. The Forest Plantation Development Fund created to encourage small-scale private investors and public sector institutions to embark on afforestation and reforestation is only an instrument for channelling funding, but is in itself not a significant source of funds.

2.4.3. Reducing Emissions from Deforestation and Degradation (REDD)

Recently, attention has turned to the scope for incorporation of community forestry within the newly proposed REDD⁸ (Reducing Emissions from Avoiding Deforestation and Forest Degradation) policy for climate regulation. In order to redress the difficulties experienced with the formalization of CDM partnerships, it was decided that the REDD payments should be arranged through national governments rather than through partnership projects. Thus, the introduction of the REDD policy involves a break with the process of decentralization in forest policy, and renewed attention to governmental policy arrangements (Wiersum 2009). Regarding the objectives of the climate payments, the CDM policy was focused on stimulating reforestation as a means for sequestering carbon dioxide, whereas the REDD policy is focused on preventing carbon dioxide emissions from deforestation and forest degradation (Wiersum 2009).

However, unlike the CDM, under which the volume of carbon sequestered is the basis for determining credits, REDD is actually about selling the ‘service’ of reducing emissions from forest degradation or deforestation (Asare 2010) and is linked to the effectiveness of slowing deforestation or degradation rates. As such, REDD is not relevant for plantation development. In literature, however, often reference is made to ‘REDD-like activities’ which actually refers to PES.

2.4.4 REDD and PES in Ghana

According to SLE (2008) REDD and PES in Ghana are still in their infancy. The most promising programme is the Readiness for Reduced Emissions through avoided Deforestation and Degradation (REDD) process, an initiative of the World Bank. Ghana is one of the 14 countries selected by the bank to prepare for the REDD process. At the moment the FC is collaborating with the Ghana office of the International Union for the Conservation of Nature (IUCN) on a demonstration site. Interviewed stakeholders have participated in workshops that discussed the readiness of developing countries for REDD. Although REDD is about mitigation measures, staff of the CCU (Climate Change Unit of the Forestry Commission) is aware of the connection between tropical forest and adaptation to climate change and therefore declares national forest rehabilitation and plantation programmes as adaptation measures.

PES is discussed by state institutions at all levels. One pilot programme is the REDD initiative which is defined by some stakeholders as a PES scheme in which carbon sequestration is

⁸ <http://www.redd-monitor.org/redd-an-introduction/> (accessed 5-10-10)

marketed as an environmental service. This initiative is in an initial phase, but may provide future insights into the opportunities and drawbacks for implementing PES schemes in Ghana (SLE 2008: 48).

However, relatively few initiatives have been started in Ghana with regard to forest plantation development and carbon sequestration. This is partly due to the lack of a national body that incorporates the specific knowledge and arrangements (SLE 2008: 48).

According to SLE (2008), in Ghana funding must be provided for the setup of any future PES scheme, including the funding of feasibility studies, training programmes, and capacity building measures. The sources of funding comprise government funds, international funds and funding through international NGOs. The Official Development Assistance (ODA) for the sector of natural resources and environment is subject to budget funding. Therefore the chance to ensure up-front funding for PES through the Ghanaian Government strongly depends on the priorities of the funding agreements between the government and its development partners (SLE 2008).

2.5 Conclusions

One of the important characteristics of the reforestation programmes is the difference between forest recovery and tree recovery. Tree recovery is mainly focused on single tree species, with lower tree densities. Consequently the plantations have less biodiversity and supply fewer environmental services than forests. Ghana's forest plantations development programme is mainly concerned with the planting of single tree species. The management of these forest plantations is done by government (HIPC-funded) and by private (commercial) developers. Exploitation of forest plantations is different from exploitation of natural forests. As tree planting is a long-term project and the trees need to be maintained, plantation workers are needed. The livelihoods approach is used to analyse how forest plantation development contributes to the livelihoods of plantation workers. A livelihood consists of five types of assets or capitals, namely human capital (like skills, knowledge, labour), social capital (like social resources and networks), natural capital (such as land, forest and water), physical capital (includes infrastructure, tools and equipment) and financial capital (which consists of financial resources). The implementation of PES schemes in the establishment of forest plantations could create additional benefits, particularly to plantation developers and hence provide an incentive to further plantation development. In such a case, private plantation developers are paid for carbon sequestration. There are however few, if any, examples of PES or REDD-related payments for plantation development in Ghana.

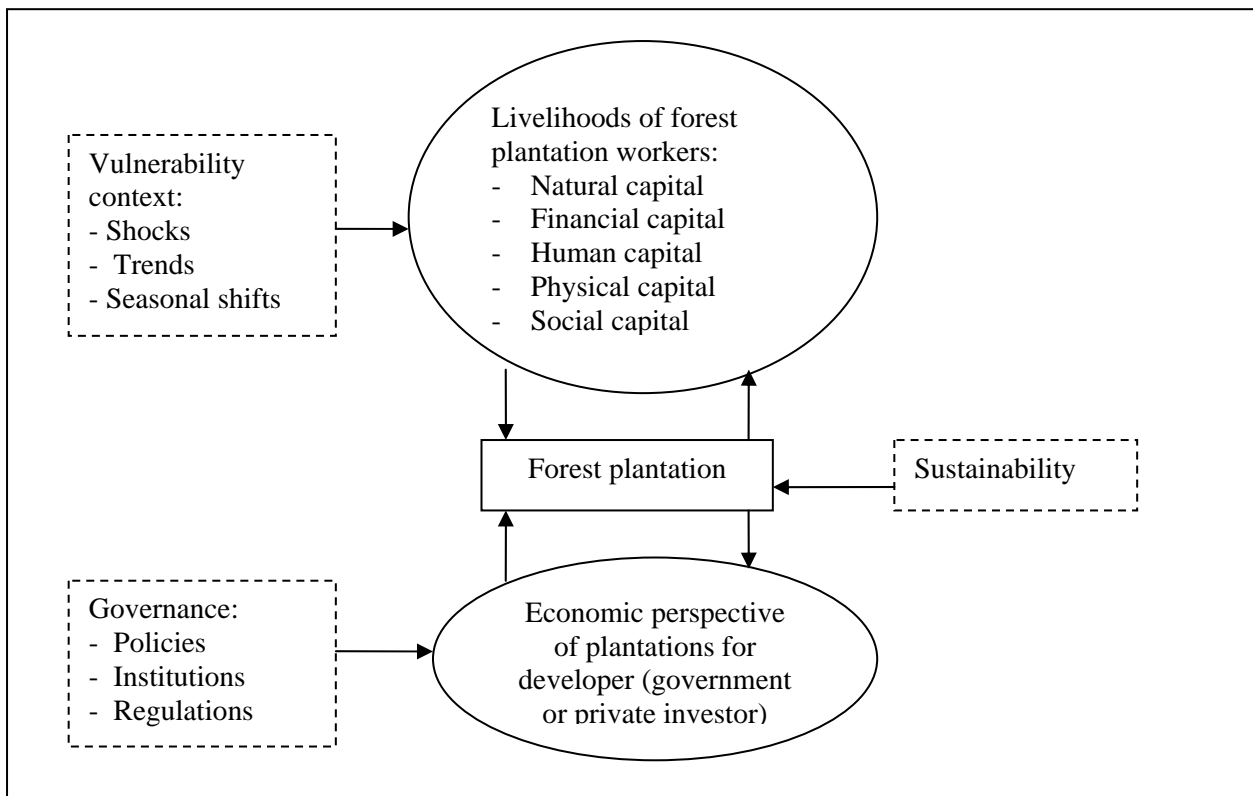
3 Methodology

This chapter discusses the methodology employed in this study. It starts with the conceptual model which is a useful appliance to guide data collection. It then discusses the operationalization of the concepts, indicating the source and properties of the variables. Lastly, the different data collection methods employed in this study will be discussed.

3.1 Conceptual model

Based on the research question and the theoretical framework outlined in Chapter 2 the following conceptual model can be drawn. This model shows the most important concepts used in this study and the relationships between them.

Figure 3.1: Conceptual model.



The forest plantation receives inputs from and delivers outputs to the plantation workers as well as to the developer. Inputs from forest plantation workers are labour, skills, knowledge (human capital), etc. Outputs generated from the plantation to the plantation workers are money (financial capital), specific skills (human capital), wood (for house building or cooking (physical capital)), and possibly farming land (natural capital). As a result, forest plantations have an effect on the livelihoods of the plantation workers who are connected to the plantation. The main inputs from the developer are money (financial capital), knowledge and organizational skills (human capital) and seedlings (natural capital). The output from the plantation to the investor is trees (natural capital), and timber (financial capital), when the trees are felled. So the inputs and outputs have both direct and indirect effects on the plantation workers and the investor.

Governance arrangements determine how commercial as well as the HIPC-funded forest plantations and the relations with surrounding communities take shape. This includes policies, regulations and institutions related to forest plantation development.

3.2 Operationalization of concepts

The schedule in Table 3.1 makes clear how the concepts of research have been operationalized.

Table 3.1: Operationalization of the concepts.

Concept	Dimension	Variable	Indicator	Information source
Livelihood of local community members	Assets	Natural capital	Access to / rights of land Ownership or lease of land, Distance to plantation	Villagers, Forestry Commission (FC)
		Human capital	Knowledge and skills related to tree planting	Village people
		Social capital	Membership / community contracts with investor/plantation.	Villagers, FC
		Physical capital	Tools for planting, maintaining and harvesting trees. Timber for domestic uses. Agricultural products. NTFPs	Villagers, PROFOR
		Financial capital	Employment on and off plantation. Ways of earning money.	Villagers, PROFOR
	Vulnerability context	Seasonal trends	Working days, full time / part time, seasonal work	Villagers
		Shocks	Sickness, extreme weather	Villagers
		Trends	Market price dynamics	Villagers
	Sustainability		Livelihood vulnerabilities, security	Villagers
Governance	Policies	Management	Planting, maintenance, harvest guidelines	Government officials
	Institutions	Management arrangements	Monitoring facility, permits, restrictions, ownership	Govt. officials, villagers
			Voice in decision-making, political empowerment, labour unions	Govt. officials, villagers
	Regulations	Access	Rights, funding	Govt. officials
Plantation	Characteristics For HPIC For CFPD	Inputs	Land, workforce, money, seedlings	Investor, FC
		Sylvicultural features	Species used, timber grow cycle; growth conditions	Investors, FC
		Sustainability	Harvesting guidelines	FC, investors
		Outputs	Money, timber, other products, etc.	FC, investors
		Certification	What kind of conditions/ characteristics, FSC principles applied?	Govt. officials, FC
Investor	Characteristics	Relation to area	Place of origin	Investor
		Economic characteristics	Economic position, livelihood portfolio	Investor
	Income from plantation	Cash	Selling of timber, selling of agricultural products	Investor
		Non cash	Wood, agricultural products	Investor

3.3 Data collection

Data collection occurred in the neighbourhood of Kumasi for several reasons. Firstly, Tropenbos International Ghana, which hosted this research, is located near this city. Secondly, this area is home to both types of forest plantations. Thirdly, there are logistical reasons: these plantations are located at a reasonable distance of around 100 km to Kumasi. All three study sites under the two plantations development schemes are located in the Offinso Forest District. This Forest District with an area of 1,255 square kilometres is located north of Kumasi. The Offinso FD has several forest reserves, which include the Asubima and Kwamisa forest reserves where the study took place. The Asubima Forest Reserve, which falls within the Ashanti and Brong Ahafo Regions, contains both the commercial plantation ('Beta') and HIPC funded types of forest plantations analysed in this study. The Kwamisa Forest Reserve, which share borders with the Brong Ahafo Region, contains the commercial plantation ('Alpha') in this study. The commercial plantation ('Beta') was selected after participating in a meeting of private plantation developers, united into an association called PADO (Private Afforestation Developers Organization).

Questionnaires were used to collect data about the livelihood portfolios of forest plantation workers (n = 145). These questionnaires contained questions about the five types of assets which form the total livelihood of the plantation workers, in order to see how beneficial the plantation scheme is to their total livelihoods. Some assets are more represented in the questionnaire than others because they were more relevant. The questionnaire (see Appendix 1) was slightly changed after the first plantation visit due to some ambiguities. Semi-structured interviews were used to interview key informants, like private developers, plantation supervisors and government officials (n = 4). During the first visit, a group discussion was held, but there were some challenges because some of the plantation workers' had limited knowledge of English and even of the local Akan language 'Twi'. These are migrants who had come from northern Ghana quite recently; and they could not speak 'Twi' very well though they understood the language. However, some information was extracted from these discussions, in particular on positive and negative consequences of forest plantation development, like benefits, threats, advantages and disadvantages.

The questionnaires were applied during working time of the workers at the plantation. This was the best way to interrupt the workers with the shortest possible time. At the plantation the workers were interviewed one by one. After finishing they were able to immediately pick up their work again. In this way they only stopped working for 30-40 minutes. The supervisors were interviewed the same way, but using a semi-structured interview list. In order to get a large number of respondents, three subsequent days were spent on each plantation to accomplish this.

3.3.1 The PROFOR tool

People tend to build their livelihoods around multiple activities, with – in the context of this study – a part of their livelihood to be earned via the commercial and/or HIPC-funded forest plantations. The PROFOR poverty-forest linkage toolkit⁹ can be used to measure livelihoods activities. “The toolkit offers simple methods for capturing data concerning the role of forests and trees in poverty reduction, including both indications of the direct cash contributions to poverty reduction that the forest may make, but also the wide range of non-cash income that poor people derive from the forest” (PROFOR¹⁰). The toolkit delivers local-level “snapshot data” on forest reliance and the livelihood and poverty reduction contribution of forests. Especially tool 4 turned out to be useful to investigate the influence of forest plantation development on the plantation workers’ livelihoods. This tool concentrates on the livelihoods analysis. With use of this tool, insights can be gained into people’s livelihood and in the proportion of cash and non-cash components of their livelihood portfolio. In this way the benefits from forest plantations to the plantation workers’ livelihoods can be measured. Important here is in what way people derive a cash or non-cash income from forest plantations development and what other activities are necessary to acquire a livelihood. Can people live solely on the forest plantation development activity or not and, if yes, for how long will people work fulltime on the forest plantations?

Box 3.1: PROFOR tool 4

The Program on Forests (PROFOR) is a multi-donor trust fund hosted by the World Bank. This partnership shares a goal of enhancing forests’ contribution to poverty reduction, sustainable development and protection of environmental services¹¹. It therefore provides analytical tools to better understand the forest as a source of livelihood. Especially tool 4 is useful in livelihoods research. The aim of this tool is to discover the extent of cash and non-cash reliance on forest resources. It also discovers the proportion of the total annual livelihood that comes from forest-based resources. This tool shows how dependent people are on forest resources to build their total livelihood. With this tool a distinction can be made between gender and wealth groups. By analysing the data, pie charts show how the livelihoods of the participants differ according to gender and different resources. For example, data could make clear that male participants from a particular village in Africa derive 35% of their cash income from forest products and 65% from farm products. This tool makes it easy to take a look into livelihood portfolios of the participants and how they are build up.

Source: Program on Forests, see (<http://www.profor.info>)

⁹ PROFOR means Program on Forests and is a multi-donor trust fund hosted by the World Bank dedicated to (i) harnessing the potential of forests to reduce poverty; (ii) Integrating forests in sustainable economic development; and (iii) protecting global forest values (<http://www.profor.info>).

¹⁰ PROFOR: Program on Forests, see <http://www.profor.info>.

¹¹ PROFOR: Program on Forests, see <http://www.profor.info>.

Elements from the PROFOR toolkit was used twice; once on a HIPC-funded forest plantation and once on a commercial forest plantation. It was done only twice because in one of the commercial plantations it was not really useful to do so as the only cash income of the workers is their wage, while other products were provided by the developer and no additional economic activities were undertaken. The tool is a useful instrument to gather data on the proportion of people's livelihoods that is based on their work on the plantation. Mainly the natural, physical and the financial assets are represented by using this tool.

3.3.2 Challenges and restrictions

A first limitation to my research was the English language, because I am not a native English speaker, although, my skills in English improved during my stay in Ghana. There can be slight differences in the interpretation of the language between myself and the respondents, whose mother tongue is not English either. This misinterpretation did occur with my research assistant. While translating the questions into the local language, some different expressions in English had the same translation in the local language of Twi, due to the fact that Twi has less vocabulary than the English language. After thorough explanation of the questionnaire and its meaning, this problem was solved. Another challenge was the presence of workers from northern Ghana and Burkina Faso, who spoke neither English nor Twi. In order to have them included in the survey, a second interpreter was necessary, who was luckily one of the plantation workers who interpreted between the local language of northern Ghana / Burkina Faso and Twi.

While administering the questionnaires at one of the plantations, not everybody was happy to be involved. They would rather work in order to get paid properly, which was their choice. In order to be able to apply enough questionnaires a small reward for their time was given. This was needed because the workers were kept from their work for at least half an hour. Therefore a piece of soap was given after finishing the questionnaire; a gesture that was generally well appreciated.

Another limitation was the distance between the study area and the city of Kumasi where I lived during my stay in Ghana. Due to transportation limitations I was not able to visit the villages at any time I wanted. Actual visits to the plantations had to be planned in advance in order to have a driver available. During the questionnaire surveys three days were spent to collect data during which we¹² stayed in a local guesthouse in one of the towns close to the plantation.

3.3.3 Ethics

An important ethical concern was whether my research brought harm to the respondents. In order to avoid these situations, participants were informed beforehand about the purpose of the research and the way in which the information was going to be used. I explained that the data would be in my possession only and that I would use anonymous quotations only. Subsequently,

¹² During fieldtrip visits, I was accompanied by a TBI driver, a research assistant and my local supervisor Thomas Insaadoo.

the plantation workers could decide whether or not they wanted to get involved in the study. A second ethical concern was the collection of data about illegal activities in the plantations, both on the part of the villagers and the investor. I opted for not presenting information about illegal activities in this thesis, in order to protect the respondents. In practice the plantations workers were very enthusiastic and hospitable. Several times they prepared lunch and dinner for us.

3.4 Data processing

Data was entered into SPSS, thereby transforming some open questions into dichotomous data in order to do better analyses. Important topics in the interviews with the developers (both private and public) were their characteristics (place of origin, economic position, livelihood portfolio), inputs (i.e. the assets which are needed to have a successful business), application of harvesting guidelines and sustainability standards, the outputs (products and income derived from the plantation), and their opinion about / perception of the relationship with people in adjacent villages.

Documents about governance issues about tree planting and harvesting guidelines or sustainability standards related to the CFPD and HIPC-funded plantations were collected from local government, particularly the Forestry Services Division of the Forestry Commission.

3.5 Summary

A total of 145 questionnaires were administered in three different forest plantations in the Offinso Forest District, divided over two commercial (private) forest plantations and one HIPC-funded (public) forest plantation. Furthermore the PROFOR tool was used twice, in order to compare a HIPC-funded and a commercial forest plantation in terms of relative cash and non-cash income provided. Several semi-structured interviews were held with government officials and private plantation developers. The primary subjects of this study are: how do the plantation workers build their livelihood and what are the economic motives of the private developers to engage in plantation development, and how are these affected by governance arrangements?

4 Forest Plantation Development in Ghana

This chapter discusses forest plantation development in Ghana. It describes the necessary requirements for the establishment of forest plantations, particularly the governance context of plantation development, the different types of forest plantation development, and the extent of plantation development.

4.1 Governance arrangements

The government launched the ‘National Forest Plantation Development Programme’ (NFPDP) in 2001. This programme encompasses three different strategies to reduce deforestation and to replant the degraded forests in the country via forest plantations in degraded forest reserves. In addition to restoring the forest cover in degraded forest reserves and improving environmental quality, the main goals are to decrease the wood deficit in the country, to create employment in rural areas with a view to improving the income of the rural communities and to increase the production of food crops (FC 2008).

4.1.1 Regulations regarding forest land

The forest areas in Ghana are divided into on-reserve and off-reserve areas. The on-reserve areas are managed as protection areas (game reserves, watersheds) and production areas. The off-reserve areas are used for food production as well as for timber and non-timber forest products (NTFPs). The on-reserve production areas are used for timber and NTFP extraction for both domestic and commercial purposes, as well as for other ecosystem functions. The on-reserve protection areas are meant to be kept intact without timber harvesting, but mainly for environmental services, though some NTFPs can be collected for domestic use. Forest reserve (on-reserve) areas which are qualified for forest plantation development are former forest areas, which are now heavily degraded. These areas are known as ‘degraded forest areas’ and allocated to plantation development to regain the tree cover. In the case of the Offinso forest district, all eight forest reserves are partly ‘degraded forest areas’, designated as ‘on-reserve’ areas available for forest plantation development. The harvest of trees is only allowed with a Timber Utilization Contract (TUC), according to the Timber Resources Management Act, 2003. To qualify for a TUC, the plantation developers have to be registered and a harvesting plan and an environmental assessment plan have to be provided to the Forestry Commission (FC 2008).

The first forest reserves were created at the beginning of 1920s at the time when cocoa farming started to grow. The first forest ordinance was constituted in 1927. With the introduction of the food crop, intensive destruction of large tracts of land including forests occurred to make way for cocoa plantations (FC 2008). Picture 4.1 shows the consequences for a former forest area, which is by now heavily degraded and being recovered with trees. Within the High Forest Zone, 1.76 million hectares (21% of the High Forest Zone) are permanently protected (see for example picture 4.2 of Kakum National Park). The reservation of forest areas was needed to protect the

remaining forest area. In order to qualify for a reserve, the lands should meet the following conditions (FC 2008):

- The area should guarantee the water supply of the district;
- Assist the well-being of the forest and agricultural crops grown on the lands or in the vicinity.
- Secure the supply of forest produce to the inhabitants of villages situated on those lands or in their vicinity.

But not all lands can be acquired for reservation; only those which are the property of the government, Stool land or lands offered at the request of the relevant authority (FC 2008).

Picture 4.1 and 4.2: Degraded area and protected forest reserve.



Photo: Lucien Hoogenbosch

After the creation of the reserves, not much attention was paid to land outside the reserves, the ‘off-reserve’ areas. It was taken for granted that within the creation of reserves, forest cover and benefits had been adequately secured. The off-reserve areas therefore were neglected and used and cleared with no systematic plan for regeneration, or respect for laws affecting timber and natural resources. The result was that between reservation in the 1920s and the end of the twentieth century, Ghana lost about 60% of her forest cover (FC 2008).

4.1.2 Ownership

In spite of the declaration of a reserve, ownership rights within the reserves are respected. Some of these rights relate to *admitted farms* which give the farmer rights and conditions under which to farm in a specific area after reservation. The farms are limited to the specific crops and cannot be expanded. There are also *admitted (communal) rights* which ensure the community’s use of the forest, and include hunting rights, footpaths to water sources, the rights to collect leaves, snails, chewing sticks and other forest products (FC 2008).

Alienation holdings refer to the rights of those who had purchased land in the reserve before reservation, but wished to preserve their interest in those lands. Their lands remained in the reserve and their ownership rights were unchanged. If any tree was felled on their portion of the forest, they were entitled to their share of the revenue. On the other hand, there were those who

had land in the reserve but did not want to continue owning land in the forest reserves, or whose use of the land was not consistent with the objectives of reservation. They were paid their purchase price *compensation payments* with interest to give up their rights to their land in the reserve (FC 2008).

The forest reserve land is communally owned and held in trust on behalf of the people through the stools and skins. However, the Concessions Act, 1962 (Act 124) vested all timber tree rights to the state on behalf of the stool landowners. So forest reserve land is under the control of the state (government), though the stools own the lands. The 'off-reserve' lands which are also owned by the stools and skins can be bought (outright purchase) or leased depending on the arrangement. Establishing a forest plantation on degraded on-reserve land is easy, but not cheap. The developer has to prepare a detailed reforestation plan and get it approved by FC. Then s/he pays for demarcation and mapping costs, and bears all necessary inputs including labour costs. However, the developer misses the advantage of owning the land and having more freedom to design his/her agricultural or forestry activities. All three forest plantations which are subject of this study are located on 'on-reserve' land that is controlled by the government. In both the commercial and HIPC funded forest plantations, the workers are able to collect some products from the plantation area, such as leaves and firewood.

4.1.3 Funding

The development of a forest plantation is an expensive investment, so the private developer should get some support from the government to start up the plantation. To this end, there is a plantation funding board, which has a specific budget to fund the developers' start-up after receiving their application. But as there are many private developers, the funding per developer is very low, so it is important that private forest plantation developers have other sources to fund the start of their forest plantation. The objectives of the plantation development fund are to provide financial assistance for the development of private forest plantations on land suitable for commercial timber production (Interview zonal plantation manager of the FC, April 2010).

Before the developer is able to get a loan s/he has to meet certain conditions to obtain the actual funding. The person should be capable of engaging in plantation programmes according to the law and has to submit an application. Besides this, the developer must already have started a plantation of a minimum of 1 hectare and there must be an available nursery to feed the plantation. There should be documentary evidence of ownership and assurances that the land is free from litigation. The funding consists of a budget up to GH ₵50 million (€ 25 million) (Interview zonal plantation manager of the FC, April 2010). After the grant or loan has been disbursed, there will be monitoring of activities to ensure that the land is being used properly. Forest plantation inspectors will monitor the progress of tree planting and give technical advice. Where loans are granted, the fund may receive its repayment in kind by taking a portion of the mature trees in place of cash payments. Initially, the focus of the fund was on industrial timber

such as *Tectona grandis* (teak), *Triplochiton scleroxylon* (wawa) and African mahogany (*Cedrela* sp.). Recently, other species used for firewood and charcoal have been added, even though they are not strictly timber species. The funding of the private developers is only meant to be assisting in starting up plantation development. It is the intention of the programme to have private developers established forest plantations without or with minimal government support and funding. Besides a small financial fund, the government does not give any other form of support. But in terms of 'on-reserve' the developer has the governments guarantee; documents that can be used as leverage to obtain credits (Interview zonal plantation manager of the FC, April 2010). The developer has to make some costs to start developing the forest plantation; demarcation and mapping costs need to be paid to the Forestry Commission in advance. The developers are supposed to pay land rent, which is based on the size of the land and the number of years the land is used. These rents need to be paid when the time of harvest starts (Interview private plantation developer, March 2010).

4.1.4 Benefit sharing agreement

Private forest plantation developers need to have agreed to a benefit sharing scheme. This is one of the conditions before developing of forest plantation. The benefit sharing agreement applicable to the private developers stipulates that 90% of the revenue is for the private investor, while the landowner, FC and community get 6%, 2% and 2%, respectively. The landowner has a share because s/he releases the land to the developer, the FC has a share because of the support and assistance, and the adjacent communities get a small share because they help to protect the planted trees, and because they partly depend on the forest areas for their livelihood (Interview zonal plantation manager of the FC, April 2010).

4.2 Extent of forest plantation development in Ghana

The establishment of forest plantations in degraded forest reserves is achieved through three different 'strategies', which are explained below. The commercial (private) and the HIPC-funded (public) forest plantations developments are subject of this study. Under the National Forest Plantation Development Programme, operational since 2001, a total area of 135,576 hectares of forest plantations nationwide had been developed by 2008. This encompasses an area of 32,652 hectares of HIPC-funded forest plantations and 15,032 hectares of commercial forest plantations. The remaining areas fall under the Modified Taungya System (MTS) and other developers like communities (NFPDP 2008).

4.2.1 Commercial Forest Plantation Development

The development of a forest plantation is an expensive operation. Since the government has not enough money to undertake all of it, private investors are stimulated to start a forest plantation. Private investors are supposed to finance their investment themselves; therefore the government doesn't assist financially per se. The government releases lands of the 'degraded forest reserve' to be developed by private investors. These are areas which are former forest reserves, which

have lost many trees through fire and logging and are in need of reforestation. Private developers acquire the forest land lawfully, as the FC releases the degraded reserve land after receiving applications and approving reforestation plans from investors. Their employees live generally on the plantation area. Although this is officially not allowed by law, this occurs under the denominator of ‘temporary hamlets’. After the application of the developer to the Forestry Commission, approval of the reforestation plan and the payment of demarcation and mapping costs (GH ₵726 or €363), the developer is able to start planting trees. Since the introduction of the NFPDP, the Ashanti Region had 214 active private developers registered for ‘on-reserve’ forest plantation development; they have planted 9,945 hectares with trees collectively till the end of 2008. Even more private developers (690) are registered for ‘off-reserve’ plantation development in the region (NFPDP 2008). This is an increase compared to the year 2007 when 116 private developers were registered for ‘on-reserve’ plantation development and 576 registered for ‘off-reserve’ plantation development (NFPDP 2007). Since the start of the NFPDP in 2001 every year more private investors are interested in forest plantation development. By the end of 2008 private developers had planted 15,031 hectares with trees. Until 2010 the government gave out 212 compartments of 128 hectares each to private developers to be planted with trees, with a total area of 272 square kilometres (27,136 hectares) nationwide (Interview zonal plantation manager, April 2010). Monitoring takes place periodically by the Plantation Department of the Forestry Services Division, to ensure the developer is doing his business according to the approved reforestation plan. Private developers can manage their plantation in several ways:

“Some commercial developers are smart, they go for the land and give the land to farmers as a taungya system (farmers are farming and planting trees), then you have free labour, and the trees grow and are protected. You need to pay them small, while the farmers are planting, weeding or maintaining the trees” (Interview private plantation developer, April 2008).

4.2.2 The HIPC-funded scheme

Government plantation development schemes, financed with HIPC-funds make use of hired labour and contract supervisors to establish industrial plantations. Plantation workers are hired and paid a monthly wage to establish and maintain forest plantations for the state; while plantation supervisors are given one year renewable contract employment to supervise and offer technical advice (FC 2008). Monitoring is done by the plantation department of FSD. The establishment of these plantations is funded through the Highly Indebted Poor Countries (HIPC) fund (see Box 4.1). The target for the HIPC plantation is 10,000 hectares a year for ‘on-reserve’ development (NFPDP 2008). The HIPC is also funding other tree planting activities, along roadsides, schools and churches (Greening Ghana Programme). As these developed plantations are owned by the government, the communities have no share in the future tree revenue. The entitled stool landowners are paid royalties and the government gets the largest share of the

revenue. Although it was not the intention of the plantation development plan to plant food crops between the trees, it is often allowed as land is available and no strict measures were taken to prevent it. The main purpose of the plantation development scheme is however the planting of trees.

Box 4.1: The HIPC funds.

The HIPC Initiative was launched in 1996 by the IMF and World Bank, with the aim being to ensure that no poor country faces a debt burden it cannot manage. Since then, the international financial community, including multilateral organizations and governments, have worked together to reduce the external debt burdens of the most heavily indebted poor countries to a manageable amount¹³.

A country with a high debt burden spends a large part of its annual revenue to service debts. The consequence is that very little is left for investment into social services, so poverty in the country gets worse. In the HIPC Initiative, the international creditors agree to erase the debts of the HIPC country over time so that the huge resources that would have gone into debt servicing are channelled into poverty reduction. It is these resources that are referred to as HIPC savings or HIPC Funds¹⁴. Ghana needed the HIPC fund due to the exceeding of the total debt obligation by the amount of goods and services that were produced in the year 2000. A third of the country's expenditure went to debt servicing. Therefore investments in social services, health and education were reduced progressively. The money which should be spend on debt relieve is now invested in projects to reduce poverty, for example in forest plantation development.

Source: <http://www.imf.org/external/np/exr/facts/hipc.htm>

4.2.3 The Modified Taungya System

The Modified Taungya System (MTS) involves the establishment of plantations by the government (FC) in partnership with farmers. The FSD assists with technical advice, surveys and demarcates degraded forest reserve areas and supplies tree seedlings and pegs (about 1 m long wooden sticks used to mark spots where tree seedlings are to be planted); while the farmers provide all the labour inputs in the form of site clearing, pegging (putting pegs in the ground to mark where the tree seedlings are to be planted and to guarantee uniform tree spacing; see Figure 7.1a and b), planting, tree maintenance and fire protection. The farmers are allowed to cultivate food crops which are planted between the trees on the same lands. As the farmers do all the labour, while not getting paid for it, they will have a share in the future timber revenue. They are entitled to 40%, whereas the government also gets 40% and the landowner and community will obtain 15% and 5% respectively. Many farmers in the MTS are migrant farmers, and they go back after 2 years, so the plantations are abandoned, which is not good for the trees as they need to be maintained. It is better for the plantation that the workers stay for a longer time; a

¹³ See <http://www.imf.org/external/np/exr/facts/hipc.htm> (accessed 23-9-10).

¹⁴ See <http://www.mofep.gov.gh/hipc.pdf> (accessed 23-9-10).

registration system makes this easier. Before starting, the farmers have to sign an agreement, in order to get the 40% tree benefit. The original Taungya system was modified, and extended with the benefit-sharing scheme because the scheme was boycotted by the farmers due to a lack of benefits and voice (Interview zonal plantation manager of the FC, April 2010).

4.3 Silvicultural characteristics

The government encourages planting multiple species in the forest plantation areas. It is good to plant different species to have a larger biodiversity and quality and a more diverse supply of timber. Forest will also better resist fire and diseases to which monocultures are more susceptible. In many plantations originally indigenous species were planted, but these appeared to be susceptible to fires after which the entire investment is gone. This was the case with *Cedrela odorata*, which was doing very well in the Offinso district, until fire destroyed it. So many developers do not take the risk, as they do know that fire is coming once in a while, but not exactly when. Most developers are mainly planting *Tectona grandis* (teak), as it is fire resistant after its first three years, which decreases the risk of destruction through fire. An exotic species from Asia, *Gmelina arborea* (gmelina) is another species planted. This species was originally introduced to be used for paper; but is no longer planted due to lack of demand. Both species have less natural enemies than indigenous species. If indigenous species are replanted on plantations, it is restricted to small areas, which can be protected from fire. Another benefit of teak is that it is fast growing. Thanks to this, the growth cycle is relatively short which makes this species an attractive investment. Normal harvesting time will be at least after 25 years, but is depending on soil, climatic conditions and the genetic composition. These conditions also affect the quality and the price of the timber. Obviously, the longer the trees are growing the better the quality becomes and the higher the price. Many developers could fell their trees earlier to have their investment recovered earlier. “The market for teak poles (for electricity) is huge and requires a growth cycle of 10 to 15 years, from which they start growing again” (Interview zonal plantation manager of the FC, April 2010). Of course these trees have a lower price than the taller and older trees. So the right time to fell the trees depends on the purpose of the timber and on the right price to sell. The developer can therefore choose between different growth cycles for the same tree, depending on the end use of the timber and on the term the developer wants to have his/her investment recovered. For many developers it is very attractive to have the first tree harvest after 15 years. The commercial developers are only planting trees which have a significant market value and are relatively easy to grow. Trees which have a low or no market value are very scarce, because the developer does make costs to plant and maintain them but cannot sell those trees due to a lack of demand. In such a way most plantations stay monoculture with one or at most two species planted.

Table 4.1: Main species present in forest plantations

Main species planted in the forest plantations:

- *Tectona grandis*¹⁵ (Teak)
 - Exotic species from South Asia (India).
 - Grows under a wide range of climatic conditions
 - Fire resistant
 - Fast growing; shoots can grow to 3 m in 2 years
 - Harvestable after 10 years
 - Height: up to 45 m
 - Average height after 5th year: 13 m (diameter of 10 cm)
 - Suitable for exterior and interior construction (furniture and house construction)
- *Gmelina arborea*¹⁶ (Gmelina)
 - Exotic species from South Asia (India).
 - Tolerant to drought
 - Fast growing tree
 - Very suitable for agro forestry
 - Harvestable from 15 years
 - Height: up to 30 m
 - Suitable for all kinds of construction
- *Cedrela odorata*¹⁷ (Cedrela) ('Spanish-Cedar')
 - *C. odorata* is most common in Southern and Central America, but naturalised in Africa as well. Often erroneously referred to as mahogany that belongs to the same family.
 - Most common in semi-deciduous forests
 - Fast growing tree
 - Tolerates a long dry season
 - Not fire resistant
 - Very good termites resistant
 - Height: up to 40 m
 - Average height after 1st year: 130-150 cm
 - Suitable for exterior and interior construction

The forest plantations are primarily developed to harvest timber trees, but in some cases food crops are planted as well. This happens in two ways; firstly intermixed with the trees and secondly on small single plots (with only food crops) in between the larger plots of trees. The disadvantage of the intermixing food crops and trees is that after four to five years when the canopy closes the food crops are not able to grow anymore, and the extra benefit disappears. A combination of both practices is used in some forest plantations. Alternating trees and food crops could be more durable if the plantation is expanded every year with newly planted trees. The forest plantations are mainly planted with fast-growing species, which can be used for multiple purposes. Table 4.1 presents information about tree species planted in forest plantations.

Many food crops are allowed to be planted, but in the HIPC-funded forest plantations and the MTS, there are restrictions with regard to planting cassava. Maize, yam, cassava and plantain are the most common food crops planted, while some minor species are cocoyam, beans, pepper,

From the AgroForestry Tree database:

<http://www.worldagroforestrycentre.org/sea/products/AFDbases/AF/index.asp> (accessed 28-6-2010)

¹⁵ <http://www.worldagroforestrycentre.org/sea/products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=1603>

¹⁶ <http://www.worldagroforestrycentre.org/sea/products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=914>

¹⁷ <http://www.worldagroforestrycentre.org/sea/products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=495>

onions, tomato, groundnut, papaya and watermelon. Maize can be harvested twice a year and be sold for good prices. Cassava is cultivated a lot because it is the main ingredient of the local Ghanaian dishes (Interview plantation supervisor, March 2008).

4.3.1 Economy vs. ecology

Forest plantation establishment has come with pros and cons from both economic and ecological perspectives. The plantations appear to be more beneficial for the investors than natural forests due to the full ownership rights available, management control and reduced bureaucracy. The use of single species makes the production more efficient and yields higher revenues per hectare. The felling of trees can be done throughout the year and is not restricted to one season. This provides a continuous income to the developer. Whenever the owner requires income to meet a need, trees can be felled. From an ecological perspective, forest plantations have disadvantages compared to natural forests. Forest plantations do not have the variety of species that natural forests have. This may enhance the intensity of and vulnerability to fire. For this reason, the outer edges and internal lines should be regularly weeded and regular inspection should be undertaken to ensure that susceptibility to fire is kept to a minimum. Due to the artificial creation of the forest plantation, the checks and balances in a natural forest are absent; this also raises the vulnerability to insect attacks and fungi (Interview plantation supervisor, March 2010). Good silvicultural practices can reduce these risks as well planting multiple tree species. Due to its artificial nature, the plantation habitat cannot support a diverse wildlife population. So the economic advantages go hand in hand with adverse ecological effects compared to natural forests. The government should consider whether the economic benefits outweigh ecological disadvantages.

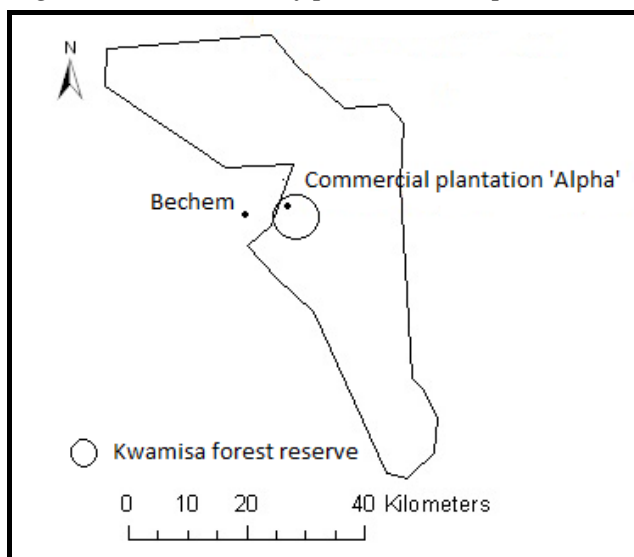
4.4 Summary

The 'on-reserve' 'degraded forest areas' are mainly designated as locations for both private and public managed forest plantations. Many private developers rent the land from the government. They have to pay the rent at time of the harvest so that it is beneficiary for them. Funding to start a plantation is available, but the intention of the government is to have private developers establishing plantations without government support. Benefit-sharing agreements are necessary and beneficial for local communities who are dependent on forest areas. There are three types of forest plantations development in degraded forest reserve areas, namely commercial, public and the MTS. By 2008, a total area of 135,576 hectares of forest plantations was developed nationwide. Private developers plant mainly species that are economically attractive. Therefore *Tectona grandis* is one of the most popular species planted: this species is fast growing, fire resistant and has a large market for sale. In smaller proportions *Cedrela odorata* is also planted in the study area but subject to intensive fire protection and management. As yet, there are no certified forest plantations in Ghana, nor forest plantations involved in carbon payments, but this market mechanism may hold a promise for the future.

5 Commercial plantation ‘Alpha’: characteristics and livelihoods

This chapter describes the characteristics of commercial plantation ‘Alpha’ and how it shapes the workers’ livelihood. The five assets and the vulnerability context of the sustainable livelihoods framework (SLF) are used to guide the data analysis. The information in this chapter is based on a semi-structured interview with the plantation developer and the questionnaires applied to 48 plantation workers.

Figure 5.1: Location of plantation ‘Alpha’.



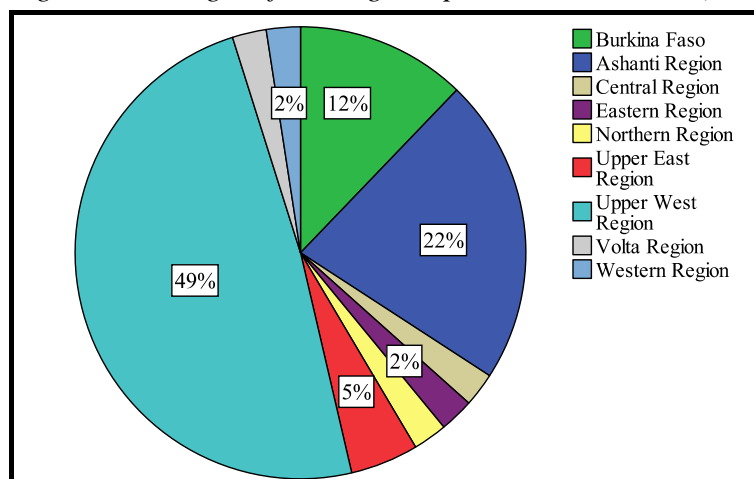
Source: Adapted from Africa data Dissemination Service¹⁸

5.1 General characteristics of the plantation

The commercial plantation (‘Alpha’), which was established in 2002 in the Kwamisa forest reserve, is located in the Offinso forest district in the southern part of the Brong Ahafo Region at the border with the Ashanti region (Figure 5.1). This plantation covers an area of 256 hectares divided into two compartments of 128 hectares each. The workers live in the village of Uropa, which is basically a ‘temporary’ hamlet located on the plantation and which is home to the workers of the plantation only. The settlement was built by the developer (and is owned by the company) to house the workers as the distance to the nearest town (Bechem) is 18 km, with the road being in an extremely bad condition. The settlement of Uropa is home to about 55 workers (22 men and 27 women) plus some children divided over several households. The plantation is quite isolated from other villages. Most of the workers are migrants (83.7%) from other regions of Ghana and Burkina Faso (Figure 5.2), although those from the Ashanti region (22%) can hardly be considered as such considering the plantation’s location near its border. The native workers (16.3%) are originally from the Brong Ahafo Region. The workers are almost equally divided between male (45%) and female (55%).

¹⁸ <http://igskmncnwb015.cr.usgs.gov/adds/index.php> (accessed 10-9-10)

Figure 5.2: Origin of the migrant plantation workers (n=41).



Source: Fieldwork, February- April 2010.

The work on the plantation includes several activities. Firstly, an area is to be prepared for planting trees and food crops; it is to be cleared and pegged (marking the spots where the tree seedlings are to be planted). Secondly, weeding is done to prevent competition with planted trees and food crops. Thirdly, tree maintenance encompasses pruning: branches are cut from the main tree stem to focus growth of the stem and ensure a straight tree bole. Fourthly, planting and harvesting of food crops are standard activities related to farming. Supervision is done by one or two people. Weeding is done by most of the workers. This is also one of the activities which is done throughout the year; as weeds keep growing this job is ‘never finished’. Only about a third of the workers are engaged in planting trees. The felling of trees is done by one or two chainsaw operators hired by the developer. The developer has some people in charge to supervise the workers, because he is not able to be on the spot on a daily basis.

In addition to planting and maintaining trees, the workers also grow food crops like maize, cassava and plantain and keep goats for the plantation owner, who sells the products in order to cover the labour costs. The food crops are cultivated in between the trees. A small proportion of the harvested food crops are for the workers’ daily meals.

The workers are employed five days a week and are paid by contract.

5.2 Characteristics and background of the plantation developer

The plantation developer started his career in the mechanical business, by selling car and truck spare parts, but has an agricultural background. He describes himself as a “farmer at heart” and “I was ‘agro best farmer’ of the year 1999”. He was always engaged in farming next to his mechanical shop which is his core business. He financed the start of the plantation with the profits from his mechanical shop. His primary motivation to step into plantation development was the desire to expand his mechanical business with a manufacturing plant. As this requires large investments, he thought he could best earn this with plantation development. The aim of

this investment is to sell the timber, preferably in a processed form to maximise benefits, and spend the revenues into his mechanical business. He is not sure how to process the timber in order to add value, but still has time to think that over because his plantation is not yet ready for logging.

A second motive to invest in plantation development was to help the government to reforest the area of Ghana:

“The Ghanaian community cut all the timber trees in previous years. One can see that there is a forest but no timber tree that is why it is a degraded forest; you cannot find a timber tree. So there is need for individual investors to support the government to replant the forests” (Interview private developer, March 2010).

Finally, he thinks it is good to help the community by creating employment.

5.3 The developer’s perception of governance arrangements

In order to be able to start developing the plantation 8 years ago, the investor needed land. With help from the FC, he obtained two compartments in the Kwamisa Forest Reserve. A reforestation plan, which contains information about the size of the land and the species to be planted, had to be approved by the FC. The plantation developer should also agree with a benefit-sharing scheme, which stipulates that 90% of the revenue is for the developer, 6% for the landowner, 2% for the government and another 2% for the local community living adjacent to the plantation. The 2% for the local community is to be spent on security and putting up fire prevention. The plantation developer was allowed to start clearing the land and prepare the planting of trees after signing the agreement. Because starting up requires money, he applied at the plantation development fund for a loan. The developer calculated a budget of GH ₵200,000 (€99,000 at the then prevailing currency rate), but the fund could only give GH ₵5,000 (€2,500). To retrieve these funds, the developer had to sign a contract. He did not like the arrangement and decided not to take the loan, because he could raise GH ₵5,000 himself. He didn’t regard the plantation development fund as a serious option (interview private developer, March 2010). The developer did not take this fund serious because they do not assist with large sums of money, due to the large number of investors who are applying for a loan.

The government was giving out free seedlings to farmers 15 years ago.

“The sad thing was, because it was free, most farmers did not put a lot of effort in growing the seedlings and the government stopped giving out the free seedlings” (Interview private developer, March 2010).

It meant the governments' mission to plant trees failed more or less. The developer personally did not receive any help from the government. He is of the opinion that if the government wants to achieve its goals it should give more support to the private sector, because the existing incentives are inadequate. The developer had complained about the road and water supply several times, but did not get any help and had to repair the road on his own in order to be able to transport the products from the plantation to the market.

The developer is also of the opinion that the government should set up a fund to compensate plantation developers for not felling the trees, so that "a real forest can grow back".

"Such compensation for not felling trees is also good for the greenhouse effect. It works elsewhere, but not in Ghana. When I get US \$5,000 every year, I will leave the trees standing for a longer time" (Interview private developer, March 2010).

So the developer thinks that there are certainly opportunities for Payments for Environmental Services (PES) in Ghana.

To have a greater say in decision making and to get more things done, the private developers are united in the PADO (Private Afforestation Developers Organisation), which has around 40 members from the Offinso Forest District. Organised, the plantation developers can accomplish more. At the moment the organisation is discussing ways to get more investors interested in tree planting and is currently working on an internet site which should take care of publicity and attract more investors, also from abroad. It is important to attract more plantation developers, because there are a lot of opportunities for future investors, as there is enough land for reforestation and a sufficiently large pool of workers to be employed. The government stimulates private investments, but has a lack of means to finance it. According to this plantation developer, the government does not know what should be done to create successful private tree farms and attract more investors from Ghana as well as from abroad, because plantation developers are not involved in policymaking.

5.4 The plantation's contribution to the workers' livelihoods

This section analyses how the plantation contributes to the workers' livelihoods, using the five assets from the Sustainable Livelihood Approach (DFID, 1999).

5.4.1. Financial capital

The workers receive a loan of GH ₵12.5 (€6.25) (women) or GH ₵17.5 (€8.75) (men) for five days work in tree planting and maintenance.

"If you are a women, you have to weed around 50 stands of teak trees per day, and then you get paid GH ₵2.5 (€ 1.25). If you are a man, you should do 80 stands and

gets paid GH ₵3.5 (€ 1.75) per day. The workers are paid for 5 days. On Friday they do unpaid farm work for the company in return for food and accommodation. Tuesday is a day to rest and go to town. On that day, a company tractor brings them to the market” (Interview private developer, March 2010).

Money is usually used to buy food, clothes and medicines or to save money for a bicycle, a piece of land and a home.

The workers express sentiments that their wage is low. Three quarters of them think that their income is negotiable, but once their contract is signed, a certain wage is agreed upon. Since January 2010, the national daily minimum wage was raised by 17 per cent from GH₵2.65 to GH₵3.11 which took effect as from February 1, 2010¹⁹. The women are paid lower than the minimum, even before the raise, and the men earn slightly more than the daily minimum wage. However, thanks to the free food and accommodation the workers are able to save money, which is quite necessary if they work as a migrant worker and have to go back to their families after a while. The workers receive non-cash income in the form of free food. The most commonly planted food crops are cassava, plantain, maize and (coco) yam. These are the main food crops which are being sold by the developer. The developer determines which food crops the workers have to plant. A small proportion of these food crops are used for the workers’ food consumption. In addition, some vegetables (pepper, tomato and onions) are grown, mainly for the workers’ consumption. The developer assigned some workers the task to rear goats and chickens.

5.4.2 Human capital

Looking at the educational level of the workers, 51% has no education at all. As can be seen from Table 5.1, the male workers generally have a higher schooling degree than the female workers. Most of the female workers have no education (78%) or primary education (15%), compared to 18% and 14% of the male workers, respectively.

Table 5.1: Educational level of plantation ‘Alpha’ workers by sex (n=49).

		Educational Level				
		None	Primary	JHS/MSLC	SHS	Total
Sex	Male (n = 22)	18.2%	13.6%	50%	18.2%	100%
	Female (n = 27)	77.8%	14.8%	7.4%	0%	100%
	Total	51%	14.3%	26.5%	8.2%	100%

JHS = Junior High School; MSLC = Mid School Level Certificate; SHS: Senior High School.

Source: Fieldwork, February- April 2010

¹⁹ (<http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=175749>)
(accessed 20-9-10)

The average age of the workers is 37 years²⁰; 41 for male workers (ranging between 19 and 65) and 31 for female workers (ranging between 18 and 55). Almost 80% of the workers are married, but they do not live together as most of them are migrants and staying for a shorter time to work and save money to send to their family. Some workers might have been migrated as a family, but the larger part migrated individually. The distance from the settlement to the place where they work on the plantation can be up to 5 kilometres, as the plantation covers a large area and the workers are housed at the edge of the property. The workers work 6 hours per day, on average, ranging from 4 or 8 hours.

The workers receive health care in case of emergency.

5.4.3 Physical capital

The workers receive free accommodation, which creates the ability to save money and care for the family. The developer has also provided a pump for the provision of drinking water, which the workers appreciate a lot. The workers complained about a lack of working equipment, such as cutlasses and wellington boots.

The feeder roads leading to the plantation are in bad shape, so conveyance of people and harvested food crops is difficult and frequently leads to accidents in the rainy season²¹. A 4x4 car is needed most of the time to reach the plantation and the workers' settlement. The company has one tractor which is used for the weekly transportation of food crops and workers.

5.4.4 Natural capital

The workers have no land for themselves to grow food crops, but are able to collect some non-timber forest products including firewood and bushmeat from the plantation area. All land which is cultivated by the plantation workers is owned by the developer and he has the final say in how to develop his plantation. The food crops and trees are planted, maintained and harvested by the workers, but remain the developer's property, although the workers receive some food crops for free for their daily meals.

5.4.5 Social capital

The workers are living close to each other and have multiple family ties. These are important as many new workers are hired through the family networks of the already employed workers. The family ties need not to be in the first (children) or second degree (brothers, sisters) nor concern the worker's partner.

²⁰ 10 workers were not able to tell their exact age.

²¹ Illustrative in this respect is that our 4 x 4 car got stuck on the way to the plantation, whereas we went there beyond the rainy season.

5.5 Stability of employment

All workers are, in principle, employed throughout the year. A large proportion of people (65%) are employed less than 1 year, 29% works on this plantation between 1 and 4 years, and another 6% has been working from 5 up to 8 years. Only one person, the plantation supervisor, is employed since the start of this plantation. This confirms the picture that many workers, mostly migrants from other regions in Ghana and Burkina Faso, work at this plantation for a limited time only and return to their home region after one or two years. Table 5.2 shows that 76% of the workers expect the benefit (income from the plantation) to be short term only, which could imply that workers work one or two years and then go back to their families with the money they earned. Even the native workers expect their work and income to be short term, possibly because they are looking for a better paying job. Hence, the developer has to employ new people every few years as many migrants go back to their families. Both native and migrant workers see their benefits to be valid for the short term only.

Table 5.2: Expected durability of the benefits from plantation 'Alpha' by origin (n=49).

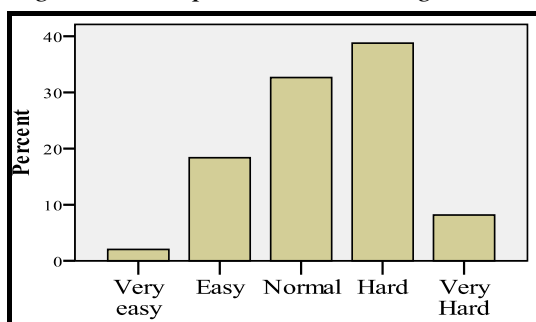
		Origin		
		Native (n= 8)	Migrant (n = 41)	Total
Expected durability of the benefits	Long term	25%	24.4%	24.5%
	Short term	75%	75.6%	75.5%
	Total	100%	100%	100%

Source: Fieldwork, February- April 2010

5.6 Workers' perceptions of working conditions

Figure 5.3 illustrates the workers' perceptions of the working conditions. A substantial portion of the workers experience the work as hard (39%) or very hard (9%) and 33% finds the work regular. Around 20% of the workers experience the work as easy to very easy. This is different for every person because it depends on the physical condition of the individual workers to experience their work load. 53% of the workers feel that the amount of work to be done has increased, 42% experienced no increase or decrease in workload and 5% had the idea that they had less work to do than before.

Figure 5.3: Experienced working conditions on plantation 'Alpha' (n =49).



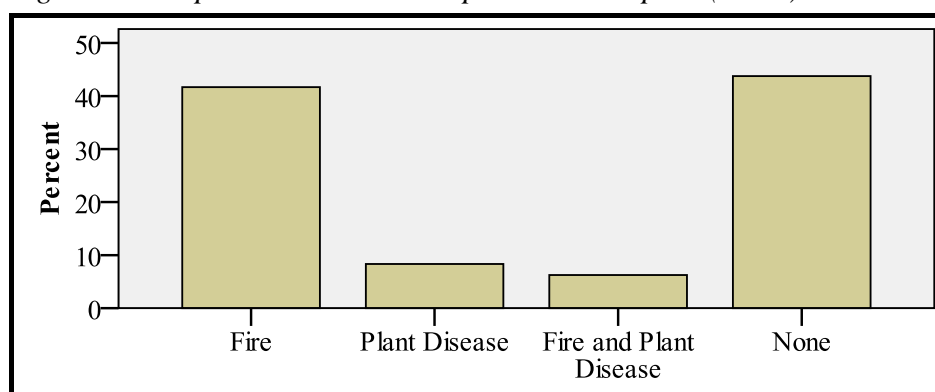
Source: Fieldwork, February- April 2010

The main improvement the workers would like to see is an increase in wage (51%). Better supply of working equipment, such as wellington boots and cutlasses, was mentioned as well (37%). Since the workers have no individual land to farm, 20% would like to have a small piece of land to grow some food crops. If workers have a small piece of farming land they depend less on the food they get from the developer, the variety of which is rather low. Another 20% is fine with the existing conditions and do not need any improvements.

5.7 Vulnerability context

Fire and plant disease are the most common shocks experienced on the plantation (Figure 5.4). But this does not negatively affect workers' livelihood, as their wage is paid anyway. The consequences and the extra costs associated with these shocks are for the plantation owner (in this case the developer) who has to replant trees and make extra costs. This could indirectly lead to a delay in wage payment or lower wages as the investor has to compensate extra costs. By planting teak trees, which are not vulnerable to fire, these shocks can be reduced. Also good fire prevention management can help. 40% of the workers did not experience any shocks at all, because a large proportion of them has been employed for less than a year and were not able to experience any shocks as yet.

Figure 5.4: Experienced shocks on plantation 'Alpha' (n=49).



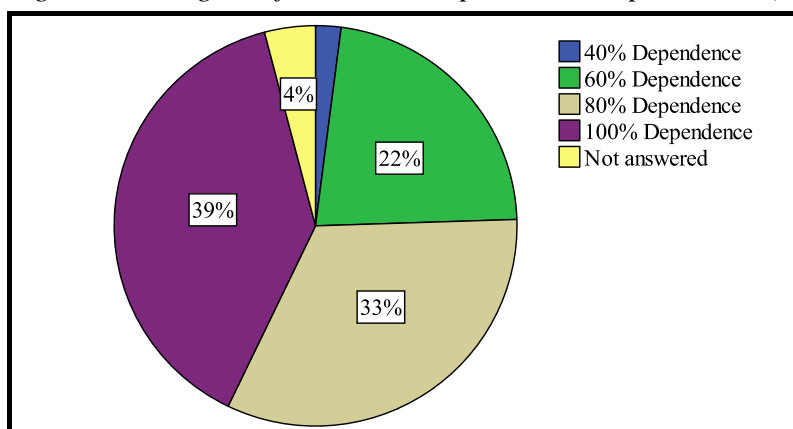
Source: Fieldwork, February- April 2010

The occurrence of shocks could lead to extra work, for instance because the land is to be recovered from fire damage. Fire also affects the food crops which could lead to food shortages among the plantations workers. In this case the workers are vulnerable as well, but this could be minimised through fire prevention.

In order to assess how diverse the livelihoods of the workers are, a question was posed on the importance of the work on the plantation to the workers' total livelihood. The workers could give a grade from 1 to 5, with each grade corresponding to 20% of their livelihood. The results are shown in the pie chart in Figure 5.5, which shows that almost 39% of the workers' livelihoods fully depend on their work on the plantation. For 33% of the workers this was 80% and for 22%

only 60%. Non response to this question was 4%. Other income-generating activities undertaken by plantation workers mainly fall under petty trading.

Figure 5.5: Degree of livelihood dependence on plantation (n=49).



Source: Fieldwork, February- April 2010

5.8 Conclusions

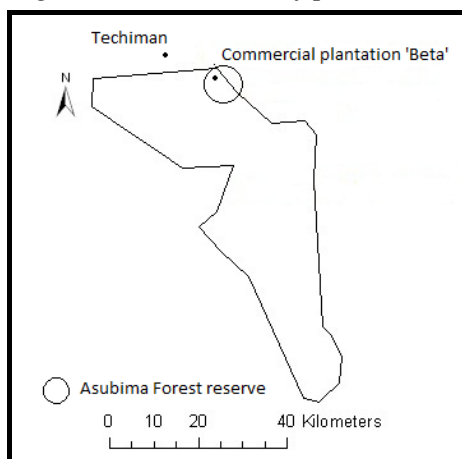
This chapter reviewed the main characteristics of ‘Plantation Alpha’, its developer and workers, and analysed how it contributes to the workers’ livelihoods. The plantation, located in the Brong Ahafo Region at the border with the Ashanti region (Offinso forest district) was established in 2002 in an effort to raise money for investments in the developer’s main business, a mechanical shop. Most of the plantation workers, 55% male and 45% female, and with an average age of 37, are migrants from other regions in Ghana and Burkina Faso. The main livelihood benefits they derive from the plantation are financial capital (cash income in the form of wage and non-cash income in the form of food and water) and physical capital (accommodation and weekly transportation to the nearby town over a road that is being maintained by the plantation owner). Wage is paid in return for a 5-day workweek, whereas one day of unpaid farm work is to be done in return for food. Although the wage is low and their living conditions basic, the workers are able to save some money because they do not need to pay for food and shelter. In addition to the benefits received, the workers are allowed to collect firewood and non-timber forest products from the plantation area, which enlarges the number of livelihood components. Social capital (mainly family ties) plays an important role in obtaining a job at the plantation.

The plantation workers’ livelihood can be regarded as stable, because plantation development is a long term investment and needs maintenance throughout the growth cycle of the trees. Labour demand on the plantation is continuous, although the number of employees can be subject to fluctuations when new areas are to be prepared for planting, trees are to be harvested or areas are to be recovered from fire damage. Although this particular plantation could provide a stable livelihood to a large part of the employees, the majority of them perceive the benefits as being short term and would prefer improvements in terms of wage, equipment and accessibility to a piece of own farmland.

6 Commercial plantation 'Beta': characteristics and livelihoods

This chapter describes the characteristics of the second commercial plantation (denoted as 'Beta') and analyses how it shapes and contributes to the workers' livelihood. As in the previous chapter, the five assets and vulnerability context from the sustainable livelihoods framework (SLF) guide the data analysis. The information in this chapter is based on a semi-structured interview with the plantation developer and the questionnaires applied to 48 plantation workers.

Figure 6.1: Location of plantation 'Beta'.



Source: Adapted from Africa data Dissemination Service²²

6.1 General characteristics of the plantation

This plantation is located in the northern part of the Offinso district, in the Asubima Forest Reserve and covers an area of 1,024 hectares, divided into eight compartments of 128 hectares each. This plantation was established in 2000, and by 2010 six compartments had been developed, while two other compartments are still to be developed in the future.

Picture 6.1: Temporary housing on the plantation.

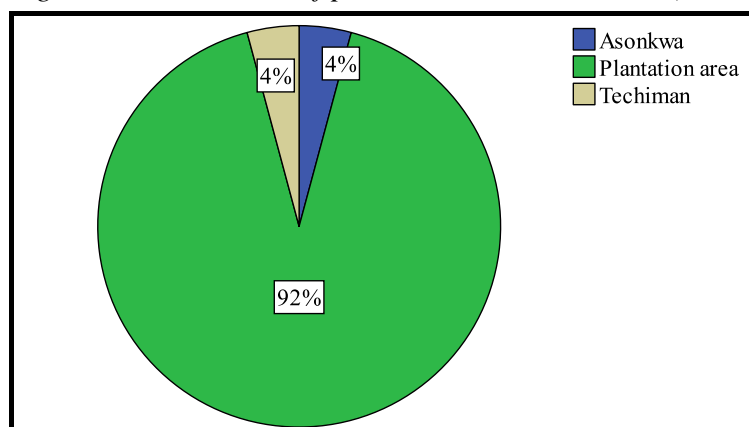


Photo: Lucien Hoogenbosch

²² <http://igskmncnwb015.cr.usgs.gov/adds/index.php> (accessed 10-9-10)

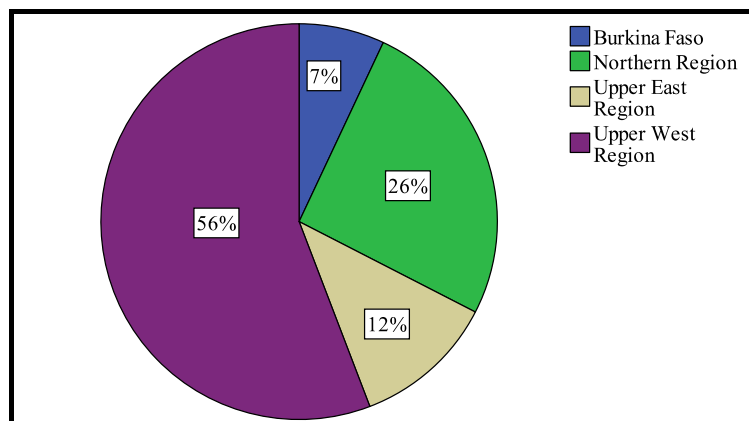
In order to reduce travel time and costs, the plantation workers are living in small temporary hamlets scattered within the plantation (Picture 6.1). This scattered housing pattern is important to protect the plantation against illegal farming and tree felling. The hamlets, which are home to about 100 people, have informal names, like Issifu-Akura, Kodekrom and Memfambako (Interview plantation developer, April 2010). The houses are built by the workers who extract all building materials from the surrounding forest and plantation area. Only migrant workers (94% of the total) live on the plantation. The native workers do not live on the plantation area, but in the villages of Techiman and Asonkwa (Figure 6.2). The migrant workers come from northern Ghana and Burkina Faso (Figure 6.3).

Figure 6.2: Residence of plantation 'Beta' workers (n=48).



Source: Fieldwork, February- April 2010

Figure 6.3: Region of origin of migrant workers at plantation 'Beta' (n=43).



Source: Fieldwork, February- April 2010

The main species planted is teak (*Tectona grandis*). Other exotic species like *Cedrela* sp. are planted along the riverside. Because a part of the plantation area is allocated as farming plots for the workers to grow food crops, not the entire area is planted with trees. Sometimes the workers sell the crops to have an additional income. The developer allocated the land to them because he is not employing the people full-time. At least once a week the farmers work for the developer to

weed and maintain the teak trees. If more work is needed, like in the planting season, the workers are temporarily hired for more days.

As on the plantation discussed in the previous chapter, the workers are engaged in many different activities. Also in this plantation, weeding is the main activity. This developer has a tractor with a plough to prepare the land for planting trees and food crops, like plantain, maize and cassava. Preparing the land with a tractor makes the work easier for the workers and saves time. Likewise, less labour is needed which also saves costs for the plantation developer because clearing and preparing land manually is much harder to do. Planting and harvesting of food crops is done by the larger proportion of the workers. Both the developer and the workers themselves grow food crops, so this activity is done on the land of the developer as well as on the smaller individual plots of the workers. There are no workers with supervision tasks, because the developer takes this job for himself; he is present at his plantation on a daily basis. No workers are engaged in fire protection, which is quite remarkable, because fires do occur every once in a while. However, fire protection can be done indirectly by weeding, land preparing and tree and food crop planting. Inflammable material, like grass, weeds and branches is removed from the area, thus reducing susceptibility to fire.

6.2 Characteristics and background of the plantation developer

The developer comes from a farm family and is farming since 1978, mostly food crops. In 2000, he decided to start planting trees and grow less food crops. He did so motivated by the fact that planting timber is a good investment for the future and that he had experience with the Taungya system. Another motive to plant trees was growing timber scarcity. To finance the start of the plantation the developer got a loan of GH ₵2,000 (€1000) from the government after he got assigned the land. The subsequent years he also applied for financial support, but did not receive any, so it was difficult to expand the area with trees. Instead he got financial help from relatives to expand his plantation. The planting of food crops was needed to pay for the workers' wages, as well as for future expansion. He is planting mostly maize for the market and to a lesser extent also yam, cassava and groundnut. Every year when the food crops are sold, he is able to finance some expansion of the plantation, for which there is still no government support. The lack of financial assets is also the reason to allocate small farm plots to the individual workers. If they work most of the time on the farm plots allocated to them, the plantation developer does not need to pay them.

Because of strong family ties the developer is able to recruit enough labour to his plantation. The surrounding community receives 2% of the tree revenue, the stool land owner (the chief) receives 6%, and the Forestry Commission 2%. The rest of the revenue (90%) is for the developer. The developer has supported the building of a school in one of the villages adjacent to the plantation. This plantation shares boundaries with another commercial plantation, FORM Ghana. With help from this company the developer could improve his plantation, particularly by benefitting from

his neighbour's knowledge of tree planting and tree seedlings production. Another advantage is that he sells food crops to workers employed by the neighbouring company, who are not allowed to plant food crops for themselves.

6.3 The plantation's contribution to the workers' livelihoods

Like in the previous chapter, this section analyses how the plantation contributes to the workers' livelihoods, using the five assets from the Sustainable Livelihood Approach (DFID, 1999).

6.3.1. Financial capital

The developer only pays the workers for the days that they work for him. When a job is to be done, the plantation owner hires a small or larger group of workers, depending on the activities that need to be done. This is particularly the case in the rainy season when more labour is needed, because of tree planting. Therefore 31% of the workers work for the developer only in the rainy season. In other parts of the year they spend time on farming. When a worker is employed, s/he receives an average wage of GH ₵1.80 to GH ₵2.6 (€0.90 to €1.30) per day. As the workers do not work every day, their wage is not their primary source of income. The workers spend more time working on the individual plots allocated to them, and they sell the products from these plots on the local markets to earn an income. Besides crop farming, some workers are assigned by the plantation developer to herd goats and chickens which provide meat and eggs both for the plantation workers' consumption and for sale (generating an additional income for the plantation developer). The workers are employed to different degrees. Some of them work for the developer three or four days per week, while others (particularly women) did not yet work for the developer at all and are only occupied with farming their individual plot.

Only 6% of the interviewees said the wage was too low to care for their family, but generally the workers are happy with their income.

One third of the workers were of the opinion that it was possible to negotiate about the income, but 56% said this was not an option (non-response to this question was 11%). One of the workers confirmed that:

“We agree the wage before starting to work on the plantation. We then decide whether we want to work at this plantation” (Interview plantation worker, April 2010).

6.3.2 Human capital

Almost 65% of the plantation workers have no education. As can be seen from Table 6.1, the male workers often have more schooling than the female workers. Most of the female workers have no education (73.3%) or primary education (26.7%) at most.

Table 6.1: Educational level of plantation 'Beta' workers by sex (n=48).

		Educational Level			
		None	Primary	JHS/ MSLC	Total
Sex	Male % (n = 33)	60.6%	30.3%	9.1%	100%
	Female % (n = 15)	73.3%	26.7%	0%	100%
	Total %	64.6%	29.2%	6.3%	100%

JHS = Junior High School; MSLC = Mid School Level Certificate; SHS = Senior High School.

Source: Fieldwork, February- April 2010

The average age of the workers is 36 years (31 for females and 38 for males)²³, ranging from 21 to 72 years. The daily working time (either for the plantation developer or on one's farming plot) is 7.5 hours.

A larger proportion of the workers are male (69%) than female (31%). Around 83% of the workers are married and 17% are single, divorced or widowed. The dominance of male over female workers suggests that many workers migrated individually to this plantation in search for work leaving their wives home in the region of origin. However, some migrant workers' wives are living on the plantation as well, as I discovered during interviews with women, who said that they did not work for the developer, but that their husband does.

The developer provides healthcare in case the workers need it, as well as help in the education of children of some plantation workers.

6.3.3 Physical capital

The existing roads are in bad shape, so transport of people and harvested food crops is difficult. The workers were renovating some feeder roads at the plantation (at the time of my visit); large holes were filled with stones and topsoil. There is one tractor which workers can use to visit the market in nearby towns, whereas some workers have bicycles and a happy few have a motorbike.

6.4.4. Natural capital

All workers have small farming plots where they can grow food crops for consumption as well as for sale. Basically, every worker is working part-time for the plantation developer and spend the rest of the time on own farming or other income-generating activities. Although they work part-time, the workers are living on the plantation throughout the year.

The food crops planted by most of the workers are maize (98% of the workers) and yam (94%), cassava (63%) and beans (60%). Other cultivated food crops are plantain (23%), groundnut (30%), tomato (27%), papaya, watermelon and pawpaw (8%), as well as leaves of indigenous plants which are used as vegetables, particularly by those from northern parts of Ghana.

²³ 2 workers were not able to tell their exact age.

Most workers live close to their farm plots within the plantation area, and are able to collect NTFPs in the neighbourhood, especially building materials such as clay, timber, grass and leaves. More than 77% of the workers are happy with the availability of farming land, which makes them less dependent on work for the developer. There are even workers who are just farming in this plantation and did not work for the developer until the time of the interview. Hence, the workers use natural capital primarily to obtain financial capital by selling their food crops on the market.

6.3.5 Social capital

In terms of social capital family ties are particularly important in obtaining a job or farming land on the plantation.

6.4 Stability of employment

The stability of the workers livelihood collection depends on the length of stay on the plantation. On average, the workers already lived five years on the plantation when I visited the plantation in April 2010. Although many workers are migrants, they have stayed for a long time. The main reason to migrate is the lack of livelihood opportunities in agriculture at their place of origin, as a plantation worker remarked:

“Because of the bad farming conditions, I migrated to the south” (Interview plantation worker, April 2010).

At this plantation the workers have plenty of farming options, a reason for them to stay for a longer time.

Table 6.2: Experienced benefits from plantation ‘Beta’ (n=48).

Experienced benefits	% mentioned
Commercial use food crops	97.9
Domestic use food crops	89.6
Free farmland	77.1
Income	10.4

Source: Fieldwork, February- April 2010

The workers really enjoy their private piece of farm land and consider this as the most important benefit from the plantation (Table 6.2). This table also shows that the income, earned with work for the developer, is considered a minor benefit; only 10% of the workers find this important.

Table 6.3 relates the perceived benefits to the migrant status of the workers. These benefits include the wage and other livelihood benefits, such as the opportunity to farm. It shows that 100% of the native workers expect the benefits from the plantation to be long term, compared to

only 20% of the migrant workers. The majority of the migrant workers (80%) expect the durability of the benefits from the plantation to be short term.

Table 6.3: Expected durability of the benefits from plantation 'Beta' by origin (n=48).

		Origin		
		Native (n = 3)	Migrant (n = 45)	Total
Expected durability of the benefits	Long term	100%	20%	25%
	Short term	0%	80%	75%
	Total	100%	100%	100%

Source: Fieldwork, February- April 2010

Specified for the duration of their employment over the year, it turns out that 93% of the seasonal workers have short term perspectives on the plantation's benefits (Table 6.4). Most seasonal workers have a short term perspective because they are unsure about whether they can return to the same job next year. Among those employed throughout the year, the proportion of workers who expect the benefits to be long term is higher (33%), but still two thirds of them expect the benefits to be short term. An explanation can be that the workers do not work many days for the developer. As they basically cultivate their own small plots and as the growth cycle of food crops is a few months, they are unable to look beyond the planting and harvest cycle of the food crops as far as their livelihood is concerned.

Table 6.4: Expected durability of the benefits of plantation 'Beta' by seasonality of employment (n=48).

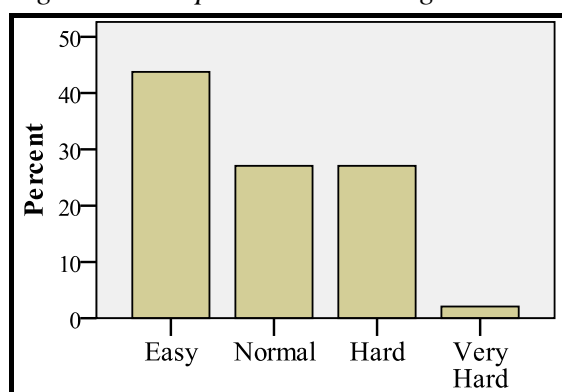
		Expected durability of the benefits		
		Long term	Short term	Total
Employment	Employed throughout the year % (n =33)	33.3%	66.7%	100%
	Seasonal workers % (n = 15)	6.7%	93.3%	100%
	Total %	25.0%	75.0%	100%

Source: Fieldwork, February- April 2010

6.5 Workers' perceptions of working conditions

Figure 6.4 illustrates the workers' perceptions of the working conditions. A substantial portion of the workers expressed the view that the work as easy (44%); around 27% of the workers had the feeling that the work is hard to very hard (2%). This is different for every person because, it also depends on the physical condition of the individual workers, as to how they experience their work load.

Figure 6.4: Experienced working conditions at plantation 'Beta' (n=48).



Source: Fieldwork, February- April 2010

70% of the workers feel that the quantity of work that is to be done has increased; 28% experienced no increase or decrease in work and 2% had the idea that they had less work to do than before.

“There is more work to be done on the trees and less on the food crops” (Interview plantation worker, April 2010).

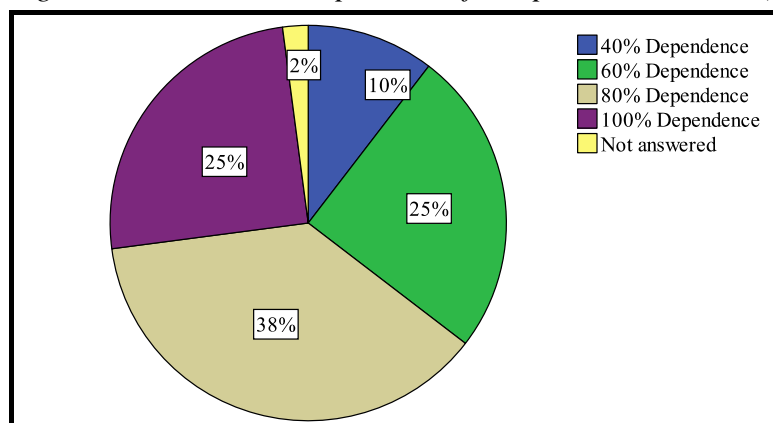
When asked about desired improvements in their livelihoods in the near future, 56.3% of the workers expressed they were happy with the current arrangement. 16.7% would like to see an improvement in the condition of the road and means of transportation. Better education, especially for their children, would be an important improvement for 12.5% of the workers. Only 4% mentioned an increase in wage.

6.6 Vulnerability context

The livelihood of the workers could be negatively affected by threats like fire, plant diseases or illegal activities. Loss of harvest due to drought can produce food shortages and result in lower earnings. Most plantation workers have not experienced any shocks (66%) that could harm their harvest. Fire is the most important threat, but hardly experienced, which could be the result of good fire protection (making sure that dry plants and shrubs are cleared) and management by the developer and/or be the result of reduced susceptibility of the plantation to fire; thanks to the large-scale planting of teak which is fire resistant. Only one person mentioned illegal activities (illegal tree felling or crop harvesting) to have affected his/her livelihood negatively.

In order to determine how diverse the livelihoods of the workers are, the question was posed of how important the work on the plantation was to the worker's total livelihood. The workers could give a grade from 1 to 5, with each grade corresponding to 20% of their livelihood. The results are shown in the pie chart in Figure 6.5; 25% of the workers indicate to be fully dependent on their work on the plantation to build their livelihood. A larger proportion (37.5%) of respondents considers their livelihoods to depend on the work on the plantation for 80%.

Figure 6.5: Livelihood dependence from plantation 'Beta' (n=48).



Source: Fieldwork, February- April 2010

6.7 Results of employing the PROFOR toolkit: cash and non-cash livelihood components

As outlined in Chapter 3, tool 4 of the PROFOR toolkit was used to analyse the cash and non-cash component of the workers' livelihoods. Twenty workers were selected – ten male and ten female workers – of different ages. Their assignment was to mention and subsequently rank all products they obtain from the plantation that contribute to their cash and non-cash income. In this assignment a distinction was made between 5 sources of livelihood; the natural forest area, where mostly non-timber forest products are gathered, the allocated farm plot, the wage, farming land outside the plantation and petty trading. The wage of the workers is only displayed in the cash part of the assignment. This assignment shows what types of agricultural products are produced and what types of NTFPs are gathered. But more important is that it reveals the various sources from which the workers obtain a livelihood. The assignment made clear that yam, maize, plantain and cassava are the most cultivated food crops. Besides these, vegetables such as pepper, tomatoes, onions and garden egg are cultivated in smaller proportions. The different charts in Figure 6.6 show the distribution of livelihood components from the different sources. A distinction was made between male and female workers and between the cash and non-cash part of the workers livelihood.

Figures 6.6a to 6.6d show the different sources from which the plantation workers derive the products that contribute to their cash and non-cash income. The allocated farm plot is the main source of income (both cash and non-cash) and very important for the workers' livelihood. Therefore the main income of the plantation workers is farming and selling food crops. This also shows that the wage (from work for the plantation developer) is not the main source of income. NTFP collection (including firewood) is only done for the non-cash component of the workers' livelihood and both done by men and women. Examples of NTFPs are building materials like clay, wood and grass for roofing. Petty trading is done by women only, and consists of selling of rice or other dishes. A few men have farm areas outside the plantation area, where they cultivate food crops as well. There are no big differences between male and female livelihood practices.

Figure 6.6a and 6.6b: Cash and non-cash components of male's livelihood at plantation 'Beta' (n=10).

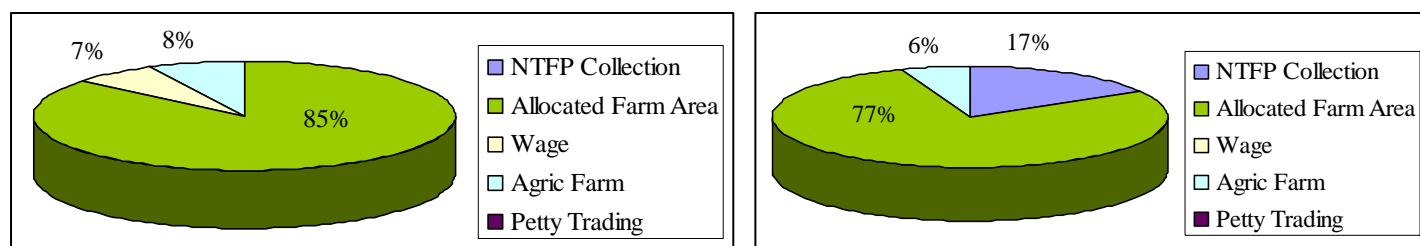
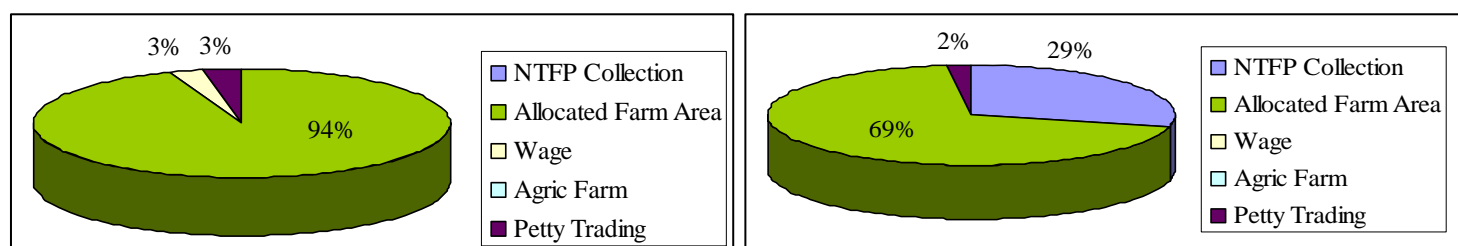


Figure 6.6c and 6.6d: cash and non cash components of female's livelihood at plantation 'Beta' (n=10).



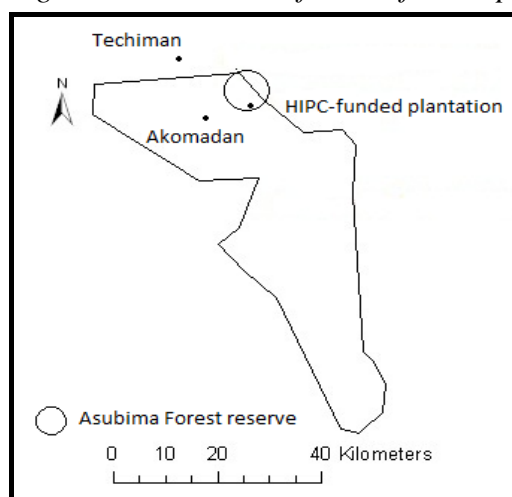
6.8 Conclusions

The circumstances under which the livelihoods are built at this plantation are different from the plantation 'Alpha' analysed in the previous chapter. The main livelihood component in plantation 'Alpha' was wage (financial capital). This plantation is managed in another way. In order to save costs, the developer employs or hires the workers only if he needs a job to be done. With a view to providing a decent livelihood to his workers, he allocated a small piece of farm land to each of them. The workers can farm this land when they are not working for the developer. Their primary source of income is the sale of food crops which they planted and harvested from these plots. When the developer needs labour he can select several workers among those who live on his plantation area, ranging from a small group of ten to a larger group of up to 70 to 80 workers. The developer is highly flexible in hiring people and saving costs. The food crops which the workers harvest can be consumed and traded among other plantation workers or sold on the local market. In this case the natural capital is more important than the financial capital, which is received indirectly. Health care is provided by the developer, but only in case it is needed. This type of plantation management seems to be quite successful, because 56% of the workers do not want any improvements and the average time they had been residing on the plantation was five years – substantially longer than those living on plantation 'Alpha'. The results from the PROFOR tool also revealed that the pieces of farmland from the developer are the workers' main source of cash and non-cash income and that the wage is less important to them.

7 The HIPC-funded plantation: characteristics and livelihoods

This chapter describes the characteristics of the HIPC-funded plantation. It analyses its contribution to the workers' livelihoods, by looking at the five assets and the vulnerability context from the sustainable livelihoods framework (SLF). The information in this chapter is based on a semi-structured interview with the zonal plantation manager and the plantation supervisor and the questionnaires applied to 48 plantation workers.

Figure 7.1: Location of HIPC-funded plantation.



Source: Adapted from Africa data Dissemination Service²⁴

7.1 General characteristics of the plantation

The HIPC-funded plantation in the Asubima Forest reserve in the Offinso forest district was started in 2004 (see Figure 7.1). By 2010, a total of 200 hectares of teak (*Tectona grandis*) trees had been planted. By the start of this plantation in 2004, Cedrela (*Cedrela odorata*) trees were planted, but these trees were not able to survive the fire outbreaks. Since teak can survive fire, these trees were planted instead of the Cedrela in subsequent years. Starting from 2004, 50 hectares were developed and planted with teak each year, except for 2008, when beating up (filling in of dead tree seedlings) was done. Tree seedlings were planted mostly in the rainy season. In the other parts of the year, the workers prepare the land for planting, cut pegs, and prune and tend the trees. Picture 7.1a and 7.1b show how pegs are used to mark the spots where teak tree seedlings are planted. Weeding is also a common activity, both in the already planted areas, and in the areas which are to be prepared for planting. Each tree has a space of 3 meters by 3 meters.

²⁴ <http://igskmncnwb015.cr.usgs.gov/adds/index.php> (accessed 10-9-10)

Picture 7.1a and 7.1b: An example of the usage of pegs.



Source: Lucien Hoogenbosch, March 2010.

Most of the teak are planted using young/growing seedlings. Although un-sprouted teak stump seedlings are better (because they can better survive the first weeks after planting), they are not always available. Depending on weather conditions, water availability and soil conditions (fertility and structure), the growth cycle of teak is expected to be around 20 years. With tree spacing being 3m by 3m, the plantation will provide approximately 240,000 trees when the time comes to fell the trees (1 ha contains 1,200 trees). The government agency in charge of this plantation (the zonal plantation manager within the Forest Services Division of the Forestry Commission) decides when tree felling occurs.

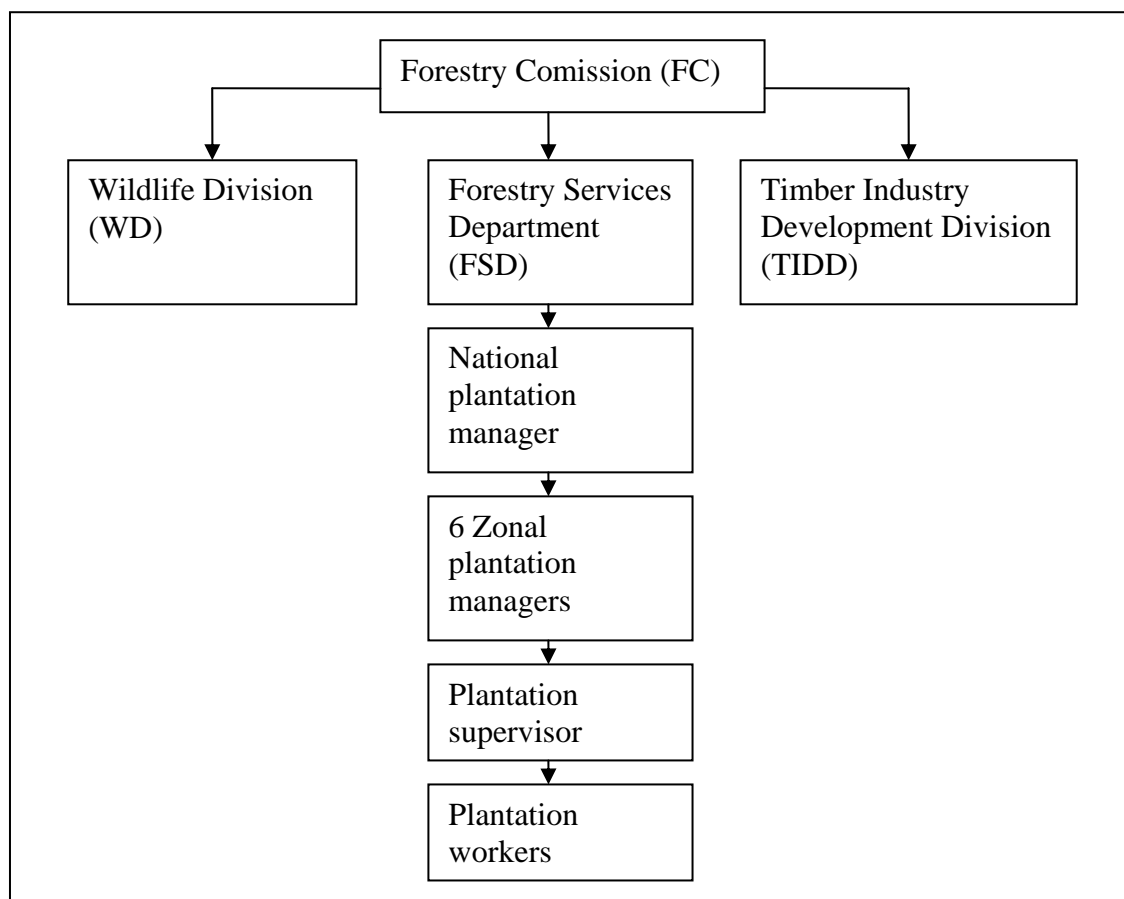
In between the teak trees, all kinds of food crops are allowed to be planted, except for cassava. The cassava is an edible root crop, and it is feared (but according to local researchers not scientifically proved) that by planting this crop in between the teak, there will not be enough space and nutrients for the teak to grow. It is up to the individual workers to decide whether or not they want to grow food crops between the trees. Except for cassava, they can choose which food crops they want to grow. There is no sharing mechanism for the food crops; each individual worker is responsible for his/her own crops. Every individual plantation worker knows where and what his food crops are. There is no specific mechanism for the allocation of plots where the food crops can be grown. Consequently, some workers were faced with loss of food crops harvested by illegal farmers who are also active in the plantation area. The workers mutually respect each other's planted food crops. In the first two years of the development of a new

plantation site, there is plenty of space to plant food crops, as the trees are still small. It will be more difficult to plant food crops, when the trees grow taller. When the tree canopy is closing after 4 to 6 years, there is not enough light anymore to grow food crops. The planting of food crops will then be shifted to newly planted areas. Hence, as long as the plantation is extending, there will be enough opportunities to grow food crops as an additional benefit.

7.2 Characteristics and background of the plantation developer

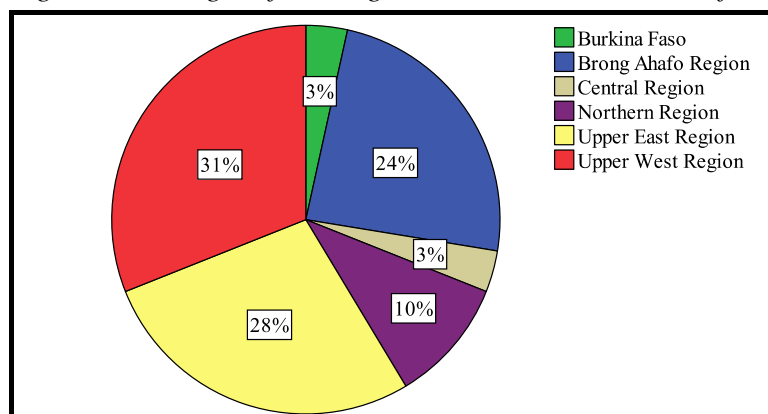
This plantation is developed by the government, with financial means from the Highly Indebted Poor Country (HIPC) Fund initiative. In Ghana, part of this fund is used to finance the planting of trees in degraded forest reserves in order to restore tree cover in the degraded areas. The plantation is headed by contracted supervisors and hired labour is used to plant and maintain the trees. For this study area, the plantation workers are divided into three groups, each headed by a supervisor. This plantation employed around 300 people in the first year when the plantation was started. By March 2010, there were 150 workers on this plantation, performing activities such as tree planting and maintenance. The plantation supervisors had to report to the zonal plantation managers who are in charge of monitoring the activities done in the field. The zonal managers are in turn controlled by the national plantation manager (Figure 7.2). The revenues of the timber tree harvest completely accrue to the government and stool land owners.

Figure 7.2: Institutional organisation of HIPC-funded plantation development.



Source: Fieldwork, February- April 2010

Figure 7.3: Origin of the migrant workers at the HIPC-funded plantation (n=29).



Source: Fieldwork, February- April 2010

The major part of the plantation employees are migrant (60%) mostly from northern areas of Ghana and from Burkina Faso (Figure 7.3). As these areas have less employment opportunities, many unemployed people move to the South in search for jobs. 40% of the workers are originally from the Ashanti Region.

Table 7.1: Number of years working on the HIPC-funded plantation (n=48).

Years	Frequency	Percent
0.3	1	2.1
1	1	2.1
2	2	4.2
3	5	10.4
4	4	8.3
5	11	22.9
6	24	50
Total	48	100

Source: Fieldwork, February- April 2010

Of the interviewed workers 75% are occupied since the plantation's start-up in 2004 (see Table 7.1). Although 50% of the initial workers had to search for other jobs, some others were hired in subsequent years. The average number of years that the workers are employed is 4.9 years. All workers are employed throughout the year; there is no seasonal variation in employment.

Weeding and planting and harvesting food crops are the major activities involving more than 92% of the workers. The planting of trees is done by 87.5% of the workers, whereas slightly more than one third is occupied with pegging (marking the spots where trees are to be planted) and pruning. Three workers are occupied with supervision; they are heading the different groups working at the plantation and assign the work to be done. 10% of the workers said to be involved in fire protection. Since fire outbreaks are common in the area a greater importance should be attached to this, which can be achieved by making fire belts (weeding along the boundary lines of the plantation) in months towards the dry season.

7.3 The plantation's contribution to the workers' livelihoods

This section analyses how the plantation contributes to the workers' livelihoods, using the five assets from the Sustainable Livelihood Approach (DFID, 1999).

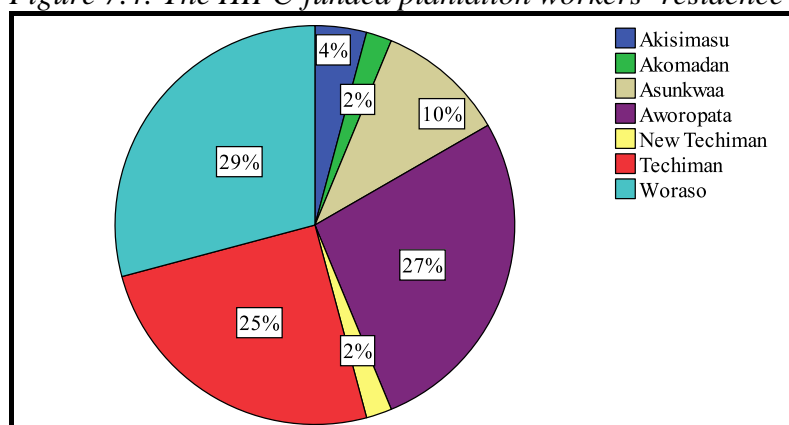
7.3.1. Financial capital

The plantation workers have several financial sources, the most important being the wage of GH ¢70 (€35) per month they obtain by working on the plantation. Half of the workers (52.1%) find the wage too low and report that the pay is often delayed. They are positive about the ability to negotiate their income, but whether this leads to an actual pay rise is less predictable. In addition to the wage, the workers cultivate food crops within and outside the plantation area. They sell the food crops to generate some extra cash income. The relative contribution of cash and non-cash income from different sources is addressed in Section 7.6.

7.3.2 Human capital

Unlike the commercial plantation workers, the HIPC-funded plantation workers do not live in temporary hamlets on the plantation itself. They live in towns and villages in the area surrounding the plantation (Figure 7.4, see also Figure 7.1). They therefore need to travel long distances to get to work, sometimes up to 1.5 hours depending on the transport possibilities (some workers do have bicycles and save time). The average distance from the plantation to the workers' residence ranges from 6 to 24 km, with an average of 12.5 km. Due to the long distances and travel time needed, the workers work on average about 5 hours at the plantation, mostly from 9 a.m. to 2 p.m.

Figure 7.4: The HIPC-funded plantation workers' residence (n=48).



Source: Fieldwork, February- April 2010

The proportion of male and female workers is 58% and 42%, respectively. The average age of the workers is 38 years (female 36 and male 39), ranging from 20 to 77 years. Most workers are married (66%).

Table 7.2: Educational level of the HIPC-funded plantation workers by sex (n=47).

		Educational level				
		None	Primary	JHS/ MSLC	SHS	Total
Sex	Male (n = 27)	44.4%	11.1%	37.0%	7.4%	100%
	Female (n = 20)	55.0%	25.0%	10.0%	10.0%	100%
	Total	48.9%	17.0%	25.5%	8.5%	100%

JHS = Junior High School; MSLC = Mid School Level Certificate; SHS = Senior High School.

Source: Fieldwork, February- April 2010

The educational level of the workers is very low (see Table 7.2). 49% of the workers have no education at all, 17% has only primary education, and about 34% have a junior high school or mid school level certificate and SHS (senior high school). The women seem to have a lower schooling compared to their male colleagues (55% vs. 44%). Health care and education are hardly given, because many workers already do have access to these services in their respective towns and villages.

7.3.3 Physical capital

The passageways to the plantation sites consist of footpaths and small with large potholed feeder roads and are hardly maintained. Some are only passable by bicycle and foot. Working equipment is poorly distributed among the workers. The workers take Jerry cans with drinking water from home.

7.3.4 Natural capital

Workers are allowed to plant food crops between the trees as long as the canopy has not been closed. In addition, most of them also have farming land outside the plantation. The majority of the workers (92%) cultivate food crops at the plantation individually, so they obtain part of their food crops from the plantation area. See also the PROFOR results in Section 7.6.

Maize is the most popular food crop planted by 85.4% of the workers. Cassava is planted by 8.3% of the workers. Although it is not allowed to plant cassava between the trees, it is planted at the plantation borders, where it is believed, the crop cannot damage the teak roots. Yam (79.2%) and plantain (45.8%) are food crops which are planted by a substantial proportion of the workers as well. Furthermore beans (15%), tomato, onion, groundnut (each by 12.5% of the workers) and pepper are cultivated in smaller proportions. This corresponds with the results from the PROFOR assignment reported below.

Another benefit that the workers mentioned is the occasionally catch of bushmeat.

In terms of natural capital, one plantation worker also referred to the fact that “The plantation restores the land in its original state” (Interview plantation worker, March 2010).

“The plantation decreases the impact of strong winds, protects from the sun, prevents the streams and rivers to dry up, and provides sufficient rainfall” (group discussion, March 2010).

7.3.5 Social capital

In terms of social capital family ties are particularly important in obtaining a job or farming land on the plantation.

7.4 Stability of employment

In addition to restoring degraded forest reserves, the major goal of HIPC-funded plantations is to create employment. For this goal to materialise and create a sustainable income for the workers, the job opportunities should be long term. Table 7.3 shows that most workers perceive the employment on this plantation to be long term (62.5%). The differences between migrant and native workers are rather small, but the majority of both native and migrant workers expect to have benefits on the long term.

Table 7.3: Expected durability of the benefits from the HIPC-funded plantation by origin (n=48).

		Origin		
		Native (n = 19)	Migrant (n = 29)	Total
Expected durability of the benefits	Long term	57.9%	65.5%	62.5%
	Short term	42.1%	34.5%	37.5%
	Total	100%	100%	100%

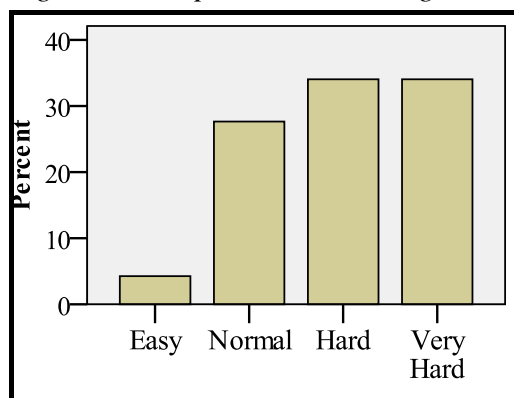
Source: Fieldwork, February- April 2010

Asked about their future prospect of working on this particular plantation, 27.5% of the respondents answered to expect short term benefits from the plantation, while 62.5% expected to be employed at the plantation in the long term. As the trees take about 20 years to mature, they have a secure cash income (the wage) and non-cash income (the food crops they grow) for several years.

7.5 Workers' perceptions of working conditions

The workers' perceptions of working conditions are presented in Figure 7.5. Most workers (66%) experience the work as hard to very hard, 27% find the work conditions normal and a minor 4% considers the work as easy. 73% of the workers perceive the amount of work as having increased, probably because of the extension of the plantation, as new sites had to be prepared for planting. 21% experienced no increase or decrease in work at all and a minor 7% is of the opinion that the amount of work to be done had decreased the past years.

Figure 7.5: Experienced working conditions on the HIPC-funded plantation (n=48).



Source: Fieldwork, February- April 2010

Asked about desired improvements, a higher wage ranks one (45.8%). Many workers also prefer better supply of wellington boots and cutlasses (35.4%), which protects them against snakebites. As the pay is often delayed, many workers (30%) would like to see a regular payment, since delayed payment makes it difficult for them to pay the bills on time and to care for their family. Medical care was mentioned by 25% of the workers and is important considering the accidents that could happen at the plantation. There is a long distance to travel to the nearest medical centre, and, as one worker said:

“A first aid box would be very helpful for minor injuries” (Interview plantation worker, March 2010).

Better transportation was mentioned by 8.3%. Since the plantation is far from the place where they live and most workers travel by foot or bicycle, provision of transportation (a car or a tractor) would save some travel time. At the same time, this is hard to accomplish because the workers live in many different villages and towns. Another desired improvement mentioned, was the timely supply of tree seedlings in the planting season. In this respect, it was suggested that the seedlings be produced by the workers to prevent late planting and create an extra income. Lastly, 15% of the workers is fine with the existing conditions, and do not wish any improvements.

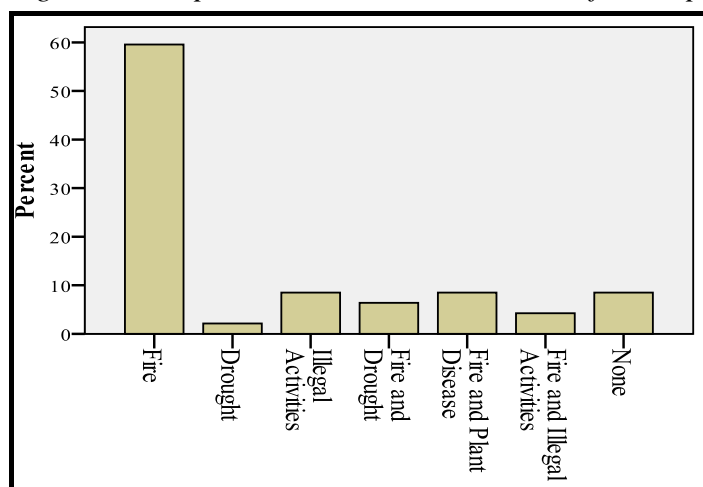
7.5 Vulnerability context

The plantation is vulnerable to several shocks, which could have negative effects on the workers' livelihoods and the continuity of the plantation. Among the several threats fire (see Figure 7.7) is mentioned most and preventions are taken to minimise fire outbreaks. Illegal activities (farming, tree felling and burning) are a second threat mentioned. The drought is often a cause of fire.

Some workers have experienced multiple shocks. Some of these threats create conflicts: among the workers themselves with illegal farmers, with farmers who destroy trees by spraying chemicals for weeding, or with illegal chainsaw operators (Interview with plantation worker,

March 2010). Such illegal activities are difficult to control because the plantation is located in a remote area, with no villages in the direct neighbourhood.

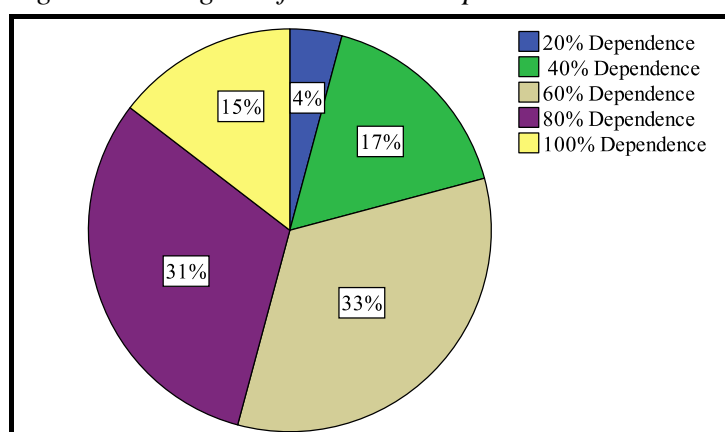
Figure 7.7: Experienced threats to the HIPC-funded plantation (n=48).



Source: Fieldwork, February- April 2010

The final question raised during the interview was to assess the importance of the HIPC-funded plantation for the worker's total livelihood. The results are shown in the pie chart in Figure 7.6. Two thirds of the plantation workers depend for 60% to 80% on the plantation for their livelihood, in terms of money and supply of food crops. Only 15% of the respondents are completely dependent on the plantation work and have no other income-generating activities. The figure shows that the larger proportion of the respondents do have other activities which generate an additional income, like petty trading or farming land elsewhere.

Figure 7.6: Degree of livelihood dependence on the HIPC-funded plantation (n=48).



Source: Fieldwork, February- April 2010

7.6 Results of employing the PROFOR toolkit: cash and non-cash livelihood components

As outlined in Chapter 3, tool 4 of the PROFOR toolkit was used to analyse the cash and non-cash components of the workers' livelihoods. To that end, twenty workers were selected – ten

male and ten female workers of different ages. Their assignment was to specify and rank the sources of their cash and non-cash income: non-timber forest products (from natural forest and plantations), food crops (from allocated plots and/or farming areas outside the plantation), wage from plantation work, and cash income from farming and petty trading. The Figures 7.8a to 7.8d show that the wage earned from plantation work contributes almost one third to the workers' livelihoods and the farmland within and outside the plantation contribute more or less equally to their livelihoods.

Figure 7.8a and 7.8b: Cash and non-cash components of the livelihood of males at the HIPC-funded plantation (n=10).

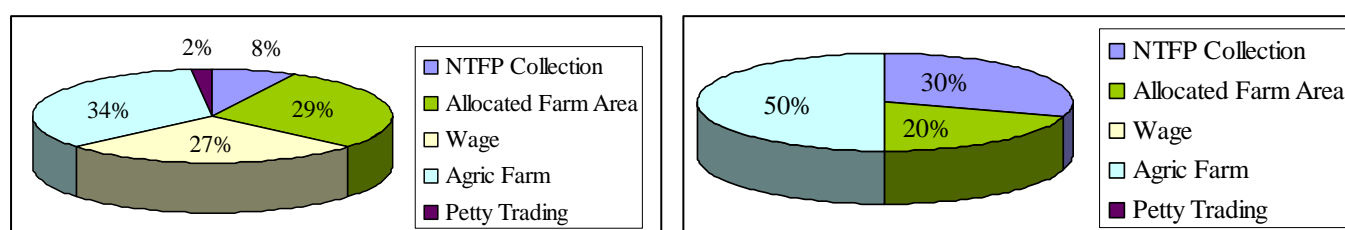


Figure 7.8c and 7.8d: Cash and non-cash components of livelihood of females at the HIPC-funded plantation (n=10).

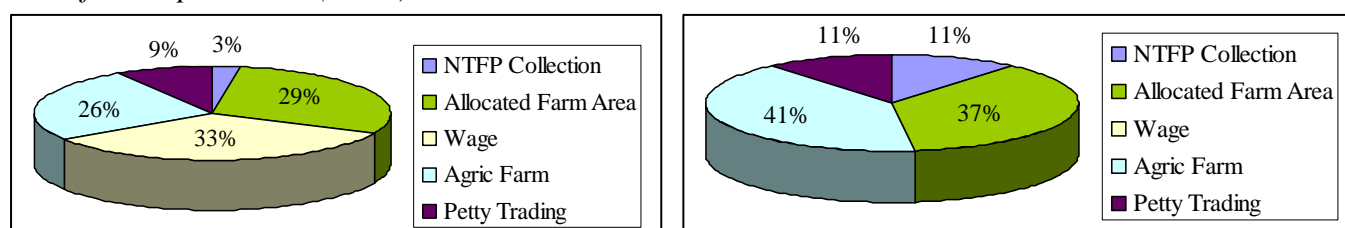


Figure 7.8a and 7.8b show the cash and non-cash components of men's livelihood. The farming land outside the plantation is the most important for their livelihood (34%), followed by the farming area inside the plantation (29%). The wage earned ranks third (27%), so the ability to farm is very important for the workers and their food supply. The collection of NTFPs (including firewood) is of minor importance, although grass-stocks mushroom, snails and occasionally bushmeat are sold for some extra income. Figure 7.8b shows that the farming area outside the plantation is very important to the workers' livelihood. Maize, plantain and cassava are the most important food crops for the workers and because they are not allowed to plant cassava in the plantation, they plant it somewhere else. Also the collection of NTFPs is important, particularly for non-cash trade and domestic use (Figure 7.8b, non-cash income of males). The results for the females are very similar to those of male plantation workers. The women are more often involved in petty trading which consists of kenkey²⁵ (food) making, rice cooking and selling fish and porridge. Figure 7.8d shows that petty trading is also important to the non-cash component of

²⁵ Traditional Ghanaian dish made from fermented maize or cassava into dough, served with a vegetable stew or soup.

their livelihood. Leftovers of petty trading are consumed by the family. Compared to the men, the wage is slightly more important as a cash component. Both men and women are farming and consider this a very important component of their livelihood.

7.7 Conclusions

This chapter reviewed the main characteristics of the HIPC-funded forest plantation. The plantation, located in the Offinso district was established in 2004 in an effort to create employment and provide future timber supply. The plantation is mainly planted with teak (*Tectona grandis*) after fire outbreaks from which cedrela (*Cedrela odorata*) did not survive. The proportion of male and female workers is almost equal (58% and 42% respectively). Unlike the commercial plantation workers, the HIPC-funded plantation workers live in towns and villages surrounding the plantation. Therefore they need to travel 12.5 km on average daily. The two basic ways in which HIPC-funded plantation contribute to the workers' livelihoods are the wage (financial capital) and the option of cultivating food crops (natural capital that turns into financial capital when the crops are sold). Food crops are cultivated in two different areas; in the plantation area where both trees and food crops are planted and farming areas outside the plantation. The financial capital is the main asset through which the plantation workers obtain cash income. The workers receive their wage as primary cash income and food crops contribute cash income when sold, or are used to feed the family (non-cash income). This picture is also confirmed by the PROFOR tool assignment, the results of which showed that farming and growing one's own food are important for the plantation workers, as they rate their ability to farm higher than the wage they receive from their work. Although the wage is low and often delayed, many workers get an additional income by selling food crops.

The plantation workers' livelihood can be regarded as stable, because plantation development is a long term investment and needs maintenance throughout the growth cycle of the trees. Most plantation workers, both migrant and native, perceive their work on the plantation to be long term and a stable source of livelihood. On average the workers are already employed for 5 years.

8 Comparison between the plantations

There are many differences between the three plantations analysed in this study in terms of how they contribute to the workers' livelihoods. This chapter will describe the differences and similarities between the three plantations.

8.1 General characteristics of the plantation

The basic difference between the three plantations is that two of them are financed and managed by the private sector and one of them by the government, supported by the HIPC fund.

In general the private plantation developers provide more benefits for their workers than the government does in the HIPC-funded plantation. The private developers provide 'temporary housing', pieces of land or free food supply. The private developers need money in order to be able to pay the costs and to keep their company financially healthy. Because the tree harvest takes a long time, money is earned by cultivating and selling food crops and rearing chicken and small ruminants (sheep and goats). The workers are therefore occupied with planting and harvesting of food crops in addition to tree planting and maintenance. On commercial plantation 'Alpha' more food crops are cultivated because the developer hires the workers fulltime and needs to sell the food crops in order to pay them. The commercial plantation 'Beta' bears fewer labour costs because the workers only get paid when they work for the developer. In this case the workers (farmers) have their own small farming plot. The workers at the HIPC-funded plantation are allowed to plant food crops in between the trees as well, although in smaller proportions and for individual use only. The plantations vary in size; plantation 'Alpha' developed 256 hectares, plantation 'Beta' and the HIPC-funded plantation developed 1,024 and 200 hectares so far, respectively. Plantation 'Beta' has still 2 hectares left to develop.

8.2 Characteristics and background of the plantation developer

The HIPC-funded plantation is managed by the government and is developed to generate employment and thereby decrease rural poverty. In addition tree cover is restored as well. The private plantations are managed by private developers; their primary interest in tree planting is the future perspective of financial capital. Both types of forest plantations are developed under the NFPDP. The government, in an attempt to restore greater part of Ghana's forest cover and address her wood (timber) deficit situation, releases degraded forest reserve land to private developers to help in tree planting. Both private developers have a farming background; the supervisors contracted in the HIPC-funded plantation have a background in both farming and forestry.

8.3 The developers' perceptions of governance arrangements

To support private developers in tree planting the government set up a plantation development fund. Private developers could then apply for a loan to be able to start tree planting. The private developer of plantation 'Alpha' applied for such a loan, but due to the small amount (the fund

calculated to give GH ₵5,000 (€2,500 at the then prevailing currency rate)), he decided to deny the loan, because he could raise this amount of money by himself. The developer of plantation 'Beta' did apply for a loan as well and got a loan of GH ₵2,000 (€1,000), to enable the start of his plantation. In subsequent years he also applied for financial support, but did not receive any, so it was difficult to expand the area with trees. Both developers had some difficulties to raise money to expand the plantation. The plantation fund only provides for small loans, to help private developers start tree planting. Further expansion should then be realised with other means. Both developers are therefore planting food crops to pay interim costs and develop new areas. The developers had to make a reforestation plan, which contains information about the size of the land and the species to be planted, which had to be approved by the FC. The plantation developers also agreed with a benefit-sharing scheme, which stipulates that 90% of the revenue is for the developer, 6% for the landowner, 2% for the government and another 2% for the local community living adjacent to the plantation.

8.4 The plantation's contribution to the workers' livelihoods

Financial capital and natural capital contribute the most to the plantation workers' livelihoods. Financial capital, like cash income, is derived directly through the workers' wage and indirectly through the selling of food crops. Natural capital refers to the availability of land to grow food crops and the availability of non-timber forest resources.

8.4.1 Financial capital

The wages at the three plantations are quite similar, but all wages are below the national daily minimum wage of GH₵3.11 (€1.56), which is introduced since February 2010. At the HIPC-funded plantation a daily wage of GH ₵3 (€1.50) is standard for every employee. The developer of commercial plantation 'Beta' pays the workers, when hired, an average wage of GH ₵1.80 to GH ₵2.60 (€0.90 to €1.30) a day. The wages at commercial plantation 'Alpha' are different for men and women; women get paid GH ₵2.50 (€1.25) a day and men get GH ₵3.50 (€1.75) a day. The workers obtain non-cash income in the form of food.

8.4.2 Human capital

The plantation workers are divided into migrant and native workers. Of the total number of workers 79.3% are migrants and 20.7% are natives. Native means the worker is born and still living in the same region as the location of the forest plantation. Plantation 'Alpha' has 16% native workers and 84% migrant workers, plantation 'Beta' has 6% native workers and 94% migrant workers and the HIPC-funded plantation has 40% native workers and 60% migrant workers. Due to the lack of housing for migrant workers on the HIPC-funded plantation, less migrant workers are employed here. In order to be employed on the HIPC-funded plantation as a migrant worker, they also have to search for housing in the nearby towns and villages, which could be difficult. The migrant workers come from regions all over the country and Burkina Faso with most of them coming from the three northern regions (Upper East, Upper West and

Northern Regions). The average age of the workers is close to each other; the HIPC-funded plantation workers have an average of 38 years and the commercial plantations ‘Alpha’ and ‘Beta’ 37 and 36, respectively. The created employment is for every age, because both young workers (starting from an age of 18) and older workers (up to 72) are employed. In general the male workers are older than the female workers (average age of 39 vs. 33 years) and the migrant workers are younger than the native workers (average ages of 41 vs. 36 years). The educational level of the workers is also very similar. For all three plantations at least half of the employees have no schooling at all (51%, 65% and 49% for commercial plantations ‘Alpha’ and ‘Beta’ and the HIPC-funded plantation, respectively). Table 8.1 shows the division between male and female workers employed at the three plantations. At commercial plantation ‘Beta’ the number of men is more than double the number of women. The HIPC-funded plantation has more men employed as well. Only plantation ‘Alpha’ employs more women than men. The commercial developers provide health care (first aid boxes and medicine) in case the workers need it. This is not provided in the HIPC-funded plantation, although desired by the employees.

Table 8.1: Sex division of workers per plantation (n=145).

	Sex		
	Male (n = 83)	Female (n = 62)	Total
Commercial ‘Alpha’	44.9%	55.1%	100%
Commercial ‘Beta’	68.8%	31.3%	100%
HIPC-funded plantation	58.3%	41.7%	100%
Total	57.2%	42.8%	100%

Source: Fieldwork, February- April 2010

8.4.3 Physical capital

In case of the private plantations, the workers live in the plantation area in the case of the HIPC-funded plantation the workers live in a nearby town and villages outside the plantation. This also concerns the migrant workers. The roads leading to the plantations are in bad shape. This goes for all three plantations. Each of the commercial developers has a tractor to transport food crops and people to the nearest villages and markets once a week. This service is not provided to workers in the HIPC-funded plantation. The supply of working equipment is poor in all three plantations. Proper boots and enough cutlasses would make the work more comfortable.

8.4.4 Natural capital

On commercial plantation ‘Alpha’ the workers have no land for themselves to grow food crops, but they are able to collect firewood and other non-timber forest products, like bushmeat from the plantation area. The food crops and trees are planted, maintained and harvested by the workers, but remain the developer’s property, although the workers receive some food crops for free for their daily meals. In contrast to commercial plantation ‘Beta’, the workers obtained their own pieces of farm land. The workers here still had the opportunity to cultivate crops in off-reserve land outside the plantation area. They are free to cultivate food crops of their choice and

are responsible for their own food consumption. The HIPC-funded plantation workers have farming land both in the plantation area and outside and therefore have multiple opportunities to grow food crops.

8.5.5 Social capital

The workers are living close to each other and have multiple family ties. These are important as many new workers are hired through the family networks of already employed workers. The family ties need not to be in the first (children) or second degree (brothers, sisters) nor concern the worker's partner.

8.5 Stability of employment

Overall, 63% of the workers and especially the workers at the commercial plantations (75%) expect the employment to be short term (Table 8.2). Only the majority of the workers at the HIPC-funded plantation expect their job perspective to be long term. Although all plantations have more migrants than local people employed, there are differences between the commercial and HIPC-funded plantations. In the commercial plantations, many migrant farmers are working for one or two years in order to save money for their families in their place of origin. In both commercial plantations workers mainly became employed through family connections. The employment is a pull factor; particularly the harsh farming conditions in the north due to climate and soil conditions constitute push factors. The workers at the commercial plantations live in 'temporary' hamlets on the plantations, where they expect to live for a few years only. The workers at the HIPC-funded plantation have more decent housing in the adjacent towns and villages and would therefore like to be employed at the plantation for a longer time.

Table 8.2: Expected durability of the benefits from plantations (n=145).

	Long term	Short term	Total
Commercial 'Alpha' (n = 49)	24.5%	75.5%	100%
Commercial 'Beta' (n = 48)	25.0%	75.0%	100%
HIPC-funded plantation (n = 48)	62.5%	37.5%	100%
Total	37.2%	62.8%	100%

Source: Fieldwork, February- April 2010

8.6 Workers' perceptions of working conditions

The workers' perceptions of the working conditions are different for every plantation. Therefore the plantations can be ranked. The workers on plantation 'Beta' find their work easy (44%) and around 27% and 2% of the workers, respectively; experience the work as hard to very hard. On plantation 'Alpha', a substantial portion of the workers experience the work as hard (39%) or very hard (9%) and 33% finds the work normal. Around 20% of the workers experience the work as easy to very easy. The HIPC-funded plantation workers experience the work as hard to very hard (66%), 27% find the work conditions normal and a minor 4% considers their work as easy. Hence the commercial plantation developers rank first and second as it comes to working

conditions. Their workers perceive the work ‘easier’ than the HIPC-funded plantation workers which might be contributed to the fact that they don’t need to travel between residence and the plantation and benefit from more services than the workers at the HIPC-funded plantation.

To improve the working conditions – for example more supply of wellington boots and cutlasses – would make the work more comfortable. Table 8.3 shows what improvements the workers would like to see in order to improve their working conditions. The table also shows that, especially in commercial plantation ‘Beta’, more than half of the workers (56.3%) do not want any improvements as they like the way things are arranged for the moment. That could also be a reason why they perceive their job to be easy compared to the workers from the other two plantations. Unlike the workers at the HIPC-funded plantation and plantation ‘Alpha’, who consider wage increases as important; this is not important for the plantation ‘Beta’ workers. At the HIPC-funded plantation 25% of the workers would like to have a first aid kit, in case of minor injuries.

Table 8.3: Desired improvements by plantation workers (n=145).

New arrangements	Commercial ‘Alpha’ (n = 49)	Commercial ‘Beta’ (n = 48)	HIPC (n = 48)
	% Mentioned	% Mentioned	% Mentioned
Increase the wage	51.0%	4.2%	45.8%
More supply of boots	36.7%	2.1%	35.4%
More supply of cutlasses	28.6%	8.3%	35.4%
Regular payment	0%	0%	29.2%
Provide medical supply	6.1%	0%	25.0%
More supply of raincoats	12.2%	0%	8.3%
Better supply of transport	6.1%	16.7%	8.3%
Individual farming land	20.4%	8.3%	2.1%
Provide education for children	0%	12.5%	2.1%
None, is OK	20.4%	56.3%	14.6%

Source: Fieldwork, February- April 2010

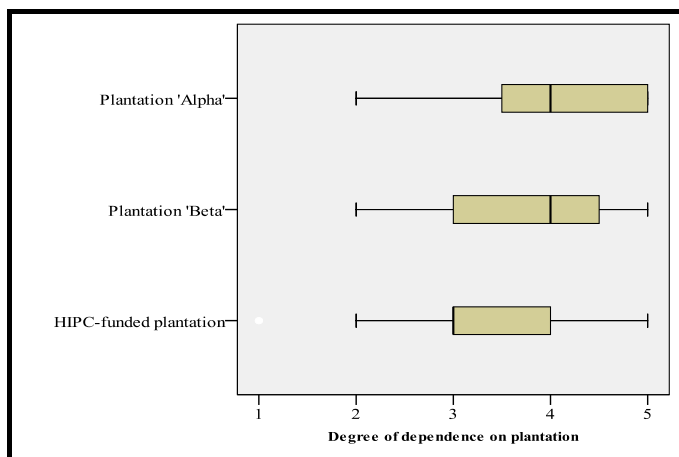
8.7 Vulnerability context

Fire and plant disease can potentially harm the cash income of the plantation workers. On all the plantations the risk of fire outbreak is the most important, although the workers on plantation ‘Beta’ have hardly experienced this. On the HIPC-funded plantation and on plantation ‘Alpha’ fire is occasionally experienced.

Figure 8.1 shows the degree of livelihood dependence on plantation employment. The yellow box represents the largest number of workers who rated their dependence on the plantation. Commercial plantation ‘Alpha’ has the largest number of workers in the group which rates the plantation importance from 4 to 5, which means that their livelihood depends for 80% to 100% on the plantation job. The workers of commercial plantation ‘Beta’ have own farming activities as well and are less depending on the wage from the work on the plantation. Therefore more

workers rank their livelihood dependence between 2 and 4 (60% to 80%). The HIPC-funded plantation workers are the least depending on their job; they have several other options to farming land, both inside and outside the plantation area.

Figure 8.1: Degree of livelihood dependence on plantation.



Source: Fieldwork, February- April 2010

8.8 Results of employing the PROFOR toolkit: cash and non-cash livelihood components

The results of the PROFOR tool showed that the plantation workers are able to build their livelihood on the basis of various components. Although the HIPC-funded plantation workers have various sources from which they obtain their livelihood (wage, and two different farming areas), they find their wage more important than the workers of plantation 'Beta', whose wage is a less important component of their livelihood and who derive a living mainly from food crops in the allocated plots. They have the opportunity to cultivate food crops on farmlands outside the plantation but they generally don't do that. The livelihoods of the HIPC-funded plantation workers are composed of cash and non-cash incomes from several sources and they can fall back on other farming areas in case they lose their job or if fire or plant diseases destroy the harvest. The livelihoods of the plantation 'Beta' workers are more concentrated on one source (the allocated farm plots). NTFPs are collected in both plantations in small proportions and provide non-cash income.

8.9 Conclusions

The primary differences between the three plantations are the way of earning a wage and the ability of cultivating food crops. For plantation 'Beta' workers incomes from food crops grown on the plots allocated to them are the most important part of their livelihood and for the other workers, the wage is the primary source of income. The commercial plantation workers are mainly settled in temporary hamlets on the plantation, whereas the HIPC-funded workers live in nearby towns and villages. The larger proportions of the workers are migrants and generally the workers have low degree of schooling. Chapter 9 will elaborate more on the differences and similarities between the plantations.

9 Summary, conclusions and recommendations

The overall research question addressed in this thesis is: what are the characteristics of forest plantation development in Offinso Forest District in Ghana's High Forest Zone and what does it contribute to the livelihoods of the forest plantation workers? This chapter will summarise the research findings, relate them to the theoretical framework and formulate some suggestions for further research and policy recommendations.

9.1 Summary of research findings

This section summarises the results of the study per research question.

9.1.1 What are the characteristics of the HIPC-funded scheme?

Government plantation schemes, financed with HIPC-funds make use of hired labour and contract supervisors to establish and maintain industrial plantations. The establishment of these plantations is funded through the Highly Indebted Poor Countries (HIPC) fund. The HIPC initiative was launched in 1996 by the IMF and World Bank, with the aim being to ensure that no poor country faces a debt burden it cannot manage. Ghana needed the HIPC fund because the total debt obligation exceeded the amount of goods and services that were produced in the year 2000. A third of the country's expenditure went to debt servicing. Therefore investments in social services, health and education were reduced progressively. The money which should be spent on debt relief is now being invested in projects to reduce poverty. Forest plantation development is one of these projects. The target for HIPC plantation development is 10,000 hectares per year for 'on-reserve' lands. As these developed plantations are owned by the government, the communities have no share in the future tree revenue. The entitled landowners are paid royalties and the government gets the largest share of the revenue. Although it was not the intention of the plantation development plan to have food crops planted between the trees, it is often allowed since the land is available anyway.

9.1.2 What are the characteristics of the CFPD scheme?

The development of a forest plantation is an expensive operation. Since the government has not enough money to undertake all of it, private investors are stimulated to start forest plantations. Private investors are supposed to finance their investment themselves; therefore financial support by the government is only marginal through the Plantation Development Fund. The government releases tracts of degraded forest reserve to be developed by private investors. Those areas which are former forest reserves have lost many trees through fire and logging and are in need of reforestation. Private developers are able to buy land in 'off-reserve' areas for plantation development. When it comes to plantation development in on-reserve areas, private developers do so under a special benefit-sharing agreement, in which the developer has a 90% share in tree revenue. After the application and approval of the reforestation plan to the Forestry Commission and the payment of demarcation and mapping costs (GH ₵726 or €363), the developer can start planting trees. Monitoring takes place periodically by the Plantation Department of the Forestry

Services Division of the Forestry Commission, to ensure the developer is doing his business according to the approved reforestation plan.

9.1.3 What are the basic components of the workers livelihoods?

The questionnaire and a specific element from the PROFOR toolkit were used to discover the basic components of the plantation workers' livelihoods. Food crops derived from the plantation area are maize, plantain, yam and, to a lesser extent, cassava and vegetables. These food crops are for the plantation workers and their households, whereas the sale of surplus food crops generates an additional cash income. These food crops are freely supplied by the investor of plantation 'Alpha', and therefore consumed collectively. Plantation 'Beta' workers cultivate their food crops individually, on plots allocated to them by the developer. In this case, the workers are responsible for their own food supply, which makes it easier to sell the surplus. This additional cash income is much needed because the workers on this plantation are not employed fulltime by the developer. This situation makes that access to private farm plots (natural capital) the major component of the workers' livelihood which enables them to be self-sufficient. This contrast the situation for the plantation 'Alpha' workers, for whom cash and non-cash income in the form of food crops (direct and indirect financial capital), are the most important components of their livelihood. These workers are employed fulltime and get paid for it; they are not able to cultivate and sell their own food crops and therefore lack the additional income opportunity from farming. However, they do obtain free food crops from the plantation developer.

The workers employed at the HIPC-funded plantation are primarily gaining cash income (financial capital), but they cultivate food crops on the plantation area as well, but in minor proportions and also have farming land outside the plantation. These workers obtain predominantly non-cash income from two different farming areas and have their paid job at the plantation. Therefore their livelihood portfolio is the most diverse. According to the results of the PROFOR exercise, the workers estimated their wage from the plantation and their non-cash income (food crops) from the two different areas to be about one third each of their total livelihood. Their livelihood portfolio consists for two thirds of non-cash income (food crops; natural capital) and for about one third of cash income (wage; financial capital). Selling food crops could generate additional money. The other three livelihood components – benefits of free housing, medical assistance, and occasional help in transportation – are of minor importance for the plantation workers.

9.1.4 What are the motives for private investors to step into forest plantation development?

The plantation 'Alpha' developer started his career in the mechanical business, by selling car and truck spare parts, but has an agricultural background. He describes himself as a "farmer at heart" and "I was 'agro district best farmer' of the year 1999". The developer was always engaged in farming next to his mechanical shop which is his core business. The start of the plantation is financed with the profits from the mechanical shop. His primary motivation to step into

plantation development was the desire to expand his mechanical business with a manufacturing plant. As this requires large investments, he thought he could best earn this through plantation development by planting trees and food crops. The sale of food crops also contributes to raise his financial capital.

The developer of plantation 'Beta' comes from a farm family as well and has been farming since 1978, mostly food crops. In 2000, he decided to start planting trees and grow food crops. He did so motivated by the fact that planting timber is a good investment for the future and that he had experience with the Taungya system. Another motive to plant trees was the growing timber scarcity. Because of strong family ties the developer is able to recruit enough labour for his plantation as well as to find some extra financial help to expand it. The developer has helped in the building of a school in one of the villages adjacent to the plantation. This plantation shares boundaries with another commercial plantation, FORM Ghana. With help from this company – mainly in the form of knowledge about tree seedlings production and planting – the developer was able to improve his plantation.

9.1.5 How does forest plantation development relate to the climate change debate?

Nowadays there is a lot of debate about how to reduce carbon release into the atmosphere and how to increase carbon sequestration from the atmosphere into biomass. It is clear that several mechanisms exist to accomplish this. The idea of Payments for Environmental Services (PES) is that private plantation developers are paid for the environmental services that their forest plantation provides (specifically carbon sequestration, but also soil protection, water conservation and the provision of local livelihoods). This is not yet practice in Ghana, but a reality in Costa Rica since the Environmental Services Payments Programme (ESP) was launched 1997 as part of the National Forestry Financing Fund (FONAFIFO)²⁶. The Clean Development Mechanism (CDM) under the Kyoto Protocol allows developed countries to meet a part of their committed reduction of CO₂ emissions by supporting CO₂ compensation/sequestration projects such as reforestation in developing countries. The Reducing Emissions from Deforestation and Degradation (REDD) policy is focused on preventing carbon dioxide emissions from deforestation and forest degradation and compensates governments for doing so.

Since growing trees convert carbon dioxide into oxygen through photosynthesis, tree planting can help increase carbon sequestration. Plantation developers could be financially encouraged to plant trees, in the name of providing this environmental service. When the trees are felled, the timber from the teak plantations will be used for construction and furniture and the carbon remains to be stored into the timber unless it is burnt. The problem of fire in plantations neutralizes the carbon sequestration effect; when burnt, the carbon is released into the atmosphere again. In that case payments to plantation developers for carbon sequestration become worthless.

²⁶ <http://www.fonafifo.com/english.html>, (accessed 13-10-2010).

The idea of REDD is reducing deforestation through rewarding forest owners for keeping the forests instead. This mechanism is not relevant for plantation development, because the area is already degraded and the idea is to fell the trees anyway. Until now, there are relatively few initiatives in Ghana with regard to payments for carbon sequestration in forest plantations. This is partly due to the lack of a national body that coordinates the specific knowledge and arrangements (SLE 2008). The creation of financial mechanisms to reduce carbon emissions and increase carbon storage remains a challenge for the future.

9.2 Discussion: relation of the research findings to the theoretical framework

The theories outlined in Chapter two provided a framework for this research. Since this study concerns the livelihoods of the plantation workers, the sustainable livelihoods approach (SLA) was central in guiding the analysis. Below we pay attention to the three elements of the SLA: the five capitals, the vulnerability context and structures and processes.

A person's livelihood consists of five capitals: natural, financial, physical, human and social capital. For the plantation workers the natural and the financial capital proved to be the most important. Financial capital is obtained by having a paid job and, indirectly, by the provision of food crops. The natural capital represents access to farming land, where people can cultivate food crops for cash and non-cash incomes. In this case natural capital can be used to obtain more financial capital by selling food crops. Through this 'trading' of capitals the plantation workers are able to increase their livelihood standard. Another strategy to do so is livelihood diversification, which is important because single activities do not raise enough money or products to build a decent livelihood. Therefore, multiple activities are undertaken to that end. Or, as worded by Scoones (2009: 2): people combine different activities in a complex bricolage or portfolio of activities. The plantation workers are occupied with at least two activities which generate cash and non-cash incomes, namely their plantation job and their farming activity. Petty trading is a third activity which is being undertaken, mostly in the form of kenkey²⁷ making, rice cooking, and selling fish and porridge.

A second element of the SLA concerns the vulnerability context of one's livelihood. Three factors influence the degree of livelihood security: shocks, trends and seasonal shifts. On the plantations the workers are employed during the whole year which eliminates the seasonal shifts. The plantation workers proved to be able to cope with shocks, such as fire and plant disease. It could only affect their individual farm plots. When there are incidences of fire outbreak in the plantation area, it becomes the responsibility of the workers and the developer to quench it. If the shock is a plant disease it is the responsibility of the developer to deal with it. It could harm the

²⁷ Kenkey ('Dokono') is a traditional Ghanaian staple dish made from fermented maize and cooked into dough, usually served with fried fish with pepper, vegetable stew or soup. It is eaten mostly in the Akan, Ga and Ewe-inhabited regions.

plantation workers when they are fired if the plantation developer cannot bear the extra costs of rehabilitating the plantation, but otherwise this could generate even more employment. The only likely factor to influence the workers' livelihood occurs when the upper layer of tree crowns (the canopy) is closing. Then, the ability to grow food crops between the trees declines and less work needs to be done on weeding. This could ultimately lead to a reduction of the workforce.

Another trend that is relevant to plantation workers is deforestation. In former times, many people depended on the forest for their livelihoods. Forest decline can therefore potentially contribute to poverty. With the establishment of forest plantations, tree planting provides renewed livelihood opportunities. Therefore a change from forest-based livelihoods to tree-based livelihoods is taking place, particularly in degraded forest areas. Natural forest rehabilitation is very hard to accomplish and therefore tree plantation establishment is a good alternative. Forest plantations lack the diversity in flora and fauna compared to natural forests but, as the results of this research showed, they are able to provide a livelihood for the plantation workers. NTFPs are still collected but in lesser quantities and diversity. This can be seen in the temporary hamlets on the commercial plantations, where the building material for the dwellings (wood, clay, grass and palm leaves) is extracted from the plantation area. Forest plantation establishment also creates opportunities for farming, which is forbidden in natural forests where it caused deforestation. The mixture of trees and food crops seems to be a good alternative for people's livelihoods, even when population pressure increases.

The third element of the SLA, structures and processes, was analysed in this thesis in terms of governance and institutions. This is mainly a concern for the plantation developer who has to deal with laws and legislation. The establishment of forest plantations is shaped by rules of the Forestry Commission and the reforestation (development) plan needs to be approved by the FC. Thanks to the legislation, adjacent communities get a small share (2%) in the future revenues. It is a bit contradictory that the larger proportions of employees are migrants from mostly northern regions from Ghana. The laws are affecting people's livelihood only indirectly: it is officially not allowed by law to live on the plantation. However, this occurs in the commercial plantations under the denominator of 'temporary hamlets'. Due to the remote location of the plantation vis-à-vis surrounding towns and villages, coping with large travel distances would take a lot of time every day (which is a reality for the HIPC-funded plantation workers who live outside the plantations). This would affect the working time and the workers' physical condition, and hence decrease their productivity and the profitability of the commercial plantations. For this reason, private plantation developers provide provisional housing at the plantation area.

Finally forest plantation development can be a measure to mitigate climate change through carbon sequestration, which can be stimulated through the carbon credit trade. Payments for environmental services should therefore be incorporated in forest plantation development schemes, in order to encourage more private developers to step into plantation development. The

main role of governance lies in the creation of a body that regulates the PES payments and revenues, and which is responsible for monitoring and control in order to prevent corruption.

9.3 Suggestions for further research

The national forest plantation development programme was introduced in 2001. In subsequent years more private investors got interested in plantation development. More degraded areas were developed by commercial developers every year since the introduction of the programme. The forest plantations that were included in this research were developed since 2001 and therefore tree harvesting had not yet taken place. I did not see large areas with mature trees ready for harvest. It would be interesting to see how the workers build their livelihood when the canopy is fully closed in about ten years. Will there still be new areas to be planted with young trees, or will the majority of the workers be forced to search for other livelihood opportunities (jobs)? Conducting the PROFOR tool again by then (or in plantations where this is already the case) would be interesting in order to find out in what way the workers shape their livelihood and in what way they will have adapted to the circumstances (i.e. a closed canopy and decreasing opportunities for planting food crops between the trees). In other words, will their current livelihood prove to be sustainable? Furthermore, it would be interesting to know why in some plantations so little work is done on fire prevention. Is it because it generates no income or does it have other causes?

Considering that the larger proportion of plantation workers are originally from northern regions of Ghana and from Burkina Faso, it would be interesting to examine whether there are more opportunities for the adjacent communities to benefit from plantation development besides their share in the benefit-sharing agreement. Questions to be addressed in this respect include whether there is more potential to help the private investors with fire prevention, increasing safety by controlling illegal farming or tree felling, or whether there are more employment opportunities on the plantation for people living near the plantation, and how the relationship between the investor and adjacent communities is.

Furthermore, it will be interesting to see what the effects of PES and/ or REDD mechanisms will be when these are implemented and working. How will the private developers think about their investment in trees; and will they consider it a good investment 20 years from their start, with or without the extra compensation through PES or REDD?

9.4 Recommendations for policy and practice

The results of this study on forest plantations development by both public and private investors shows that it creates employment opportunities for many people and therefore positively influences people's livelihoods. Having a permanent job is one of the basic components of one's livelihood. The forest plantation developers do offer this to their workers. Although many workers are happy with their living and working circumstances, improvements are always

welcome. Good working equipment would make the work safer and more comfortable. Legislation could therefore be adapted to ensure that workers involved in forest plantations are provided with adequate working outfits and equipment, including wellington boots, rain coats and cutlasses. In addition, the results showed that workers find the possibility of cultivating their own food crops very important and that it contributes significantly to their livelihoods. This makes the workers self-sufficient, which is important especially when they live remotely from other towns and villages. Plantation workers could therefore be assigned small pieces of farmland for them to cultivate food crops, not only to feed their family but also to generate additional cash income.

Concerning safety and fire prevention it could be explored whether there is more potential to involve communities adjacent to commercial plantations in these tasks. Actually, the 2% tree benefit-share for the community, which is included in the Commercial Plantation Development Agreement, is compensation to the surrounding communities for their expected involvement in fire prevention and general protection of the tree property. To actually involve them requires more awareness raising and education in the surrounding communities, to be organised by the FC. These activities should be geared towards increasing awareness of the communities' share in plantation development and their tasks of helping to ensure the protection of the forests and plantations.

To improve the environmental quality of forest plantations, it is recommended to explore the feasibility of allocating a certain proportion of each plantation to the planting of a diversity of trees and other vegetation, without the intention of felling, and of making this mandatory.

In the HIPC-funded plantations, settlements of workers on the plantation area could increase safety and fire prevention. This would also be a solution to the transportation problem (in time and distance).

The livelihood stability of the HIPC-funded plantation workers could be further enhanced by making timely monthly wage payments. This would make their life less insecure and prevents people falling into debts due to late payment of the wages.

In order to stimulate plantation development and recovery of tree cover in degraded areas, and benefit from the associated livelihood benefits, carbon sequestration, environmental quality and supply of timber for the domestic and foreign timber market, it is recommendable to explore the investors' receptivity to and the feasibility of implementing a PES system.

Finally, it is recommended that all actors – government, civil society and the private sector – join forces to stimulate the conservation of remaining forests. Despite all their benefits, forest plantations cannot act as substitutes for natural forest.

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11 Appendices

Appendix 1: Questionnaire

 Forest plantations benefiting to local people livelihoods in Ghana's High Forest Zone 			
University of Amsterdam, Kwame Nkrumah University of Science and Technology (KNUST) and Tropenbos International Ghana.			
Questionnaire		Village	
Interviewer		Region	
Forest Plantation		Forest district	

Introduction: [to be read to respondent]

I am a student carrying out research on forest-related livelihoods in Ghana. We are supported by Tropenbos International Ghana, Kwame Nkrumah University of Science & Technology (KNUST) and the University of Amsterdam. This study is trying to determine the role of governance arrangements (rights to access, extract, plant, manage and transport) in forest plantations to local people's livelihoods.

We would like to ask you some questions related to forests, in particular, livelihood assets from forest plantations. Your answers will be treated anonymously, meaning that nobody can see the responses you have made.

You are very welcome to ask any questions during and after the interview.

Section A: BIODATA

No.	Question	Code	Answer	Code	Answer
1	Gender (sex)	1	Male	2	Female
2	Age	Num		99	Not answered
3	Educational level	1	Primary	5	None
		2	JHS / MSLC	6	Other: ...
		3	SHS		
		4	Informal education	99	Not answered
4	Origin	1	Native/indigenous → 9	99	Not answered [→9]
		2	Migrant [→5]		
5	Village of origin	String		99	Not answered
6	District of origin	String		99	Not answered
7	Region of origin	String		99	Not answered
8	No. of years in this village	String		99	Not answered
9	Marital status	1	Single	4	Widowed
		2	Married	5	Separated
		3	Divorced	99	Not answered
10	Household type	1	Nucleus	99	Not answered
		2	Extended		
11	Household size (total)	Num		99	Not answered
12	No. of adults	Num		99	Not answered
13	No. of children	Num		99	Not answered

Section B: FOREST RELATED LIVELIHOODS (natural assets) IN

14	What is the most important Forest livelihood for you	1	Commercial	4	NTFP collection
		2	HIPC	5	Both
		3	Tree Nursery	99	Not answered
15	What are occupied professions <u>before</u> work on plantation? And how long have you been working on this job?	str	Years	99	Not answered
16	Access to forest plantation	1	Always	4	Never
		2	Regular	5	Other
		3	Sometimes	99	Not answered
17	Distance to forest plantation	Nm	Miles	99	Not answered
18a	Working time a day	Nm	Hours	99	Not answered
18b	Seasonal trends, working time.	1	Whole year	3	Other
		2	Specific season, which time of year ...	99	Not answered
19	Is work in the forest plantation increased or declined over the past years, why?	1	Increased	99	Not answered
		2	Same		
		3	Decreased		
20	Do you have land for tree planting?	1	Yes	99	Not answered
		2	No		
21	Would you like to plant timber trees yourself (if had land)	1	Yes	99	Not answered
		2	No		
21a	If yes, why? Name 2/3 reasons				
21b	If no, why? Name 2/3 reasons				

Section C: FOREST RELATED LIVELIHOODS (human assets) IN

22	Number of years working in the plantation	nm	Years	99	Not answered
23	Working experience on forest plantation.	1	Positive (like to work)	3	Neutral
		2	Negative (do not like to work)	99	Not answered
24	List of activities usually performed on forest plantation (input)	Str		99	Not answered
25	Type of benefit/ income from the plantation?	1	Long term	3	Unknown
		2	Short term	99	Not answered
26	How do you find the work on the forest plantation?	1	Very Easy		
		2	Easy	99	Not answered
		3	Normal		
		4	Hard		
		5	Very hard		
27	What development projects have gov't or investor done in your village as a result of the plantations here?	1	Health care	5	Other
		2	Education	6	None
		3	Infrastructure	99	Not answered
		4	Water supply		
28	Are you content with the output (income/food) from the plantation?	1	Yes	99	Not answered
		2	No		
28a	If yes, why? Name 2/3 reasons				
28b	If no, why? Name 2/3 reasons				

Section D: FOREST RELATED LIVELIHOODS (social assets) IN

29	Are you involved in any tree grower associations?	1	Yes	99	Not answered
		2	No		
30	How many times contact with FSD Officers/ contact person	Nmper wk-month-year	99	Not answered
31	How many times contact with Investor (Commercial)	Nmper wk-month-year	99	Not answered
32	Experience of contact FSD Officers/ contact person	1	Positive (Friendly)	3	Neutral (Normal)
		2	Negative (Unfriendly)	99	Not answered
33	Experience of contact Investor (Commercial)	1	Positive (Friendly)	3	Neutral (Normal)
		2	Negative (Unfriendly)	99	Not answered
34	Relation with investor (Commercial)	1	Strong	99	Not answered
		2	Weak		
35	Is the relation improving, worsening	1	Improving	3	Same
		2	Worsening	99	Not answered
36	Experiencing shocks	1	Fire	4	Other
		2	Drought	5	None
		3	Plant diseases	99	Not answered
37	Are you allowed to plant food crops?	1, str	Yes, what type of crops.....	99	Not answered
		2	No		
38	Is it possible to renegotiate the benefit sharing agreement in this scheme?	1	Yes	99	Not answered
		2	No		
39	What new arrangements do you prefer in the scheme?	str		99	Not answered
40	What kind of benefits of plantation have you experienced?	str		99	Not answered
41	On a scale of 1 (least) to 10 (most), how important are forest products for your livelihood	nm	Least Most 1/ 2 – 3/ 4 – 5/ 6 – 7/ 8 – 9/ 10	99	Not answered
42	What are other activities (now) done, besides working on plantation	str		99	Not answered

Appendix 2: PROFOR toolkit 4: Table results

Livelihood Resource	COMMERCIAL Forest Plantation 'Beta'				HIPC-funded Forest Plantation			
	Male Cash	Male Non-Cash	Female Cash	Female Non-Cash	Male Cash	Male Non-Cash	Female Cash	Female Non-Cash
	%	%	%	%	%	%	%	%
NTFP Collection	0	16,5	0	28,5	7,5	30	2,5	11
Timber (construction)		3,5						
Clay (construction)		3		5,5				
Firewood				9	3	7,5	1,5	7,5
Grass				8	1	2,5		
Kwamsuiisa				6				
Bushmeat		4			2	8,5		0,5
Pestles		6			0,5	6	0,5	
Bushrope						2		3
Snail					0,5	1,5		
Mushroom						2		
Leaves					0,5		0,5	
Allocated Farm Area	86	78	94,5	69,5	29	20	29,5	37
Maize	24	22,5	26	22	7,5	4,5	10	13,5
Yam	19,5	15	22	15	11	5	6,5	6
Cocoyam					4	2	1	2
Cassava	12,5	13	12,5	8				
Plantain	3,5	3	8	4,5	3	5	6,5	7
Beans	8,5	6,5			1,5			0
Groundnut	3,5	4	2,5		1,5		2,5	1,5
Pepper		1	12	8		1,5	1	2,5
Tomatoes		1,5	6	6	0,5	1,5	1	2,5
Onions		1	1	1,5		0,5	1	2
Garden Egg			1,5	0,5				
Cocoyam Leaves			3	4				
Chickens	9	5,5						
Goat/Sheep	5,5	5						
Wage	6,5	0	2,5	0	27	0	33,5	0
Agric Farm	7,5	5,5	0	0	34,5	50	25,5	41
Maize	2,5	2			12	10	7,5	10
Yam	0,5					7	2,5	5,5
Cocoyam					3,5	3	2,5	4,5
Cassava					6	14	5,5	12,5
Plantain					6,5	8	2	2,5
Beans		1						
Groundnut	2,5	1						
Pepper	0,5				0,5	2,5	1,5	1,5
Tomatoes	1				0,5	2,5	1	1,5
Onions					0,5	2	0,5	1,5
Garden Egg						1	0,5	1,5
Goat					0,5			
Cashew					3		2	
Palmnut					1,5			
Atoko	0,5	1,5						
Petty Trading	0	0	3	2	2	0	9	11

