Carbon Offsets and Agricultural Livelihoods:

Lessons Learned From a Carbon Credit Project in The Transition Zone Of Ghana

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Acronyms

ACR	American Carbon Registry
ACT	African Carbon Trust
ADB	Agricultural Development Bank
AFOLU	Agriculture, Forestry and Other Land Use
AFP	Absentee Farmer Programme
BAU	Business-as-usual
BNI	Bureau of National Investigations
CAR	Climate Action Reserve
CCB	Climate, Community and Biodiversity
CCI	Cocoa Carbon Initiative
CCP	Carbon Credit Project
CCU	Climate Change Unit
CDM	Clean Development Mechanism
CEA	Country Environment Analysis
CFVS	Community Fire Volunteer Squad
COP 13	Conference of the Parties
CREMA	Community Resource Management Area
CSIR	Council for Scientific and Industrial Research
DIS	Decentralised Implementation System
EDC	Environmental Development Consultants Ltd
ENRAC	Environment and Natural Resources Advisory Council
EPA	Environmental Protection Agency
ERD	Environment and Rural Development
FACE	Forests Absorbing Carbon-dioxide Emissions
FAO	Food and Agriculture Organization of the United Nations
FBODF	Farmer-Based Organizational Development Fund
FC	Forestry Commission

FCPF	Forest Carbon Partnership Facility
FGD	Focus Group Discussion
FPIC	Free Prior and Informed Consent
FPS	Forest Project Standard
FSD	Forest Services Division
GNFS	Ghana National Fire Service
GHG	Greenhouse gas
GoG	Government of Ghana
GNFS	Ghana National Fire Service
GPRS	Ghana Poverty Reduction Strategy
JI	Joint Implementation
LULUCF	Land-Use, Land-Use Change and Forestry
MCA	Millennium Challenge Authority
MDG	Millennium Development Goals
MEST	Ministry of Environment, Science and Technology
MOFA	Ministry of Food and Agriculture
MRV	Measurement, reporting and verification
MTS	Modified Taungua System
NBSG	National Biodiversity Strategy for Ghana
NGO	Non governmental organisation
NCRC	Nature Conversation Research Centre
NPP	New Patriotic Party
NTFP	non-timber forest products
NTFP	non-timber farm product
PDD	Project Design Document
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	Reducing Emissions from Deforestation and Forest Degradation
R-PIN	Readiness Preparation Idea Note

RPP	Readiness Preparation Proposals
RTIP	Root and Tuber Improvement Programme
SRA	Social Responsibility Agreement
TRIMP	Root and Tuber Improvement and Marketing Programme
TRAGRIMACS	Tropical Agricultural Marketing and Consultancy Services
TUC	Timber Utilisation Contract
VCS	Verified carbon standard
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VIP	Very Important Person

1. Climate Change Agriculture and Forestry: Challenges and Solutions in Ghana's Transition Zone

The Global Context

Tropical deforestation accounts for 20 to 25 percent of annual global carbon dioxide emissions (Watson *et al.* 2000; Metz *et al.* 2007a) and is therefore a major contributor to climate change. On the other hand, forests play a crucial role in combating climate change by absorbing massive amounts of carbon dioxide from the air and storing more than three-quarters of the planet's above- and below-ground carbon (Metz *et al.* 2007a). This has generated considerable interest in new approaches to reduce deforestation rates as a climate change mitigation strategy (Vhugen *et al.* 2012) and the most important way to cost-effectively and immediately reduce global carbon emissions (Stern 2006 as cited in Negra and Wollenberg 2011). Reducing Emissions from Deforestation and Forest Degradation (REDD+)[1] has therefore become an important item of the international climate change negotiations which are ongoing under the United Nations Framework Convention on Climate Change (UNFCCC) (REDD-net undated a). At the thirteenth session of the Conference of the Parties (COP 13) of the UNFCCC in Bali 2007, a process was initiated to find a way to incorporate REDD+ in a future global climate change agreement and afterwards, a relatively advanced outline of the broad principles of using international policies to achieve REDD+ was developed at the 2009 UNFCCC conference in Copenhagen (REDD-net undated a).

The REDD+ policy process generally entails providing tropical developing countries with financial incentives from developed countries to reduce deforestation and degradation rates (REDD-net undated b). The mobilization of funding, technical activity and institutional engagement for REDD+ has been relatively quick and broad, with at least 37 countries already preparing national REDD+ programmes and a wide array of public and private entities investing attention and resources (Negra and Wollenberg 2011). The success of the REDD+ initiative will, however, not be achieved, unless agricultural expansion into tropical forests is taken into account by REDD+ policy decisions (Johns *et al.* 2010; IIED 2010; FAO 2011a). Considering that agriculture alone accounts for about 14 percent of global GHG emissions or 6.8 Gt of CO_2 equivalents (e) per year (Parry *et al.* 2007), it becomes critical to maximize synergies between REDD+ and agriculture to ensure that food production and forestry do not compete for natural resources (FAO 2011a).

Although the majority of countries that are participating in the REDD+ mechanism recognize agriculture as the main cause of deforestation, most of them lack clear policies on how they would address the link between agriculture and forestry (Meadu 2011). In Ghana for instance, expansion in cocoa production is a major cause of deforestation, yet the immense contribution of cocoa to the Ghanaian economy makes it quite challenging for the government to restrict the quantity of cocoa production (Anim-Kwapong and Frimpong 2005; Breisinger *et al.* 2008). 'There is simply no way governments can have credible REDD+ strategies unless their top priority is to address agriculture and food security – these are the main drivers of forest destruction', was how Bruce Campbell of the CGIAR Research Program on Climate Change, Agriculture and Food Security expressed the tradeoffs between REDD+ and agriculture (Meadu, 2011). The need to build bridges between REDD+ strategies and agriculture is urgent because the commercial demands, food security issues, and government mandates driving agriculture's expansion into forested areas will only increase (FAO 2011a; Meadu 2011). The need to link REDD+ and agriculture under the

[1] The plus (+) component of REDD+ includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks

banner of climate-smart agriculture has, hence, been included in the COP17 Durban Agreements and is poised for implementation as an international mechanism for climate change mitigation and adaptation.

Achieving REDD+ in agricultural landscapes, however, raises food security concerns for subsistence farmers and poor communities that rely on forest resources for their food and livelihoods (IIED 2010). In view of weak land rights and population-induced land scarcity, it is also foreseen that REDD+ strategies and projects can restrict poor communities' rights and access to forest resources without recompense (Sunderlin *et al*. 2009: Springate-Baginski and Wollenberg 2010: IIED 2010), or with payments that are too low to make up the shortfall in their food supply (IIED 2010). Another key concern is unclear carbon rights and the likelihood of unfair practices and inequitable distribution of benefits that often occur in tropical forest areas where land tenure systems are unclear, contested or poorly enforced (Vhugen *et al,* 2012).

To ensure the success of REDD+ in farming landscapes, a range of political, cultural and socio-economic issues, including unsound policies, weak governance, corruption, unclear allocation rights, landlessness, migration, rural poverty, and a lack of financial resources need to be addressed at the local level as they are indirect drivers of deforestation (FAO 2011a). The REDD policy process has, however, been criticized for lacking attention to the inclusion of local communities and local level stakeholders (Negra and Wollenber 2011). It was against this background that indigenous communities, through the Anchorage Declaration (April 2009), declared forest offsets to be a 'false solution' and requested representation in the UNFCCC secretariat as well as funding for indigenous peoples' participation 'in all climate processes' (Negra and Wollenberg 2011). Families and entire communities have been marginalized from participation and even displaced from their land by more powerful stakeholders, as in the case of the Forests Absorbing Carbon-dioxides Emissions (FACE) Foundation‘s reforestation project in Mount Elgon National Park, Uganda; in the early PROFAFOR work in Ecuador; and the first CDM reforestation project in Pearl River Basin, China (USAID, 2011). Some carbon offset projects have, however, worked to secure tenure by helping to formalize traditional rights, as in World Vision‘s Humbo Assisted Natural Regeneration Project on communal land in Ethiopia (USAID, 2011). As REDD+ becomes an integral part of the international response to climate change, it is important to learn from existing forest carbon offset projects to ensure that REDD+ does not undermine property rights at the grassroots (USAID 2011). The concerns raised about the top-down nature of the REDD+ policy process clearly call for more grassroots-level case studies that will help explore local people's perception and response to globally-driven carbon offset interventions in order to enhance their inclusion in climate change policy debates.

The Vision 2050 Forestry Carbon Credit Project: A case study

Across the world, a huge number of REDD-type projects are emerging responding to this agenda. Some are initiated by governments as part of the UN-REDD umbrella, others are private commercial or non-profit initiatives. Some are project funded, while others are aiming to link into emerging voluntary carbon markets. There is a huge array of experimentation going on in this field, much of it not fully documented. All efforts are grappling with the challenges outlined above.

This paper focuses on one project in Ghana, and is aimed at understanding how the Vision 2050 Forestry Carbon Credit Project (CCP) interacts with property rights, resource access and livelihoods of smallholders in the Forest-Savanna Transition zone of Ghana. The focus is on the process of project implementation, and the underlying assumptions driving this. The impacts the project has – intended and unintended – are explored. While in many ways not typical, this project case study nevertheless exposes some of the core dilemmas and challenges of REDD-type projects in agricultural areas, highlighting in particularly the social,

institutional and political dimensions. In the following sections, the paper explores the land use history of the study area and how past land-use interventions are shaping farmers' perception of the carbon offset intervention. It draws out the narratives (the storylines which define problems and solutions) of the key actors about carbon and climate change and how these narratives converge and conflict. Differential interests and power relations of various actors and how they influence resource access and control in the CCP are also discussed in this paper. The paper assesses how carbon rights get appropriated and examines the local understanding of carbon as a commodity. It finally analyses the implications of the CCP on land-use change and livelihoods in the study sites and the transition zone.

The paper brings into the limelight alternative narratives from the grassroots that had been obscured by the dominant narratives of the more powerful actors. The conclusions underscore the need to make REDD+ interventions contribute to the wellbeing of smallholders. Such counter narratives from the grassroots potentially provide policy spaces for making carbon offset interventions more equitable, while enhancing the inclusion of marginalized local actors. The design of the CCP itself, the challenges faced by farmers and the project developer, as well as factors which ultimately contributed to the collapse of the project, all provide useful lessons for ongoing and future REDD+ projects worldwide, especially with regard to making them grassroots-centered and compatible with smallholder agriculture.

Methodology for the Study

This sub-section provides a brief description of the project and study area. It gives the rationale for choosing the project and study sites and outlines the methods used for data collection.

The CCP was initiated by Vision 2050 Forestry in 2008, with the main aim of providing a solution to global climate change through tree farming in agricultural landscapes. The project seeks to achieve this by providing land (on behalf of the landless), tree seedlings, equipment and carbon credits (pre-finance) to smallholders and other interested individuals and groups to engage in agroforestry and forest plantations.

When this study was initiated, the project was found to be the only active REDD+-related project on the ground in the Agriculture, Forestry and Other Land Use (AFOLU) and Land-Use, Land-Use Change and Forestry (LULUCF) categories. Ghana's REDD programme was then preparing to launch a few pilot projects which were later placed on hold due to technical and land tenure reasons. A famous example was the proposed Nyankamba Community Resource Management Area (CREMA) REDD Project in the Northern Region of Ghana. Another was the Ghana Stove Project which had been on the ground for about five years under the auspices of ClimateCare. The stove project was, however, focused on emission reductions from sustainable energy, and hence, had little bearing on land-use and agriculture. The lack of any mainstream REDD+ project on the ground in the AFOLU/LULUCF category made the three year presence of the CCP at the grassroots and the considerable local response it had generated indispensable to this study.

However, the CCP was not a formal REDD project, and would have been rejected by the Ghana government programme for a number of reasons. First, the project documents lacked the technical details required by REDD+ carbon markets to prove additionality and for measurement, reporting and verification (see below). In addition, the project was more or less individual-led; there was no evidence of donor support, institutional collaboration and third-party auditing typical of mainstream carbon projects. Nevertheless, the project provided a good case for examining the tradeoffs between REDD+ and agriculture as it was tailored at enhancing carbon stocks and food production in agricultural landscapes. Issues relating to

land tenure, resource access and livelihoods, highlighted as central to the design of REDD+ projects, all came to the fore, revealing important lessons.

The Forest-Savanna Transition Zone of Ghana

The transition zone is that portion of the country between the Guinea Savannah to the north and the dry semi-deciduous forest zone to the south (Figure1.1). Rainfall is in one peak in some years and two peaks in other years, although the double maximum is more common (FAO undated). This variation in the distribution of rainfall shows the transition nature of the zone. The vegetation is predominantly forest fragments in the midst of savanna shrubs and a wide range of tall grasses. Among the forest patches are *Antiaris, Phyllanthus* and *Elaeis,* while *Borassus, Lophira, Daniellia, Lonchocarpus, Pterocarpus, Burkea* and *Parkia* represent the savanna tree elements (FAO undated). The humid zone representatives among the grasses include *Pennisetum purpureum* and *Panicum maximum*, while the subhumid zone species include *Andropogon gayanus*, *Andropogon tectorum*, *Hyperthelia* and *Hyparrhenia spp*. (Fianu *et al*. 2001 as cited in FAO undated). The vegetation of the area is thus a blend of the Northern Savannah vegetation and the Southern Forest Zone - hence the name, transition zone. The soil and climatic conditions are suitable for crops from both the Savanna and Forest regions. Crop farming is, hence, the main source of livelihood in the area. Maize is the dominant food crop grown, generally under rain-fed conditions in two seasons-the early (April/May) season and the late (July/August) seasons. Most of the people are therefore maize farmers. Other major food crops grown are pepper, plantain, cassava, yam, cocoyam and legumes. Oil palm and cocoa are also grown but on a limited scale.

Farmlands, which are predominantly family lands, are inherited based on kinship. The existing land tenure system implies that migrants cannot own land, but have to depend on other arrangements such as share cropping and land renting to acquire land (Adjei-Nsiah *et al*. 2004). There are two different types of share cropping negotiation, locally known as *abunnu* and *abussa.* Under the *abunnu* arrangement, the yield from the land is shared equally between the landowner and the tenant (farmer), with the farmer providing all the farm inputs, including the labour. In *abussa* farm produce is divided into three parts; a third goes to the landlord and two-thirds to the farmer. Occasionally, land is also given out on a rental based on mutual tenancy arrangements between the landlord and the tenant farmer. Land can be rented for a definite period usually ranging from one to five years, depending on the financial need of the landowner. Due to insufficient security to land, migrants tend to cultivate short-duration crops such maize and legumes (Adjei-Nsiah *et al*. 2004). In contrast, natives who have adequate security to land tend to grow long-duration crops such as plantain, cassava and cocoyam (Adjei-Nsiah *et al*. 2004).

The transition zone of Ghana was selected for case studies because that is where Vision 2050 Forestry had been focusing most attention with a special objective of 'using carbon offset payments to slow down desertification and the southward progression of the Savanna into the forested areas'.[2]I This study explores whether this is the case, and whether the good aims of Vision 2050 Forestry were realized. The transition zone had also witnessed a whole series of 'sustainable land-use interventions' over the years, which were thought to have laid the necessary foundation for a fascinating REDD+ related case study.

History and Socioeconomic Contexts of Case Study Communities

The study took place in two communities in the transition zone: Badu and Dumasua, including their respective suburbs - Tainso and Mantukwa (Figure1.1). The ancestral

[2] Dr. Kofi Frimpong (Director and Founder of Vision 2050 Forestry), Kumasi, September 2011.

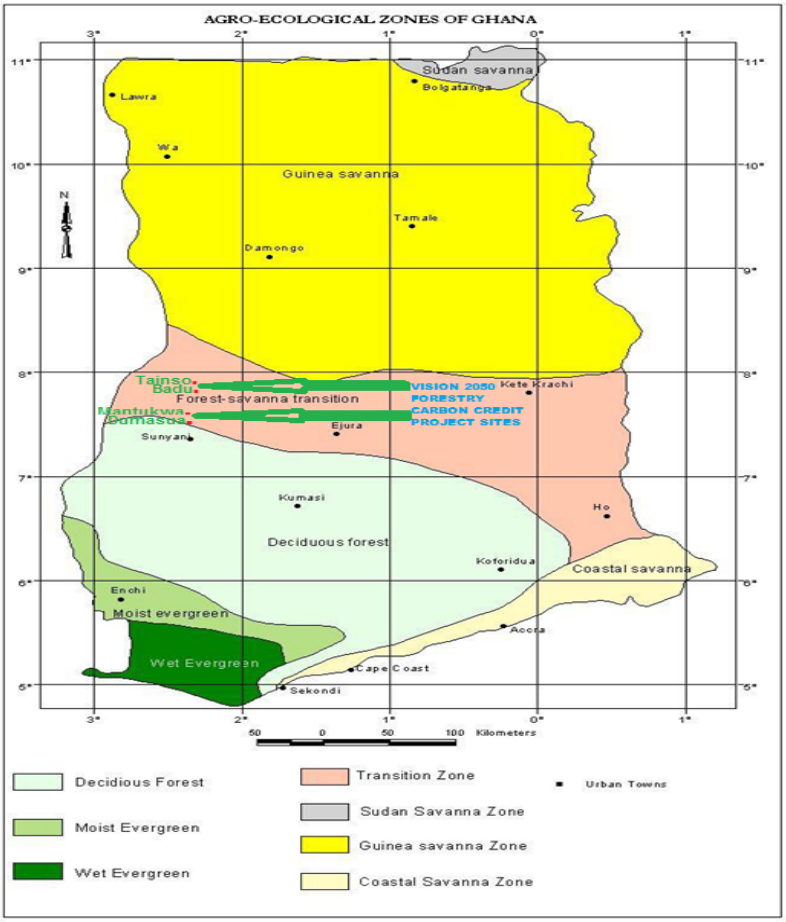

Figure1.1: Map of the transition zone of Ghana showing case-study communities (Adapted from Aning et al. 2008)

histories of both communities, although lacking precise dates, give a certain indication of the state of past forests and how the land-use pattern has changed over time

A Short History of Badu

The people of Badu originally come from Bona in the Ivory Coast. They were compelled to migrate to Kumasi in Ghana following frequent tribal wars with the Lobi people. After assisting the Ashanti Kingdom to defeat the Fanti people, the people of Badu were rewarded with a vast forest land at Offinso by Nana Osei Bonsu, the then Ashanti King. The old woman who was leading the people of Badu later discovered the absence of a particular sweet chewing stick at Offinso and therefore decided to move the people to the grassland where that special chewing stick was very likely to be found. The people ended up settling in Badu where they helped in conquering the people of Mo who had been tormenting the people of Badu over the years. Having realised their might as a group, the Badu people sought their independence from the people of Wenchi and relocated to Korango. They later moved to more suitable location where it was unanimously declared *ya du* which literally translates from the Twi language as 'we have (finally) arrived'. *Yadu* became a buzz word and was gradually adulterated to *Badu*, which eventually became the name of the final destination - the present day Badu.

The establishment of Badu dates back to around 1830. The ancestral tale holds that the vegetation of the time was originally small patches of grassland in the midst of vast thick forests. The open grass fields were ideal for yam cultivation while the forested areas where cleared for cocoa production. Cocoa production expanded rapidly until the 1983 bushfires

burnt cocoa farms and recurrent fire episodes rendered the area unsuitable for cocoa production.

A Short History of Dumasua

In search of better economic opportunities, the people of Dumasua migrated from Jaaman-Broko Sassa in Cote d'Ivoire to present day Odumasi in the Brong Ahafo Region of Ghana. They later relocated to a thick forested area bequeathed by the chief of Odumasi to whom they paid allegiance. The people derived their livelihoods mostly from exploiting the forest for hunting and fertile lands for cocoa production and extensively used bush fallow systems to rejuvenate the farming landscape. The point of settlement in the forest was the bank of a river which was named 'dom asua' (literally translated from the Bono language as 'the river of blessings') due to multiple benefits the people derived from the river. 'Dom asua' was gradually pronounced as Dumasua, which became the name of the place of settlement. A major road was later constructed a few miles away from Dumasua so the people abandoned Dumasua and established a new town by the roadside in order to facilitate transportation to and commerce with neighbouring towns. The abandoned Dumasua was renamed Old Dumasua and the new establishment was named New Dumasua which is present day Dumasua.

Today the forest of Old Dumasua has become farmland. Various artifacts, including foundations of abandoned settlements, makes Dumasua a unique place for remembering the ancestors, and is marked by large trees where the old settlements were.

Socioeconomic Comparison of Badu and Dumasua

Dumasua falls within the Sunyani West District and is located about 6.7 km north of Sunyani-the capital city of the Brong Ahafo Region. The close proximity of this community to Sunyani favours high rates of youth emigration for greener pastures, thereby leading to little youth involvement in farming. The closeness and expansion of Sunyani are also affecting land values and availability of farmlands in Dumasua and its environs, as farmlands are being converted into expensive building plots. A single parcel of land measuring 10000ft² that used to sell for about GH¢500 (£200) ten years ago is currently priced averagely at GH¢3000 (£1200), representing a 500% increment. Urbanization-induced land scarcity mainly explains the limited population of migrant farmers in this community.

On the other hand, Badu is a rural community in the Tain District and not close to any major city. The nearest major town is Wenchi which is about 16 km away. Unlike Sunyani, Wenchi does not offer many attractive economic opportunities to warrant high rates of rural-urban drift by the youth. For this reason, a large of number of the youth is actively engaged in farming. Farmland is cheaper and more readily available compared to its counterpart land in the peri-urban community. Farmers in Badu therefore tend to own big farms whereas farms in Dumasua are generally small in size. For instance, the average size of farmland used for the carbon project in Dumasua is 0.19 ha as compared to 41ha in Badu.

Although land is relatively cheap in Badu, increasing demand from settler farmers and population growth are gradually pushing up the value of farm lands. In Badu for instance, the price of one plot of land (10000ft²) has increased by about 200,000% in the last ten years; from GH¢ 0.50 (£0.20) to about GH¢1000 (£400). In Tainso which is more rural, land which used to be free of charge a decade ago now sells for about GH¢100 (£40). The increase in the monetary value of farm lands is partly blamed for the continuous decline in soil productivity. In the past when land was free of charge, landlords could dictate to tenant farmers how the land should be managed sustainably. However, with land now being commoditised, landlords are no longer able to dictate to tenant farmers how the land should

be managed. The lack of control over land management allows tenant farmers to intensify production at the expense of sustainable land use in order to break even.

A high population of migrant farmers in Badu presents another major contrast with Dumasua. The transition zone generally witnesses frequent migration of farmers from the neighbouring Upper West Region where the climate and soil of the Sudan Savannah agro-ecological zone are less favourable for food production. Badu and its suburbs provide a haven for most of these migrant farmers due to the good availability and relatively low cost of farmland. There are two categories of migrant farmers: the settler farmers who settle permanently to farm, either by renting land or through share cropping; and those who migrate annually to work as farm labourers during the peak of farming season and return during the off-peak season.

Table 1.1 below uses additional parameters to compare and describe Badu and Dumasua.

Criteria	**Badu**	**Dumasua**
Average Annual Rainfall[3]	1,140 – 1,270 mm	1,700 mm
Forest Type/Cover	Forest-Savanna Transition Zone: forest cover relatively low	Forest-Savanna Transition Zone: forest cover relatively high
Main Farming System	Subsistence crop production (mainly maize)	Subsistence crop production (mainly maize and pepper) and livestock production (mainly poultry)
Proximity to Urban Centre	Very far	Very close
Land Value	Relatively cheap	Relatively expensive
Land Tenure System	Predominately family lands	Predominately family lands
Population[4]	9302	1784
Migrant Population	Relatively high	Relatively low
Labour Cost	Relatively low	Relatively high
Number of Landowners involved in the Project	41	31
Gender of Landowners	27 Males and 14 Females	22 Males and 9 Females
Number of Resident Absentees (landless) involved in the Project	1	1
Gender of Resident Absentees (landless)	Male	Female

Table 1.1 Description and Comparison of Badu and Dumasua

[3] Source: Ghana Meteorological Agency (2011). District climate data provided for the Ministry of Food and Agriculture.

[4] Source: Ghana Statistical Service (2012). The 2000 Population and Housing Census. Data for this statistics was collected over a decade ago and hence, does not give a true reflection of the current situation. Only regional and national level estimates from the 2010 census are so far available to the public. Moreover, the census data does not give population density estimates for individual towns and villages. Data on the sizes (Km^2) of Badu and Dumasua, which could have been used to estimate population density, were not also available at the respective district assemblies.

Rationale for Selecting the Project Sites

Badu and Dumasua were specifically chosen for community-level investigations because of their longest experience of approximately three years in the CCP. Besides, Dumasua is a peri-urban community whereas Badu is rural. Badu is bigger in size than Dumasua except that Dumasua enjoys the opportunities of being close to a city. This contrast provides an opportunity to investigate the implications of urbanization and land pressure on the future of smallholder agriculture within the framework of REDD+. The large population of migrant farmers in Badu and Dumasua also offers an excellent setting to investigate how the resource access of vulnerable groups who lack secured land rights and social protection will be contested following the introduction of a carbon offset project premised on wealth creation from valuable farmlands.

Methods of Data Collection

The study employed the following methods of data collection: desk studies, key informant interviews, Focus Group Discussions (FGDs), transect-walk discussions, farm visits and observations and phone conversations.

Desk Studies: This entailed literature reviews and the analysis of key project documents such as feasibility study reports, project's operational manual, old field reports and contractual agreement forms. A volunteer experience with Vision 2050 Forestry in the area on proposal development and grant writing facilitated access key project documents.

Key Informant Interviews/Conversations: Dr. Kofi Frimpong, the Director of Vision 2050 Forestry and project developer, was interviewed several times to ascertain the dominant narrative and clarify counter narratives from the grassroots. Information on the history of land-use interventions was obtained from project management staff of the Ministry of Food and Agriculture (MOFA). Conversations were also held with representatives of key institutions running Ghana's REDD Programme - the Climate Change Unit (CCU) of the Forestry Commission (FC), Forest Trends and Nature Conversation Research Centre (NCRC) - to identify their perception of the CCP and obtain information on the state of potential REDD pilot projects. Information on land-use histories were obtained from the linguist of the chief Badu and the head of the royal family of Dumasua.

Focus Group Discussions, transect-walk conversations and *farm visits and observations:* These methods were used to obtain information from landowners (active farmers) involved in the project. Interestingly, most of the fascinating stories came up from informal conversations held during transect walks and farm visits when farmers were less conscious of being interviewed.

Figure 1.2: Focus Group discussions with farmers

Figure 1.3: Transect-walk conversations with farmers

Figure 1.4. Farm visit

Figure 1.5: Farm observation

Phone conversations: Phone conversations were very effective in obtaining information from absentee farmers (Chapter 3) who reside at various places far away from the selected communities. It was difficult to hold face-to-face interviews with absentee farmers due to proximity constraints and the fact that their usual meeting place which was the Regional Office of Vision 2050 Forestry in Sunyani was closed most of the time. A mobile telephone number was therefore left on the notice board of the office for absentees to call whenever the office was closed. Absentee farmers frequently called for various reasons and got interviewed in the course of the telephone conversations. Phone conversations were also used to clarify ambiguous and contradictory responses from active farmers and for asking follow up questions.

The Structure of this Paper

The paper is divided into nine sections, beginning with an overview of challenges and solutions to climate change, agriculture and forestry in the transition zone of Ghana and methodology for the study. Section 2 looks at the mechanisms and challenges of REDD+, whereas Section 3 specifically looks at REDD+ in the Transition Zone within environmental and land-use change contexts. Section 4 provides a detailed description of the project, how

it was introduced, key factors that contributed to its failure and the way forward. The narratives of the various actors on forest degradation, carbon emissions and climate change, food security and poverty alleviation, which frame the project intervention, are presented in section 5. Section 6 explores carbon as a commodity and local understanding of carbon value. In section 7, the influence of the powers of exclusion on the resource access of the various actors is critically analysed. Section 8 examines how the livelihoods of small scale farmers, migrant farm labourers and sharecroppers are influenced by the CCP, including how the project is triggering a shift from food crop to tree and cocoa farming and its implications on the sustainability of the carbon offset project. Section 9 seeks to tie the narratives together and gives recommendations for making REDD+ sustainable, grassroots-centered and compatible with smallholder agriculture.

Overall, the paper argues that:

- Justifications of additionality based on dubious baseline data on forest cover need to be avoided. A more careful assessment is required which takes into account the dynamic relationships between forests, farms and climate in transition zone landscapes. Incentives to gain carbon finance are strong, and this can result in impositions which are inappropriate, and may not result in either carbon benefits or livelihood improvements if not managed carefully and transparently.

- The successes and failures of past land-use interventions can greatly shape farmers' perception of REDD+ interventions in smallholder contexts. REDD+ projects will have to prove their credibility in order to reverse the negative impressions that have been created by unsuccessful land-use interventions of the past. To achieve this, the idea of rushing to pre-finance projects has to be avoided; relevant baseline data required for proving additionality need to be collected and adequate funding has to be secured from the carbon market before fully engaging farmers and landowners.

- The justification for carbon offset in smallholder contexts should be based more on farmers' understanding of climate change and livelihood concerns rather than on scientific theories. Tying carbon offset payments with good rainfall, fire prevention and availability non-timber forest products (NTFPs) to justify reforestation is likely to encourage greater participation of farmers and landowners than just using arguments for carbon sequestration.

- It is important to consider land value in the determination of carbon values. Increasing land value in urban and peri-urban areas should attract higher carbon values than in rural areas where land is relatively cheap and readily available. To enhance the long-term participation of smallholders and youth involvement in carbon offset projects, carbon revenue will have to match or exceed benefits from profitable local crops, and payments have to be made on a short-term basis.

- As in every other form of land-use, it is not exceptional for carbon offset interventions to bring about some form of exclusion. Legitimate rights to land inheritance, however, predominantly dictate the degree of inclusion or exclusion and the extent to which benefits from carbon offset can be accessed in smallholder contexts. Until customary land laws become free of kinship, gender and age discrepancies, the inclusion and resource access of migrants, women and youth in carbon offset interventions will continue to be restricted.

- Changes in farming landscapes brought about by carbon offset interventions can have both positive and negative implications. While increasing tree stocks can augment carbon benefits, the gradual shift from food crops to tree farming potentially threatens food security and the livelihoods of farmers and especially sharecroppers.

2. Redd+: Mechanisms and Challenges

Introduction

Land tenure is considered as the foundation for the success of REDD+ since the implementation of REDD+ will require enormous tracts of land, typically in grasslands and forest, where the statutory laws and customary norms that define rights in many countries are often poorly defined, weakly enforced, or even contradictory so that the property rights of the individuals or communities who own these assets may be challenged (USAID 2011). It is in this light that the concepts of carbon offset and land-use are treated concurrently in this section. The section begins with an overview of the REDD+ framework and the requirements for carbon offset payments. It then outlines the land-use opportunities and challenges, including land-use interventions, which set the scene for the Vision 2050 Forestry Carbon Credit Project.

The International REDD+ Mechanism

The agreement to establish the UN Framework Convention on Climate Change (UNFCCC) at the 1992 Rio Earth Summit marked the beginning of formal negotiations to reduce emissions of greenhouse gases in order to avoid the risks of dangerous anthropogenic climate change (Bumpus and Liverman 2011). In 1997, the first legally binding international climate agreement under the UNFCCC, the Kyoto Protocol, committed industrialized countries to reduce their greenhouse gas emissions based on their 1990 emission levels (UNFCCC, undated), but eased the task through creating a market that would allow countries to trade emission reductions or to purchase emission reductions from projects in Eastern Europe (Joint Implementation (JI)) and the developing world (Clean Development Mechanism (CDM)) rather than make them domestically (Liverman 2009 as cited in Bumpus and Liverman 2011). Around the same time private sector companies and NGOs were creating a parallel voluntary market that would allow firms and individuals to compensate for their emissions by purchasing credits from emission reduction projects in the developing world (Bumpus and Liverman 2011). The emission reduction credits from the CDM and the voluntary market became known as 'carbon offsets' (Bumpus and Liverman 2011). Because deforestation is a major source of greenhouse gas emissions and new forests absorb carbon dioxide, reforestation was covered under the CDM (Bumpus and Liverman,2011). However forest protection could not generate credits under Kyoto and it was not until the UNFCCC negotiations in Bali in 2007 that proposals were made to allow credits for Reducing Emissions from Deforestation and forest Degradation (REDD) within the international climate regime (Neeff and Ascui, 2009 as cited in Bumpus and Liverman, 2011). However, a lack of progress in the wider UNFCCC negotiations, combined with some outstanding issues on the details of REDD+, mean that an international REDD+ framework is still evolving (REDD-net undated a).

Although the structure of the international regime for REDD+ is still in flux, private investors and national governments have begun laying the groundwork for national-level REDD+ in preparation for a link to the international carbon market, which was valued at US$126 billion during its height in 2008 (Capoor and Ambrosi 2009 as cited in USAID 2011). The markets for REDD, CDM and voluntary carbon offsets have grown dramatically over the last decade, dominated by carbon offsets generated by the CDM and with a value of almost US$10 billion (Bumpus and Liverman, 2011). Nevertheless, forest carbon activities make up less than 1 percent of the carbon market but this is expected to grow substantially as additional clarification on the international REDD+ regime emerges (USAID 2011). Investors are seeking to capitalize on these climate change mitigation opportunities by financing and trading emission reduction credits to meet voluntary targets or comply with international agreements (USAID 2011). Prominent sources of finance for the international REDD+ policy

process include the Voluntary Carbon Market, UN-REDD Programme and the World Bank's Forest Carbon Partnership Facility (FCPF).

The Voluntary Carbon Market

In the absence of legally-binding regulatory frameworks on carbon emissions in most jurisdictions, a number of standards from the voluntary carbon market present an array of options for REDD+ project development, of which the Verified Carbon Standard (VCS) generates the most widely accepted type of REDD credit (Seifert-Granzin 2011). The VCS is the most comprehensive standard, covering all relevant Agriculture, Forestry, and Other Land Use (AFOLU) and Land-Use, Land-Use Change and Forestry (LULUCF) activities (Seifert-Granzin 2011). It is based on IPCC guidelines and is commonly combined with the Climate, Community and Biodiversity (CCB) Standard to address other environmental and socioeconomic impacts (Seifert-Granzin 2011).

Recent market surveys clearly point to a preference among buyers and investors for projects validated under the VCS (Seifert-Granzin 2011). VCS credits have been particularly sought-after by buyers and investors preparing themselves for forthcoming compliance schemes beyond the UNFCCC, e.g., in the context of US national and regional climate legislation and other national programs (e.g., Japan) (Seifert-Granzin 2011). In addition to the VCS, several other voluntary carbon standards such as American Carbon Registry (ACR) Forest Project Standard, Climate Action Reserve (CAR), Plan Vivo Standards, ISO 14064 and SOCIALCARBON-provide regulations, methodologies, or protocols for REDD+ activities (Seifert-Granzin 2011). These functioning voluntary markets are demonstrating an increased demand for emissions reductions generated from forest carbon activities, with a total market value of US$705 million in 2008 and ten percent of the transaction volume coming from projects in the forest sector (Hamilton, et al. 2009 as cited in Virgilio and Marshall 2009).

The UN-REDD Programme

The UN-REDD Programme is the United Nations Collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) which was launched in September 2008 to assist developing countries to prepare and implement national REDD+ strategies, building on the convening power and expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) (UN-REDD, nd). The Programme currently supports 42 partner countries in Africa, Asia-Pacific and Latin America and a total of US$59.3 million has been approved to support the development and implementation of national REDD+ strategies 16 of the partner countries (UN-REDD undated). Ghana is among remaining 26 partner countries which are not receiving direct support from the UN-REDD Programme, but engage with the Programme in a number of ways, including serving as observers to the Programme's Policy Board, and through participation in regional workshops and knowledge sharing (UN-REDD undated).

The World Bank's Forest Carbon Partnership Facility

Similar to the objectives of the UN-REDD Programme, the World Bank's FCPF became operational in June 2008 as a global partnership to complement the UNFCCC negotiations on REDD+ by demonstrating how REDD+ can be applied at the country level and by learning lessons from the early implementation phase of REDD+ projects (FCPF undated a). The FCPF supports participant countries through the Carbon Fund and the Readiness Fund. The Carbon Fund, resourced with about US$205 million committed or pledged by ten public and private contributors, provides payments for verified emission reductions from REDD+ programs in countries that have made considerable progress towards REDD+ readiness (FCPF undated a). With about US$230 million committed or pledged by 15 public donors, the Readiness Fund instead supports participating countries to prepare for REDD+ by

adopting national strategies; developing reference emission levels; designing measurement, reporting and verification (MRV) systems; and setting up REDD+ national management arrangements, including the proper safeguards (FCPF undated a). A total of 26 countries, including Ghana, have already prepared their Readiness Preparation Proposals (RPPs), of which 19 have undergone formal assessment, and three have received grants to implement these proposals (FCPF undated a).

The Current Status of REDD+ in Ghana

Ghana's REDD Readiness Preparation Idea Note (R-PIN) received FCPF approval in July, 2008, following which US$200,000 was granted for the preparation of a Readiness Preparation Proposal (R-PP) in November 2009 (FCPF undated b). Ghana is now implementing its REDD+ R-PP which was approved in March 2010 (Kwakye 2011). Ghana's R-PP is expected to facilitate the establishment of institutional structures and development of strategies needed to enable Ghana to fully participate in the REDD+ mechanism (Kwakye 2011).

The R-PP sets out a national work plan for REDD+ implementation between 2010-2013, through which task forces are established to design, test and propose emissions reducing policies and actions (Chagas *et al*. 2010). The Environment and Natural Resources Advisory Council (ENRAC) has been instituted to provide guidance on REDD+ initiatives at the cabinet level (FCPF 2011). The National REDD+ Technical Working Group, a multi-stakeholder body, has also been established within the Ministry of Lands and Natural Resources to provide advice and guidance on all REDD+ processes (FCPF 2011). A Climate Change Unit has been formed within the Forestry Commission to serve as the REDD+ secretariat of the National REDD+ Technical Working Group (FCPF 2011). Within the Ministry of Environment, Science and Technology (MEST), a Carbon Credit Policy Committee has been set up to clearly define the operational modalities for carrying out carbon credit generating activities, allocation of carbon rights and participation in sub-national activities (FCPF 2011). These institutional structures will be supported by legislation to implement the National Climate Change Policy which is in the consultation phase (FCPF 2011).

The R-PP also presents various REDD+ strategy options and proposes research activities to identify the appropriate options (Bamfo 2010). REDD+ strategies proposed fall into two broad thematic areas (Bamfo 2010): timber policy and supply (Theme A) and wider aspects of forest policy including agroforestry and carbon conserving activities (Theme B). Theme A seeks to promote: (i) on-reserve timber supply; (ii) off-reserve timber supply, including optimizing incentives for tree planting and carbon rights outside the forest reserves; and (iii) enhancing REDD+ payments for improved forest management and emission reduction performance (Bamfo 2010). Specific activities to be promoted under Theme B include: (i) improve the emissions profile of activities related to charcoal and fuelwood production; (ii) encourage carbon-friendly agroforestry; and (iii) reduce emissions via improved fire management (Chagas *et al*. 2010).

Currently the REDD Secretariat at the Forestry Commission is registering companies, institutions and individuals that are engaged in various REDD/REDD+ projects in Ghana as part of measures to enhance effective collaboration among key actors and stakeholders and to also facilitate the provision of support for such actors (Forestry Commission of Ghana, undated). A grant of US$ 3.6 million has been received from the World Bank's FCPF for the capacity building of key actors and relevant stakeholders. Seven projects (Table 2) have competitively been selected for piloting to facilitate 'learning by doing'.

	Proponent	Project Title	Location	Region
1.	K.A Poku Farms	REDD+ Piloting Project	Kwamisa Forest Reserve, Offinso	Ashanti
2.	Cocoa Research Institute(CRIG)	Managing the Cocoa Production Landscape for Increases in Forest Carbon Stocks and Biodiversity Conservation	Aowin-Suaman	Western
3.	Permian Ghana	Ecosystem Restoration: A Proposal for a REDD Project in Ghana	Atewa & Atewa Extension/ Dadieso Forest Reserve	Eastern/Western
4.	Conservation Alliance	Cocoa Agroforestry Project	Kakum National Park Area	Central
5.	International Union for Conservation of Nature (IUCN)	IUCN Pro-Poor Agroforestry Project	Asankragwa	Western
6.	Portal Company Limited	Portal Agroforestry Model	Akasaho Amuni	Western
7.	Vicdoris Limited	Bee-keeping and Woodlot Development to Alleviate the Degradation of the Agro Ecosystems of Dawadawa and Surrounding Areas in Northern Brong Ahafo	Kintampo	Brong Ahafo

Table 2.1 Projects Selected for Piloting at the National Level

At same time, some international organisations in Ghana are also trying to implement carbon projects to supplement government's efforts. A popular example is the Cocoa Carbon Initiative (CCI). The CCI is a project implemented by the Katoomba Incubator and the Nature Conservation Research Centre (NCRC) to Reduce Emissions from Deforestation and Forest Degradation (REDD) and increase carbon stocks in cocoa farms (REDD+) primarily through shade-grown cocoa production system (NCRC 2010). Shade-grown cocoa systems (over 30 per cent canopy cover) in Ghana have been found to store about 70 per cent of the carbon found in primary forests and more than twice that stored in full-sun (under 10 per cent canopy cover) cocoa production systems (Wade *et al*. 2010 as cited in Forest Trends and the Katoomba Incubator Group undated). Meanwhile, cocoa farms are expanding into forested areas which are major carbon sinks, thereby, providing positive feedback for climate change (MEST 2002; Anim-Kwapong and Frimpong 2005).

The Technical Requirements for REDD+ Carbon Markets

Under a market mechanism, clear technical requirements guiding REDD+ actions need to be established in compliance with international carbon markets (UNEP 2010). No matter whether REDD+ actions are carried out at national or sub-national level, it is necessary to address issues of additionality, reference level, Monitoring, Reporting and Verification (MRV) requirements and leakage (UNEP 2010). Other requirements that need to be addressed include permanence, co-benefits and land eligibility (VCS 2011; Seifert-Granzin 2011).

Additionality and Reference Level (Baseline)

Additionality is the requirement for projects to prove that they produce carbon benefits which are additional to anything that might have happened anyway in the business-as-usual (BAU) scenario (EAC, 2007). It entails calculating baseline emissions which then give a business-as-usual (BAU) scenario against which the project is compared (i.e. the reference level). The additionality of a project is basically the difference between the project emissions and the baseline emissions (reference level) (EAC 2007). Additionality enables project developers to show that emission reductions would not have happened but for the project.

Baseline methodology and carbon monitoring plans for measuring, reporting and verifying additionality are technically challenging, although they form major elements of the PDD (UNEP 2010). Thus, the drafting of the PDD requires technical expertise beyond the capacity of local technicians and local people, especially small landowners and the rural poor (UNEP 2010). Defining the baseline for deforestation and collecting relevant forestry and biomass data necessary to determine forest carbon stock, is very time consuming and carbon measurement data is not always accurate. Although certain tools have been developed to simplify the estimation of additionality, the final judgment of additionality is quite subjective since it may be impossible to determine accurately what would have happened to eligible land in the distant future (UNEP 2010). Some authors (Gorte and Ramseur 2008 as cited in UNEP 2010) even argue that it is nearly impossible to verify additionality, as it is subject to intense lobbying and manipulation by profit-seeking market participants. Virgilio and Marshall (2009) further concur that the models for demonstrating additionality are essentially predictions of the future; proving additionality relies in part on good judgment and expert opinion.

Proving additionality is even more complicated for projects related to agriculture and forestry due to the complex nature of the carbon cycle in trees and soils (Ramseur 2009). Carbon sequestration in trees and soils varies across tree species, ages, and geographic locations, thus making it quite challenging to establish a credible baseline (Ramseur 2009). Proving additionality can also be quite expensive due to the complexity and costs associated with defining, measuring, and verifying environmental baseline levels across heterogeneous and dynamic landscapes (Marshall and Weinberg 2012). The huge cost of demonstrating additionality adds to the implementation and transaction costs of a project, thereby reducing the profitability of the project (Marshall and Weinberg 2012; Van Bodegom *et al*. 2009).

Monitoring, Reporting and Verification (MRV)

MRV is the monitoring, reporting, and verification of GHG-emission reductions/removals from forests using field measurements, remote sensing, or modeling (REDD-net undated c). This includes estimation of the areal extent of significant land use classes and monitoring of land use change within and between various classes (activity data). It also involves carbon density measurements and monitoring of changes to carbon density within major land use classes. MRV helps to make REDD+ a credible mitigation strategy (REDD-net undated c) and generate a registry system that maintains separate carbon accounting records for each sub-national initiative carried out in a country, thus avoiding double counting of emission reductions where these are sold as offset credits to governments or private entities with legally binding emission reduction commitments (UNEP 2010).

The capacity to implement MRV systems is, however, low in many countries (REDD-net undated c). Less than 20 per cent of countries have submitted a complete GHG inventory and only three out of ninety nine countries (China, India and Mexico) currently have capacities considered to be ‘very good’ for both, monitoring forest area change, and for forest inventories (Herold 2009 as cited in REDD-net undated c).

Leakage

Leakage is measured as increased emissions or reduced sequestration outside the project that is caused by the implementation of the project and which must be deducted from the total amount of certified emission reductions (UNEP 2010). It is important to ensure that avoided deforestation in one place is not simply displaced to another location (Bond *et al.,* 2011). The project developers are generally required to prove that projects do not cause leakage or that the leakage caused is qualified and monitored, and deducted when calculating the project's emission reductions (UNEP 2010). There is, however, a difficulty of obtaining accurate data on activities outside a given project (UNEP 2010).

Permanence

Permanence is ensuring that carbon sequestered is not released back into the atmosphere (UNEP 2010). The question of the permanence has been one of the most controversial issues since the early days of the Kyoto Protocol due to the non-permanent nature of forest carbon itself (Seifert-Granzin 2011). Trees sequester carbon when they grow, but they can emit it even faster when they burn or decay (UNEP 2010). Carbon emission reductions and removals can also be reversed by anthropogenic factors such as failure of a project or policy to control the drivers, underlying causes, and agents of deforestation (Seifert-Granzin 2011).

The requirement for permanence has surely been one of the key hurdles for forestry and land-use projects to join the regular carbon market (UNEP 2010). To ease this difficulty, the risk of carbon sequestered being released again is estimated in tons of carbon and is deducted from the actual amount of carbon sequestered when issuing carbon credits to obtain the 'risk buffer' which then generates a reserve to compensate for future losses in carbon stock (UNEP 2010; VCS 2011).

Co-benefits

Co-benefits are benefits generated by a forest carbon project beyond GHG benefits, especially those relating to social, economic, and biodiversity impacts (Seifert-Granzin 2011). They incorporates aspects of poverty alleviation, livelihood security, strengthening of local community rights and conservation of biodiversity, soil and water into the project design with the aim of enhancing sustainable development in the project area (UNEP 2010). Although the pursuit of co-benefits may increase a project's attractiveness to buyers, there is no detailed technical guidance or guidelines for how co-benefits can be measured (UNEP 2010).

Eligible lands

The carbon market has established several binding criteria affecting the choice of project sites, including requirements on the forest definition and control over the project area (Seifert-Granzin 2011). Land eligibility differs among different carbon markets. Under the CDM for instance, eligible land must have been non-forested for at least fifty years and of a minimum scale of some 2000 ha (UNEP 2010). For developing countries, demonstrating eligibility and finding available land of suitable size has often proved difficult (UNEP 2010). The Verified Carbon Standard stipulates that boundaries of REDD projects may only encompass areas qualifying as forest, including mature, secondary, or degraded forests, for a minimum of 10 years before the project start date and project proponents must demonstrate control over the entire project area with an acceptable proof of title (Seifert-Granzin 2011). Land eligibility can often be an obstacle if projects cannot provide the appropriate documents, approvals, contracts, or whatever is needed to establish proof of title or right of use (Seifert-Granzin 2011).

Conclusion

At a conceptual level, payments for REDD+ is a simple and elegant solution to destructive land-use (Bond *et al*. 2011). The methodological and technical requirements that need to be met can, however, present numerous challenges and problems to impede its implementation (Bond *et al*. 2011). These complex technical requirements pose a big challenge for developing countries lacking adequate technical expertise (UNEP 2010). The next section looks at how land-use factors, which have some bearing on the technical requirements of the carbon market, affect the implementation of payments for carbon offset in the context of the Forest-Savanna Transition Zone of Ghana.

3. Environmental and Land-Use Change Contexts in the Transition Zone

Introduction

Any external project does not start from a blank slate. It must engage with past histories and experiences and complex socio-ecological contexts. The CCP was no exception. This section outlines some of these contexts, focusing on perspectives on environmental change and past land use interventions.

Forest change or forest degradation?

The central narrative driving most tree-focused interventions in the transition zone is one focused on forest degradation. Forest degradation is thought to trigger problems at different levels. At the local level deforestation is seen to lead to soil degradation and renders farm lands less productive and sustainable. By negatively affecting agriculture, the ultimate source of livelihood, forest degradation is considered to threaten livelihood security and contributes significantly to poverty. At the national and global levels forest degradation is thought to provide positive feedback to climate change which in turn threatens agricultural sustainability. These problems have prompted a series of land-use interventions in the transition zone within the last couple of decades, including the Vision 2050 carbon project, aimed at offsetting this degradation cycle.

However local narratives of environmental change in the transition zone revolve less around a pattern of secular decline, but more around the idea of cyclical patterns and key events. Local accounts emphasise the impact of the devastating 1983 bushfires that destroyed forests and farmlands, and resulted in a major shift in ecology and livelihoods in the area. Farmers recount that the massive loss of forests has caused a considerable reduction in rainfall which has in turn promoted soil aridity and compaction - all having a negative impact on agricultural productivity. The mushrooming of invasive weeds following the fire incidence is reported to have resulted in recurrent fires and increased the labour cost of farming. Essential non-timber forest products like bushmeat, mushrooms and snails have also been disappearing after the devastating fire. Cocoa farms were burnt down and cocoa production, which used to be the main source of wealth, began to decline after the fire to the point that the land was no longer able to support production.

Farmers therefore believe that reforestation can help rehabilitate the environment, curb wildfires and improve livelihood opportunities for smallholders. This provides a firm basis for carbon offset interventions. However any such intervention must occur in highly dynamic landscape ecology. Justifying additional benefits of carbon sequestration is especially challenging in the transition zone. This is because the transition zone is a dynamic socio-ecological system where forest, bush fallow and savanna are in continuous flux – and has been since the 19th century as witnessed by the ancestral histories of the two settlements (see above).

It is, thus, difficult to say that there is a clear baseline, due to highly uncertain fluctuations in carbon gains and losses as forests shift to savanna and back again as a result of complex settlement, migration and agricultural histories. Indeed it is the dynamic interaction of fire, fallow and farming which makes the landscape (Amanor 1994). A baseline forest level is in some ways antithetical to a sound ecological understanding of this system. Of course there have been overall changes within this dynamic but the technical requirements of the carbon offset schemes assume a stable, predictable decline which can be reversed (see above), and proving this is rather difficult, in fact impossible, as the data are so disputed, and poorly founded.

Changes in this dynamic system are due to climatic factors such as increasing temperatures and decreasing precipitation, which result in frequent forest fires and drought events (Van Bodegom *et al*. 2009). The prevailing semi-arid conditions, coupled with the flammability of the open savanna vegetation, emergence of flammable invasive weeds and the routine use of fire in agriculture, hunting and charcoal production further make the area prone to wildfire, especially during the dry season. Destruction of the forest and farming landscape by wildfire is therefore not uncommon. Non-climate drivers of landscape change include increasing deforestation activities (logging, charcoal production, expansion of agricultural lands and mining activities) which leads to forest degradation and desertification (Van Bodegom *et al*. 2009). Clearance of forests for settlements to meet the demands of an increasing population is another source of landscape modification. The introduction of hybrid cocoa varieties into the farming landscape is also encouraging farmers to eliminate shade trees from the farming landscape (i.e. adopt full-sun system of production) in order to intensify production.

Thus, the drivers of behind landscape change are diverse and hard to monitor, contrary to conventional findings (Idinoba *et al*. 2010; FAO undated) which use overly simplified and sometimes questionable methodologies to estimate and predict changes in the dynamic system (refer to Section 5.0 for forest degradation narrative).

Past experiences shape current perceptions

Forestry interventions in the transition zone are of course not new. Any REDD-type intervention being designed today therefore must encounter expectations and experiences from diverse forestry projects, comprising of teak plantations, the Taungya system and timber concessions, implemented with varying degrees of success over the years.

The Taungya system has been practised in Ghana since the colonial times to restore degraded forest lands and boost the supply of commercial timber and food crop production (Van Bodegom *et al*. 2009). The system was abolished in 1984 because it was ineffective or inequitable; the communities involved had no tree ownership, financial benefits or decision-making power in management (Van Bodegom *et al*. 2009). The practice was reviewed and in 2002 was relaunched as the Modified Taungya System (MTS) by the Forestry Commission (Van Bodegom *et al*. 2009). The new approach took into account financial benefits for farmers and other stakeholders involved and transferred ownership of the trees from a single entity (the Government) to multiple owners (farmers, local communities, government and land-owners) (Van Bodegom *et al*. 2009).

Under the MTS farmers are allocated portions of land in degraded parts of forest reserves and are given tree seedlings to reforest the area. Forest reserves that have been used for taungya in the transition zone include the Yaya, Pamu Berekum, Tain II, Opro, Afram and Asufuo forest reserves. Farmers are allowed to interplant tree seedlings with food crops for the first three years to earn an income (Osafo 2010). Once the timber is harvested the State and the farmers get 40 percent of the revenue each, while the remaining 20 percent is shared between the landowner and the local community (Osafo 2010). This formula has been approved by the Government but has yet to be transposed into law (Oasafo 2010).

Nevertheless, the modified system has also encountered several challenges such as a lack of clear ownership agreements on trees and land between the government and other stakeholders and meeting the livelihoods needs of farmers in the medium term (Van Bodegom *et al*. 2009). Indigenous and exotic tree species that are planted under taungya have a rotation cycle of 20 to 30-plus years (Osafo 2010). This means with the exception of the first three years in which crop cultivation is allowed, farmers have to wait for several decades before they can receive revenue from harvested timber. Investigations have revealed that farmers are destroying tree saplings in order to stay longer on the land and to continue cultivating food crops in order to generate income in the short-term (Osafo 2010).

Farmers explained that they could not afford to wait for 20-plus years to receive financial benefits (Bamfo 2010: cf. Osafo 2010). The success of the Taungya system has therefore been low.

Farmers are also familiar with planting trees, particularly teak, on their own land. The law on rights to planted trees on private lands in Ghana has been amended to encourage afforestation, reforestation and plantation development in the private sector (Osafo 2010). The amended section 4(3) of the Timber Resource Management (Amendment) Act, 2002 (Act 617) now prohibits the granting of timber concessions on private forest plantations and land with trees grown or owned by private persons (Osafo 2010). Besides, private tree planters are entitled to 90 percent of the revenue from harvested timber, with only 10 percent going to the State (Osafo 2010). This new arrangement offers private tree planters a significantly better deal than key beneficiaries of revenue from naturally-occurring forests (Osafo 2010). Under the national benefit sharing scheme for revenue from the forest reserves, 60 per cent of the total stumpage is paid to the Forest Service Division (FSD) receives; 10 per cent to the administrator of stool lands; and the remaining 30 per cent is shared among the district assembly (55 per cent), traditional council (20 per cent) and stool land owner (25 per cent) (Boakye and Baffoe, 2006). From the off-reserves, 40 percent of the total stumpage allocated to the FSD whereas the remaining 60 percent of the royalties goes to the stool landowner (Boakye and Baffoe 2006).

The amendment of the Timber Resources Management Act in favour of tree planters has encouraged landowners to invest in tree plantations. In the transition zone which is fire-prone, teak is the predominately used species in forest plantations because of its fire-resistant quality. This quality also makes teak the preferred species for green firebelt construction in the transition zone. Teak farmers, however, complain of low price from middle men and call for government to make it easy for them to directly export logs.

Timber concessions are also another familiar intervention affecting tree stocks. Concessions, also known as Timber Utilisation Contracts (TUCs), are given to timber contractors (concessionaires) who have clearly demonstrated the commitment to provide specific social amenities for the benefit of the local communities that live in the proposed contract area. Once the TUC has been awarded, the concessionaire obliged by Social Responsibility Agreement (SRA) to spend not less than five per cent of the annual royalties accruing from its operations to support the development of local communities (Forestry Commission 2004). Contractors are also required to ensure forest sustainability and therefore usually employ local people, including farmers to reforest areas that become degraded in the course of timber extraction. The main concern often raised against timber concessionaires is the destruction caused to farm property without paying adequate compensation to farmers.

The concept and art of tree planting are therefore not new to people in the transition zone. This knowledge and experience therefore affects people's responses to tree-based interventions, which may include carbon projects. However, landowners and farmers generally have very little knowledge of the role of carbon in climate change, the need for carbon offset, and the role of tree-based interventions in climate change mitigation. Their knowledge of carbon offset revolves around what they have heard from project developers and not necessarily what is deemed to be true. For this reason, landowners and farmers hardly equate tree planting to carbon offset. The justification for tree planting is instead deeply rooted in the need for more rainfall and green firebelts to improve agroecological conditions for sustained agriculture. The concept of carbon offset therefore seems to be a misplaced priority from the perspective of landowners and farmers.

In addition to these forestry-focused projects, the farmers of the transition zone have also experienced a series of failed external-imposed interventions which have shaped farmers'

perception of carbon projects. Prominent among these are the Cassava for Starch and Sunflower Projects.

The Cassava for Starch Project was introduced into the transition zone by MOFA in the early 1990s for the purposes of job creation and poverty alleviation in rural areas. Farmers were resourced with high-yielding cassava sticks and loans through the Agricultural Development Bank (ADB). Farmers were initially promised attractive farm gate price as the cassava would be processed into starch for export. There was, however, no ready market for farmers when the cassava was in abundance due to processing constraints. It was also difficult for farmers to find alternative markets because the cassava produced contained high level of starch, hence, undesirable outside the starch industry. Farmers were therefore compelled to sell their produce to retailers at very cheap prices and the left over cassava was sun dried for future consumption.

Consequently, farmers incurred huge debts that called for sue threats from the ADB, the project-designated bank. One farmer said, 'I incurred a lot of debt and was always apprehensive about possible police arrest from the bank'[5]. Farmers became disappointed, not only because of the marketing constraints, but also because MOFA could not cancel their debts. 'The debts did not result from our inefficiency; so we became very disappointment when MOFA could not explain to the bank to cancel our debts'[6], a farmer narrated. The project eventually collapsed.

The cassava project was revived in 2003 by MOFA with funding from the African Development Bank. The project was initially dubbed the Root and Tuber Improvement Programme (RTIP) and later changed to Root and Tuber Improvement and Marketing Programme (RTIMP) to alleviate the marketing constraints the plague the first project. Three cassava processing factories have been established in Chiraa, in the Brong Ahafo Region, to improve market access for farmers. Despite this improvement in marketing, most farmers who suffered from the first project have refused to join the RTIMP for the fear that history may repeat itself. The RTIMP is still running, except that farmers have been complaining of low pricing of their cassava. Before farmers could completely get over their disappointments from the Cassava for Starch Project, the Vision 2050 Forestry Carbon Credit Project was introduced.

The Sunflower Project was initially introduced in the transition zone in the mid 1990s by the MOFA to enhance the commercial production of sunflower seeds for domestic use and as a non-traditional export crop. The project was developed in response to a rise in rural poverty, environmental deterioration from unsustainable agriculture and increased global demand for sunflower oil due to its cholesterol-free property. Apart from the attractive price for dried sunflower seeds, the economic prospect of the crop was justified through its benefits to the poultry and apiculture industries. Sunflower cake was promoted to increase the growth rate of poultry since it has much higher protein content than other types poultry feed. By speeding up growth, the poultry could be sold much earlier, which would eventually generate higher profits because more birds could be produced within a shorter period. Apiculturists were also enthused to take the advantage of the abundant bees that could pollinate the sunflower plant to produce honey for additional income. The project was, thus, touted for its potentials for creating jobs for the youth and improving the livelihoods of the rural poor. The project also held prospects for improving agroecological conditions needed to sustain agriculture. Many food crop farmers adopted the project as sunflower was promoted as have the potential to improve soil fertility, reclaim original vegetation and renew the productivity of otherwise marginal lands.

[5] Interview: Past beneficiary farmer, Badu, October 2011
[6] Interview: Past beneficiary farmer, Badu, October 2011

The project, however, failed shortly after the cultivation phase because the varieties of sunflower seeds supplied to farmers were incompatible to the prevailing soil and agroclimatic conditions. This resulted in poor germination of seeds which was blamed on inadequate scientific information on the soil and climatic requirements of sunflower seeds supplied to farmers. Farmers became very disappointment, considering how much money, land and time had been wasted.

Consequently, the MOFA was mandated to revamp the sunflower initiative using lessons learnt from the failed project. The project restarted in 2004 with funding from the Government of Ghana (GoG). Sunflower farmers were supplied with two varieties of seeds approved by the Crop Science Department of the University of Ghana and the Savanna Agricultural Research Institute of the Council for Scientific and Industrial Research (CSIR). An amount of US$ 289 million was granted by MOFA under the Farmer-Based Organizational Development Fund (FBODF) to revive sunflower cultivation (Ghana News Agency 2005). Farmers were trained to form cooperatives in order to ease access to grants and farm inputs and enhance their participation in decision making. The Tropical Agricultural Marketing and Consultancy Services Sunflower (TRAGRIMACS) was subcontracted to provide subsidised seeds, agro inputs and enhance marketing opportunities for farmers. A sunflower processing factory was established in Odumasi in the Brong Ahafo Region, close to community-owned sunflower fields in order to improve marketability.

The revamp strategies adopted by MOFA in collaboration with other institutions were, however, unable to convince most farmers to get involved in the project again. Farmers' apathy towards the project was a true reflection of the level of disappointment and fear they experienced from the unexpected collapse of the initial project. The project failed again in 2006 when the processing factory collapsed and farmers could not get access to an alternative market. The Carbon Credit Project was introduced two years after the collapse of the new sunflower initiative-at the time when farmers had not completely forgotten about their disappointments from the previous land-use interventions.

Conclusion

Past histories and current contexts significantly influence the prospects for any new intervention. The dynamic landscape of the transition zone is not amenable to defining clear baselines against which forest decline can be assessed. As farmers themselves point out, the forest-savanna transition zone is characterized by an ecology which sees substantial shifts over time, affected by a combination of drivers, most notably bushfires. Forests and agricultural landscapes certainly undergo change, but this is not always appropriately described as 'degradation', in line with the narrative of secular decline. There is thus a mismatch in understanding between external project designers and local people. This conflict is exacerbated by past experiences of interventions, very often imposed from outside with poor understanding of local conditions and perspectives. The long history of forestry and other land use interventions dramatically affects local perceptions, and heightens skepticism about external interventions. It is into this context that the CCP arrived, making its implementation difficult in both technical terms (defining baselines and so gaining access to carbon finance) and in terms of acceptance by local communities (given the repeated failures of past interventions, which to local people looked remarkably similar in aims, content and process).

4. The Vision 2050 Forestry Carbon Credit Project

The history of Vision 2050 Forestry

Vision 2050 Forestry[7] was established two decades ago as a community-based Non-governmental Organisation (NGO) in the Kwaebibrim District in the Eastern Region of Ghana by one Dr. Frank Kofi Frimpong, a Private Forest Plantation Developer. The objective was to sensitize local communities, particularly farmers, about the negative consequences of uncontrolled exploitation of forest resources. Recognising that the plight of tropical forests and forest-fringe communities attract very little or no attention from officialdom, and the fact that one of the root causes of deforestation is poverty, the organisation began to pilot reforestation and agroforestry projects aimed at poverty reduction. The outcome of this initial thrust includes thriving reforestation projects in the Eastern, Western, Brong Ahafo and Volta Regions of Ghana.

> 'Dr Frank Kofi Frimpong later emigrated to Equatorial Guinea to advance his career and take on new challenges and opportunities. Due to the high rate of corruption he encountered in Equatorial Guinea, he later relocated to Kenya where he embarked on large scale afforestation projects aimed at environmental sustainability and poverty alleviation. Some key members of the outgoing ruling party of Ghana, the New Patriotic Party (NPP) after hearing of his achievements in Kenya invited him to bring the afforestation and rural poverty alleviation idea to Ghana to improve living standards in the villages while enhancing environmental sustainability. This led to the development of the Carbon Credit Project (CCP) in 2008 which sought to expand and add value to existing afforestation and agroforestry pilots by capitalizing on a perceived booming carbon market'.[8]

The CCP was therefore designed to augment the solution to global climate change through tree planting and voluntary carbon trading. The project was arguably the first carbon offset intervention to be implemented in Ghana in the AFOLU sector. The project is said to have, 'engaged about 300,000 farmers (280,000 active farmers and 20,000 absentee farmers) in tree farming throughout the country in order to: sequester carbon, slow down the conversion of forests into Savanna; improve agro-ecological conditions for sustained agriculture, and to create jobs to reduce poverty and rural-urban drift'[9]. The trees are planted on family lands, hence the cooperation of individual family members and clan heads who control these lands is critical to the sustainability of the project. The gloomy history of external land-use interventions has, nevertheless, undermined landowners' confidence in the project.

Project Aim and Specific Objectives

The CCP aims at contributing significantly to climate change mitigation and adaptation by 2050. The specific objectives are to: reclaim degraded forest of the country by planting 450 million trees over a five year period and thereby improve the climatic conditions for both food production and good health; reduce poverty in the rural communities by opening up avenues for employment creation in consonance with both the Government of Ghana's policy of poverty reduction in line with goal number one of the UN Millennium Development Goals; help save river bodies which have been destroyed as a result of wanton destruction of forests in the catchment areas; prevent the occurrence of seasonal droughts and famines, and their concomitant health implications; and to help decongest the country's urban centre by stimulating urban-rural migration (Vision 2050 Forestry undated). Vision 2050 Forestry

[7] vision.vision2050forestry.com/
[8] An active farmer from Badu, June 2012
[9] Dr. Frank Kofi Frimpong: Personal Communication

envisioned achieving these objectives by renting land on behalf of those who do not own land and providing tree seedlings, equipment and carbon credits (pre-finance) to smallholders and other interested individuals and groups to engage in agroforestry and forest plantations, but this vision has not been fully realised due to reasons discussed under Section 3.8.

Types of Programmes

The CCP runs two main programmes: the regular programme and the Absentee Farmer Programme (AFP).

The Regular Programme

The regular programme engages landowners, also referred to as active farmers. Active farmers generally comprise of adults who constitute the Regular Adult Programme and sometimes, in addition, their children who constitute the Regular Minor Programme. Active farmers invest in tree farming and take full responsibility for maintaining trees, expecting financial and agri-environmental benefits in return. A regular adult farmer is required to plant 100 trees whereas the minor programme requires a regular adult (who has an additional land to commit) to plant 50 trees on behalf of a child. Regular adult maintain trees on behalf of their children seeking an educational fund (Chapter 3) for the children. The number of minors a regular adult can register is dependent on land availability of the parent(s). The table below gives the age distribution of participants of the regular programme.

Participant	Badu	Dumasua	Total
Old people[10]	22	28	50
Youth[11]	19	3	22
Children[12]	5	10	15
Total	46	41	87

Table 4.1: Age Distribution of Participants in the Regular Programme, Vision 2050 Forestry Carbon Credit Project

Lack of financial incentive has been the main obstacle facing active farmers who have committed their otherwise productive farmlands for carbon offset (refer to Appendix 4 for supplementary information). Farmers are yet to be paid adequate pre-finance as initially promised. Financial problems make it difficult for active farmers to hire farm labourers to assist in tree maintenance. The emergence of invasive weeds has compounded the financial difficulties faced by farmers by increasing the labour cost of tree maintenance. Invasive weeds account for high tree seedling mortality among farmers who are unable to weed themselves or pay for the services of farm labourers. Lack of funds also renders some farmers highly susceptible to wildfire as they are unable to afford the construction and maintenance of fire belts around their farms. Wildfire outbreak therefore dominates the fears of these active farmers. Fire outbreak can lead to significant loss of fortune since active farmers consider trees as future wealth and possible inheritance for their children. The fear of losing trees to wild fire is also aggravated by lack of tree insurance benefits as one active

[10] Persons aged 35 years and above; i.e. using the national youth definition as a reference point. Majority of these old people are within the age bracket of (50) and sixty (60).
[11] Persons within the age bracket of fifteen (15) and thirty-five (35). National Youth Policy of Ghana. http://www.ghana.gov.gh/documents/nypolicy.pdf, accessed 13th June 2012.
[12] Persons aged 15 years and below; i.e. using the national youth definition as a benchmark.

farmer complained: 'And there is no insurance to compensate us in case the trees are devastated by wildfire'[13].

Moreover, lack of pre-finance has brought disappointments to active farmers who committed their lands to the carbon offset project with the intention of using pre-finance to start a trade, buy new lands solely for food production or invest in livestock production. The educational plans of some minors have also been affected as a result of lack of pre-finance. One farmer complained: 'I enrolled my children in expensive schools thinking I will get support from the educational fund (i.e. pre-finance for minors) but I had to pull my children out of school because the money was not forthcoming'[14].

The Absentee Farmer Programme (AFP)

The AFP is designed to enhance the inclusion of individuals who desire to participate in the project but do not own or do not have easy access to land in the target areas. The landless are made up of a large number of non indigenes who have no legitimate right to land inheritance and a small number of indigenes who have already used up their inherited lands. Under the AFP, vast lands have been secured at various locations in the country to serve as land banks for absentee farmers. In the transition zone, land banks are located at Badu (200ha) and Tainso (20ha) due to the good availability of farmlands but the necessary lease documents have not yet been secured. The Vision 2050 Forestry intended to rent out these lands from individual landowners for a period of twenty years, but legally the landbanks still belongs to the original owners as no due compensation has been paid yet to the landowners.

Figure 4.1: Land bank intended for absentee farmers at Tainso, a suburb of Badu

Small and industrial tree plantations have been established on designated land banks. Absentee farmers basically adopt tree plots and pay for the costs of maintaining trees on adopted plots with the ultimate interest of generating cash profits from carbon credits. Most absentee farmers are smallholders, though a few are middle income professionals popularly referred to as the 'Very Important Persons' (VIPs) who have significant financial resources large enough to adopt big tree plantations. Smallholder absentees generally comprise low-

[13] Interview: Active farmer, Badu, September 2011.
[14] Interview: Active farmer, Dumasua, September 2011.

income farmers, students, pensioners, traders and artisans. By regulation, smallholder absentees have to adopt 100 trees whereas VIPs have to adopt 1000 trees. Almost all absentee farmers are non-residents who have to travel from various locations in the country to visit their adopted trees; only a few are residents of land-bank communities. Hence, occasional field trips are organised by Vision 2050 Forestry to offer absentee farmers (although only a few) the opportunity to see, appreciate and monitor the progress of their investments.

Unlike active farmers, the main problem facing absentee farmers is the distance from project sites. Land banks for absentee farmers are generally situated at far locations that require long-distance traveling in order to visit adopted trees. Absentees who have not been able to visit their farms due to proximity feel very insecure about their investments. One absentee farmer narrated: 'I get worried about the credibility of my investments; sometimes I even doubt if the trees are really there'. The insecurity of most absentee farmers stems from their inability to confirm the existence of their adopted trees and monitor the progress of their investments.

Another challenge is the difficulty of raising the required capital. The AFP is quite expensive, as it requires farmers to take full responsibility of pre-financing the maintenance of adopted trees. Most absentee farmers, especially the smallholders, have not been able to pay the required maintenance fees, meaning their trees can easily be killed by weeds.

Absentee farmers, by virtue of their weaker land rights, are particularly afraid of possible loss of their investment returns in case the project fails or the carbon market collapse. This fear stems from the fact that carbon credit is a new intervention in Ghana, with no success stories to derive hope from. The history of unsuccessful land-use interventions has also contributed farmers' uncertainty about the credibility of the carbon offset project. Like active farmers, absentee farmers are also afraid of wildfire outbreak, especially those who have invested much capital in the project. These farmers consider wildfire outbreak as a big threat to their investment.

Introducing the Project

The CCP was introduced to the general public through radio advertisements which highlighted the potential economic and agri-environmental prospects of the project. The radio adverts drew much attention to pressing environmental problems in the transition zone, particularly decreasing and erratic rainfall, dwindling crop yields and frequent wildfire outbreaks. Potential farmers became quite enthused about the agri-environmental prospects of the project, particularly with regard to promoting rainfall and reducing wildfire incidence. The adverts also covered issues relating to drying up of streams and the southward progression of the Guinea Savanna, and justified reforestation as the universal solution all the environmental problems highlighted.

Besides agri-environmental prospects, the radio adverts contained attractive financial promises that were related to poverty alleviation. Potential active farmers (landowners) were promised GH¢10000 (£4000) in 20 years as the carbon revenue for every 100 trees, half of which was to be be paid out as pre-finance to active farmers after the first six months following tree coding and inspection. Thus, regular adults and minors were promised a GH¢5000 (£2000) pre-finance and GH¢2500 (£1000) educational fund respectively. The pre-finance was to provide short-term compensation for adult active farmers for committing their lands to the project whereas the educational fund was to serve as scholarship package for the children of active farmers (See Appendix 1 for a sample certificate of educational fund). Absentee farmers were also promised high investment returns from carbon offset considering the little capital needed and the booming carbon market. The slogan 'plant trees

for cash' was accordingly used to sum up the perceived financial prospects of the project to the general public.

Nevertheless, farmers were generally skeptical about the financial prospects of the project because of their bitter experiences from past land-use interventions. Farmers' doubts were deeply rooted in the commonalities between the CCP and the previous unsuccessful land-use interventions. First, the CCP was promoted through radio adverts just as the past interventions. Like previous projects, the CCP also posed the risk of committing valuable farmlands to an alternative use. Besides, marketing (carbon market) was central to the extent to which benefits can finally be realised. Apart from these commonalities, the carbon credit intervention was completely new to the people; there had not been any successful project elsewhere to serve as reference.

Beneficiary	Number of trees required	Pre-finance promised (GH¢)	End of project revenue expected (GH¢)	Total revenue expected (GH¢)	Total revenue expected (£)
Regular Adult	100	5000	5000	10000	4000
Children of regular adults	50	2500	2500	5000	2000
Smallholder absentees	100	None	10000	10000	4000
VIP absentees	1000	None	100,000	100,000	40,000

4.2: Expected Financial Benefits of Vision 2050 Forestry Carbon Credit Project

However, the promise of pre-finance was too attractive to be completely ignored by landowners. Landowners considered the carbon value of GH¢100 (£40) per tree in twenty years to be inadequate in view of inflation and the high opportunity cost of farmlands, but were enticed by the pre-finance that was expected to be available six months after signing up for the project. It was actually the pre-finance that drew landowners' attention to the project as twenty years was also deemed too long a time to wait. Active farmers were planning to invest the expected pre-finance in other ventures to compensate for the inadequate carbon revenue agreed upon. 'We knew the proposed carbon revenue was not enough judging from how much money we could make from the land in twenty years, but we thought we could invest the pre-finance in other ventures for better returns', one active farmer remarked in a focus group.[15] Absentee farmers, on the other hand, were satisfied with the carbon value of GH¢100/tree, on condition that the investment breaks even. This was because absentees considered the carbon credit project as a part-time business that poses no or little risk to their main livelihoods. Hence, any amount of profit from carbon offset can be sufficient to supplement their primary income.

Consequently, the only obstacle left to be removed was people's uncertainties about the financial promises made. The project advertisement was therefore scaled down to the community-level, the door steps of the people, in order to build trust through face-to-face discussions. The community-level adverts were led by Obaasima Yaa Asantewaa, a famous journalist of the Radio Brong-Ahafo Region, whose charisma alone was enough to get many people to believe in the project. One farmer said during focus group discussions, 'We were

[15] Focus group discussion: Active farmer, Dumasua, November 2011.

still doubtful about the project until we saw Obaasima Yaa Ansantewaa in our community promoting the project herself'.[16] To most farmers, the involvement of the radio personality in the project gave an assurance that the pre-finance and other financial benefits will be granted as promised.

Implementing the Project

The project has been implemented by Vision 2050 Forestry, a non-governmental organisation based in Ghana, with technical support from the Environmental Development Consultants Ltd (EDC), a UK-based environmental consultancy firm. The project employs the Decentralised Implementation System (DIS) under which technical knowledge and assistance are delivered to active farmers through periodic workshops rather than employing extension officers. Resource persons are hired to train active farmers on land preparation, tree planting, tree maintenance and agroforestry. Active farmers are trained to plant trees, mainly *Cedrela odorata*, at a planting distance of 10ft x 10ft, and to cultivate food crops in the first two years before the tree canopy closes.

Cedrela is a fast-growing tree of a high carbon sequestration potential that is native to large areas of Central and South America from southern Mexico to Bolivia, 28ºS–26ºN (Plan Vivo undated). In Mexico, planting 133 *Cedrela* trees as windbreaks around 1 ha farms resulted in an average 0.4 tC/ha/year being sequestered above-ground (Plan Vivo 2008 as cited in Lal undated), thus underscoring its significance in the Plan Vivo's Carbon Management and Rural Livelihoods Project. *Cedrela* is also a drought-resistant, high-value timber species that produces many low branches and a spreading crown to provide an excellent shade for food crops (Orwa *et al*. 2009). For instance, the enrichment planting of *Cedrela* into coffee plantations in Mexico has helped to diversify coffee revenues with timber revenues and provided shade to improve coffee yields (Plan Vivo undated).

Figure 4.2: *Cedrela* plantation at Tainso, a suburb of Badu

The expertise gained by active farmers through workshops is supplemented by extension services that are delivered by relevant public institutions under the banner of civic responsibility. The Ministry of Food and Agriculture for instance, periodically equips farmers with skills in land preparation, row planting and tree maintenance, which are essential in the agroforestry and reforestation components of the carbon offset project. Likewise, the Forest

[16] Focus group discussion: Active farmer, Dumasua, November 2011.

Services Division (FSD) and the Ghana National Fire Service (GNFS) provide occasional training on fire prevention and control, with much emphasis on green belt establishment and maintenance. Vision 2050 Forestry therefore planned to establish formal collaboration with these government agencies in order to improve upon the quality of technical assistance delivered to active farmers. With regard to absentee farmers, Vision 2050 Forestry occasionally holds meetings to discuss issues relating to carbon investment and site visits.

The project has decentralised offices in eight out of the ten regional capitals where local farmers can obtain seedlings and other project-related support, and for the registration of new farmers. Project executive committees have also been established in well-organized communities to steer affairs of the project at local level and to ensure long-term sustainability.

Funding Mechanisms

The project was originally considering the African Carbon Trust (ACT) as a potential carbon broker. ACT is a non-profit trust based in Cape Town, South Africa which was founded in 2007 to provide a platform for Africans to manage the continent's carbon footprint and mitigate the effects of climate change while stimulating sustainable growth[17]. Unfortunately, ACT ran out of resources in the midst of the global financial crisis, thereby hindering the project's accessibility to carbon funds. Since the National REDD+ Programme which is expected to disburse carbon funds through NGOs was still struggling to take off and efforts to solicit funds from the World Bank's BioCarbon Fund had been hindered by stringent funding requirements, Vision 2050 Forestry adopted strategies to pre-finance the CCP until actual carbon funds through voluntary markets or project sources became available.

One of the main sources of pre-finance was an investment fund of US$750,000 from the EDC UK and Environment and Rural Development (ERD) Ghana Ltd., a subsidiary of EDC in Ghana. The project had also been pre-financed with income generated from teak plantations belonging to Vision 2050 Forestry. Harvested teak logs (Figure 4.3) were sold to timber merchants and the revenue was used to support active farmers, regardless of the clear carbon leakage caused by harvesting mature teak trees for financing the planting of trees for carbon sequestration.

In addition, membership registration fees paid by farmers (Table 4.3) have also been used to pre-finance the project. Active farmers are required to pay annual membership fees of GH¢25 (£10), bringing their cumulative fees to GH¢500 (£200) in 20 years. Smallholder and VIP absentee farmers are also required to pay an initial membership registration fee of GH¢35 (£14) and GH¢100 (£40) respectively, which must be renewed annually. This brings the cumulative membership fee to GH¢700 (£280) and GH¢2000 (£800) in 20 years for smallholder and VIP absentee farmers respectively. Part of the membership fees are supposed to gradually cover the costs of seedlings, seedling transport and tree coding, which were originally estimated at GH¢1 (£0.40) per seedling (together with transportation) and GH¢2 (£0.80) per tree coding. Besides membership fees, farmers are responsible for the maintenance cost of trees which is estimated by Vision 2050 Forestry at GH¢28.4[18] (£11.4) per tree for 20 years. Young active farmers normally meet the tree maintenance costs through their own labour but the aged often have to hire services of farm labourers at the cost of GH¢6 (£2.4) per labourer for three hours. On the other hand, absentee farmers are required to pay the full cost of tree maintenance through Vision 2050 Forestry. In addition small donations have been sought from individuals and corporate bodies that are passionate about environmental sustainability.

[17] http://www.africancarbontrust.org

[18] i.e. GH¢3/tree for 1st year; GH¢2/tree from 2nd to 5th year and GH¢1.16/tree from 6th to 20th year

Figure 4.3: Teak logs harvested for pre-finance

1.	Active farmers (adults and minors)	25/10	500/200
2.	VIP Smallholders	35/14	700/280
3.	VIP Absentees	100/40	2000/800

Table 4.3: Registration Fees Paid by Local Actors

Some active farmers have benefited from interim financial assistance of GH¢100 (£40) for every 100 tree seedlings planted on 10000ft^2 parcel of land. The organisation was planning to supplement its internally generated funds with bank loans in order to pre-finance farmers on a quarterly basis. Several appeals have been made to the government for a rescue fund, but without any success. The project has also been seeking access to voluntary carbon funds through the Environmental Development Consultants Ltd (EDC)[19], a UK-based consultancy firm. As a potential carbon broker, EDC was expected to facilitate access to the voluntary carbon market in the areas of trade negotiations and project registration and verification.

Regulation of Access to Benefits

Access to benefits is primarily governed by three different kinds of contractual agreement. First, individual agreements are made between Vision 2050 Forestry and adult active and absentee farmers. Adult active farmers were given the right to make contractual declarations on behalf of their children below the age of 18. Joint declarations have also made between Vision 2050 Forestry and the local Executive Committees to indicate local acceptance of the project. The agreements bind farmers to protect and sustain trees at least for an initial contract period of 20 years. Both farmers and Vision 2050 Forestry are also prohibited from harvesting the trees within the contract period. Farmers are however allowed to grow and harvest food crops during the initial two years when the tree canopy has not completely closed. After farmers have been paid their due carbon revenue after 20 years, land ownership will be reverted to the original landowner (the farmer), but the trees will belong to

[19] www.e-dci.com

Vision 2050 Forestry and financiers of the project. The trees will have to be felled so that the land can be put to use by the farmer if the contract is not renewed. Farmers will allow the trees on their lands for another 20 years, if the contract will be renewed after adequate compensation has been agreed upon.

Several flaws are noticeable in the agreement documents (Appendix 2). The amount of carbon royalty to be paid to land owners was not stated in the agreement documents. Besides, the agreement does not stipulate fringe benefits such as life and tree insurance which were promised to active farmers at the beginning of the project. The insurance package is intended to insure trees against wildfire and the lives of farmers during fire outbreaks, but the details have not been agreed with farmers. The agreement does not also specify conflict resolution: how potential issues on property rights and resource access will be affected in case the project fail or the carbon market collapse, thereby allowing land owners to assume total rights over trees, especially in the absence of adequate financial compensation. Moreover, not every farmer has signed a contractual agreement and these farmers can illegally harvest the trees and probably go unpunished. And finally, the agreement, although renewable, lasts for 20 years, and at that point the trees would have to be harvested if the farmers wished to use the land for other purposes, thus undermining significantly the carbon sequestration benefits of the arrangement in the longer term.

All contractual declarations constitute oaths that are considered true and correct pursuant to Statutory Declaration Act 389 of the 1971 Constitution of Ghana. The contractual agreements are protected by the fear of legal sanction and possible court prosecution. One farmer said in a focus group, 'We don't want to breach our contracts with Vision 2050 Forestry because that would warrant a police arrest'.[20] The legal backing of the project agreements is crucial to the viability of the carbon offset project, considering the tendency for farmers to sell trees to compensate for the delay of carbon funds. The attractive timber market and increasing demand for timber from the local and export markets have given some landowners the idea of selling trees as timber if carbon revenue is not paid soon. Legal sanctions connected to the contract agreements, however, serve as deterrence at least within the contract period, but there is a high tendency for farmers to sell trees for timber revenue if carbon revenue is not paid at the end of the first contract period.

Integration with the National REDD Process

The Carbon Credit Project (CPP) theoretically fits into the two broad thematic areas of the national REDD+ mechanism. Under Theme A, it relates directly to 'optimizing incentives for tree planting and carbon rights outside the forest reserves' by facilitating the development of forest plantations on degraded lands outside the forest reserves for the purposes of carbon sequestration and carbon revenue generation. With regard to Theme B, the CCP takes into account agroforestry practices and fire prevention measures. The project trains farmers to integrate food crops into tree planting as long as tree canopies would allow crops to survive underneath. Farmers are also trained to construct and maintain firebelts around farms and are motivated by the carbon value of trees to expel fire hunters, charcoal burners and palm wine tappers especially during the dry season when flammability is higher.

Despite the thematic intersections, no formal collaboration exists between the CCP and the national REDD policy processes. The CCP is yet to be registered with the national REDD programme although the REDD Secretariat at the Forestry Commission has been registering companies, institutions and individuals that are engaged in various REDD/REDD+ projects in Ghana as part of measures to enhance effective collaboration among key actors and stakeholders and to also facilitate the provision of support for such actors (Forestry

[20] Focus group discussion: Farmer, Dumasua, December, 2011.

Commission of Ghana undated). Key people involved in the National REDD Process think of the CCP as a poorly thought out private sector venture that was not aligned or attuned with the national REDD Readiness process. 'No one in the Climate Change Unit office had knowledge of it, as I recall. My assumption has been that the project did not understand the REDD space or scope as the 'story telling' and tree planting that they supposedly did or aimed to do would not have qualified for REDD+ for a number of a very simple technical reasons, and it never could have passed the Free Prior and Informed Consent (FPIC) nor the tenure considerations that are elemental to finding any market interest'.[21] Similarly, most members of key landuse agencies such as MOFA, FSD and GNFS who are involved in the National REDD process were almost unaware of the project. A few had only enquired about the project from some active farmers after seeing the signposts of the project by the roadside.

In contrast with the National REDD Programme which is taking many years to establish procedures and pilot programmes, the CCP seems to have been in a rush to get into the carbon market for commercial gain. The national programme started relatively early, but it took more than two years for it to receive its Readiness funding from the FCPF. Despite the fact that Ghana's R-PP was approved in March 2010, the associated US$3.6 million to actually start to work on REDD+ was not received until March 2012. Thus, the national REDD process has moved very slowly, but this allowed more time to define reference levels and consult relevant stakeholders, besides allowing the key implementing institution more time to understand REDD and to clearly define their roles. In mid-2012 none of the seven selected pilot projects are even remotely close to implementation, 'Rather they are still re-working their concepts because all were unfeasible as initially articulated. Of the selected 7, I would say that we will be lucky if 2-3 actually move forward to PDD development. But in truth I see this as being a 2-3 year process. REDD is really technically challenging'.[22] The CCP by contrast failed to do the necessary ground work before jumping to full implementation phase.

Challenges, Fears and Uncertainties

The main challenge of Vision 2050 Forestry has been the difficulty of accessing carbon funds from international donor agencies and the Government of Ghana (refer to Appendix 3 for a press release for government funds). The project's inability to access the carbon market is mainly due to its inability to compile the type of technical detail required by the international carbon markets, notably information on additionality, MRV and control over project area. In addition, the requirements for accessing carbon funds from international donors have been found to be too stringent and complex. For instance, the organisation had to produce a digital map of all tree farms as a prerequisite for accessing funds from the World Bank, which has been quite technically challenging and expensive.

Divergent political interests between the project management and the current government are also blamed for the inaccessibility of carbon funds. The Director of Vision 2050 Forestry complained, 'There is this perception from the ruling government that I am a member of the opposition party, the NPP; hence, all the requests for government's support for this project have fallen on deaf ears.' He further stressed, 'Even there were occasions when I was arrested by the Bureau of National Investigations (the BNI) under the ploy that I had not paid carbon funds to farmers as promised. So I have been wasting many productive hours in the law courts these days at the expense of the project.' He added, 'Political hindrances are even encountered when thinned out logs have to be exported to pre-finance the project;

[21] Email correspondence: Dr. Rebecca Asare, Forest Trends Ghana, May 2012.
[22] Email correspondence: Dr. Rebecca Asare, Forest Trends Ghana, May, 2012.

sometimes I have to write a petition to the Ministry of Lands and Forestry before the organization would finally be allowed export its own logs.'[23]

Thus, Vision 2050 Forestry is afraid of adverse effects of political interference on the sustainability of the organisation's projects. For this reason, the organisation has expressed little hope in receiving carbon funds from the National REDD+ Programme which is now taking off. The organisation is also afraid that the government may claim a proportion of carbon revenue in the future as happened in the timber sector. This fear stems from the 1994 Forest and Wildlife Policy and the Timber Resources Management Act (Act 547) of 1998 which vests all trees and forest resources in the president and gives government the right to revenue from all trees, whether from private or public lands. The Director of Vision 2050 Forestry challenged the status quo, 'The government has no equity in this project and should therefore not expect any share of revenue from it.' He continued. 'The government can only claim revenue from this project after it has sponsored it'.[24]

The end result of all these challenges is a financial crisis which has rendered the organisation unable to honour the financial promises it had made to landowners; a situation which has dramatically reduced landowners' confidence in the project. For the same reason, the organisation has not been able to properly secure and develop land banks for absentee farmers. This situation has worsened the willingness of most absentee farmers, especially the smallholders, to pay the required maintenance costs, thereby causing the organisation to make up for the deficits through its limited internally generated funds. The Director of Vision 2050 Forestry narrated, 'Only about one per cent of the expected maintenance fee has been paid by our absentee farmers; we have to struggle to cover the remaining 99 per cent. If payment from absentees does not improve soon, we may be forced to ask them to maintain trees on their own just like active farmers.'[25]

However, absentee farmers who have invested in the project, sometimes with quite substantial sums, suspect a fraudulent deal. They have complained to the police and the matter has been referred to the Bureau of National Investigation (BNI). The project founder has subsequently been arrested (in March 2012). As part of on-going investigations and an impending court case, the BNI recently visited the project sites and invited key landowners to assist in investigations. While some suspect political motivations in these developments, others regard the project as a 'carbon cowboy' operation which was trying to exploit farmers, on the back of fraudulent claims.

Current Status

In mid-2012 the CCP was on the verge of collapse. The project has been taken over from Vision 2050 Forestry by Environmental and Rural Development (ERD) Ghana Limited[26], a partner organisation of EDC in Ghana in order to improve it, recoup money invested earlier on in the project and to win back the confidence of farmers. ERD Ghana Ltd is planning to lease a vast amount of land from legitimate landowners and to obtain all the necessary land documents such as indenture. The new leadership is aiming to shift attention from smallholdings to a tree plantation model which will allow farmers and legitimate landowners to intercrop tomatoes, maize, cassava and pepper for short-term profits. A processing factory will be established to add value to the tomatoes for export, while creating employment opportunities in the project's catchment communities. The tree stocks will be managed for sustainable timber supply and carbon offset, with the aim of registering under

[23] Interview: Dr. Frank Kofi Frimpong, Tainso, October 2011.
[24] Interview: Dr. Frank Kofi Frimpong, Kumasi, October, 2011
[25] Interview: Dr. Frank Kofi Frimong, Kumasi, January 2012.
[26] www.erd-ghana.com

the national REDD+ scheme. In order to meet the stringent technical requirements of verifiable carbon standards, the company is in the process of hiring TREES Forest Carbon Consulting to collect the necessary baseline data and document other technical details such as leakages, risk buffer and project emissions required to prove additionality.

Under the new leadership, the land and trees (including carbon stored) will entirely belong to ERD Ghana Limited within the lease period as landowners will be paid as soon as the land is leased out. It, however, remains unclear how the new management of the project will address the concerns of farmers who already have contracts with Vision 2050 Forestry. It will certainly be crucial to follow up on how the change in leadership may affect existing contractual agreements, ownership of existing trees and payment of carbon revenue from trees already planted.

In sum, the smallholder model originally envisaged by the CCP has been abandoned in favour of a land lease model, where land and tree rights are taken on by a private operation. This is seen by EDC as more technically feasible and more commercially viable. In the process, the wider ambitions of 'triple wins' involving combining poverty reduction, food security and carbon sequestration have been abandoned in favour of a streamlined, large scale operation which can comply with the incredibly stringent requirements of both national REDD guidelines and voluntary carbon markets.

Conclusion

The Carbon Credit Project (CCP) offers a salutary lesson for other notionally (at least in promotional, rhetorical terms) 'pro-poor', 'community-based' carbon projects. From the beginning it had little prospect of working under a REDD umbrella, especially with regard to its inability to meet the stringent technical requirements of the carbon market.

This is similar to community-based REDD projects in elsewhere which have difficulty complying with international requirements even though they contribute to REDD objectives (Van Bodegom *et al*. 2009). As a result, governments have been urged to receive international payments based on a general reduction in emissions and to allocate these payments to forest conservation and management efforts at the local level where appropriate (Van Bodegom *et al*. 2009), even without exact compliance. Otherwise, if local-level actors have to comply with international REDD requirements it is unlikely that they will ever be eligible (Van Bodegom *et al*. 2009).

Desperation for finance meant, in the case of the CCP, all sorts of manoevers that undermined both the carbon and poverty reduction objectives. For example, the business model of harvesting teak logs to pre-finance the project resulted in significant carbon leakages clearly defeating the climate change mitigation agenda the project seeks to pursue. Equally, contracting out land to absentee farmers removes productive land from the area, and does not benefit local people directly. Subsequent sections of this paper provide further details of the impacts of the project – intended and unintended, positive and negative – on local people.

The next section looks at how the CCP intervention was framed, by looking at the underlying narratives, from various actors. As will be shown, despite its recent demise, the CCP is very similar to many other projects being established across the world under the guise of 'carbon sequestration' and 'REDD'. There are some important lessons to be learned.

5. Narratives: Framing the Project Intervention

Introduction

As discussed in earlier sections, the dominant narratives associated with the project are deeply rooted in forest degradation, and its detrimental effects on agricultural productivity and livelihood security. The contribution of deforestation to climate change and the need to reforest for carbon sequestration and climate change mitigation have been repeatedly underscored. Some of the dominant narratives are in harmony with narratives from the grassroots. Others are, however, challenged by alternative narratives from farmers and ancestral history tellers, thus underscoring the need for policy spaces in the carbon offset policy process.

The Forest Degradation Narrative

As discussed earlier, the vegetation of the transition zone is a mosaic of forest fragments in the midst of Savanna shrubs and grasses. It is commonly narrated by Vision 2050 Forestry these forest fragments are remnants of pristine semi-deciduous forests of the past which are being degraded into grassland, hence the need for reforestation. This narrative is reinforced by a recent finding (Idinoba *et al*. 2010) that the open forest in the transition zone has reduced from 1,629 to 243 km2 between 1972 and 2000 at a rate of 1.2 per cent per annum and only about five per cent of the land surface is currently covered by open forest. The dominant narrative also follows the Ghana Poverty Reduction Strategy's (GPRS) premise that the country's forest cover had been reduced from 8.2 million hectares at the beginning of the twentieth century to 1.6 million hectares in the twentyfirst century (Government of Ghana 2003), a figure repeated frequently in nearly every official document and consultancy report on the subject. For example, the National Biodiversity Strategy for Ghana (NBSG) document reinforces that less than one per cent of forest cover is found outside the forest reserve (MEST 2002). Overall deforestation in Ghana is estimated at around 65,000 ha/year and costing about 3.5 per cent of the country's GDP (World Bank 2006).

Based on these estimated deforestation rates, the dominant narrative then follows experts' projection that Ghana can lose its entire forest cover in less than 25 years. The need to reforest is, therefore, of both major environmental and socioeconomic concern.

However, the above narratives and deforestation statistics are questionable for a number of reasons. First, the notion that past forests were once in a 'pristine' condition is flawed by ancestral history (see earlier), which suggests that the landscape has been a blend of forests and grassland as far back as the nineteenth century. This is akin to findings from Kissidougou in Guinea where forest patches in the midst of savanna had popularly been misinterpreted by policy makers as forest degradation, when it was in fact, a product of forest islands established by villagers around settlements to encourage formation of secondary forest thickness in savanna (Fairhead and Leach 1995).

The landuse history also indicates that past generations have historically exploited the forest for shelter and farming lands, but have extensively relied on the bush fallow system to rejuvenate the agroecological landscape. This points to the fact that the transition zone has for centuries been a dynamic system where forest, grassland and fallow have been in continuous flux (see earlier), a complex dynamic of gains and losses of forest cover which challenges the art of using quantitative statistics to describe how past forests have changed over time. Unfortunately, conventional analyses of Ghana's forest history over rely on air-photographic and satellite imagery interpretations, without rigorously compiling historical data (documentary or oral) in assessing vegetation change (Fairhead and Leach 1998). In fact, some parts of Ghana's forest zone had historically been settlements, farmlands, bush fallows and even patches of high grasses and low-bush Savanna dating back to the

twentieth century, contrary to conventional framings that the entire forest zone was forest (Meniaud 1993 as cited in Fairhead and Leach 1998). There have even been periods of forest gains in Ghana due to depopulation following tribal wars and emigration, yet these gains in forest cover are simply overlooked by dominant framings on deforestation (Fairhead and Leach 1998). Of course there have been overall changes within the dynamic landscape of the transition zone, even as narrated by farmers, but the changes are too complex to prove and predict accurately.

Forest degradation is popularly blamed on wildfire. This popular narrative from Vision 2050 Forestry and farmers is reinforced by scientific literature (Hawthorne 1994; Nsiah-Gyabaah 1996) that attributes forest degradation in the transition zone to the high incidence of wildfire, particularly the historic 1983 wildfires that devastated the semi-deciduous forest zone of Ghana. The NBSG document reports that approximately 50 per cent of Ghana's vegetation cover and about 35 per cent of standing crops were destroyed by the 1983 wildfires (MEST 2002). An alternative narrative from elderly farmers reveals that it was rather the effects of the fire on cocoa production that brought significant loss of trees from the farming landscape and not the fire in and of itself. Traditional cocoa production which required high-level shade from indigenous trees was the main system of farming prior to the fire. Cocoa farms were, however, destroyed by the fire and the aftermath fire episodes presented a barrier to cocoa production. The failure of cocoa gave way to maize as the succeeding dominant crop. Maize production encouraged farmers to remove trees from the farming landscape as it requires an open field (i.e. fewer trees) for optimum production. An elderly farmer narrated, '…so we needed to burn the trees in our farms to ash in order to grow more maize.'[27]

The routine use of fire in slash and burn agriculture, charcoal production, group hunting and palm wine tapping is also blamed for the high incidence of wildfire in the transition zone and the resulting degradation of forest habitats. Some make strong connection between forest degradation, emergence of invasive weeds and wildfire incidence. Degraded forests in turn provide room for the emergence of invasive weeds, notably, the spear grass (*Imperata cylindrica*) and *acheampong* (*Chromolaena odorata*) which increases flammability when dry. Forest degradation also means loss of wind breaks. Loss of wind breaks enhances wind speed which increases the rate of spread of wildfire once it has started.

The dominant narrative also links forest degradation directly to rapid population growth which increases the demand for farming lands, timber, fuelwood and human settlements (TREES FCC 2010). This narrative is reinforced by the Environmental Protection Agency's (EPA) report that the availability of agricultural land per capita in Ghana has already decreased from 1.56 ha/person in 1970 to 0.74 ha/person in 2000 (EPA 2002 as cited in World Bank, 2006). In the 'Ghana 2000 and Beyond' document, the World Bank concurs that the land frontier has been receding rapidly in the last three decades, and rising population density has led to the shortening of the fallow period and a reduction in soil fertility resulting from continuous cropping, usually at the expense of the forest (World Bank 1993). The World Bank's Country Environment Analysis (CEA) report reinforces that more than 50 per cent of the original forest area of Ghana has been converted to agricultural land by slash-and-burn practices (World Bank 2006).

However, farmer interviews and field visits have revealed that the extent at which the fallow system is practised in the transition zone is largely dictated by land ownership and not as directly attributed to population expansion. Whereas the practice of bush fallow system is uncommon or relatively shorter among families with smaller lands, those with customary rights to bigger lands tend to fallow for as long as ten to forty years to instead rejuvenate the land for shifting cultivation. Some families even practice bush fallow as a means of

[27] Transect-walk conversation: Farmer, Badu, March 2012.

preserving and rehabilitating degraded farmlands for the future generation. A farmer narrated, '...and the land will be fertile again for the children to cultivate by the time they grow up.'[28] Moreover, it is these old bush fallows that are typically converted to slash and burn agriculture (Figures 5.1 and 5.2) and not the primary forest as the dominant narrative holds.



Figures 5.1 and 5.2: Old bush fallows for slash and burn agriculture

Just as it cannot be denied that some form of forest loss had occurred in the transition zone over the years, simultaneous gains in vegetation cover through bush fallows and afforestation cannot also be overlooked. Local findings on the age-long existence of grassland vegetation in the transition zone; the establishment of bush fallows and their conversion to slash and burn agriculture rather than the primary forest; and maize production as the main agent of landscape change instead of wildfire, point to several flaws in the dominant framings on forest history. Basing our understanding of past forests solely on 'outsider' interpretations may, hence, lead to an exaggeration or distortion of actual changes and an omission of essential indigenous knowledge that may better help to reconstruct knowledge of past forests. Ghana's conventional deforestation statistics particularly are very misleading as they extrapolate backwards from deforestation rates calculated in more recent periods and rely on the assumption that what is today defined as the forest zone was indeed covered with forest (Fairhead and Leach, 1998). Therefore, a comprehensive narrative on Ghana's forest history does not yet exist. To achieve this it is imperative to fine-tune conventional framings on past forests with indigenous understanding. Until this is achieved, the foundation of many carbon projects which are generally rooted in these dominant framings will remain disputable.

The Food Security Narrative

Climate change is blamed for dwindling crop yields, in line with (Metz *et* al, 2007b). Hence, the popular storyline from Vision 2050 Forestry that carbon sequestration through reforestation will ultimately improve agroecological conditions for sustained food production. This storyline is to some extent being witnessed by farmers. Farmers narrate that in the first two years of planting, the carbon-offset trees, mainly *Cedrela* is able to improve soil fertility, reduce soil compaction and provide shade essential for food crops. A farmer stated, 'the plantains do very well under the shade provided by the *Cedrela*'.[29] The *Cedrela* trees have also helped to reduce the incidence of wildfire and its devastating effects on farm produce as

[28] Transect-walk conversation: Farmer, Dumasua, March 2012.
[29] On-farm conversation: Farmer, Dumasua, October 2011.

can be inferred from the narrative, 'the incidence of wildfire on our farms has reduced significantly because we have been putting in extra efforts to protect the trees from fire'.[30]

The dominant narrative on food security is, however, challenged by a counter narrative from farmers, which holds that the *Cedrela* canopy inhibits crop production after two years of planting. The alternative narrative raises an important question on farmers' understanding and acceptance of the design of the project. The design of the project is *Cedrela*-food crops agroforestry system in the first two years and then *Cedrela* plantation with very few or no food crops after two years when the canopy begins to close (Chapter 3). Some farmers did not fully grasp this farming concept of switching from agroforestry to tree plantation at the consultation phase of the project, hence, their concerns on losing food crops. However, these concerns only come from Dumasua (the peri-urban area) where land is relatively scarce, and specifically from farmers with limited lands.

Job Creation, Poverty Alleviation and Youth Migration Narrative

Planting trees for carbon credits is touted by Vision 2050 Forestry as a sustainable income-generating venture and pro-poor policy intervention, especially in the rural areas where the main source of livelihood is farming (Vision 2050 Forestry undated). Based on a booming carbon market scenario, the dominant narrative further holds that carbon revenue can serve as enough incentive not only to curb rural-urban migration of the youth, but to also help decongest the country's urban centers by stimulating urban-rural migration.

According to active farmers, however, the job creation benefits of the project are so far felt by migrant farm labourers who are regularly hired (usually by the older farmers) to tend the trees. Farmers are yet to feel the alleviation of poverty because of the limited financial impacts of the CCP, but the older ones have rather become over dependent on the services of farm labourers. For the project to be regarded as pro-poor, active farmers are of the opinion that carbon revenue must outweigh income from highly profitable crops such as chili pepper and cocoa and has to be paid on short-term basis. Absentee farmers, on the other hand, generally consider the project as economically viable since they expect carbon revenue to significantly exceed the amount of money they have to invest in the project.

The lack of involvement of the youth in the project, however, calls for a review of the dominant narrative. The reasons for youth apathy are complex; they go beyond urbanisation and vary between the peri-urban and rural areas. In the peri-urban areas (i.e. Dumasua and its environs) the youth (according to their own narratives) are attracted to lucrative job opportunities in Sunyani, the nearby regional capital, and generally tend to associate farming with failure. Elderly farmers who are supposed to serve as role models are generally been known to be poor. Besides, the plight of these elderly poor farmers have often been worsened by series of unsuccessful landuse projects, notably the Sunflower and Cassava for Starch projects.

Youth involvement in the rural areas (i.e. Badu and its suburbs) is relatively encouraging due to limited availability of alternative jobs to farming. In addition, many elderly farmers have acquired wealth from large-scale farming and they serve as good role models for the youth. The long-term investment returns of the CCP are, however, a disincentive to a section of the youth who are interested in short-term profits. The 20-year period after which accruable carbon revenue will be paid is too long a time to wait. This category of the youth therefore prefers to illegally engage in marijuana farming for relatively high and short-term profits regardless of the risks involved.

[30] Focus group discussion: Farmer, Dumasua, February 2012.

Thus, in contrast to the simple narrative that carbon forestry will result in pro-poor gains, especially for the youth, the situation on the ground is much more complex. Farmers highlight the relative returns to carbon forestry versus other opportunities. These vary across sites, with urban employment being attractive in Dumasua, while marijuana farming is a good earner in Badu. The time frame of returns is also significant, with farmers emphasizing the importance of immediate, short-term returns in contrast to the long-term prospects promised under carbon forestry. In addition, the benefits vary across age, gender and wealth group, with relatively wealthy and older male farmers being the prominent beneficiaries. Carbon forestry, therefore, enters a highly differentiated setting where its uptake is conditioned by a range of factors simply not considered as part of the 'pro-poor' wealth and job creation narrative promulgated by Vision 2050 and others.

Carbon Emissions and the Climate Change Narrative

From the perspective of Vision 2050 Forestry, carbon emissions from forest degradation are primarily responsible for climate change, hence the justification to reclaim degraded forests by planting trees for carbon sequestration and ultimately climate change mitigation. This narrative is generally shared by VIP absentee farmers who have some knowledge from formal sources of environmental issues and good access to media reports on climate change issues. The narrative that deforestation causes climate change is of course also well supported by scientific literature. Tropical deforestation has been found to contribute 20 to 25 per cent of annual global carbon dioxide emissions (Chapter 1).

Smallholders, however, attribute climate change directly to forest degradation and not carbon emissions. Most farmers only heard of carbon emissions during sensitization workshops organised by Vision 2050 Forestry at the beginning of the project, whereas others had not heard of it before. 'The workshop was when we first heard about carbon',[31] a farmer stated in a focus group.

Farmers' understanding of climate is deeply rooted in its adverse effects on their livelihoods. They associate climate change with erratic rainfall patterns that makes it difficult to determine the appropriate planting periods. According to these farmers, climate change is what compels them to delay planting until they are sure the rains have come to stay. One farmer gave an example, 'the planting time for maize has gradually changed from April to later in the year due to late rainfall resulting from climate change'.[32] The distortions in rainfall pattern have also been observed by farmers to result in early and prolonged dry seasons at the expense of the rainy season. For instance, the dry season of the year 2011 is reported to have started in October instead of December. Farmers have blamed the early dry season for the devastating wildfire outbreak of February-March 2012 which is said to be unprecedented in the last decade.

Besides erratic rainfall, farmers think of climate change as low rainfall that results in low crop yields. This climate-induced low rainfall is thought to promote soil compaction, loss of secondary farm products, and emergence of invasive weeds that impede agricultural productivity. Low rainfall is also frequently mentioned as the second reason (next to wildfire) why the transition zone has become less suitable for cocoa production as compared to the past. This fits into recent research findings on the adverse effects of rainfall decline on Ghana's cocoa and that Ghana's climate may not be able to support cocoa production in the future (Chapter 2). Rainfall is therefore considered by farmers as the most important climatic element to agriculture in the transition zone. Like Vision 2050 Forestry, farmers share in the belief that trees can induce rainfall, which in return, can help alleviate the agri-environmental

[31] Focus group discussion: Farmer, Dumasua, September 2011.
[32] Focus group discussion: Farmer, Dumasua, September 2011.

problems that results from low rainfall. Hence, the environmental justification behind smallholder involvement in the CCP is the quest for adequate and predictable rainfall and not necessarily carbon sequestration (refer to Appendix 4 for supplementary information).

Conclusion

While the dominant narratives pushed by policymakers and organizations like Vision 2050 focus on the benefits of tree planting as carbon sequestration and a route to climate change mitigation, farmers view trees more in relation to micro-scale weather systems offering stability in rainfall patterns, and protection against erratic seasons and wildfire risk. The link to carbon is alien, and not clearly understood. They are skeptical about the carbon sequestration project, arguing that the benefits lie in tree planting, a practice they know well. The long-term focus of mitigation is usurped by short-term interests in livelihoods and survival. Also for them, the project is no different to past projects focused on community and individual farm based forestry, and their memories of past failures are widely shared. As generations before, farmers see benefits in tree planting in certain places on the farm, for specific reasons and as part of a wider farming and livelihood strategy, with trees intimately linked in. Trees are part of lived in landscapes with long histories, with certain trees marking grave sites and past village settlements, and some being protected as ‘sacred groves’ protected by the spirits of the ancestors.

The idea of carbon sequestration is therefore not part of this worldview, and the range of policy narratives which justify the project intervention have little purchase at the local level. There is thus a mismatch between perspectives, a disjuncture which undermines the project’s ability to work effectively on the ground.

6. Carbon as a Commodity: Understanding Value

Introduction

As the CCP project is premised primarily on the slogan 'plant trees for cash', it is crucial to explore actors' understanding of the value of carbon. This chapter therefore covers how carbon rights are allocated and how carbon value is determined. The chapter also looks at farmers' perception of the value of carbon and the implications it holds for the long-term sustainability of the carbon offset project.

Actors' Perceptions of Carbon as a Commodity

The understanding of carbon as a commodity is championed by Vision 2050 Forestry. The organisation promotes carbon offset as a highly profitable venture, considering the limited capital needed and the increasing demand for carbon from the carbon market. This explains why the slogan 'plant trees for cash' was coined to drive home the financial prospects of the carbon credit intervention. The project developer narrated, 'The cash turnover of the project is expected to be high because it costs very little to maintain the trees and the carbon market is also booming'.[33]

Commoditisation of carbon was, however, a completely new concept to farmers prior to the project. Most farmers had never even heard of carbon as a constituent element of trees, let alone the idea that it could be sold. For most local project actors, the whole idea was completely alien. There were a few exceptions. Some well-educated, urban-based VIP absentee farmers had heard of carbon as a chemical element but not as a potential source of cash. Farmers draw their understanding of carbon as a commodity primarily from the explanations given by Vision 2050 Forestry during sensitization workshops. Through the these, farmers have come to perceive carbon as, 'money locked up in the air that can only be accessed by planting trees to tap the money.'[34] Thus, farmers have been made to understand that the carbon is stored up in the trees. They have also come to understand that, 'for every aircraft that flies, an amount of money, linked to exhaust gases, is saved up in the air for the tree planter'.[35]

Despite farmers' understanding of carbon as a commodity inculcated during sensitization workshops, farmers are quite uncertain about the credibility of the concept as narrated. 'For good reasons, we still have doubts about the reliability of this carbon business.'[36] The uncertainty of absentee farmers primarily stems from the fact that, 'carbon credit is a completely new concept in Ghana; without any success story elsewhere from which one can derive hope'.[37] In contrast, the sense of insecurity expressed by farmers (landowners) takes originates from lessons learnt from unsuccessful land-use interventions of the past. 'We fear that this project will fail us just as land-use projects of the past',[38] a farmer stated.

Allocation of Carbon Rights

Rights over carbon are not explicitly stated in the agreement documents (Appendix 2), but all the actor groups vest carbon rights in the potential carbon buyer. The Director of Vision 2050 Forestry concluded, 'the carbon belongs to whoever would pay for it'.[39] Based on the

[33] Interview: Project developer, Tainso, November 2011.
[34] Focus group discussions: Farmer, Badu, October 2011.
[35] Focus group discussions: Farmer, Badu, October 2011.
[36] Focus group discussions: Farmer, Dumasua, September 2011.
[37] Focus group discussions: Farmer, Badu, October 2011.
[38] Focus group discussions: Farmer, Dumasua, September 2011.
[39] Interview: Dr. Frank Kofi Frimpong, Wenchi, November, 2011.

understanding that the carbon is stored in trees, farmers understand carbon rights more in terms of tree rights. Thus, whoever owns the trees owns the carbon stored by the them. Land owners (active farmers), however, think that ownership over carbon (and trees) can only be claimed by the financiers of the project after all outstanding carbon revenues and land royalties have been fully paid to farmers. A farmer narrated,

> 'We are interested in the carbon money promised. But until we are paid the carbon revenue, the trees, including all the carbon, will continue to belong to us; we forfeit the rights over our trees and the carbon for 20 good years the moment we receive carbon revenue for the 20 years.'[40]

Similarly, absentee farmers generally showed no interest in carbon rights and concurred that the trees and the carbon belong to whoever pays the accumulated carbon revenue. These converging narratives on carbon rights clearly indicate that financial interest in the project supersedes rights over carbon and ultimately climate change mitigation.

Estimation of Carbon Value

The carbon value of each tree in monetary terms has been agreed between farmers and Vision 2050 Forestry to be GH¢100 (£40) that shall be standard for a period of 20 years (see Appendix 2 for the agreement form). The 20-year time frame was justified by Vision 2050 Forestry as the average time frame for REDD+ contracts globally. Stakeholders of potential REDD+ pilot projects in Ghana, Nigeria and Sierra Leone have similarly negotiated for 20-year contracts (Mason 2010).

There was, however, inadequate scientific data to justify the standard carbon value of trees agreed upon. In order to estimate a reliable carbon value, data on carbon benefits (additionality) and project costs are essential (Bond *et al.* 2011). Carbon stocks of the tree plantations range between 231 and 274 tCO_{2e} per ha and is expected to increase to approximately 320 tCO_{2e} per ha as trees continue to grow (TREES FCC 2010). However, the lack of baseline data makes it impossible to estimate carbon benefits (additionality). The total cost of the project could not also be estimated due to lack of quantitative data on opportunity, implementation and transaction costs.

The GH¢100 (£40) carbon value per tree agreed upon was, therefore, improvised based on the market value of a 20-year old *Cedrela* tree 'which gives a minimum yield of $5m^3$ for a negotiable average farm gate price of GH¢75/m^3'.'[41] This gives a cumulative revenue of GH¢375 (£150) per tree for 20 years. The remaining GH¢275 (£110) per tree (after deducting carbon revenue of GH¢100) is crudely projected to cover related implementation and transaction costs. Commenting on the accuracy of the above method of estimating carbon revenue, the Director of Vision 2050 Forestry said,

> 'This method, although not free of flaws, is the best we can have, particularly in the absence of sufficient data on historic emission levels and project-related costs. The risk involved is that this method is based on the assumption that potential carbon revenue for Cedrela will be more lucrative than its timber revenue, which may not necessarily be the case due to fluctuations in carbon value. The carbon values agreed upon may, however, be reviewed with the consent of farmers if the project finally gets access to the Voluntary Carbon Market.'[42]

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[40] Focus group discussions: Farmer, Badu, October 2011.
[41] Interview: Dr. Frank Kofi Frimpong, Tainso, November 2011.
[42] Interview: Dr. Frank Kofi Frimpong, Tainso, November, 2011.

In addition to the standard carbon value, land owners are entitled to 10 per cent of carbon revenue from each tree planted as land royalties. Thus, for every tree planted, the landowner stands to earn GH¢10 (£4) as land royalties to compensate for land rent.

Farmers' Perception of the Economic Value of Carbon

The different categories of farmers hold different views on the adequacy of the carbon value of GH¢100/tree/20 years that has been agreed upon. Absentee farmers are generally satisfied with the agreed carbon value based on the hope that investment will break even. Besides, absentee farmers consider the carbon credit project as a part-time business that takes little toll on their main livelihoods. Hence, cash profits that will accrue from carbon offset payments is expected be sufficient to supplement their primary income.

Landowners, however, consider the agreed carbon value to be inadequate considering rising inflation and high opportunity cost of farmlands. It was rather the promise of investing the pre-finance in other profitable ventures that pushed landowners into the project and not the carbon value of trees. For the project to be considered as profitable and pro-poor, landowners are of the view that the carbon value of trees per land unit must exceed income from highly profitable crops (Table 6.1 and Figure 6.1) and payment of carbon revenue has to be short-term.

	Investment	**Estimated 20-Year Income (≈£)**	**Years to realizing benefits**
1.	Carbon offset	4400	20
2.	Hybrid cocoa	3328	6
3.	Chili pepper	17,998	1
4.	Rain-fed maize	2103.36	¼ (i.e. 3 months)
5.	Improved maize	7,662.24	¼ (i.e. 3 months)

Table 6.1: Income and years to realizing benefits of carbon offset compared with hybrid cocoa and chili pepper per 10000ft2 (0.093 ha) land unit

In Dumasua, farmers used income from pepper as a benchmark for appraising the adequacy of carbon value as they regarded pepper as the most profitable crop in recent times. Smallholders estimated that 10000ft^2 of land (standard for 100 trees) can yield about two bags of pepper weekly, but could not provide reliable data on the frequency and duration of harvesting, as well as variation in yield with respect to time and season. As a result of apparent flaws in farmers' estimation, projections from the 'Chili Pepper Investment in Ghana' document of the Millennium Challenge Authority (MCA) were used for the chili pepper income assessment. Extrapolating from the average outgrower productivity of 12 tons/acre/year (MCA, 2010a), 10000ft^2 (0.23 acres) of land is estimated to yield ≈2760 kg of pepper per annum for a market value of GH¢ 8,625 using the average local wholesale price of GH¢ 3.125/kg[43]. This will generate a cumulative income of ≈GH¢ 172,500 (≈£69,000) in 20 years, and revenues can be realised within just a year (MCA 2010a).

[43] Esoko Ghana Commodity Index. Latest wholesale prices in Ghana Cedi. http://ghana.esoko.com/?co=network#sid=115;misc=N;m=prices, accessed 9th June 2012.

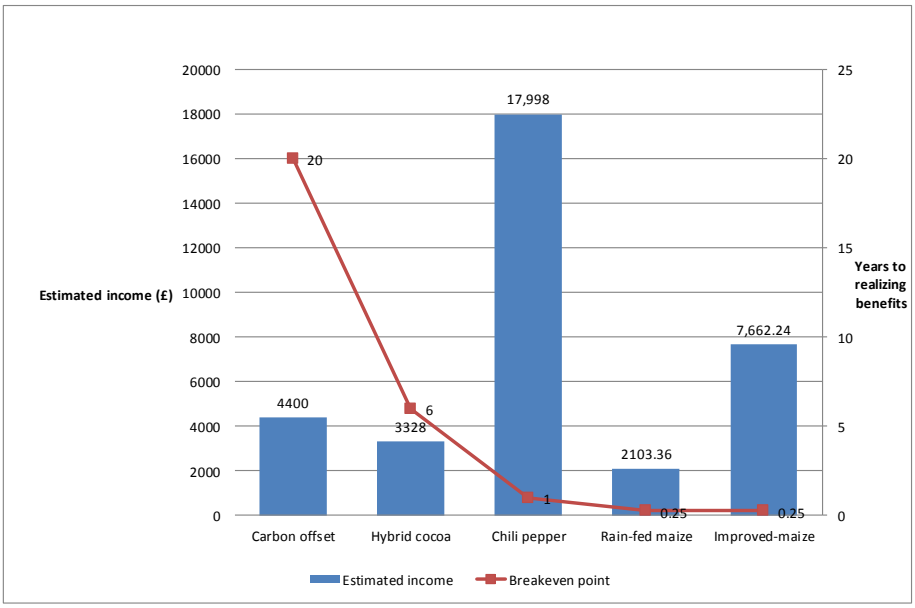

Figure 6.1: Years to realise benefits and estimated20-year income from carbon, cocoa, pepper and maize per 0.093ha of land

In Badu, income from cocoa was used as the yardstick for assessing carbon value of trees because cocoa was a significant source of wealth in the transition zone prior to the 1983 bush fires when the soil and climate could support cocoa production. Besides, farmers who migrated to Sefwi (a farming area in the Western Region of Ghana) as a result of the fire, to continue with their cocoa farming have become successful. Farmers' knowledge of cocoa productivity was, however, scanty as cocoa farming is still only now returning in the transition zone. Hence, cocoa productivity was estimated from the literature. Using the average productivity of 1400 kg/ha/year of best-practised hybrid cocoa systems in Ghana as a reference (CSAE 2009), 10000ft^2 (0.093 hectares) of land was estimated to produce ≈130 kg of cocoa in a year for a price of GH¢416 (£167) using the 2011/2012 producer price of GH¢205 (£82) per bag (64 kg). Thus, a total income of ≈GH¢8320 (£3328) can be earned in 20 years, and cash profit can be realized just after six years of planting (Oppong *et al*. 2006).

The financial returns of maize, the dominant crop, was also analysed although, despite its dominance in Badu in particular, none of the communities used it as a standard for assessing carbon value. The average productivity of maize in Ghana is 1.5 and 5.5 metric tons per hectare per production season under the traditional rain-fed and improved systems [44] respectively (MCA 2010b). By extrapolation, 10000ft² (0.093 ha) will yield between 0.14 and 0.51 metric tons in a season and between 0.28 and 1.02 metric tons per annum (i.e. two production seasons in a year) under the traditional rain-fed and improved systems respectively. At an average local wholesale price of GH¢ 0.939/kg[45] (GH¢ 939 per metric ton), the traditional rain-fed and improved systems are estimated to produce an annual income of GH¢ 262.92 and GH¢ 957.78 respectively. Thus, in 20 years the rain-fed and improved maize farms are projected to earn an income of GH¢ 5,258.4 (≈£ 2103.36) and GH¢ 19,155.6 (≈£7,662.24) respectively. Maize farmers admit that profit can generally be realised after each production season, which is typically three months (i.e. quarter of a

[44] The improved system uses improved seeds, fertilizer, mechanization and irrigation. The estimated productivity is in a range of 5.0 -5.5 metric tons per hectare. The 5.5 metric ton per hectare is therefore the maximum productivity estimate.

[45] Esoko Ghana Commodity Index. Latest wholesale prices in Ghana Cedi. http://ghana.esoko.com/?co=network#sid=115;misc=N;m=prices, accessed 9th June 2012.

year)[46]. The Table 6.1 and Figure 6.1 compare the gross incomes and the numbers of years to realizing benefits of carbon offset, hybrid cocoa, chili pepper and maize per 10000ft^2 (0.093 ha) land unit.

It can be observed from Table 6.1 and Figure 6.1 that estimated gross income from carbon offset is far below that of chili pepper but slightly exceeds projected income from hybrid cocoa. Estimated carbon revenue represents only about 24 per cent of expected revenue from chili pepper, but corresponds to about 32 per cent more of estimated cocoa revenue. The estimated income difference between chili pepper and carbon offset is even expected to widen in the course of 20 years, considering potential increases in farm gate price of chili pepper and income from successive crops when pepper is off-season. The UK producer price of green chili pepper increased by about 32 per cent in a decade; from US$ 1821.4/tonne in 1999 to US$ 1821.4/metric ton in 2009 (FAOSTAT 2011). This points to a better market advantage of chili pepper over carbon offset in the future. Similarly, the estimated income from hybrid cocoa will probably exceed carbon revenue when future rises in the producer price of cocoa[47] and non-cocoa income from secondary products (fruits, timber and fuelwood) are taken into account over a 20-year period.

However, carbon revenue is more than twice the income from rain-fed maize but represents just a little more than half the income from improved maize. Since rain-fed production is the common practice, it implies most of the farmers are currently earning below the expected income from carbon when planting maize. This probably explains why maize was not used as the comparator even though it is the dominant crop. Income from rain-fed maize may, however, compete favourably against carbon revenue in the future considering its short-term returns and the increasing corn price worldwide due to the use of corn for ethanol in the USA[48].

None of these comparisons include the most lucrative crop: marijuana. This is a popular, although illega,l crop in Badu and nearby areas as mentioned above, particularly for younger farmers who had never experienced the cocoa boom. The relative returns are significantly more than carbon and probably exceeding pepper, although accurate data are not available.

It must, however, be emphasized that estimated gross income is not a flawless indicator of economic viability. Profitability analysis taking account the range of costs would have been better, but no credible data was available on the production costs (fixed and variable) of carbon offset, hybrid cocoa, chili pepper and maize. Nevertheless, estimated gross income, combined with market prospects and revenue flows probably gives chili pepper, hybrid cocoa and improved maize better economic viability relative to carbon offset options.

Such valuations are further influenced by the overall value of land. Land values are very different in the two study sites, with the peri-urban site having fast appreciating land prices. Thus land owners in the peri-urban areas (Dumasua and nearby areas) are very concerned about wasting their lands on carbon offset, whereas those in the rural areas (Badu and nearby areas) are relatively satisfied if all benefits will be paid as promised. One farmer in Dumasua said, 'we could have used our lands for something more beneficial than planting

[46] Interviews: Maize farmers, Badu and Dumasua, June 2012.

[47] The producer price of cocoa in Ghana has increased by as much as 12,957% in the last 20 years; from GH¢25.12/tonne in the 1991/1992 season (COCOBOD 1998) to GH¢3280/tonne in the current (2011/2012) season (estimated from ICCO Daily Prices of Cocoa Beans of 16th December 2011, http://www.icco.org/statistics/daily_prices.aspx)

[48] José Graziano da Silva (FAO Director-General), http://www.cattlenetwork.com/cattle-news/FAO-Corn-price-increases-due-to-ethanol-137922143.html, accessed on 11th June 2012.

trees',[49] whereas a farmer in Badu differed, 'we will be satisfied with the project if all the benefits promised are paid, especially the pre-finance'.[50]

The disparity in the level of satisfaction is primarily brought about by differences in land value and competition from alternative land-use options. Land is more available and relatively cheaper in Badu as compared to Dumasua. In Dumasua land is being bought up for building as well as for the establishment of intensive chicken production units. This is increasing land prices dramatically. Moreover, in Badu there is little rivalry between different farming options as land users are predominantly crop farmers. In Dumasua, however, strong rivalry exists between crop farmers and livestock farmers as to which group has chosen the most profitable land-use option. Many land owners have switched from crop farming to livestock production in response to unsuccessful crop-related interventions in the past. Hence, as much as livestock farmers like to justify their change of land-use option, crop farmers are keen to justify their consistent engagement in crop-related interventions. 'We are always mocked by those livestock farmers for wasting our lands on trees for a little compensation which may not even materializ', [51] was how one farmer expressed the competition between the two groups of farmers. The rivalry from livestock farmers has probably heightened the expectations of crop farmers in Dumasua (and surrounding areas) from the carbon offset project.

With regard to the pattern of revenue flows, one farmer in Dumasua posed this rhetorical question. 'What is the point in waiting for 20 years for carbon revenue when I can earn more from chili pepper within a short time?.'[52] An elderly farmer also remarked, 'what is the guarantee that I will be alive in 20 years?' [53] Even farmers who plan to leave their investments as legacies to their children were concerned about the long timeframe for the carbon offset project. One of them said. 'I also deserve to enjoy for a while, although I know my children will inherit my investment if I die too soon.'[54]

Conclusion

The relative economic viability of chili pepper and hybrid cocoa compared to carbon revenue can be very critical to land use decisions and contract negotiations between landowners and Vision 2050 Forestry. Farmers reserved the right to switch land use if the carbon option offered fewer returns. This was contained in the expressions of various farmers during focus group discussions, 'we will not rent out our lands again after the 20 years until we are offered what is better than income from cocoa', 'we will rather use our lands to grow pepper if future carbon benefits will not be lucrative enough', and 'we will negotiate for short-term payments rather than wait for too long'.[55]

If alternative land uses are very profitable it will be difficult for carbon money to be competitive (Van Bodegom *et al*. 2009). Thus, carbon value and terms of payment will have to be more attractive than economic returns from chili pepper, hybrid cocoa and indeed marijuana in order for landowners to renew their contracts and for new landowners to hand over their farmlands for carbon offset.

[49] Transect-walk conversation: Farmer, Dumasua, February 2012
[50] Focus group discussion: Farmer, Badu, October 2011
[51] Focus group discussion: Farmer, Dumasua, September 2011
[52] Focus group discussion: Farmer, Dumasua, September 2011.
[53] Focus group discussion: Farmer, Badu, October 2011.
[54] Focus group discussion: Farmer, Dumasua, September 2011.
[55] Focus group discussions: Farmers, Dumasua and Badu, September/October 2011.

7. Resource Access: Inclusion and Exclusion

Introduction

Resource access, defined by (Ribot and Peluso 2003) as 'the ability to derive benefits from things' is governed by a multiplicity of socioeconomic factors and power relations. Although the carbon revenue agreed upon is not attractive enough relative to a number of prevailing landuse alternatives, the carbon project presents some benefits such as agroecological services for food crops, fire prevention, job creation and Non-Tree Farm Products. This chapter examines how different processes affect local actors' ability to join the project and derive benefits from it, focusing on the power relations affecting inclusion and exclusion. Particular attention is paid to socially differentiated patterns of access, drawing out comparisons between different actor groups in terms of land ownership (landowners versus the landless); ethnicity (migrants versus indigenes); gender (men versus women); wealth (the rich versus the poor); age (the old versus children and the youth); and the nature of livelihood (whether considered as a potential threat or not).

Landownership (Landowners versus the Landless)

In the CCP, land ownership primarily dictates the extent of inclusion of smallholders and what benefits can be derived. Ownership to land is largely controlled by families and individuals whose ancestors were the first to settle on or cultivate a given portion of land and not by traditional authorities. This system of land acquisition locally referred to as *'do dee wo betumi'* (which is translated from the *Twi* language as weed and own as much as you can) was instituted by ancient traditional rulers purposely to encourage hardworking and bumper harvests among families in the past when land was vast and not much competition existed among the small human population. Thus, access to farming land is primarily guaranteed through kinship and membership of a particular clan.

The existing land tenure system implies that migrants cannot own land, but have to depend on other arrangements such as share cropping and land renting to acquire land. Lack of legitimate rights to land inheritance has therefore been the main reason behind the exclusion of many migrants and non-indigene settlers from the carbon offset project.

It was against this background that the Absentee Farmer Programme (AFP) was initiated by Vision 2050 Forestry to encourage the participation of the landless in the project. Legitimate landowners, however, have certain advantages over absentee farmers, in terms of financial benefits, access to non-tree farm products, close proximity to trees and insurance against collapse of the project.

Unlike absentee farmers, landowners are entitled to 10 per cent of the carbon revenue of each tree as carbon royalties to compensate for their lands and losing their food crops in the course of the project. The 10 per cent carbon royalties given to land owners follows timber royalties given to the stool lands under the Forestry Commission's benefit-sharing scheme of royalties from the forest reserves. Thus, for every 10000ft^2 of land committed or adopted, a landowner shall receive GH¢1000 (£400) more in carbon revenue than an absentee farmer in the course of 20 years. Besides disparity in carbon revenue, land owners are required to pay GH¢25 annually as registration fees as compared to GH¢35 and GH¢100 of absentee smallholder absentees and VIPs respectively (Table 4.3). If the registration fees should remain the same for the 20 years smallholder absentees and VIPs will respectively pay GH¢200 and GH¢1500 more than landowners in membership registration. In addition, land owners have the right to access pre-finance and educational fund to compensate for their lands, unlike absentee farmers.

Another benefit gained by land owners over absentee farmers is access to food crops grown in the tree plantations, as well as harvested non-timber farm products (NTFPs). Food crops include tubers, fruits, vegetables and cereals), while NTFPs include snails, mushrooms, medicine and fuelwood. Food crops form the largest share but begin to dwindle after the first two years when the tree canopy has closed up. The other NTFPs can be accessed throughout the project cycle although in limited quantities. In addition, landowners stand to gain from potential soil rejuvenation following the 20-year tree fallow. They believe the rejuvenated soils can translate into higher yields and profits if they opt for crop production after the 20 twenty years.

Land owners enjoy close proximity to their farms and do not have to travel over long distances to monitor their trees. This affords them the opportunity to regularly maintain trees and guard their farms from the activities of hunters, charcoal burners and palm wine tappers. Proximity also affords land owners the opportunity to frequently appreciate their efforts and enjoy the aesthetic appeal of the trees. One active farmer said, 'unlike our counterpart absentee farmers, we can at least see the trees whenever we want, just to ensure that all is well.'[56] This saves active farmers from the anxiety many absentee farmers have to go through in order to see their adopted trees.

Moreover, land owners have some insurance against the worst-case scenario where the project fails or the carbon market collapses. Landowners believe they can claim ownership of the trees (including the carbon stored). They are also hopeful of leaving their future investment returns as legacies for their children in case of death since the land is their legitimate property. Some said, 'the trees belong to us if the project should fail because the registration fees we have been paying cover the cost of the tree seedlings,'[57] 'we have the right to sell the trees as timber if carbon revenue is not received in due course because the trees are standing on our own lands,'[58] 'my children can inherit the trees and all awaiting benefits if I die sooner than expected because they will automatically inherit the land.'[59] Absentee farmers, on the other hand, feel very insecure due to their absence of land rights. One absentee smallholder remarked regarding weak land rights, 'it will certainly be difficult to retrieve my investments if the project should collapse since I have almost no control over the land.'[60] Land rent agreements (see Appendix 2 for agreement form) are made between land owners and Vision 2050 Forestry (on behalf of absentee farmers), thereby excluding individual absentee farmers. Hence, the ability of absentee farmers to claim property rights over trees in the worst-case will largely depend on the legal rights of Vision 2050 Forestry.

Ethnicity (Migrants versus Indigenes)

The AFP aims to enhance the inclusion of the landless, yet land access shaped by ethnicity, presents barriers to the inclusion of migrant farmers. Unlike non-resident absentee farmers whose insecurity revolves around being distant, landless migrants and tenant farmers feel insecure about land rental agreements under the AFP. The negative perceptions about land rental agreements under the AFP are largely influenced by weak land rental agreements that have existed in the communities long before the carbon offset project was introduced.

Landowners are often compelled to rent out their lands when they need to pay for emergency situations such as funerals, medical bills and court fines. After settling emergency bills, some covetous landlords, motivated by the absence of enforceable

[56] Focus group discussion: Farmer, Badu, October 2011.
[57] Focus group discussion: Farmer, Dumasua, February 2012
[58] Focus group discussion: Farmer, Badu, October 2011
[59] Focus group discussion: Farmer, Dumasua, September 2011
[60] Phone conversation: Absentee Farmer, Takoradi Kumasi, December 2011

sanctions, decide to abrogate the land rental agreement by paying off the tenant farmer. This often leads to a land dispute as the tenant farmer will strive not to lose investments made on the land to the landowner. Resident migrants therefore reason that land rental agreements under the AFP cannot similarly offer them sufficient security to the land to justify long-term investment in carbon offset. For this reason, migrants are rarely involved in the AFP and for that matter the CCP. The majority of absentee farmers are non-residents who are less concerned with local land rental issues.

The negative perception of land rent is also caused by land litigations that characterise the family system of land inheritance. Land litigation is deeply rooted in the extended family system, polygamy and matrilineal system of inheritance in indigenous Akan societies as they result in conflicting heirs (Gedzi, 2009). Under the extended family and matrilineal system of inheritance, for instance, nephews, by custom, have the legitimate rights to inherit from uncles who may at the same time have their own biological children. Land disputes can result between nephews and children over the legitimate right to inheritance when an uncle (who was at the same time a father) dies intestate. Similarly, in polygamous families, there is often controversy over which of the wives (including the children) has more right to land inheritance than the other(s) when the husband dies intestate. Therefore, the rights to land, which has already been rented by the buyer, can sometimes be challenged or disputed by a different allodial titleholder (Asumadu 2003). Land disputes can be quite costly and frustrating, for which reason some migrants avoided the option of renting land purposely for the carbon offset project.

It must, however, be emphasized that the nuclear family system is gradually displacing the matrilineal system of inheritance, thus making the land dispute it causes less prevalent. A famer in Dumasua posed this rhetorical question, 'how can my nephew inherit from me when my own children are live?'[61] Similarly, increasing public interests in wills and the introduction of the Intestate Succession Law (PNDC Law 111 of 1985) which clearly defines property sharing in case a parent dies intestate, are making land disputes caused by the matrilineal inheritance and polygamy relatively easy to resolve by the court of law (Gedzi 2009).

Gender (Men versus Women)

How land ownership is customarily regulated also presents gender barriers which affect land access and holding sizes. Traditional inheritance rules and norms often exclude women from inheriting and controlling land. The following statements from female farmers give different dimensions of the customary arrangement. 'The lands are customarily for the males in the family because they supposedly have more physical strength to make optimum use of the land.'[62] 'We don't decide how much of the land we are entitled to; the men decide how much is suitable for us.'[63] 'Our husbands sometimes compensate us with portions of the land after helping them substantially with the farming business'.[64]

This gender inequity in land control and distribution generally gives men better access to land and bigger holding sizes than women (FAO, 2011b). Women's access to land probably has a role to play in determining the dominant crop. For instance, available data suggests that chili pepper is the most lucrative crop in selected communities (see above), yet it is not the dominant crop. This is because chili pepper cultivation is socially regarded as a women's crop who generally have limited access to farmland. Limited access land is one of the reasons why few women are involved in the CCP as compared to men. In general, big

[61] Focus group discussion: Farmer, Dumasua, March 2012
[62] Focus group discussion: Female farmer, Badu, March 2012
[63] Focus group discussion: Female farmer, Badu, March 2012
[64] Focus group discussion: Female farmer, Dumasua, March 2012

landholding sizes also allow men to plant more trees than women. Hence under the scenario where the project becomes profitable, men would generally have better a chance of benefiting than women.

Wealth (Rich versus the Poor)

The carbon offset project can be described as a self-financed intervention that has received little external donor support. For this reason, pre-finance has not been paid to farmers as initially promised. The resulting financial constraint has necessitated monetary commitments from farmers in the form of registration and maintenance fees that are not affordable to many rural and peri-urban poor, thus leading to their exclusion from the project. Most absentee farmers, especially the smallholders, have been unable pay the required maintenance costs due to financial constraints. Farmers who are unable to pay the required project-related costs will have their outstanding debts deducted from their accumulated carbon revenue.

One farmer narrated, 'I know of some people who could not join the project simply because they could not afford registration fees required'.[65] Some farmers had to borrow money or sell their property in order to afford project-related costs. Another farmer said, 'I had to sell a piece of land and use some of the money to pay the registration fees for myself and my children.'[66] Thus, the project generally favours wealthier actors, undermining the 'pro-poor' claims.

Financial commitments from farmers, although challenging, have some positive impacts on the sustainability of the project. Money invested by farmers has coincidentally increased their stake in the project. 'We cannot easily abandon the project now after spending so much money; we have to persevere for the sake of our investment returns,'[67] was how one farmer expressed their unintended commitment to the project. It is, nevertheless, perceived that adequate pre-finance from Vision 2050 Forestry will enhance the inclusion of the poor in the project.

Age (The Elderly versus the Youth and Children)

The project is dominated by older people (Table 4.1) as they have better access to land than the youth and children. Most elderly people have already inherited lands from their fathers (or uncles in the case of families that still practice the matrilineal system of inheritance), whereas young people generally have to wait later in life to inherit land. However, the reasons for little youth involvement in the carbon project go beyond land access. Reasons range from rural-urban drift in Dumasua (peri-urban) to better returns from marijuana farming in Badu (rural) where farmland is readily available. All the same, old people's better access to land enables them to voluntarily plant additional trees beyond what is required by the carbon project for extra economic gains, unlike the youth.

The disparity in land-holding sizes between elderly and young people is rooted in customary inheritance. Traditionally, fathers control farmlands on behalf of the entire family. Mature male children get portions of the land from their fathers generally after having helped with the farm work. This is usually when fathers grow very old and are not strong enough to manage the entire land. Thus, in a situation where there are many mature male children, each gets just a small portion of the land. A young man narrated, 'my father's children are

[65] Focus group discussion: Farmer, Dumasua, September 2011
[66] Focus group discussion: Farmer, Dumasua, September 2011
[67] Transect-walk conversation: Farmer, Badu, November 2011

many, so each got just a little bit of the land.'[68] However, the youth's access to land is probably better than younger children, in that the latter has to wait longer to inherit land.

The Regular Minor Programme (Chapter 3) was therefore designed to facilitate children's indirect access to land and ultimately enhance their inclusion in the carbon project. The educational fund tied to the Minor Programme has encouraged parents to invest portions of their lands in the carbon project on behalf of their children, rather than bequeath the land to the children later. Nevertheless, children's inclusion in the project depends on parents' access to land. One landowner posed this rhetorical question, 'the Minor Programme is designed for children but what do you do if your father hasn't got the land?'[69] This means children of the landless, especially migrant farmers, can hardly be included in the Minor Programme. The Absentee Farmer Programme also has no space for children as it targets only adults. Thus, the Minor Programme is effectively a preserve for children whose parents have enough land.

Nature of Livelihood (whether considered as a threat or not)

The carbon offset project is also indirectly excluding group hunters, charcoal burners and palm wine tappers, whose operations often result in uncontrolled burning of farms. Group hunting is an important livelihood in the transition zone, but most hunters set uncontrolled fires to flush out game. Likewise, charcoal burners set fire in pits and add dry fuel to burn wood over a long period of time. Palm wine tappers also carry naked fire to tapping sites where they use it to light bunches of dried palm branches to facilitate the tapping of palm wine.

Farmers used to force out fire users from their farms even before the CCP was introduced, but to a limited extent. The carbon offset project has only made farmers more cautious about anthropogenic causes of wildfire, since the trees have added value to farmlands. Many farmers, therefore, have to guard their farms more frequently against fire users as a measure to protect their trees. Farmers also seek the assistance of the Community Fire Volunteer Squad (CFVS) more often than before. The CFVS is mandated by the Ghana National Fire Service (GNFS) to prevent and control wildfires at the local level. Fire users who are apprehended by the CFVS are sent to the GNFS for damage assessment and finally to the Ghana Police Service for the appropriate sanctions to be effected (usually fines or imprisonment or both). The CFVS occasionally resorts to the help of the Buffalo Unit of the Military Service when fire users become difficult to control.

Conclusion

The carbon offset project results in a series of exclusions. Different mechanisms of exclusion are applied through the exertion of different forms of power (Hall *et al*. 2011). Exclusion occurs by force when hunters, charcoal burners and palm wine tappers are chased from croplands. Older, male land owners with large farms are the dominant group involved in the project. Rights over land are legitimated customary inheritance systems. Property rights over land allow landowners to exclude others, including through drawing on the fire and military services. Inheritance rights to land are thus an important factor influencing inclusion and exclusion. Until customary land laws become free of kinship, gender and age discrepancies, the inclusion of migrants, women and young people in carbon offset interventions will continue to be restricted.

Absentee farmers gain access to the project through the market. Only those able to afford registration and maintenance fees have been able to buy into the project. The market

[68] Focus group discussion: Young farmer, Badu, March 2012.
[69] Focus group discussion: Landowner, Dumasua, September 2011

mechanisms have, however, functioned poorly resulting in multiple disputes between the project and absentee farmers. In the end the legal system has been called on to adjudicate rights over carbon trees, with claims of fraud and malpractice being made.

Overall, the claims that the carbon project is pro-poor, supporting local communities through investment can be questioned. A highly differentiated impact is observed, with many groups excluded. Even those included in the project have not received pre-finance, and questions are being raised about the project by both farmers and officials.

8. The Livelihood Implications of a Carbon Offset Project

Introduction

Most of the rural households of Ghana (which represent 63 percent of the total population) directly depend on land resources for their livelihoods (World Bank 2006). In the transition zone, many rural households derive their livelihoods from farming of forested lands, hunting of bush meat, illegal chainsaw operations, fuelwood collection and gathering and commercialization of diverse NTFPs. Being a land-use intervention, the carbon offset project certainly has significant implications, especially on the livelihoods of landowners who have committed their lands to tree farming, as well as migrant farm labourers and share croppers who play a role in the farming system. This section therefore examines how the livelihoods of landowners, sharecroppers and migrant farm labourers are influenced by the CCP, including how the project is triggering a shift from food crop to cocoa production and its implications on the sustainability of the carbon offset project. Livelihood implications for absentee farmers, however, could not be examined as their main occupations are not directly linked to land resources, as well as the fact that the project is not advanced enough for cash profitability analysis.

Livelihood Implications for Small-scale Farmers/NTFP Collectors

The project has both positive and negative implications for small-scale farmers whose sustenance largely depends on crop yields. The carbon-offset trees, mainly *Cedrela*, have been found to interact positively with food crops in the first two years, thereby improving crop yields. *Cedrela* is reported by farmers to improve soil fertility, reduce soil compaction and provide shade essential for neighbouring food crops. The trees have also helped to reduce the devastating effects of wildfire on farm produce as farmers put in extra efforts to protect the trees from fire. Farmers are also of the hope that reforestation can bring back non-timber forest products (NTFPs), especially snails, mushrooms and wildlife (grasscutters, rats and duikers) that have almost disappeared as a result of recurring bush fires and attendant forest loss. Farmers believe they can diversify their source of income from commercialisation of NTFPs and also cut the costs of animal protein by consuming bush meat locally.

Some farmers are, however, concerned about losing food crops, their main source of livelihood, after two years when the tree canopies close and inhibit crops from growing underneath. Figures 8.1 and 8.2 below compare the state of food crops under different canopies of *Cedrela* on the same plot of land in Dumasua. Some farmers have reported reductions in crop yields, while others have observed a decline in the quality of their farm produce. One woman in Dumasua complained, 'because of the trees, my harvests have reduced by about two-thirds; my cocoyam and plantains are no longer growing well because they are not getting enough sunlight'.[70] Another woman seconded, 'sometimes I have to throw away my cassava because they taste bitter and I think it is the roots of the *Cedrela* which causes this bitterness.'[71]

These concerns of food security, however, only come from Dumasua (the peri-urban area) where land is relatively scarce, and specifically from farmers with limited lands who were mostly women. People with better access to land have been able to develop effective coping mechanisms as the carbon project requires as little as 10000ft² and 5000ft² per regular adult and minor respectively. Farmers who own multiple farms usually commit only one farm to carbon offset and reserve the rest solely for crop production. Those who have single but large farms would retire only a small portion for carbon offset, leaving the rest for food crops.

[70] Focus group discussion: Farmer, Dumasua, September 2011
[71] Focus group discussion: Farmer, Dumasua, September 2011

Figure 8.1: Crops present before *Cedrela* canopy closes

Figure 8.2: Crops eliminated when *Cedrela* canopy begins to close

Figure 8.3 is a typical farm sketch demonstrating how different plots are used for different purposes on big farms. In contrast, those who have neither multiple nor large farms are considering acquiring new lands solely for food crop production, but land scarcity and expense present yet another big challenge in the peri-urban area where urban expansion is putting pressure on available farmlands. The following quotes are how some farmers with limited land access expressed their feelings on food security and land issues, 'I wish I can get new land elsewhere exclusively for food crops, but where are the lands?'[72]

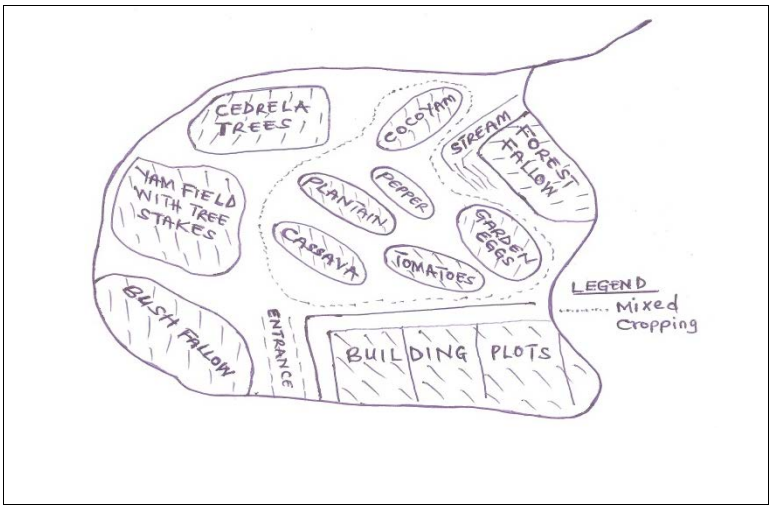

Figure 8.3: Farm sketch

'I wish I can afford another land elsewhere to grow only food crops,'[73] 'land has now become very expensive because of increasing demand from wealthy people from Sunyani, and the limited farmlands available are also too far for one to manage';[74] 'my farm has now become near to the proposed campus of the Catholic University.'[75]

[72] Transect-walk conversation: Farmer, Dumasua, September 2011
[73] Focus group discussion: Farmer, Dumasua, September 2011
[74] Transect-walk conversation: Farmer, Dumasua, September 2011
[75] Farm visit: Farmer (not involved in carbon project), Dumasua, March 2012

These concerns raise some important questions about the design of the project with respect to balancing between carbon offset and food security in the face of increasing land scarcity. The design of the project changes from agri-silviculture agroforestry (before tree canopies close completely) to woodlot plantations after two years when tree canopies have closed completely. Thus, food crop production and the livelihoods of the land deprived which depend on it are sacrificed for carbon sequestration without any alternative. These farmers are looking forward to invest their pre-finance (when paid) in alternative livelihoods such as livestock production and trading in order to compensate for the loss of farm produce, their main source of livelihood.

Although achieving the purposes of food crop production and carbon storage on the same piece of land is possible, it is necessary to increase farmers' awareness of possible trade-offs and to customize the project design to suit the land availability the area and of individual farmers. Alley cropping agroforestry system at a sizeable planting distance would probably work best for urban and peri-urban areas where land is relatively limited and for individual farmers who have access to limited lands. Although a sizeable planting distance would mean less carbon stored, addressing the livelihood needs of individual farmers is necessary to make carbon offset a win-win and a pro-poor intervention, and to ultimately enhance its acceptability in smallholder context.

Livelihood Implications for Migrant Farm Labourers

Hiring the services of migrant farm labourers (locally referred to as 'by-day') is one significant way the CCP is contributing to job creation in the transition zone. Farm labourers are regularly hired to weed around tree seedlings and prune mature trees. The livelihoods of these migrant farm labourers depend largely on hiring by older farmers and as a response to the expansion of invasive weeds. Most active farmers involved in the CCP are 50-60 years old and often require the services of farm labourers due to lack of adequate physical strength and family labour to maintain trees regularly. The burgeoning of invasive weeds is also making aged farmers more dependent on farm labourers. For instance, invasive weeds, notably spear grass (*Imperata cylindrica*) and *Chromolaena odorata* require frequent weeding because of their fast-growing nature. They become highly flammable when dried; hence, farmers consider their clearance as an urgent measure to prevent wildfire.

A farm labourer on average earns GH¢6 (£2.50) from weeding for only three hours in a day (usually from 9am till 12 noon), which is about 60 per cent more than the daily minimum wage of GH¢3.73 (£1.50) in Ghana. Most farmers find the charges of farm labourers too expensive to afford and have been resorting to the application of herbicides which are said to be relatively cheap, although not environmentally friendly. The increasing supply of and demand for herbicides, particularly Sunphosate (Figure 8.4), a selective weedicide, is gradually diverting farmers' attention from the services of farm labourers. Instead of reducing their charges in order to win more customers, farm labourers are rather forced by increasing cost of living to increase their charges. Some labourers have started negotiating for GH¢7 (£2.80) instead of the usual GH¢6 (£2.50). Migrant farm labourers probably stand the risk of losing their livelihoods in the future if the cost of weedicide application is not increased astronomically or if the government does not enact policies to restrict weedicide application.

Figure 8.4: Sunphosate

Livelihood Implications for Sharecroppers

Sharecropping arrangements are alternative ways the landless, especially migrant farmers (sharecroppers) can have access to farmlands in order to earn a living. Sharecroppers are important sources of farm labour in the transition zone, especially for retired local landowners and non-resident landowners. Ideally, a sharecropping arrangement is a win-win situation for both the landowner and the sharecropper. However, because it is difficult for landowners to monitor production from the land, there is often distrust between landowners and sharecroppers. Dissatisfied landowners are motivated by the 'plant trees for cash' idea and the fact that trees are easier to monitor than food crops, and are therefore considering investing their lands in trees rather than in share cropping. An old woman complained,

> 'My sharecropper is a cheat; he takes almost all the farm produce and gives me just a little because he knows am I not strong enough to monitor his activities. If only you (referring to the researcher) can offer me additional tree seedlings, I will sack him and use the whole land for trees since it will be easy to monitor the trees.'[76]

Thus, sharecroppers stand a risk of being displaced by trees, especially considering the fact that sharecropping arrangements do not exist for tree plantations. It also has to be noted that sharecroppers will not be displaced alone, but together with food crops. And the potential displacement of food crops by trees will certainly not be without adverse implications on food security.

Livelihood Change from Food Crop to Cocoa Production

The introduction of the carbon offset trees is also triggering shifts from food crop to cocoa production. Cocoa was once cultivated on a large scale in the transition zone prior to the 1983 bush fires. Cocoa farms were, however, devastated by the 1983 wildfire and fire recurrences and soil aridity have since presented barriers to sustained cocoa production. Farmers had the desire to grow cocoa long before the carbon project, because of the attractive market for cocoa and the introduction of early-bearing and high-yielding hybrid varieties. The fear of wildfire had, nonetheless, stood between farmers and cocoa farming.

[76] Focus group discussion: Landowner, Badu, March 2012

The introduction of carbon offset trees has given some farmers the assurance that wildfire can be prevented to some extent. The trees have placed more value on farmlands and this motivates farmers to put in extra efforts to protect their farmlands from fires. Common fire-prevention methods adopted by farmers are the construction of firebelts around farms and the expulsion of fire users, typically fire hunters, charcoal burners and palm wine tappers, especially during the dry season when flammability is higher (Chapter 6). These fire-prevention measures proved their worth during the February-March 2012 wildfires which devastated several farms, as those protected by fire belts were saved. A farmer in Dumasua reported, 'five farms close to mine have all been devastated by the wildfire; mine did not get burnt because of the fire belt I have constructed.' The hope that wildfires can be tamed is encouraging some farmers to start growing cocoa. Some cocoa has already been established close to tree plantations where the likelihood of wildfire is thought to be low (Figure 8.5).

Figure 8.5: Cocoa farm established close to a tree plantation in Dumasua

The renaissance of cocoa farming is also underpinned by fear of possible collapse of the carbon offset project. Farmers believe cocoa farming can ultimately serve as insurance against possible collapse of the CCP. Memories of the collapse of the Sunflower and Cassava for Starch projects are still fresh, and farmers are keen to hedge their bets. Although farmers stand to benefit from the attractive economic benefits of cocoa, revamping cocoa farming will further limit the availability of farmland for food crop production. Farmers are, however, hopeful that cocoa revenue can be enough for them to afford food items from the market regardless of the price.

The renaissance of cocoa farming may either augment or undermine the carbon offset project, depending on landowners' decisions on the choice of shade level. Today, the main system of cocoa production in the transition zone is the early-bearing Amazon hybrid grown under the shade of few timber and fruit trees (i.e. full-sun production system). Shade trees are maintained to improve soil productivity and to obtain secondary products such as fruits, timber and fuelwood for household consumption and additional income. Some farmers intend to establish carbon offset trees at the boundaries of their cocoa farms to serve as wind/fire breaks and to ameliorate the microclimate for enhanced productivity. This system of boundary planting, coupled with a good number of shade trees, can open up new opportunities for farmers to access carbon funds from the Ghana Cocoa Carbon Initiative (CCI) (see Chapter 2) if well practised.

It is, however, unlikely that cocoa farmers will be willing to maintain adequate number of carbon offset trees in their farms to augment the CCP, considering the low productivity of shade-grown cocoa relative to full-sun cocoa. Although shade trees have been found to increase the production span of cocoa (Lin *et al.* 2008; Rice and Greenberg 2000), full-sun cocoa has the advantage of generating higher yields and profits in the short term (WWF-Vietnam 2006; Anim-Kwapong and Frimpong 2005). Higher yield and short-term returns of hybrid cocoa appeal to aged farmers, who form the majority of landowners in the CCP. The early-bearing quality of hybrid cocoa is also likely to win the interest of other landowners who are likewise interested in short-term investments. It is these short-term benefits of hybrid cocoa have won it the accolade *'akokora bedi'* (literally translated from the *Twi* language as the old man shall live to enjoy it).

Hybrid cocoa is causing many farmers in Ghana to remove shade trees from their farms (i.e. a shift from agroforestry to intensive full-sun monoculture), as it performs best under direct sunlight (Asare 2005). Intensification of cocoa production is already a serious concern in Malaysia (Rice and Greenberg 2000), Indonesia (Belsky and Siebert 2003), Cote d'Ivoire (Padi and Owusu 1998) and other parts of the humid and sub-humid tropics (Lin *et al.* 2008). The six-year timeframe for gaining benefits from hybrid cocoa (Oppong *et al.* 2006) when compared to 20 years of the carbon offset project appeals not only to the elderly farmers, but also to the youth who are interested in quick returns. In addition to the fact that cocoa carbon benefits are projected to be modest due to the relatively low price of carbon and the need to compensate for project costs (NCRC 2010), the intensive hybrid cocoa system being developed may not diversify to the proposed shade-grown system if carbon benefits are not adequately supplemented by other incentive schemes.

The renaissance of cocoa production, although an opportunity for livelihood security and diversification, may thus have adverse implications on the impacts of the carbon offset project. The competitive investment returns of hybrid cocoa is not only diverting the interest of landowners from tree farming, but it has also limited the amount of lands active farmers have committed to the carbon offset project. Some farmers with big farmlands have committed only the minimum amount of land (10000ft^2) required by the project, while the rest of the land is used to cultivate cocoa. Even in the best-case scenario where these farmers maintain high level of shade on their farms, the amount of carbon that will be sequestered will definitely be a fraction of what would be sequestered by tree plantations.

The attractive investment returns of cocoa will also play a vital role in the sustainability of the CCP as it is likely to hinder the renewal of contracts after the first 20 years. Farmers will not be willing to renew their agreements with Vision 2050 Forestry after the initial contract period if hybrid cocoa continues to present better economic returns. Improvement in soil fertility that is expected to result from the 20-year tree fallow can as well influence farmers' choice of future landuse options as higher profitability of cocoa correlates positively with soil fertility. One farmer remarked, 'I know my land will be more fertile for cocoa after 20 years of fallow'.[77] Intensification of cocoa production can possibly mark the beginning of the end of the carbon offset project as most landowners may prefer to invest their lands in full-sun hybrid cocoa production rather than planting trees.

Conclusion

The carbon project has both positive and negative livelihood implications. The *Cedrela* trees present an opportunity for farmers with large land areas to diversify income through agroforestry and NTFPs but those of limited lands have a difficulty coping with the competition between trees and crops. While the project is promoting the livelihoods of

[77] Focus group discussion: Farmer, Dumasua, February 2012

migrant farm labourers, the potential displacement of crops by trees will have negative consequences on the livelihoods of sharecroppers. The potential shift from food crops to trees and the intensification of hybrid cocoa also have adverse implications on food security.

9. Conclusion

Introduction

The experience of the Carbon Credit Project (CCP) in Ghana is an important reminder of the challenges of realizing the ambitious goals projected in global narratives about the new carbon economy. While the project was not compatible with the REDD framework in Ghana, and would have been rejected on multiple fronts for technical non-compliance, the CCP is not dissimilar to many projects being elaborated across rural Africa in the hope of tapping into what are assumed to be highly lucrative carbon finance options.

The CCP story will likely be the fate of many other REDD+-type projects as high expectations fail to match the rigorous requirements for gaining carbon finance. In the end many have no prospect of delivering and, as with the CCP, a transformation away from a community-based approach (however flawed) to one based on a centrally controlled carbon plantation model is perhaps inevitable, given the strict technical requirements. The CCP story suggests that, in many cases, the prospects of realizing the 'triple win' claims of the global narrative will remain a mirage, and instead a 'carbon grab', where land is leased in large blocks managed as a plantation is the more likely outcome.

Studying project failure is perhaps a bit depressing - and many aspects of the CCP were certainly disappointing – but it is important to learn lessons from these experiences, particularly as REDD-type projects are rolled out with very substantial international backing. It is therefore important to study how the whole array of private sector/NGO players operate in the carbon regime, as there are actually some important lessons about how the technical dimensions of additionality, baselines, as well as tenure, exclusion, benefit-sharing come out even from the bizarre goings-on of Vision 2050 Forestry. The lessons that can be drawn from the Vision 2050 Forestry case study highlight the following recommendations for the development and sustainability of grassroots-level carbon projects:

- The justifications for gaining access to carbon markets in the transition zone depend on establishing clear baselines and data which shows additionality. This has proved exceptionally difficult, in part because of the technical challenges of measurement, and in part because of the problems with existing baseline data on forest cover and deforestation rates. National assessments of forest change are notoriously unreliable, undermining claims made for REDD type projects. Local understandings of forest change emphasise dynamic change rather than secular decline and past and current forest interventions in the transition zone are about managing this dynamic, creating forest patches, changing fire regimes, and so on. The requirements for entry into formal carbon markets and REDD type project funding are so stringent it is unlikely that smallholders in the transition zone will ever be eligible. Hence, the idea of governments receiving international payments based on a general reduction in carbon emissions and allocating payments to carbon offset projects at the local level is probably the only route to engage smallholders in such efforts, if the CCP experience is anything to go by. The alternative is a plantation style forestry option which has a poor track record in Ghana, and one that has limited benefits for local farmers.

- The successes and failures of past land-use interventions can greatly shape farmers' perception of REDD+ interventions in smallholder contexts. This largely explained why only 72 landowners have signed up for the project in Badu and Dumasua altogether, while the majority of landowners are waiting for the project to prove its credibility before signing up. The 'wait-and-see' category of landowners has probably been vindicated. REDD+ projects will need to prove their credibility in order to reverse the negative impressions that have been created by unsuccessful land-use interventions of the past. To achieve this, the idea of rushing to pre-finance projects has to be avoided. Much time

needs to be spent in collecting relevant baseline data required for proving additionality; appropriate land lease documents required to demonstrate ownership over the project's area need to be obtained; and adequate funding has to be secured from the carbon market before fully engaging farmers and landowners. Vision 2050 Forestry as a forerunner which ultimately failed should therefore offer some useful, and salutary, lessons to help dampen the fervour around REDD+. If not, REDD+ interventions may only worsen the gloomy history of past land-use interventions which has negatively shaped farmers' perception of externally-introduced land-use interventions. The grand aims of pro-poor, win-win, food security oriented and environmentally sustainable projects have failed to be realized in the past and the hype and expectation of REDD+ schemes suggests they may well again in the future, unless a radical shift in approach is adopted.

- The justification for carbon offset in smallholder contexts should be based more on farmers' understanding of climate change and livelihood concerns, rather than on scientific theories. Farmers lack understanding of carbon offset. They can rarely make connections between carbon and climate change and so are disempowered by the project, not knowing what it is for. Instead, their understanding of climate change is primarily based on the effects of apparent environmental changes on their livelihoods. Tree planting to improve rainfall, fire prevention and availability non-timber forest products is welcomed, and encourages participation of farmers and landowners, while arguments about carbon sequestration remain alien.

- The attractiveness of carbon forestry will depend on the potential returns from alternative uses of land. In the study areas, high value crops offered a higher return over a shorter period, and so were more appealing to farmers. The value of land in many areas is increasing, especially in peri-urban sites where demand for land for building is growing. These areas are unlikely to offer good opportunities for carbon investments as returns from other options will be higher. It is only in relatively land rich areas, where farms are in large blocks and new land uses are not competing with other uses, carbon forestry is likely to take off. This was more the case in Badu than Dumasua, but questions are raised about the future, given pressures on land through growing populations and expanding urban areas. Carbon offset schemes are designed to operate over a minimum of 20 years, and it is clear that land values will change dramatically over this period, potentially undermining the incentives to maintain carbon trees, even in areas which have land surplus now.

- As in every other form of land-use, it is not exceptional for carbon offset interventions to bring about some form of exclusion. Hunters, charcoal burners and palm wine tappers have been excluded from areas under carbon forestry, undermining their livelihood options. Land inheritance systems dictate the degree of inclusion or exclusion and the extent to which benefits from carbon offset can be accessed in smallholder contexts. Until customary land laws become free of kinship, gender and age discrepancies, the inclusion and resource access of migrants, women and young people in carbon offset interventions will continue to be restricted.

- Changes in farming landscapes brought about by carbon offset interventions can have both positive and negative livelihood implications. The *Cedrela* trees present an opportunity for farmers with large lands to diversify income through agroforestry and NTFP commercialization, but those with limited lands have difficulty coping with the competition between trees and crops. Although achieving the purposes of food crop production and carbon storage on the same piece of land is possible, it is necessary to increase farmers' awareness of possible tradeoffs and to customize the project design to suit the land availability the area and of individual farmers. While the introduction of trees into the farming landscape is promoting the livelihoods of migrant farm labourers

through the generation of employment, the potential displacement of crops by trees will have negative consequences on the livelihoods of sharecroppers. The potential shift from food crops to trees and the intensification of hybrid cocoa can also have adverse implications on food security.

The CCP case study has therefore highlighted some of the dilemmas presented by the enthusiastic rush to carbon offset projects as part of agricultural and rural development, under REDD+-type programmes. If not implemented effectively they can result in limited finance flow (due to compliance challenges), the exclusion of some people within communities (in this case mostly poorer farmers, young people and women, as well as migrants and sharecroppers) and benefits accumulating to a limited group (in this case mostly male farmers with larger land areas and some finance). With a long-term return of an uncertain amount, dependent on project finance and access to carbon markets, carbon offset options must compete with other land uses. In the Ghana case, alternative uses may be much more lucrative, certainly over the longer term, reducing incentives to engage with the project. The livelihood and food security consequences of a carbon project mean that such an intervention can result in declines in food production and displacement of livelihoods (including hunters, charcoal burners and NTFP collectors). Despite the rhetoric, carbon offset projects outcomes are not automatically pro-poor, win-win. This depends on power relations within local communities which can include and exclude, as affected by gender, ethnicity, migrancy, age, wealth and land ownership rights. Unless such issues are taken into account in project design and implementation, carbon projects will have unequal and uncertain outcomes.

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Appendix 1. Educational Fund Sample Certificate

EDUCATIONAL FUND OF THE GREEN REVOLUTION

Certificate

This is to certify that

PETERSON AMOAKO

has contributed Thirty Five Ghana Cedis Only

GH¢ 35.00

and is eligible for Five Thousand Ghana Cedis Only

GH¢ 5,000.00

on 25TH September 2015

Director / Accountant

Date: 2/3/16

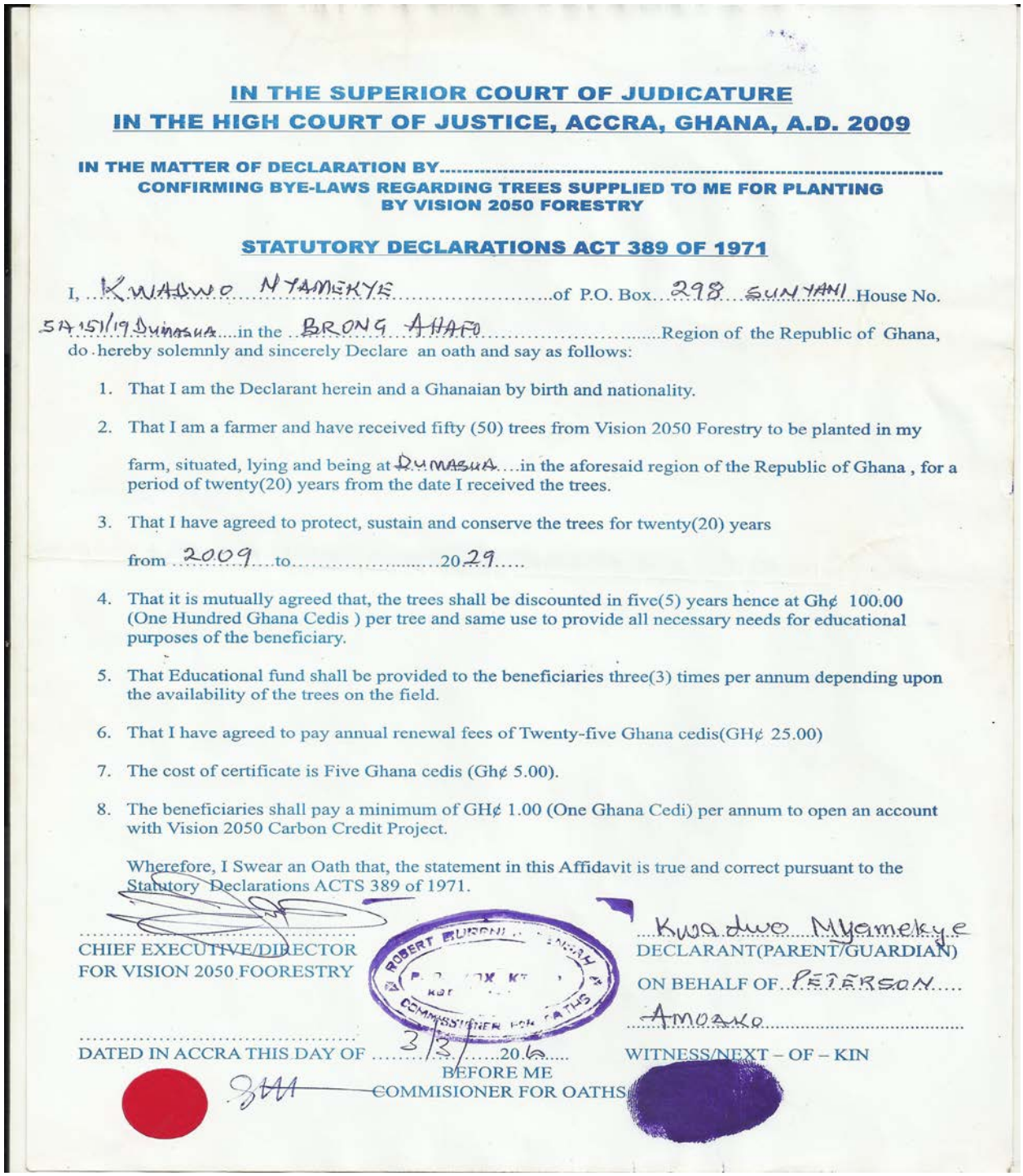
VISION 2050 FORESTRY

Forestry in all aspects: Agro-Forestry, Sustainable Agriculture & Rural Employment

Chief Executive / Chairman

Date: 2/3/16

Appendix 2. Sample Agreement Form



IN THE SUPERIOR COURT OF JUDICATURE
IN THE HIGH COURT OF JUSTICE, ACCRA, GHANA, A.D. 2009

IN THE MATTER OF DECLARATION BY.....
CONFIRMING BYE-LAWS REGARDING TREES SUPPLIED TO ME FOR PLANTING BY VISION 2050 FORESTRY

STATUTORY DECLARATIONS ACT 389 OF 1971

I, KWADWO NYAMEKYE .....of P.O. Box 298 SUNYANI House No. 57/151/19 Dumasua....in the BRONG AHAFO .....Region of the Republic of Ghana, do hereby solemnly and sincerely Declare an oath and say as follows:

1. That I am the Declarant herein and a Ghanaian by birth and nationality.
2. That I am a farmer and have received fifty (50) trees from Vision 2050 Forestry to be planted in my farm, situated, lying and being at Dumasua....in the aforesaid region of the Republic of Ghana , for a period of twenty(20) years from the date I received the trees.
3. That I have agreed to protect, sustain and conserve the trees for twenty(20) years from 2009....to.....2029.....
4. That it is mutually agreed that, the trees shall be discounted in five(5) years hence at Gh¢ 100.00 (One Hundred Ghana Cedis) per tree and same use to provide all necessary needs for educational purposes of the beneficiary.
5. That Educational fund shall be provided to the beneficiaries three(3) times per annum depending upon the availability of the trees on the field.
6. That I have agreed to pay annual renewal fees of Twenty-five Ghana cedis(GH¢ 25.00)
7. The cost of certificate is Five Ghana cedis (Gh¢ 5.00).
8. The beneficiaries shall pay a minimum of GH¢ 1.00 (One Ghana Cedi) per annum to open an account with Vision 2050 Carbon Credit Project.

Wherefore, I Swear an Oath that, the statement in this Affidavit is true and correct pursuant to the Statutory Declarations ACTS 389 of 1971.

.....
CHIEF EXECUTIVE/DIRECTOR
FOR VISION 2050 FOORESTRY

ROBERT BURTON ... COMMISSIONER FOR OATHS

Kwadwo Nyamekye
DECLARANT(PARENT/GUARDIAN)
ON BEHALF OF PETERSON....
Amoako

DATED IN ACCRA THIS DAY OF 3/3/.....20.16.....

BEFORE ME
COMMISIONER FOR OATHS

WITNESS/NEXT – OF – KIN

Appendix 3. Vision 2050 Forestry's Appeal for Government Funds

Tuesday, 19 April 2011 16:35

Vision 2050, a leading private Forestry Company in Ghana with the aim of recovering 50 per cent of the degraded forest and reducing poverty by 50 per cent in the country by the year 2050, has called on the government to take over the operations and affairs of the company.

Vision 2050 Forestry, covers 560,000 hectares of landmark in seven geographical regions in Ghana namely, Eastern, Ashanti Volta, Central, Western, Brong Ahafo and the Northern Regions respectively.

Speaking to the Information Services Department in Accra, today, the C.E.O. of Vision 2050, Dr. Frank Kofi Frimpong, expressed optimism that with the President's dream of achieving a 'Better Ghana Agenda',

diversifying the company into state owed will serve as an avenue for job creation which will go a long way to reduce poverty and enhance the standard of living of people in the country.

According to him, the government loses over 30 billion dollars of revenue every year from wood exportation and the activities of illegal chainsaw operators in the country.

This happens because the Ghana Forestry Commission demands series of certificates from companies and individuals before it issues certificates of permit for the transportation of wood from the forest to the ports or final selling joints.

This process sometimes takes a year which results in the decay of harvested trees causing financial loss to the companies.

He expressed regret that due to this situation, his company is forced to sell the harvested trees to foreigners who through dubious ways, manage to transport the wood to the ports without paying taxes. He said the activities of the Forestry Commission are causing the country huge loss of money.

He, therefore, appealed to the government to come to the aid of his company since it is not able to manage the affairs of the company with regards to the operational system of the Forestry Commission and the stress involving the transportation of harvested trees.

Vision 2050 is able to plant 130 million trees in a year and within five years has engaged the activities of 300, 000 farmers with a rising number of four to five million people signing up for shares in a year.

Dr. Frimpong said the main intention of the company is to use the trees for voluntary carbon trading.

He mentioned that the company is the first to receive feasibility report from the World Bank in November, 2010 which stressed on corruption in the Forestry Commission in Ghana.

Dr. Frimpong revealed that the World Bank and an Environmental Development Consult in the U.K. have promised to fund the company after auditor's report by some students from Norway.

http://www.ghana.gov.gh/index.php/news/general-news/5601-vision-2050-calls-for-government-intervention

Appendix 4. Field Reports by Norwegian Students

Fieldwork Report Vision 2050 Forestry Week 2 Kjell Endre Aasmundtveit, Slemdalsvingen 1, 0776 Oslo

In our second week working with the Vision 2005 Forestry, we went to Nkoranza which is a smaller town in the Brong-Ahafo district of Ghana. Here we drove out to smaller villages in the areas around Nkoranza and talked to and interviewed around ten farmers. We also traveled to Wenchi, where we interviewed four more farmers. Wenchi is a village about 20-30 minutes drive from Nkoranza.

The farmers in this district seemed more positive about their future than in Sunyani, although none of them had seen any investors or money yet. First of all the farmers where interested in earning money to improve their financial status, but we also found engagement in global environmental issues in some of the farmers. They told us that the African weather had change during the last years. The rain season had become wetter and the dry season had become hotter. Some of the farmers had also heard about the changing weather in Europe, and would be glad if their contribution to the global environment through the planting of trees could be of any help.

By speaking with Dr. Kofi Frempong, we got informed that the NGO Vision 2050 Forestry now had closed the registration of new farmers to the project. Because of the, by now, lack of investors the organization would prior the farmers already involved in the program. After all there is around 300 000 farmers who have planted trees from V2050F, which actually is a lot of people. When V2050F starts to get money, they would give 100 dollars to some farmers in all the areas which they are represented. So that also farmers around would see results from the project and keep or refresh their faith in the poverty reduction part of the program.

Many of the farmers we talked to told us that if the financial support didn't appear in some time, they would have to cut the trees down. Then they would sell the trees and use the part of the land where the trees had been standing to for planting other species like jam, coco or cashew. Even though the trees where good for their land and for the environment, they needed money, and would have to quit the programs if no money showed up.

I hope that Vision will be able to get investors in the near future, because the farmers where very positive about the concept. They see this as a great opportunity for extra income. One of the farmers we interviewed, Samuel Owusu, told us that the money from the Vision-trees would be enough to send his children to school. He had to quit school himself at Level 2 at Senior High because of two reasons, his father was old and needed help in the farm and they didn't have the money for continuing school. The idea of combining reforestation and poverty reduction is quite genial, and I hope that this project and similar project has the right of life. If the money and the investors don't shows up, a lot of work by V2050F and the farmers would be wasted. The idea is to good to be thrown away.

Fieldwork Report Vision 2050 Forestry Week 7 Elizabeth Schafer, Bjerregaardsgate 21, 0172 Oslo, Norway

Off to Nkoranza and the districts (there amongst Wenchy-Koase) to interview more farmers about their situation on the farms and life in general, after joining the Vision 2050 Forestry program. Nkoranza is located in the Brong Ahafo district in Ghana. Many are working as farmers and many are involved in the V2050F program on reforestation and poverty reduction. The reasons people are interested in being a part of the project are actually quite

interesting, except the obvious reason, that is to sustain a certain level of livelihood, people are fully aware of the environmental issues both locally and globally, and they are more than willing to help not only themselves, but others, if one considers environmental consequences around the globe, and the life of their families and of their people.

The farmers are friendly and always glad to see us, one can tell they are really engaged and eager to see some results of what they are doing, not just because of their struggle to get their ends to meet, although this is a primary necessity, but as I mentioned, they are really concerned about the environmental issues, their daily life as farmers and their life as a nuclear family. Wanting to send as many children to school as possible they need money, but as the other reports shows, there is a lack of investors. To be able to get food and send their children to school, some of them works as traders as well, for example, they buy mais and sell it on the marked or makes kenke to sell this. The days are long, almost every farmer works every day from early morning to eveningtime, only taking Sundays off to go to church and relax with friends and families.

The important thing here is that the farmes are really positive to help change their land into tree growing areas, for the benefit of their people, their families and for all of us. This cannot be stresses enough. When there is trees, people are happy, many catastrophes can be avoided with more trees, bushfires is a common problem, wind and dust the same, the soil will get better with more trees, shadows for the farmes to sit under the trees and talk, the consequeses are huge on the positive side. And again I have to mention what impact the environmental issues concerning the project will have on all of us.

The farmers encourage their neigbours and friends to join the program, and they want to expand the tree growing on their farms, but as the company V2050F have no more money and investors, they have closed the registration, because they cannot afford to have more farmers involved in the program.

Dr Kofi Frempong has been the head force on the project for over 10 years and has really made more work then one person can actually achieve througout a lifetime, he is always on the move for the cause, working for every man's well being in the name of poverty reduction and the environment. To whom this may concern; this project would be able to help farmers all over the country of Ghana; we have seen the farmers and talked to them, they are more than willing to help and this is a far to good a project to turn down.

Fieldwork Report: Vision 2050 Forestry Week 8, 21.02.2011 from Marit Lundby, Lysverkbakken 10, 2015 Leirsund, Norway

This has been our second week, working with Vision 2050 Forestry. After a couple of days in Sunyani, we went to Nkoranza. In this town, and the Villages we went to around the city, we got to interview more farmers. This week we have also tried to ask the farmers, in addition to the poverty reduction perspective of the program, about their point of view about the environment, reforestation and deforestation, both in a local and a global perspective.

We interviewed about 9 farmers in the Nkoranza district, and 4 in Wenchi-Koase. Most of the farmers told us that they are well aware about the environmental perspective of the program, and most of them told us that they thought that tree planting is very important for both the local and the global environment. For instance: Amankwaa Adu Donicor, a 52 year old, male farmer tells us that he thinks that the tree planting is an investment both environmentally and economically. He also tells us that he think that the trees will contribute to save the world. Another farmer, 48 year old, female Janet Boahemaa, tells us that she knows about the importance of the trees. She tells us that under the trees she can find shadow, and rest from the sun. She tells us that the problem is economical, and that she is in lack of money. She hopes that she will get financial assistance from Vision 2050 Forestry to continue to maintain

the trees. She also tells us that she is planning to plant more trees, if she just can get money support from the project. She says: 'It is the money that is the problem, not the trees.' This opinion is the same for almost all the farmers. They tell us, one by one, that they really would like to plant more trees, and to contribute to help the environment. Their only problem is their lack of money. They are all waiting for Vision 2050 Forestry to get investors to the project and a sustainable income for the farmers.

Another, big problem the Vision 2050 Forestry project is facing is that most of the farmers who have joined the program have used most of their land, who they previously were planting food crops on, to plant the trees from Vision 2050 Forestry. While the trees are still small they can keep food crops around the trees, and the crops will still get sun and nurturing, but after a couple of years, the trees will have grown too big. Then the farmers will not be able to keep the food crops, because of the shadow from the big trees, and because the trees are taking most of the nurturing from the ground. A lot of the farmers are telling us that they have to kill the trees, and take them down if they cannot get an income from the trees. They need to use their land for something who will give them a sustainable income, or at least something to eat. If this should happened, the whole Vision 2050 Forestry project would be a big failure. A lot of time, money, work, reforestation and improving of the environment would have been done for nothing. In addition, all of the farmers would have lost their hope for a better and easier future, and a greener future for Ghana.

Fieldwork Report: Vision 2050 Forestry 21.02.2011 by Iris Lotzer, Aubertsgt. 13, 3183 Horten, Norway, iris_cl4@hotmail.com

The second week of our fieldwork here in Ghana has passed. After a few days of interviewing people in Sunyani, we went to the small city of Nkoranza, where we wanted to interview farmers who are a part of the Vision 2050 Forestry project. To get a better perspective and overlook over the situation in Ghana, we feel it's important to travel around, not only interviewing people in one city. This week, in addition to previous questions in our interview guide, we have also asked the farmers about the environment, especially reforestation/deforestation, in a local and global perspective.

In Nkoranza we interviewed about 10 farmers, and 4 in Wenchi-Koase. I got the impression that people have less and are poorer here, but still, they are optimistic. Most of the farmers are telling us that they know very well about the environmental approach of Vision 2050 Forestry, and that they are aware of the importance of trees. Many of the farmers think in big perspectives, and they seem genuine concerned about the environmental problems the world is facing today. Some of the older farmers we talked to were around before the deforestation in Ghana peaked, and they tell us that without the trees the sun is hotter, it's more windy, the ground is not so nutritious - the food crops are not as good as they used to be. The farmers need the trees when they work at their fields; they need the shadow they provide when the sun is burning. Earlier the trees were protecting the villages from the harsh winds, the sun, and bushfires – an increasing problem both local and global.

Concerning the financial problem, we hear the same thing we did last week. They are all lacking money, and are waiting for financial assistance. Most of the farmers are interested in planting more trees, because they know the benefits, but they can't afford it. Many of the farmers we have talked to this week, have no education at all, and now can't send their children to school either, both because they can't afford it, and because the children are needed at the farms. Farmers need sustainable income, and if they can't get that from the trees, as many of them are now thinking, they will have to cut them down and sell the timber. If this happens, the whole Vision 2050 Forestry program has been for nothing. All the hard work and the money spent will be a waste. Millions of trees will be cut down, and the farmers' life situations probably will not change for the better. Since most of the farmers have used the majority of their lands for tree planting, they can't grow anything else. Now that

many of the trees are still small, it's still possible for them to grow some food, but when the trees get big, and they grow unbelievably fast, they will take all the nurture from the ground. If the farmers get their money, 100 USD a year for 20 years, they hopefully will be able to establish some additional ventures, so that they will get income. Farmer Emmanuel Frempong told us he wants to continue planting trees, and when he gets income, he will continue his education and become a nurse.

In addition, the farmers tell us they have learned a lot from joining the Vision 2050 Forestry program. They get education in farming, and they for instance learn how to protect their lands from bushfires, animals etc. Amankwaa Adu Donkor tells us he attends monthly meetings where the communities meet and discuss their problems, encourage each other and learn more about farming. He also tells us there are many people who are interested in the project, but since no one has gotten financial assistance yet, they are too scared to get involved.

The people need financial assistance, so that they can be empowered and sustain the trees, and get better lives.

Second Fieldwork Report: Vision 2050 Forestry Week 8: 21.02.2011 : Are Einari Skau, Trondheimsveien 26 C, N- 0560, Oslo, Norway, areskau@start.no

In our second week of field work at V2Fs tree planting sites, many of the same issues as seen earlier occurred. We went to Nkoranza, a small town an hour drive from Sunyani, and interviewed more farmers there and in villages nearby.

The first thing I noticed being different from the Sunyani farmers, is greater poverty, but yet more faith in the project. In the Sunyani surroundings many of the farmers were about to lose faith in the project and said they would cut the trees if they would not see any money coming soon. The lack of financial assistance was just as severe in Nkoranza, but the farmers there seemed to have more patience. When interviewing the Nkoranza farmers, it occurred that most of them also are concerned about the environment, both local and global, and sees it as an important reason for joining the project. They were therefore also more willing to wait and see, unlike the many of the Sunyani farmers. Many of the elder farmers we spoke to was very happy to see that trees are planted around. They remember what the area was like when they were younger, before the former forest was cut down, and told about the trees giving a milder climate, stabilizing the humidity during and between the wet and dry season and enriching the soil. They say the climate has gotten warmer as the trees were cut down, the differences between the seasons have become more extreme, and food yields being smaller than before.

All this makes the locals very positive to the project, and those who cannot remember, or do not know about the benefits trees brings both to the global and local environment gets educated by the V2F in addition to the education on how to plant and maintain the trees. Some of the farmers could tell that they already see positive effects of the tree planting, by getting a richer soil, less desert spreading and more humidity in the soil during the dry season, and trees preventing floods in the wet season.

The main issue anyway, is still the same; lack of money and monetary assistance from the organization. Many of the farmers have little land, and as some of it is provided to trees, less is remaining for food crops and income. A farmer quoted 'the trees is not the problem, it is the money'. By now it is not a bigger problem, but as the trees grow, they will leave big parts of the land in shade, and it will no longer be possible to grow food crops on it. As in Sunyani, though more patient, the farmers told that they will have to cut the trees if money do not appear soon. This will soon be a huge problem, as thousands or even millions of trees will be cut, and all the work done so far will be a waste, also economically, as the trees were

provided for free after the registration fee was paid, even though the cost of every tree is three Ghana cedis.

This will not gain anyone, and the need for investors is very urgent, and the urgency grows every day. By now, the organization has seen it necessary to cut an amount of their teak plantations, to sell on the world market, and through the income provide a hand out for an amount of farmers to make them keep the faith and patience in the project, and make the rest of the farmers see that money hopefully will come.