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# To plant, or not to plant?

## A case study of woodlot and plantation establishment under ELCIR+ in Kintampo Forest District

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## Abstract

In Ghana's transition zone, deforestation and forest degradation have put tremendous pressure on forest landscapes, primarily driven by fuelwood extraction and the occurrence of wildfires. With their pilot programme ELCIR+, the multilateral donor fund FIP intends to target these drivers through community engagement. One strategy to revert forest loss under ELCIR+ is the establishment of smallholder woodlots and plantations. Tree planting has the potential to address these drivers of deforestation and forest degradation, while rendering existing livelihood strategies more sustainable. However, the mid-term review in January 2018 revealed that tree planting under ELCIR+ has not progressed at the pace expected, reaching only 11.5% of the target volume of plantations/woodlots to be established. The objective of this case study is thus to explain the limited adoption of woodlot/plantation establishment under ELCIR+ in Kintampo Forest District. To achieve this objective, we triangulate qualitative data and analyse it using a theoretical framework, grounded in literature on innovation and decision-making. Semi-structured interviews with (non-)adopters and key informants constitute the primary sources of data for this study, while participatory rural appraisals, document review, and participant observation supplement the main data sources. Our findings suggest that the decision to plant trees is guided by individual cost-benefit considerations, *perceived behavioural control*, and the *subjective norms* surrounding tree planters. The long-term nature of the benefits stemming from timber products, combined with the related high costs, often deterred individuals from tree planting, making cashew or food crop cultivation a more appealing alternative. Land constraints, little tangible support, and threats such as cattle grazing, or bushfire lowered the *perceived behavioural control*, whereas environmental awareness and *principles knowledge* had an empowering effect on tree planting behaviour. The policy lessons learned in our case study point towards employing bottom-up approaches, where communities' demands and needs are taken into consideration.

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## Acronyms and abbreviations

|           |  |
|-----------|--|
| ADF       | African Development Fund   |
| AfDB      | African Development Bank   |
| AU-ECOSOC | African Union's Economic, Social and Cultural Council  |
| BSM       | Benefit-Sharing Mechanism  |
| CABUD     | Centre for Agroforestry Business Development   |
| CIF       | Climate Investment Funds   |
| COCOBOD   | Ghana Cocoa Board  |
| COP       | Conference of Parties  |
| CSSVDU    | Cocoa Swollen Shoot Virus Disease Control Unit   |
| DGM       | Dedicated Grant Mechanism for Indigenous Peoples and Local Communities   |
| ELCIR+    | Engaging Local Communities in REDD+/Enhancement of Carbon Stocks   |
| ERPA      | Emission Reduction Purchase Agreement  |
| ER-PD     | Emission Reduction Programme Document  |
| ESMP      | Environmental & Social Management Plan   |
| FAO       | Food and Agriculture Organization of the United Nations  |
| FC        | Forestry Commission  |
| FC RMSC   | Forestry Commission's Resource Management Support Centre   |
| FCPF      | Forest Carbon Partnership Facility   |
| FORIG     | Forestry Research Institute of Ghana   |
| FIP       | Forest Investment Programme  |
| FIPMU     | FIP Management Unit  |
| FRA       | Forest Resource Assessment   |
| GDP       | Gross Domestic Product   |
| GEF       | Global Environment Facility  |
| GHS       | Ghanaian Cedi (1GHS = 0.206647 USD, October 19, 2018)  |
| GIMPA     | Ghana Institute of Management and Public Administration  |
| G-DGM     | DGM in Ghana   |
| HFZ       | High Forest Zone   |
| IBRD      | International Bank for Reconstruction and Development  |
| KAP       | Knowledge/Attitude/Practice  |
| KNUST     | Kwame Nkrumah University of Science and Technology   |
| MLNR      | Ministry of Lands and Natural Resources  |
| MOFA      | Ministry of Food and Agriculture   |
| MRV       | Measurement, Reporting and Verification  |
| MTS       | Modified Taungya System  |
| M&E       | Monitoring and Evaluation  |
| NEA       | National Executing Agency  |
| NGO       | Non-governmental Organisation  |
| NSC       | National Steering Committee  |
| NTSC      | National Tree Seed Centre  |
| PMU       | Project Management Unit  |
| POD       | Project Objective Document   |
| PPP       | Public Private Partnership   |
| PRA       | Participatory Rural Appraisal  |
| REDD+     | Reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and the enhancement of forest carbon stocks. |
| REL       | Reference Emission Level   |
| R-Package | Readiness Package  |



|       |                                |
|-------|--------------------------------|
| R-PIN | Readiness Plan Idea Note       |
| R-PP  | Readiness Preparation Proposal |
| SCF   | Strategic Climate Fund         |
| SQ    | Sub-question                   |
| SSI   | Semi-structured interview      |
| USD   | US Dollar                      |

## 1 Introduction

Resilience is commonly understood as the capacity of a system to absorb perturbations, or the magnitude of disturbance that a system can bear without changing structure (Holling et al., 1995 as cited in Adger, 2000). In the context of climate change and associated changes in ecosystems, social resilience becomes an important concept, particularly for those directly relying on natural resources. For instance, the subsistence dependence of smallholder farmers on stable yields renders them vulnerable to extreme weather events and fluctuating market prices for agricultural commodities (Asmamaw et al., 2015). Such vulnerability at times requires adjustment of local communities' livelihood strategies, which may include increased extraction of natural resources, imposing an environmental externality on their own future self (Adger, 2000).

In the case of Ghana's transition zone, Brobbey et al. (2018) show that charcoal production constitutes a major adaptation strategy to diversify and smooth out income, as well as to mitigate economic shocks. Apart from establishing a reliable income source, charcoal production is listed as one of the driving forces of forest degradation in Ghana (FC Ghana, 2016a). Despite the importance of forest resources to Ghana's population and economy, deforestation and forest degradation have put tremendous pressure on national forest landscapes, materialising in a 2.19% deforestation rate between 2005 and 2010. Since 1990, Ghana has lost 33.7% of its forests (FAO, 2010). Weak law enforcement and complex tenure regulation additionally disincentivise farmers to retain trees on their lands and shape negative attitudes towards tree planting. Effective targeting of drivers and causes requires a comprehensive design of policies and programmes to reduce the country's vulnerability to climate change. In order to counteract the effects of deforestation, Ghana has been participating in REDD+ (*Reduce emissions from deforestation and forest degradation, and foster conservation, sustainable management of forests, and the enhancement of forest carbon stocks*) since 2008. REDD+ is an example of an international policy which aims at reducing deforestation and forest degradation while enhancing carbon storage.

The Forest Investment Programme (FIP) finances three REDD+ pilot programmes that aim to prepare Ghana for effective policies to tackle deforestation and forest degradation, while increasing social resilience of targeted communities. Being one of them, ELCIR+ (*Engaging local communities in REDD+ / Enhancing Carbon Stocks*) aims at contributing to carbon stocks and reducing poverty through direct engagement of communities in land management. Specifically, ELCIR+ is designed to address the key drivers of deforestation in Ghana which include conversion of forest lands for agricultural production, illegal logging, and high demand for fuelwood and charcoal among others (AfDB Group, 2013a). Moreover, a strong emphasis is placed on the project piloting for policy change, through exploring alternative and more inclusive models of forest management and benefit-sharing mechanisms (BSM) (CIF, 2012).

A resilience strategy used within ELCIR+ is tree planting. Tree planting has the potential to reduce deforestation and forest degradation due to over-extraction of fuelwood and timber, while at the same time rendering existing livelihood strategies more sustainable. This perspective is reflected in the design of the tree planting components under ELCIR+ which aim at creating a sustainable source of income for those participating. The programme seeks to change attitudes towards tree planting by reducing costs of investment, presenting the establishment of woodlot and plantations as a source of financial benefit and reducing tenure insecurity. By addressing existing barriers and creating favourable conditions conducive to tree planting, ELCIR+ constitutes an innovative way of plantation/woodlot establishment for local populations. Yet, the mid-term review revealed that tree planting under ELCIR+ did not progress as expected. By the beginning of 2018 - two years after project start - only 11.5% of the targeted 6,200ha plantations and woodlots were established.

In the light of the limited uptake of woodlot/plantation establishment under ELCIR+ it is interesting to explore what factors influence smallholders' decision to plant trees. Consulting the literature on the region, it becomes evident that the authors mainly focused on farm-level characteristics and the role of institutions such as the policy environment and markets. On the farm-level, the age of the household head (Abiyu et al., 2015, Gebreegziabher et al., 2010, Ndayambaje et al., 2012) and household size (Abiyu et al., 2015, Danquah, 2015, Gebreegziabher et al., 2010) are significant factors in the decision to plant. The size of landholdings influences the tree planting behaviour, since the more land that is available to the farmer, the smaller are the opportunity costs they face. Thus, the farmer is more likely to plant trees (Danquah, 2015, Ndayambaje et al., 2012). Concerning relevant institutions, the influence of tenure security has been widely studied (Amanor, 2009, Aoudji et al., 2014, Danquah, 2015, Gebreegziabher et al., 2010, Kassa et al., 2011). Market access and extension services were found to influence smallholders' decisions to plant trees since most often financial objectives underlie tree planting efforts (Aoudji et al., 2014, Kulindwa, 2016). Some researchers suggest that latent factors, such as knowledge, perceptions, and attitudes are key determinants in the decision to plant (Gessesse et al., 2015, Krause et al., 2007, Oduro et al., 2018, Ndayambaje et al., 2012). Policies and schemes that aim at encouraging communities to plant trees that were studied in the literature often failed to capture these factors. Hansen et al. (2012) for instance recommend that policy makers should address local needs and demands.

With this paper, we contribute to the literature on knowledge and attitudes and how they influence the decision to plant trees under a policy intervention. We focus on the case of Kintampo Forest District, where we look at tree planting under ELCIR+ as an innovation. To reveal latent factors, the cognitive processes behind adoption or non-adoption decisions are analysed. These insights will be complemented by the perspectives of various stakeholders, including the policy makers and officers who were responsible for developing and implementing the programme. The following research question guides the analysis:

- ♦ “Why was the adoption of the woodlot and plantation establishment under ELCIR+ in Kintampo Forest District limited?”

We unfold this question by addressing the following three sub-questions (SQs):

- ♦ SQ1. “What were the trajectories of ELCIR+ and DGM and how did they influence common innovation characteristics?”
- ♦ SQ2. “What is the underlying decision-making process behind adoption of tree planting under ELCIR+ in Kintampo Forest District?”
- ♦ SQ3. “What are the reasons for non-adoption of tree planting under ELCIR+ in Kintampo Forest District?”

The case study developed in this paper is based on a theoretical framework that is grounded in literature on innovation and decision-making. During the data collection process qualitative information was collected, using a mixed method approach. Semi-structured interviews (SSIs) with (non-)adopters and key informants constitute the primary sources of data for this study. Participatory rural appraisal (PRA) methods, document review and participant observation supplement the main data sources.

The findings of this study will contribute to research on how individuals' attitudes and knowledge shape their decision to plant trees under an intervention. Additionally, we will critically reflect on the strengths and weaknesses of the ELCIR+ programme, from which a number of policy lessons will arise. The findings will be of interest to policy makers, researchers, development professionals and extension agents who are

interested in developing and propagating sustainable tree planting interventions that address the realities and needs of local communities.

This report is structured as follows. After this introduction (chapter 1), a study background is provided (chapter 2) where issues of deforestation in Ghana are discussed (section 2.1) and an overview of REDD+ processes in Ghana is given (section 2.2). In chapter 3, literature on African smallholder decision to plant trees is reviewed, followed by the description of the theoretical framework applied in this thesis (chapter 4). The methodology is presented in chapter 5, with an overview of our general research strategy; a case study (section 5.1) and a description of particular methods applied during the course of this study (section 5.2). In chapter 6, the study's findings are presented. Firstly, the project characteristics and trajectory, as well as opinions on the project from the implementer's perspective will be presented in section 6.1, followed by an in depth analysis of the decision-making process of clusters of adopters of tree planting under ELCIR+ (section 6.2). The final section of this chapter (section 6.3) discusses the results concerning non-adopters. Chapter 7 outlines the discussion of the results (section 7.1) and places them in the context of findings in the literature reviewed earlier (section 7.2). The chapter concludes with reflections and the limitations of the study (section 7.3). Finally, conclusions and lessons learnt are presented (chapter 8).

## 2 Study background

This section aims at providing the context in which this research is conducted. Therefore, first the issues of deforestation and forest degradation in Ghana are explored (section 2.1) followed by a description of the national and international reaction in form of coordinated action under REDD+ and in particular the ELCIR+ project (section 2.2).

### 2.1 Deforestation and forest degradation in Ghana

Ghana comprises an area of about 23.9 million ha with a forest coverage of 21.7% or 4.94 million ha (FAO, 2010)<sup>1</sup>. The country can be divided into three ecological zones; the savannah zone (15.7 million ha), the high forest zone (HFZ, 8.1 million ha), and a transitional zone of dry forest and savannah landscapes. In the savannah zone, 60% of the area are woodlands where trees and shrubs form an open canopy. The HFZ hosts mainly farms and fallowlands and 20% of the area is designated to forest reserves (Oduro et al., 2014). Rainforests (wet and moist evergreens) and semi-deciduous forests (moist and dry semi-deciduous forests) are the prevalent forms of forest ecosystems (Nanang, 2010). Most of the country's economic activities are concentrated in the HFZ and include the cultivation of crops (cocoa, oil palm, para rubber, coconut), as well as mining and forest industries (Odoom & Varmola, 2002).

Ghana's forests are under high pressure, materialising in a 2.19% deforestation rate between 2005 and 2010. Since 1990, Ghana has lost 33.7% of its forests (FAO, 2010). At the same time, forests play a critical role for the country. The Forestry and Logging sector contributions to the GDP have halved since 2006 and now account for only for 2.1% of the country's GDP (Ghana Statistical Service, 2017). Yet, about 49% of the Ghanaian population lives in rural settings (Ghana Statistical Service, 2010), where environmental income<sup>2</sup> usually contributes substantially to people's livelihoods. A study of two sites in the HFZ (comprising 478 households from 15 villages) revealed that environmental income is the second most important net income source, after agriculture. For poorer households, environmental income seems to constitute the major income source (Hansen et al., 2015).

In spite of the high importance of forest resources for Ghana, sustainable land use and management practices are not well established, leading to an incremental degradation of forests (FC Ghana, 2010). Geist and Lambin (2002) differentiate between direct drivers - actions that explicitly impact forest cover - and indirect causes understood as socioeconomic processes that direct people's behaviour and thus indirectly placing pressure on forests. Table 2-1 below gives an overview of such drivers and causes in Ghana.

The REDD+ Readiness Preparation Proposal (R-PP) provides statistics on the relative contributions of some of the mentioned drivers. Accordingly, agricultural expansion accounts for half of the changes in forest landscapes and wood harvest for 35%. Minor influences stem from demographic changes (10%) and mining (5%) (FC Ghana, 2010). According to Nanang and Yiridoe (2010), fuelwood consumption, food crop production and the export of forest products exert significant effects on forest cover loss. According to the authors, cocoa production does not seem to directly affect deforestation, but might indirectly

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<sup>1</sup> For the purpose of providing a background to our study, we report the estimates given in Forest Resource Assessment (FRA) 2010 (FAO, 2010). The follow-up report uses a different methodology and provides significantly higher numbers (FAO, 2014). Comparing FRA 2010 and 2014, the new methodology leads to a reclassification of another 4.26 million ha "Other Land" to forest adding up to 9.19 million ha forest area in 2010 and 9.34 million ha in 2014. Furthermore, upon comparison it seems that deforestation trends are reversed: according to FRA 2010, Ghana's forests have been decreasing since the 1990, whereas the updated numbers in FRA 2014 show an increase in forest area for the same time span.

<sup>2</sup> Defined as income earned from wild or uncultivated natural resources (Sjaastad et al, 2005).

contribute through pressures on trade and fiscal forces. However, the quantification of drivers and their relative contributions to forest loss often produce rather weak estimates as underlying data varies in quality and precision. Furthermore, FC Ghana (2016a) refrains from static analyses and uses the spike in gold prices 2013 and the inherent expansion of mining activities as an example of how the relative importance of single drivers can change and therefore needs to be evaluated continuously.

Table 2-1. Drivers of deforestation in Ghana. Source: FC Ghana, 2016a.

| Direct drivers                          |  |
|---|--|
| Agricultural expansion, land conversion | <ul style="list-style-type: none"> <li>– Cocoa production and other tree crop systems (rubber, citrus oil palm, coffee, cashew, mango)</li> <li>– Food crop farming under shifting cultivation using slash-and-burn</li> </ul> |
| Timber harvesting                       | <ul style="list-style-type: none"> <li>– Illegal logging by timber companies and chainsaw operator</li> </ul>  |
| Fuelwood harvesting                     | <ul style="list-style-type: none"> <li>– Firewood and charcoal production</li> </ul>   |
| Wildfire                                | <ul style="list-style-type: none"> <li>– Slash-and-burn agriculture</li> <li>– Cattle ranching</li> <li>– Hunting</li> </ul>   |
| Mining                                  | <ul style="list-style-type: none"> <li>– Mining inside forest reserves</li> <li>– Illegal small-scale mining (<i>galamsey</i>)</li> </ul>  |
| Infrastructure Development              | <ul style="list-style-type: none"> <li>– Urban and rural settlement expansion</li> <li>– Roads and other infrastructure</li> </ul>   |
| Indirect causes                         |  |
| Population growth and development       | <ul style="list-style-type: none"> <li>– High population growth rate</li> <li>– Increasing demand for food crops, fuelwood and building material</li> </ul>  |
| Global Markets                          | <ul style="list-style-type: none"> <li>– Increasing demand for high value timber species, cocoa products, palm oil</li> <li>– International market prices for timber and agricultural products</li> </ul>                      |
| Weak law enforcement                    | <ul style="list-style-type: none"> <li>– Weak institutional capacity</li> <li>– Corruption</li> </ul>  |
| Tree tenure                             | <ul style="list-style-type: none"> <li>– Incentives for removal of on-farm trees</li> </ul>  |
| Low Stumpage prices & Overcapacity      | <ul style="list-style-type: none"> <li>– Low stumpage prices in domestic markets</li> <li>– Proliferation of chainsaws and small-scale mills</li> </ul>  |

## 2.2 REDD+ in Ghana and the ELCIR+ programme

### 2.2.1 The state of REDD+ in Ghana

The international REDD mechanism was first introduced in 2005 at the Conference of Parties 11 (COP11) in Montréal, Canada and focused on *reducing emissions from deforestation*. Over the past few years, the concept has evolved and expanded in scope from REDD to REDD+ by further including *forest degradation* and *carbon stock enhancement*, as well as *sustainable forest management* and *biodiversity conservation* (Angelsen & McNeil, 2012; FC Ghana, 2016a).

Traditionally, REDD+ implementation follows a phased approach. During the first phase (*Readiness*), countries prepare national REDD+ strategies and policies as well as reference emission levels (RELs), Measurement, Reporting and Verification (MRV) systems, and safeguards. In the second phase (*Initiation*),



countries begin the implementation of strategies, in connection with policy and legal reforms and the execution of demonstration activities. These two phases will then lead to the establishment of *performance-based payment schemes*— which is the third phase (Kipalu, 2011).

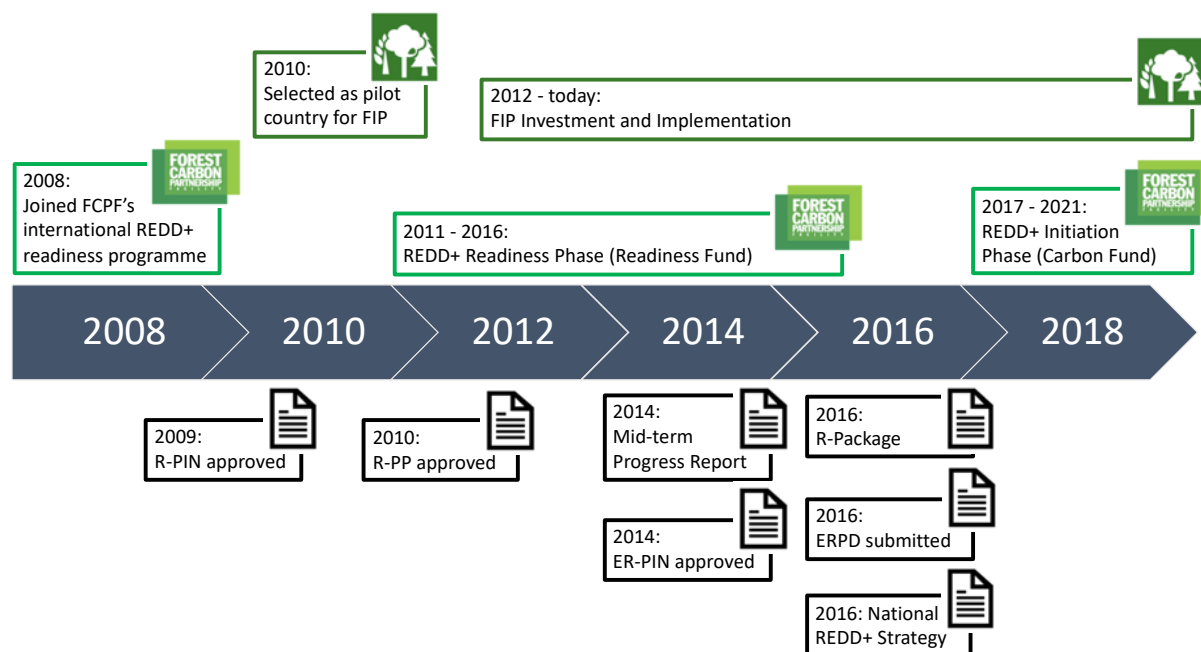


Figure 2-1. Key milestones of Ghana's REDD+ process. Own presentation based on FC Ghana, 2016a and the redddesk, 2018.

Ghana has participated in REDD+ since 2008, i.e. since joining the REDD+ Readiness Programme by the Forest Carbon Partnership Facility (FCPF). In 2010, Ghana became pilot country of the FIP under the CIF (Figure 2-1). According to Asiyanbi et al (2014), Ghana's motivation to participate in the REDD+ mechanism stemmed from two sources: The high pressure on Ghana's forests in combination with the need for a change in forest resource management, and the government's expectation to raise significant funding through multilateral REDD+ finance arrangements and result-based payments. Both FCPF and CIF are major public multilateral funding mechanisms facilitating the access to finance for REDD+ efforts (Text box 2-1). For both funds, Ghana was one of the first participant countries, indicating Ghana's early engagement with international REDD+ donors.

*Text box 2-1. Public multilateral funding mechanisms present in Ghana. Source: FCPF, 2016 & 2017a; CIF, 2018; Parker et al., 2015 & FIP, 2017.*

The **Forest Carbon Partnership Facility (FCPF)** connects governments, businesses, civil society and indigenous communities globally to work on four strategic objectives around REDD+ implementation:

- ♦ To support REDD+ efforts by providing financial and technical assistance in capacity building;
- ♦ To pilot performance-based payments systems for emission reductions generated from REDD+ activities, while ensuring equitable benefit-sharing and promoting future large-scale positive incentives for REDD+;
- ♦ To investigate ways to sustain or enhance livelihoods of local communities and to conserve biodiversity within the REDD+ approach;
- ♦ To disseminate broadly the knowledge gained in the development of the Facility and implementation of Readiness Plans and emissions reduction programmes.

Launched in 2008, today the FCPF works today with 47 countries and 17 donors. FCPF comprises two funds; The Readiness Fund (2008-2020) and the Carbon Fund (2011-2020) that combined received commitments of over USD 1.1 billion. The Readiness Fund fosters activities during phase 1 of the REDD+ mechanism, The Carbon Fund

supports countries from REDD+ readiness activities to verified emissions reductions through a performance-based approach (Phase 2 and 3). To date, no payments have been made for emission reduction. However, due to signed Emission Reduction Purchase Agreements (ERPAs), it is likely that the Carbon Fund will commit all its resources within the next two to three years. Ghana is one of 19 countries in the pipeline.

The **Forest Investment Programme (FIP)** was approved as part of the CIF in May 2009. It aims at supporting efforts to implement REDD+ in a sustainable and equitable way. Additionally, FIP investments pursue other objectives, like enhancing sustainable development, sustaining biodiversity and ecosystem services, and supporting forest-dependent communities. By 2017, approximately USD 723 million was pledged by the FIP and channelled through partner multilateral development banks. Currently, Ghana is one of 23 countries where FIP is active. FIP tries to create synergies with other REDD+ and forest relevant funds, such as the FCPF. FIP and FCPF might share the same objectives, but FCPF, and especially the Carbon Fund, focuses more on the development of RELs and MRV and provision of results-based payments, whereas FIP's ex-ante funding places stronger focus on readiness activities and capacity building.

When Ghana was integrated into the funding activities of FCPF in 2008, the National REDD+ Technical Working Group was established to manage and coordinate REDD+ related activities. The multi-stakeholder body within the Ministry of Lands and Natural Resources (MLNR) has its secretariat in the Climate Change Unit of the Forestry Commission (FC) and provides expertise on strategic environmental and social assessments; policy, legislation and governance; consultation and participation; MRV; and RELs. As outlined in Figure 2-1, key documents were issued to mark the progress of Ghana along the phases. FCPF requires the Readiness Plan Idea Note (R-PIN) prior to joining the REDD+ Readiness Programme. With approval of the R-PP, the country entered the Readiness Phase, funded by the FCPF Readiness Fund. The R-PP served as a blueprint for the implementation of readiness activities throughout this first phase, by outlining a clear plan, budget and schedule to effectively implement the REDD+ mechanism alongside with a driver analysis (see section 2.1 above). With the submission of the Readiness Package (R-Package) and the development of a National REDD+ Strategy, Ghana left the first phase in 2016.

The second phase of REDD+ within the FCPF framework is financed by ex-post payments by the Carbon Fund. These payments will be determined in Emission Reduction Payment Agreements (ERPAs) between the REDD+ Participant Country (here Ghana) and the International Bank for Reconstruction and Development (IBRD) as a trustee of the FCPF Carbon Fund. By determining responsibilities, rights, and obligations, ERPA facilitates the provision of carbon finance in return for emission reduction (FCPF, 2017b). With the formal acceptance of Ghana's Emission Reductions Programme for the Cocoa Forest Mosaic Landscape in 2014 and the submission of the Emission Reduction Programme Document (ER-PD) in 2016, the foundation of Ghana's first ERPA was laid (FC Ghana, 2016b) and it has been approved for inclusion into the Carbon Fund Portfolio per decision CFM/16/2017/1 (FCPF, 2017c).

Ghana's REDD+ Strategy refers to a timeframe of 20 years while acknowledging the need for continuous adjustment based on scientific or experience-based evidence. In Ghana's REDD+ Strategy, the shift of implementation strategies is described. Whereas the R-PP document in 2010 aimed at "*learning from the ground up*" by setting up seven small-scale pilot programmes, reality showed that the majority of these projects remained unrealised. Lack of technical expertise and insufficient financial backing were the major barriers (FC Ghana, 2016a). Additionally, many of the underlying causes of deforestation and forest degradation such as weak law enforcement and complex tree tenure required national policy actions (see Text box 2-2). As a consequence, the National REDD+ Strategy proposes a dual national-jurisdictional approach, where large-scale sub-national programmes that follow ecological boundaries are implemented within a set of overarching national activities (FC Ghana, 2016a). The Strategy is implemented through FIP activities, as encapsulated in the 2012 FIP's Investment Plan for Ghana (CIF, 2012). As a part of the efforts, three pilot projects have been designed, which are described below in subsection 2.2.2.

*Text box 2-2. Tree tenure in Ghana. Sources in text.*

In Ghana, **rights related to trees and tree products** differ based on whether the concerned tree grew wild or was purposively planted. FIP's Investment Plan for Ghana (CIF, 2012) points to the complicated tree tenure regime and uncertain rights to benefits from trees as one of key drivers of deforestation, but also as a significant influence on perceptions and attitudes towards trees and forests within reserves.

Concerning **planted trees**, Timber Resources Management (Amendment) Act 617 of 2002, section 4(3) restricts the ability to create a concession on farmer's land, regardless of whether the tree is planted on own land, under a sharecropping or tenancy agreement. The clause states that *"no timber rights shall be granted in respect of [...] land with any timber grown or owned by any individual or group of individuals"*, which implies that the planted trees are private property and so only the owner, not the State, can authorise usage of these trees. However, having the right to use the tree and its products is not synonymous with having the ability to do so. For instance, when a tree is located on land that the tree owner lost a claim to, access can be denied.

From the point of view of the customary tenure system a planted tree constitutes a property but planting trees might additionally affect the perception of rights over the land on which the tree is planted. As argued by Dumenu et al. (2014), planting trees is a signal of extending stay on a given plot of land (i.e. tree planting is treated as a long-term investment), or even as means of gaining access to land, as it increases the security of tenant land rights. Hence, in case of migrant or landless farmers, landowners often discourage their lessees to plant trees, to ensure that their property rights over land are not threatened (PAB Consult, 2016a).

The landmark legislation affecting the rights regarding the ownership of **naturally occurring trees** is the 1962 Concession Act. Section 16 outlines that such trees *"are vested in the President in trust for stools"*. This provision implies a centralised control over wild growing trees, limiting the farmers' ability to freely use, sell, and harvest trees growing on land they hold a claim to. As a result, the State possesses a full range of *de jure* rights, i.e. recognised in statutory law, over naturally growing timber trees, regardless of on what land these trees are growing. This implies that farmers and communities are not allowed to extract naturally growing trees and their products. In fact, a farmer, on whose land a wild growing tree occurs, possesses only *de jure* access and exclusion rights and a *de facto* management right (e.g. through nurturing activities) (Dumenu et al., 2014). The *de jure* management and transaction (i.e. right to approve the transactions concerning forest resources) rights<sup>4</sup> are held by the FC, on behalf of the President (PAB Consult, 2016a). In the case of timber, to obtain a withdrawal right a special permit must be obtained.

Overall, REDD+ in Ghana has progressed substantially over the past five years, when Ghana successfully completed the Readiness Phase with the submission of major outputs, such as REDD+ Strategy, Environmental and Social Management Framework, National Forest Reference Level, draft versions of Benefit-sharing Plans, RELs, and modalities for MRV; and the country is about to enter the implementation phase, i.e. entering the Carbon Fund portfolio. However, one of the most eminent challenges; a highly complicated land and tree tenure system that exacerbates deforestation and forest degradation especially off-reserve remains in place (FCPF, 2017c).

### 2.2.2 FIP's pilot projects and ELCIR+

The objective of FIP's Investment Plan for Ghana is to *"address the underlying drivers of deforestation and catalyse transformational change by providing upfront investment to support the implementation of the REDD+ strategy, and generate information and experience for policy and regulatory changes."* (CIF, 2012, p. iv).

<sup>3</sup> "Stools" and "skins" are traditional ways of referring to chiefs.

<sup>4</sup> Forestry Commission Act, 1999 (ACT 571), amended by the Timber Resources Management (Amendment) Act, 2002 (Act 617)

The investment targets two regions – Western and Brong Ahafo, located in the HFZ, where carbon sequestration and storage potential have been estimated to be the highest in the country (CIF, 2012). Four specific goals guide the interventions under FIP:

*“1. Ensure the integrity and sustainable forest management of forest reserves; 2. Restore forest cover in off-reserve areas through forest plantation and rehabilitation of degraded forest land; 3. Promote sustainable climate smart cocoa and agriculture farming; and 4. Develop viable alternative livelihoods to local communities to reduce pressure on forests.” (ibid., p.v).*

FIP, aiming at transformational change, points to the fact that these goals will be impossible to achieve without ensuring that parallel changes take places. According to the strategy, improvements have to be made at the policy level to ensure better coordination and communication between ministries, agencies and other stakeholders. The document also points to the necessity of tree tenure policy change, especially regarding naturally occurring trees in off-reserve areas. Further, the management and benefit-sharing schemes in the forest reserves have to be revised and strengthened. Finally, the FIP would like to further engage the private sector in REDD+ and sustainable investment activities.

To achieve these goals, three pilot projects have been designed. Project FIP1 “Reducing pressure on natural forests through an integrated landscape approach” intends to develop, pilot and validate replicable and up-scalable participatory forest resources management models on and off forest reserves. “Engaging the private sector in REDD+” (FIP3) project aims to transform the ways in which private actors in the forestry and agricultural sector operate, through addressing key barriers that discourage private sector engagement. This paper is concerned with the second of the FIP interventions – ELCIR+.

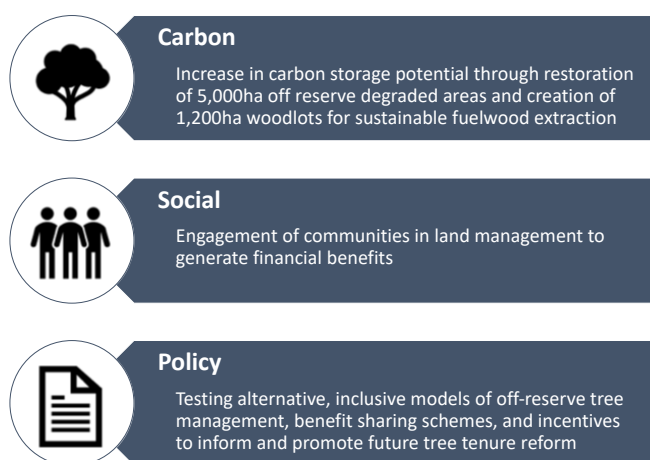


Figure 2-2. Objectives of ELCIR+. Source: AfDB Group, 2013b.

Figure 2-2 presents the objectives of the ELCIR+ project. As mentioned, ELCIR+ is an off-reserve intervention, that aims at contributing to carbon stocks and reducing poverty through direct engagement of communities in land management and the generation of financial and environmental benefits. Specifically, ELCIR+ is designed to address the key drivers of deforestation, which include conversion of forest lands for agricultural production, illegal logging, and high demand for fuelwood and charcoal among others (AfDB Group, 2013a). Moreover, as with all FIP interventions, a strong emphasis is placed

on piloting for policy change, through “testing alternative, inclusive models of forest reserves management, benefit sharing schemes, and incentives” (CIF, 2012, p. v).

The ELCIR+ intervention got accepted by CIF on September 25, 2013 and was projected to take place from 2013 until 2018 (see Figure 6-1a for the actual timeline of the project). The FIP Management Unit (FIPMU) within MLNR coordinates the programme, whereas FC’s district offices are responsible for the implementation. The project is mainly funded by the African Development Bank (AfDB) (AfDB Group, 2013b).

Table 2-2 below contains information on the four programme components including locations, estimated costs, and a short description. The activities will be conducted in 14 districts in Western and 24 districts in

Brong Ahafo and will target 12,000 people. It is estimated that further 175,000 people will benefit from the programme indirectly through increased income and access to environmental goods and services, as well as enhanced livelihood resilience (AfDB Group, 2013b).

Table 2-2. Programme components of ELCIR+. Source: AfDB Group, 2013b.

| Name and estimated cost   | Description of activities   |
|---|---|
| <p><i>C1. Community Restoration of Degraded off-reserve forests and Agricultural Landscapes</i></p> <p>USD 5.3 million<br/>Brong Ahafo Region</p> | <p><i>Restoration of Degraded Off-Reserve Forests</i></p> <ul style="list-style-type: none"> <li>– Surveying, mapping and registering of 5,000ha of degraded lands and the establishment of woodlots;</li> <li>– Reconnaissance and sensitisation of beneficiaries on options for Public Private Partnerships (PPP);</li> <li>– Establishment and maintenance of six model plantations for training and extension through the farmer field schools and cross farm visits;</li> <li>– Identification of innovative options and development of best practice guidelines for PPP in Plantation establishment off-reserve;</li> <li>– Provision of seed and equipment for plantation development;</li> </ul> <p><i>Promotion of Strategies for Wildfire Management in Off-Reserve Areas</i></p> <ul style="list-style-type: none"> <li>– Promotion of strategies for off-reserve wildfire management;</li> </ul> <p><i>Conservation and management of sacred groves / dedicated forest</i></p> <ul style="list-style-type: none"> <li>– Conservation and management of 1,008ha of forests and sacred groves;</li> </ul> <p><i>Promote Availability of High-Quality Tree seeds through NTSC</i></p> <ul style="list-style-type: none"> <li>– Promotion of high-quality tree seeds and support management of seed stands and orchards.</li> </ul> <p>The project will incentivise the beneficiaries by promoting a BSM as obtained during the closed bank intervention.</p> |
| <p><i>C2. Promoting Climate Smart and Environmentally Responsible Cocoa and Agroforestry systems</i></p> <p>USD 3.2 million</p>                   | <p><i>Promotion of Integration of Shade Trees in Cocoa Landscape</i></p> <ul style="list-style-type: none"> <li>– Implementation of tested technologies in shade trees (tree planting, enrichment planting and natural regeneration) into 16,000ha of the cocoa landscapes including establishment of climate-smart cocoa plantations in erstwhile degraded cocoa fields;</li> <li>– Testing and integration of shade trees into the cocoa landscape to increase yields, resilience, carbon stocks and biodiversity;</li> <li>– Support for Cocoa Swollen Shoot Virus Disease Control Unit (CSSVDU) and the operationalisation of a cocoa roundtable (COCOBOD's Ghana cocoa platform)</li> </ul> <p><i>Integration of trees into other agricultural farming systems to increase yields, resilience and carbon stocks</i></p> <ul style="list-style-type: none"> <li>– Integration of trees into 10,000ha of other agricultural farming systems to increase yields, resilience and carbon stocks through the enhancement of soil carbon and fallow management;</li> </ul>  |
| <p><i>C3. Community alternative livelihoods and capacity building</i></p> <p>USD 4 million</p>  | <p><i>Alternate Livelihood activities</i></p> <ul style="list-style-type: none"> <li>– Supporting the Establishment of 1,200ha of woodlots for fuel wood and charcoal production in charcoal production areas;</li> <li>– Promoting interventions for enhanced efficiency in charcoal production and usage (including charcoal value chain and create awareness);</li> </ul> <p><i>Capacity building support to community groups/ national institutions</i></p>   |

|                               |  |
|-------------------------------|--|
|                               | <ul style="list-style-type: none"> <li>– Value addition to Non Timber Forest Products;</li> <li>– Sponsorship of three master's degree programmes in plantation economics, carbon stocks management and REDD+ related Policy training,</li> <li>– 40 specialised short courses in REDD+ and carbon stocks management, climate smart agriculture and provision of motorised transport,</li> <li>– Training on methods of restoration of degraded off-reserve forest;</li> <li>– Community Capacity building for sustainable alternative livelihoods and climate smart agriculture;</li> <li>– Knowledge Management studies including Gender &amp; REDD+;</li> <li>– Review of existing governance systems for carbon, tree and land tenure and Promotion of Benefit-sharing/Carbon Rights;</li> </ul> |
|                               | Promotion of Strategies and policy for Payment for Environmental/Ecological Services for Off-Reserve Watersheds Services.  |
| <i>C4. Project Management</i> | <ul style="list-style-type: none"> <li>– Formulation of work plans and annual budget;</li> <li>– Programme monitoring and evaluation;</li> </ul>   |
| USD 1.4 million               | <ul style="list-style-type: none"> <li>– Procurement;</li> <li>– Financial management;</li> <li>– External audits and quarterly progress reports;</li> <li>– Environmental and Social Management Plan implementation;</li> </ul>   |
|                               | Carbon Monitoring (MRV, REL, Certification), Monitoring and Evaluation (M&E), Implementation of ESMP   |

The data collection of this research has been centred around the first sub-component of component 1 and first sub-component of component 3, as both of them are concerned with engaging local populations in tree planting.

The goal of the activities under component 1 was to establish 5,000ha small-to-medium sized forest plantations in degraded off-reserve forests. As the title of component 1 stresses, such plantations were to be established on community land, i.e. land dedicated by chiefs (in whom the land is vested in) for the communal purpose of establishing plantations. The ELCIR+ project Technical Annexes identified several risks that could limit the success of the component and designed interventions to address them, summarised in Table 2-3.



Table 2-3. *Risks of ELCIR+ component 1. Source: AfDB Group, 2013a.*

| Risks   | Interventions  | Means   |
|---|--|---|
| Lack of clarity on benefit-sharing with respect to plantations. | Identification of innovative options and development of best practice guidelines for plantation establishment. | A consultancy study will be undertaken to identify appropriate innovative options for establishing plantations using PPP models for off-reserve areas to guide the participation of government, private organizations or individuals in this restoration exercise. Options for sharing cost of establishment and benefit-sharing of profits for PPP off-reserve plantations will be identified and published in best practice guidelines. |
| Limited interest in tree plantation establishment.              | Reconnaissance and sensitisation of beneficiaries.   | Guidelines and outputs of other studies on benefit-sharing will be used for an awareness creation exercise to solicit the interest of communities in establishing tree plantations. This will be done through facilitated community durbars, community radio programmes and reconnaissance.   |
| Weak extension services in FC for off-reserves.                 | Model plantation establishment.  | To enhance extension services, 6 model plantations will be established and maintained in the two regions. These will be used for farmers' field schools and demonstration of good silvicultural practices.  |
| Difficulty in obtaining appropriate land registration.          | Surveying, mapping and registration of degraded plots.   | The selected areas for establishment of tree plantations will be surveyed to establish cadastral maps and facilitate the registration of the lands to ensure it will be free from any land disputes for the rotation of the trees and beyond.   |
| Unavailability of tree nurseries                                | Provision of high-quality seed and equipment for plantation development.                                       | The project will provide opportunities for Flying Tree Nursery Entrepreneurs to establish Tree Nurseries. The entrepreneurs shall be trained and supported with a starter pack made up of basic equipment, fencing materials and high-quality seed.   |

The first sub-component of component 3: Alternative Livelihoods aimed at supporting the establishment of 1,200ha of woodlots for fuelwood and charcoal production. According to AfDB (2013a) under this sub-component charcoal producers were to be identified, registered and mobilised into 120 groups. These groups would be educated to understand REDD+ interventions and to encourage the establishment of their own plantations (instead of felling natural forest for the businesses), as well to create favourable attitudes towards carbon friendly practices. As in the case of component 1 the project would develop cadastral maps and facilitate the registration of these lands to prevent future land disputes. Each group would be provided with hand tools and other services like haulage of seedlings to plantation sites, clearing and maintenance.

### 2.2.3 DGM in Ghana

The Dedicated Grant Mechanism for Indigenous Peoples and Local Communities (DGM) is a global capacity building project that is financed under FIP and implemented in 14 countries. In Ghana, DGM provides training to the 38 target communities of FIP pilot projects with the objective of strengthening knowledge and practices in REDD+ processes and sustainable forest management. (World Bank, 2017). The DGM was created as a special programme under the FIP, designed to act in synergy with other projects under the Ghana FIP (see Figure 2-3).

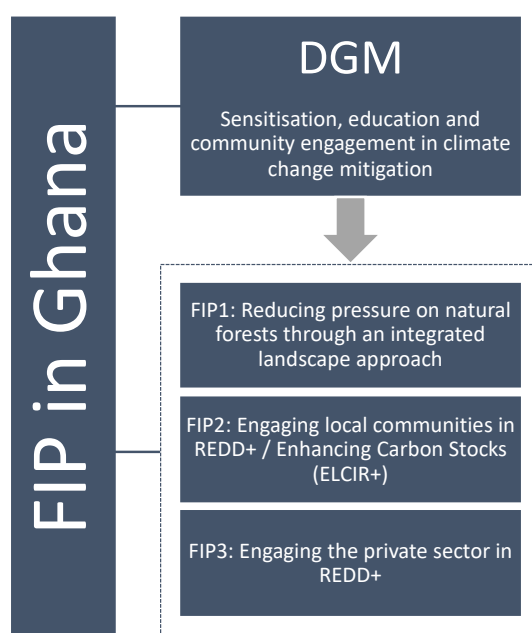


Figure 2-3. The pilot projects and DGM under FIP. Own representation based on World Bank, 2017, p.25.

The project aims at a strong community involvement, therefore the National Steering Committee (NSC) which oversees project implementation consists of 13 voting members elected within local communities and four non-voting observers (two from NGOs, one representing the World Bank and one from MLNR). The voting members are individuals living in targeted communities. The NSC has been responsible for selection of the National Executing Agency (NEA) of DGM. As a result, Solidaridad West Africa has been selected as the NEA in Ghana, the process is described in detail in subsection 6.1.1. Prior to DGM, Solidaridad West Africa was primarily concerned with projects surrounding sustainable cocoa and oil palm production, such as developing and integrating innovative solutions to address supply chain challenges, promoting best management practices to improve rural livelihood and encouraging policy discussion on certification standards (Solidaridad, 2018). Besides being in charge of the implementation, Solidaridad West Africa also acts as a secretariat for NSC.

DGM is structured around three components (World Bank, 2017). The first of them is *Capacity building and Institutional Strengthening*, where a funnel approach is applied to create awareness and knowledge. Within this component a general awareness session and REDD+ training is carried out addressing the community at large. Solidaridad carries out a community level assessment to determine the baseline of knowledge regarding REDD+ and sustainable forest management. The aim of the general training is to inform the communities about the project, provide an overview of REDD+ issues and link climate change to human activities.

A subset (at least 10%) of the broad participant group has an opportunity to move on to the basic training. As outlined in the DGM project document, basic training

*“must be undertaken by community members, eligible community based organisations, and individuals to engage in the project and better understand the link between the concepts of climate change, REDD+, their activities on the ground and the grants for investments. The project will finance minor goods, services required, and operational costs under capacity building.”* (World Bank, 2017, p. 7)

The training is carried out in a classroom-like setting, where a group of educators is teaching in Twi and actively engaging the participants, by creating space for discussion and drawing on the participants own experiences. The project aims at ensuring that all participants reach the same level of understanding of the project, climate change, REDD+ and how their activities on the ground are linked to these concepts, both locally, nationally, and globally, as well as to climate-proof current livelihood practices, promoting livelihood diversification and climate smart solutions. The teaching emphasises the need of changing environment threatening behaviours and making long-term decisions, *“by thinking about the consequences of each action in the short, medium, and long term as a basis for rationalizing natural resource-related decisions”* (ibid., p. 35). Knowledge gained is verified in a test at the end of the basic training. Moreover, the most dedicated and outstanding participants are presented with an opportunity to participate in further training to deepen their knowledge and are introduced to the communities as role models to follow.

The second component is *Sustainable and Adaptive Community Initiatives*. At the end of teaching, as a part of Component 1, DGM trainers present a bouquet of interventions i.e. *“small-scale activities for sustainable initiatives that fall under predetermined themes related to REDD+ and climate change such as forest and natural resources”* (ibid., p.37), such as water and soil conservation measures, efficient wood-burning stoves, alternative energy to wood, rehabilitation of degraded areas, rainwater collection and storage systems for crops. The community votes on the opportunities presented and based on the ranking a Community Action Plan is developed. DGM under component 2 will finance goods and the operational costs needed to implement the top priority. If another organisation in the future is willing to provide funding, the community can make use of the Action Plan established and follow the initiatives ranking. Finally, within this component, based on the type of intervention chosen, the community will receive specific training and assistance in implementing the top priority initiative.

The third component of the DGM project is *Project Management, Monitoring and Evaluation* and is concerned with governance and management as well as the execution of the project’s monitoring and evaluation. This component will finance costs incurred by Solidaridad in assisting the NSC, project’s technical coordination and reporting, financial management and auditing, costs of field operations and other operational costs.

#### *Connection to FIP projects*

DGM, was designed on the basis of complimenting to the FIP pilot interventions. The DGM project document states that *“DGM is an essential part of the FIP, focusing on local communities in the FIP project area”* (World Bank, 2017, p.3), with an objective of strengthening the capacity of the local communities to facilitate their informed and active participation in the FIP programmes. This relationship is explicitly stated in FIP’s Investment Plan for Ghana (CIF, 2012), where DGM is seen as an opportunity to sensitise local communities to future FIP projects and level the playing field. On this basis, DGM implementation took the same regional focus as adopted by the FIP i.e. on Western and Brong Ahafo regions. The design of both programmes was planned so as to include information and learning loops explicitly built into the project (ibid.) to create synergies, as well as to ensure seamless implementation and knowledge exchange.

### 3 Literature review on tree planting decision-making

This chapter presents a literature review on smallholders' decisions to plant trees. Many empirical studies aiming at understanding factors that influence tree planting have been conducted. Due to the wealth of work on the topic the search was limited to research conducted on Africa and publications not older than 15 years (see Table 3-1). Moreover, tree planting as a part of agroforestry practices has been excluded from the review, focusing on woodlot and plantation of timber trees (whether as a block, boundary planting, fire belt or live belt or in a scattered form,) motivated not by agricultural enhancement, but e.g. income from the sale of processing of timber (e.g. charcoal) or environmental reasons<sup>5</sup>. Such distinction has been made to ensure similarity to the case studied in this paper, as the motivations behind agroforestry and timber tree planting vary significantly. Table 3-1 summarises the reviewed literature on decision to plant trees. The results are later grouped into sections, collecting findings on household-level characteristics (section 3.1), the role of institutions (section 3.2) and attitudes towards tree planting (section 3.3).

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<sup>5</sup> Some works cited include agroforestry benefits as additional positive effects to tree planting e.g. shade provision in Hansen et al., 2012. Such papers are not excluded from the review, as their main focus is consistent with the scope outlined in this review.

Table 3-1. Summary table of literature review on decision to plant trees.

| Authors, Yr                 | Country            | Tree Planting  | Type of data | Objectives   | Main Results   |
|-----------------------------|--------------------|--|--------------|--|--|
| Abiyu et al., 2015          | Ethiopia           | Tree planting as livelihood strategy, most relevant: Woodlots, boundary planting, homesteads | Quantitative | To identify the most important tree species grown, investigate the drivers of the existing pattern, and identify determinants of the number and diversity of tree species and their spatial patterns.  | <ul style="list-style-type: none"> <li>– Eucalyptus globulus, Acacia decurrens and E. camaldulensis are the most planted species.</li> <li>– Products mainly sold in the form of poles or charcoal, seldomly for household use.</li> <li>– Number of tree species and trees grown: location in relation to markets (+), livestock owned (+), landholding size (+), age of household head (+)</li> <li>– Gender affected the species and spatial pattern of trees.</li> </ul> |
| Amanor, 2009                | Ghana, Brong Ahafo | Plantation establishment   | Quantitative | To examine the impact of plantation development and the accumulation of new wealth on land tenure systems and conflicts over land. To explore major constraints on development programmes that attempt to capitalise farm assets, register land and plantations, and provide access to loans for farmers | <ul style="list-style-type: none"> <li>– High land registration transaction costs have negative impact on the number of plantations established.</li> <li>– Scarcity of capital for loans and unwillingness to take long-term risks are important factors which presently hinder the capitalisation of Teak plantations.</li> </ul>  |
| Aoudji et al., 2014         | Benin              | Teak plantation, smallholder forestry  | Quantitative | To show the policy line best suited to capturing the potential of smallholder forestry, by examining how do smallholder farmers manage to integrate tree growing on their farms.   | <ul style="list-style-type: none"> <li>– Major motivations for growing Teak were to earn income, to satisfy household timber needs and to secure title to the land.</li> <li>– Secure land tenure and the existence of a domestic market outlet are essential to the successful development of on-farm tree growing.</li> </ul>  |
| Danquah, 2015               | Ghana, Brong Ahafo | Voluntary tree planting  | Quantitative | To determine socio-economic factors influencing farmers' decisions to participate in voluntary tree planting projects in rural communities.  | <ul style="list-style-type: none"> <li>– Likelihood of voluntary tree planting: secured land tenure rights (+), large landholdings (+), on-farm conservation of remnant forest tree species (+), the dynamics of soil erosion (+), large household size (-), increasing land area under crop production (-)</li> </ul>   |
| Gebregeziabher et al., 2010 | Ethiopia           | Tree planting  | Quantitative | To analyse the determinants of household tree planting and exploration of the most important tree attributes or purpose(s) that enhance the propensity to plant trees.   | <ul style="list-style-type: none"> <li>– Propensity to plant trees and amount of planted trees: land size (+), age (+), male household head (+), tenure security (+), education (+), exogenous income (+), agro-ecology (+), increased livestock holding (-)</li> </ul>  |

|                      |                |  |                              |   |   |
|----------------------|----------------|--|------------------------------|---|---|
| Gessese et al., 2015 | Ethiopia       | On-farm tree planting as degraded landscape management | Quantitative                 | To explore the major determinants of farm level tree planting decision as a land management strategy in a typical framing and degraded landscape of the Modjo watershed.                | <ul style="list-style-type: none"> <li>– Planting trees as land management strategy: household size (+), productive labour force availability (+), disparity of schooling age (+), deforestation perception (+), current land tenure system (+).</li> </ul>   |
| Hansen et al., 2012  | Northern Ghana | Tree planting  | Qualitative and quantitative | To document the local use and management of trees in two communities in northern Ghana and compare with development strategies.   | <ul style="list-style-type: none"> <li>– Farmers demonstrated knowledge and interest in tree management.</li> <li>– Most respondents considered tree planting for generation of cash income as their last priority. Tree products are used for home consumption as well as for sale. Fuelwood offers an important source of cash income for the inhabitants.</li> <li>– The current development strategies poorly acknowledge the value to local farmers of indigenous tree species and the local tree management practices.</li> </ul>   |
| Kassa et al. 2011    | Ethiopia       | On-Farm Tree Planting                                  | Qualitative and quantitative | To examine the historical trend and current status of tree planting by smallholder farmers.   | <ul style="list-style-type: none"> <li>– Major policy failures identified, and which persisted over a long period of time, include lack of tenure security, historical background that promoted free grazing, political and institutional instability, abrupt and radical changes in rural development policies and strategies and market distortions due to de facto open access of forest resources on the one hand and price control and lengthy permit requirements to sell wood and wood products produced on farms on the other hand.</li> </ul>  |
| Krause et al., 2007  | Ethiopia       | Integration of woody plants                            | Qualitative and quantitative | To analyse farmers' decisions in making use of woody plants under perceived constraints and examine influencing factors that determine the deliberate tree and shrub growing behaviour. | <ul style="list-style-type: none"> <li>– Woody plants are primarily grown on-farm in view of the perceived utility of the species, predominantly fuelwood and timber-based produce, followed by cash-generation. Service functions pertaining to the protection of land are of secondary importance.</li> <li>– Major decision determinants comprise resource-based factors, e.g. the shortage of land and seedlings or competition with agricultural crops.</li> <li>– Adoption of trees is characterised by the available resource base, access to infrastructure, and support services as well as by personal characteristics of the farmers.</li> </ul> |



|                        |          |   |                              |   |  |
|------------------------|----------|---|------------------------------|---|--|
| Kulindwa, 2016         | Tanzania | Tree planting (for commercial and household uses.)    | Quantitative                 | To analyse the factors driving tree planting behaviour.   | <ul style="list-style-type: none"> <li>– Whether or not to plant trees and amount of planted trees: households' land sizes (+), households' awareness of tree planting programmes (+), tree planting for wood energy (+), the age of the household head (+), the right/freedom to harvest and transport tree products (-), households' attitudes towards tree planting (-), and family size (-)</li> </ul>   |
| Ndayambaje et al. 2012 | Rwanda   | Tree planting (scattered on-farm, boundary, woodlots) | Quantitative                 | To evaluate rural households' demographics and socio-economic characteristics, as well as their attitudes, that influence the presence of trees on farms.   | <ul style="list-style-type: none"> <li>– The household-level survey results indicate that households in Rwanda are mainly motivated to plant trees on farms for economic benefits, not for environmental purposes.</li> <li>– Households were commonly motivated to plant trees on farms to meet their needs of food and firewood as well as in income from the selling of tree products.</li> <li>– Influences on tree planting decision: Ability to sell tree products, availability labour (the fewer labour inputs required the better).</li> </ul>  |
| Oduro, et al. 2018     | Ghana    | Tree planting under schemes                           | Qualitative and quantitative | To describe on-farm tree management and conservation in Ghana, to identify farmers' motivational factors and barriers to engage in on-farm tree planting assessing schemes, and to determine the volume of trees resulting from on-farm tree planting and management. | <ul style="list-style-type: none"> <li>– Farmers' objectives of gaining economic benefits and providing for the future of their families provide the key motivations that drive farmers' decision-making on on-farm tree planting and management. In general, farmers in the studied communities recognise the benefits of on-farm tree planting and see it as a worthwhile investment and therefore have planted trees on their own land or land given under the tree planting scheme.</li> <li>– Farmers' knowledge about current environmental issues also motivated them to engage in on-farm tree planting and management.</li> </ul> |

### 3.1 Individual and farm level determinants of tree planting

Several researchers have explored what socio-economic traits of households and individuals determine tree planting behaviours. Additionally, farm characteristics, such as the size and location of holdings, have been found to be significantly correlated with the decision to plant trees. In this section, both household and farm level determinants of tree planting are reviewed.

#### 3.1.1 Characteristics of a household

The age of the household head has been found to be positively related to tree planting (Abiyu et al., 2015, Gebreegziabher et al., 2010, Ndayambaje et al., 2012). Ndayambaje et al. (2012) explain that older farmers often have access to a larger land and so are more likely to use it for tree growing. Gender differences in tree planting have received considerable attention in the literature. Abiyu et al. (2015) find that in Ethiopia the gender of the household head affects the spatial pattern of planting and choice of species, but not the decision to plant per se. Household size has been found to be positively related to the volume of tree planting activities by Gebreegziabher et al. (2010), whereas Danquah (2015) reports a significant negative relationship between the household size and participation in reforestation programmes. The author suggests two possible explanations for this finding. Firstly, households with a higher dependency ratio (i.e. the share of children and elderly in the overall household composition) tend to redirect the available labour to off-farm activities to increase the disposable income. Secondly, because of the high number of household members the demand for food products is higher than in smaller families and therefore more labour is dedicated to crop cultivation. Abiyu et al. (2015) do not find a significant relationship between the household size and number of trees planted but found that in the study area in Ethiopia *“larger families were more likely to grow a diverse range of tree species than smaller families”* (p.209).

#### 3.1.2 Characteristics of a farm

Researchers found that a variety of farm-specific characteristics influence the decision to plant trees. The size of the landholdings accessible has been found to be positively related to the decision to plant trees (Abiyu et al., 2015, Danquah, 2015). As explained by Danquah (2015), a farmer with more land is more likely to participate in tree planting programme *“given the low opportunity cost of land and the reduced competition with food cropping”* (p. 15). Similar results are reached by Ndayambaje et al. (2012). The authors conclude, based on a household survey in Rwanda, that policies aiming at food security and income diversification would likely result in increased tree planting activities, as they would reduce the existing competition for land between food crop production and tree growing. Abiyu, et al. (2015) who have inspected tree planting as an emerging livelihood strategy in Ethiopia find that livestock ownership is positively related to tree growing, as it *“promote[s] tree planting and conservation of tree species that have forage values”* (p.208), even though within the de facto open land access, the risk of plantation destruction exists. Finally, Danquah (2015) claims that the presence of naturally occurring trees on farms is representative of an underlying environmental awareness of the owners. As a result, farmers who retained remnant forest trees on their farms are more likely to participate in tree planting activities.

### 3.2 Role of institutions

In this section the influence of existing institutions on the decision to plant is reviewed. Firstly, we explore how the degree of land tenure security (e.g. given underlying tenancy arrangements) and laws and regulations governing trees impact tree planting. A review of market characteristics and extension services available to farmers is provided in the second part of the section.

### 3.2.1 Legal and policy environment

Several of the studies reviewed above analyse the relationship between land tenure security and tree planting decisions. In his study, Amanor (2009) explores the consequences of a programme that provides informal mechanisms for registering teak plantations. His findings state that the formalisation of customary land agreements is accompanied by high land registration transaction costs and thus have a negative impact on the number of plantations established. In addition, the benefits of registering were not clear to the farmers and the policy design failed to embrace political struggles over land between traditional authorities and planters. Furthermore, the programme failed at tackling the scarcity of capital for loans and farmers' unwillingness to take long-term risks, i.e. important factors which presently hinder the capitalisation of Teak plantations. In a survey of 200 farm households conducted in Brong Ahafo in Ghana, Danquah (2015) finds that holding the title to a land is positively related to voluntary tree planting initiatives. This is in contrast to other forms of land tenure arrangements (sharecropping, leasing, and renting), which, as Danquah (2015) points out, are usually entered into by migrant farmers in the Brong Ahafo region. Gebreegziabher et al. (2010) find perception of tenure security to be a more significant determinant of the decision to plant trees than household characteristics (such as the gender distribution of the household). On contrary, Aoudji et al., (2014) who investigated smallholder Teak plantation establishment in Benin, report that planting trees was motivated by land tenure insecurity, as *"growing a perennial crop (e.g. oil palm, teak) on a plot is an indirect mean to show one's ownership on land"* (p.16). The authors conclude that confirming security in tenure is a crucial aspect in promoting plantation establishment, especially in light of the high risk of land appropriation in a land-scarce environment.

Two papers in this subsection analyse the effects that policy and legal frameworks governing trees have on farmers' motivation to plant trees. Kassa et al. (2011) traced the historical trend and explored the current status of tree planting in Ethiopia. The authors detected multiple policy failures, such as lack of tenure security, lack of mechanisms to limit unconstrained cattle grazing and abrupt changes in rural development strategies, stressing the importance of a favourable policy environment. With an objective of providing a basis for improving the design and implementation of tree resource management programmes in Ghana, Hansen et al. (2012) have conducted a survey among two rural communities as well as interviewed a range of development actors such as governmental organizations, NGOs, and institutions involved in issues of tree management. As a conclusion the authors state that the approaches taken by the development actors poorly reflect the needs of the local populations and that they should address matters of dependency on indigenous trees for fuelwood, food, fodder, construction materials, and other indirect uses. At the same time, local tree practices should be integrated in the development strategies and farmers should be reinforced in their role as managers of tree resources.

### 3.2.2 Market and extension services

In a study of the perception of Teak planting in Benin, Aoudji et al. (2014) find that the main motive behind the establishment of plantations was to earn income. Hence, the researchers conclude that Teak growing *"falls in the general framework of market-oriented agriculture"* (p.16) and therefore the existence of a domestic market outlet is a prerequisite to the successful development of tree planting schemes. Kulindwa (2016) analysed what factors affect the decision whether or not to plant trees and how these factors affected the quantity of tree planting in Tanzania and concludes that *"efforts to promote tree planting behaviour should focus on the right/freedom to harvest and transport tree products to the market"* (p.48). Such measures, in the author's opinion, would positively contribute to the farmers' perception of tree planting as a secure business, making tree planting efforts more widespread and would additionally reduce deforestation driven by fuelwood extraction and timber felling.

On the topic of extension services, Abiyu et al. (2015) claim that *“a generic extension package that encourage tree planting may not have a desirable outcome, in which case management-oriented outreach development plans and a policy of food security may need to be developed and implemented”* (p. 210). This is due to competitive uses of land in areas where shortages of crops and animal feed may occur. Kulindwa (2016) finds a significant positive influence of the existence of schemes facilitating tree planting on decision to plant.

### 3.3 Attitudes towards tree planting

Researchers have also looked closely at decision-making to explore how people behave facing a real-life situation and how their knowledge, perceptions, beliefs and attitudes shape their decision to plant trees. Hence, in such analysis researchers often wish to elicit the farmer's point of view and identify factors, measurable and non-measurable, that have contributed to a specific course of action. Such an approach has been taken by Krause et al. (2007) who investigated how smallholders' perceptions influence tree planting in Ethiopia, incorporating internal (e.g. knowledge and capabilities) and external (e.g. bio-physical conditions) factors. Moreover, the perceived utility of trees, as fuelwood, timber-based produce and source of income guides the selection of species being planted. Oduro et al. (2018) have explored farmers' motivations to plant and manage on-farm trees in Ghana, and as Krause et al. (2007), include analysis of factors internal and external to the farmer. The authors explain that in this approach *“economic factors like costs and benefits are ‘filtered’ through psychological ones”* (p.396) such as knowledge and attitudes. In a series of 156 questionnaires, the authors find that the provision of technical assistance, supply of free seedlings and other farming inputs are the main factors that motivate farmers to participate in tree planting activities, as they lead to a higher overall financial benefit from planting. The authors point out that the farmers' knowledge of environmental issues influences positive attitude towards planting and contributes to the volume of trees on-farm. Ndayambaje et al. (2012) reach similar conclusions. According to their findings, to maximise the benefits of tree planting, extension services in form of awareness raising and environmental education should be developed, as various benefits of trees were poorly understood by farmers. These efforts would lead to creation of positive attitudes towards tree planting. Indeed, Gessesse et al. (2015) included a measure of awareness of the problem of deforestation and its relation to tree planting. They find that understanding the negative effects of deforestation increased the likelihood of participation in tree planting activities.

## 4 Theoretical framework for the decision to plant trees under ELCIR+

After having reviewed the factors that determine whether or not to plant trees in literature, we present the theoretical framework on decision-making that underlies this paper to examine the reasons for (non-) adoption of tree planting under ELCIR+. Due to the nature of the project, as will be explained in the first section of this chapter, we will draw upon the innovation diffusion and decision-making literature. Two theories, the *Diffusion of Innovations* and the *Theory of Planned Behaviour* are discussed in section 4.1 as direct theoretical underpinnings of this thesis. The last section explains in detail the framework applied, which has been adapted from Meijer et al. (2015a) for the purpose of woodlot and plantation establishment under ELCIR+ as an innovative source of resources and financial security for tree planters in Kintampo Forest District.

### 4.1 Tree planting under ELCIR+ as an innovation

According to Rogers (2003), an innovation is an idea or a concept, technical information or actual practice that is perceived as new by an individual or a group. In this paper, we argue that woodlot and/or plantation establishment under ELCIR+ fulfils the criteria of this definition. Hence as a theoretical underpinning, we apply innovation diffusion and decision-making theories to understand the adoption patterns of tree planting under ELCIR+.

Woodlot and plantation establishment is not widely practiced in Ghana due to a variety of reasons. Firstly, as outlined in Text box 2-2, the laws regulating tree tenure are highly complex, which disincentivises farmers to pursue tree planting. Complicated regulation surrounding timber sale and no institutional framework to sell trees create unfavourable market conditions for small-scale timber sale business. Another source of disincentive is the high risk surrounding such investment. Farmers interested in woodlot/plantations face threats such as bushfires and draughts (Amanor, 2009). Finally, farmers can enjoy the benefits of their investment only in the future, while the costs of the establishment have to be incurred in the present. Such large time lag may, in the farmer's perception, render the undertaking non-viable due to a potential high discount rate (Quah, 2012), making competitive uses of land such as food crop production a more appealing investment. These risks may apply to all farmers, however to different degrees. For instance, tree planting often appears less attractive for migrants. They are likely to face insecure land tenure and do not know whether they will be able to collect benefits in future. Often, the act of tree planting in itself is perceived as an attempt to claim the land by landowners (Dumenu et al., 2014).

In theory, the ELCIR+ project creates a specific environment, where some of these challenges are addressed and, through that, comprise an innovation. As outlined in subsection 2.2.2, establishing a woodlot/plantation under the project is done in cooperation with the FC, where the land is first inspected and surveyed and subsequently the participant receives a map stating their name and acting as a proof of ownership, whether migrant or not. Hence, tree planting under ELCIR+ gives participants a source of reassurance and reduces the risk of the investment changing the nature of tree planting practice. The ELCIR+ project also bears part of the cost of the initial investment, by providing free seedlings and by holding workshops and trainings on tree planting. The programme, through reducing costs of investment, presenting establishment of woodlot and plantations as a source of financial benefit and reducing tenure insecurity, aims to change attitudes towards tree planting. By addressing existing barriers and creating favourable conditions conducive to tree planting ELCIR+ constitutes an innovative way of plantation/woodlot establishment for local populations.

## 4.2 Theoretical foundations

### 4.2.1 Diffusion of Innovations

In his theory on *Diffusion of Innovations*, Rogers (2003) defines diffusion as “the process in which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). The goal of the innovator is to ensure that the novelty reaches people, hence the message concerning the idea is spread *communication channels* which are influencing all stages of the Innovation-Decision process. The author understands these channels as “means by which messages get from one individual to the other” (ibid., p.18). Through the steps of this process individuals deal with uncertainty surrounding the adoption of the innovation, given the perceived newness of it.

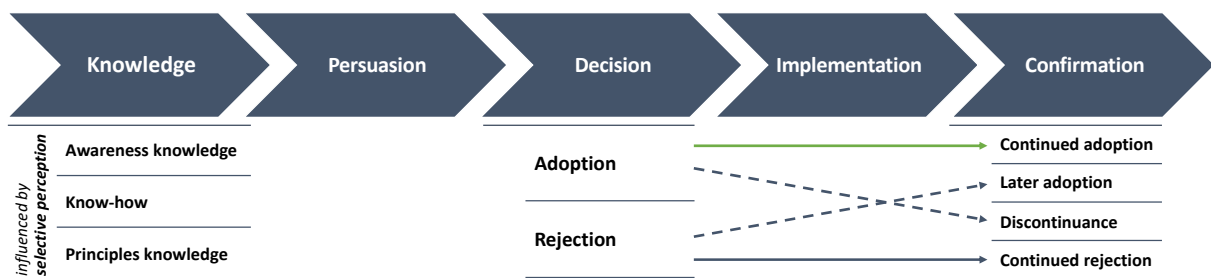


Figure 4-1. The Innovation-Decision Process. Own representation based on Rogers, 2003.

Figure 4-1 depicts the five stages of Innovation-Decision process. The first stage - *Knowledge* is the period when an individual or group learns about the innovation’s existence and gains an understanding of its implications. Rogers (2003) distinguishes between three types of knowledge: *awareness knowledge*, i.e. knowing that the innovation exists, “*know-how*” *knowledge* consisting information on how to use the innovation properly and *principles knowledge*, that is the information about functioning principles underlying how the innovation works<sup>6</sup>, which later allows the adopters to judge the effectiveness of the innovation. A *change agent*, i.e. the propagator of the innovation, can contribute to the effective diffusion of the new idea through addressing knowledge gaps of all types mentioned. The knowledge a person obtained is influenced by the process of *selective perception* (Hassinger, 1959 as cited in Rogers, 2003), which is a tendency to interpret received messages given already existing attitudes and beliefs. This “filtered” knowledge may not always align with reality.

During *persuasion*, the individual/group forms a positive or negative *attitude* toward the innovation, which is according to Rogers (2003) an enduring collection of beliefs concerning a given a phenomenon or an object that predispose agent’s actions. At the *knowledge* stage of the process, a person or a group engages mostly in cognitive mental activities (such as collecting information), while during *persuasion* the affective type of thinking is present i.e. people experience favourable or unfavourable emotions towards the innovation, becoming psychologically involved with the novelty. These characteristics of innovation influence the resulting attitudes, as during *persuasion*, a person or a group uses these criteria to hypothesise how the innovation may affect their situation in the future, weighing perceived advantages and disadvantages.

Afterwards, the *decision* to adopt or to reject the innovation is made. The outcome of the *decision* stage is dependent on the underlying attitude to the innovation, yet a positive attitude is not always synonymous with a decision to adopt. This situation is known as KAP gap (knowledge/attitude/practice gap)<sup>7</sup>. An

<sup>6</sup> An example of principle-knowledge in tree planting under ELCIR+ would be understanding of the notion of climate change and ways in which tree planting can contribute to its mitigation.

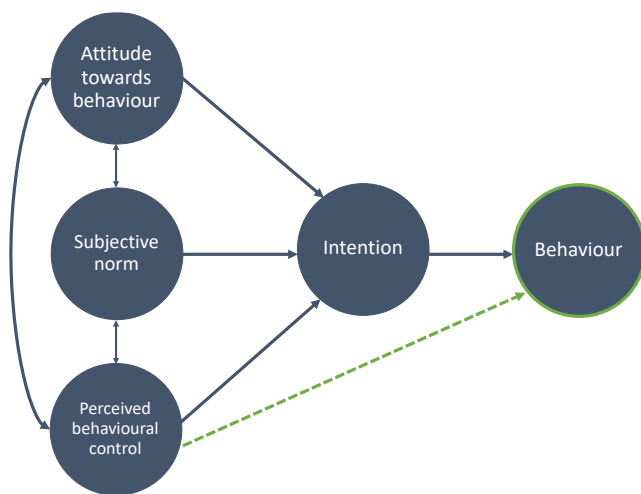
<sup>7</sup> Often also referred to as value-action gap.



individual may also reject an innovation and do it either actively (i.e. rejecting after consideration) or passively (i.e. never considering adoption). The *implementation* is the representation of the behaviour change, i.e. putting the innovation into practice, succeeded by the *confirmation*, that is whether the decision is reinforced or reversed (ibid.).

#### 4.2.2 Theory of Planned Behaviour

Another approach of explaining how individuals adopt behaviours, i.e. are persuaded into innovations is the Theory of Planned Behaviour by Ajzen (1991). The author draws on the assumptions made in Anderson's Information Integration Theory (Anderson, 1981) and in Fishbein's and his Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The theory contributes to explaining how behaviours form based on the three constructs *attitude toward behaviour*, *subjective norm* and *perceived behavioural control* (see Figure 4-2).



The *attitude toward behaviour* is an individual's belief whether a certain behaviour makes a positive or negative contribution to their life. It comprises the personal thoughts and feelings about the behaviour and reflects expectations and evaluations. There are two types of *behavioural attitudes*; the *affective attitude* that captures whether a person believes the behaviour to be enjoyable or not and the *instrumental attitude* that entails the person's perception of how beneficial or harmful that behaviour is (Ajzen & Fishbein, 1980).

Figure 4-2. Theory of Planned Behaviour. Own representation based on Ajzen, 1991.

The *subjective norm* is the social pressure surrounding that particular behaviour. More precisely, it is the sum of normative beliefs of how social referents want the person to behave weighted by the respective motivation to comply (Ajzen, 2012). Hence, the *subjective norm* is concerned with whether the behaviour is socially approved and whether others give encouragement on which an individual can rely.

The *perceived behavioural control* is the new contribution of Ajzen's Theory of Planned Behaviour (1991) and relates to the perceived ability to perform a certain behaviour, i.e. expresses the extent to which a person feels capable and confident to behave in a certain way. This construct encapsulates whether the person believes they have the means and resources necessary (such as time, money, skills, cooperation of others) to perform the behaviour and refers to people's confidence in their own ability to perform a behaviour i.e. self-efficacy (ibid.). The *perceived behavioural control* has important implications for the behaviour materialising (visualised by the dotted line in the Figure 4-2 above) - a person, despite a strictly positive intention to perform a certain behaviour, may fail to engage in it if they do not believe they have sufficient means and confidence to do so.

According to Ajzen (1991), a positive *behavioural attitude*, favourable *subjective norm* and a high level of *perceived behavioural control* are likely to form the positive *intention* that leads to actual behavioural outcomes. As in the case of Rogers' KAP gap (2003), positive attitudes are not always leading directly to behaviour. In Ajzen's theory (1991) the *Intention* is an indication of willingness to adopt new behaviour, whereas the *Behaviour* is the observable change. This distinction is made since the intentions are consisting motivational factors i.e. are indicative of how much effort people are willing to exert. In this case, even in light of a favourable

*attitude toward behaviour*, *subjective norm* and *perceived behavioural control*, if a person is not willing to dedicate time or effort to try adoption, the behaviour will not materialise.

### 4.3 The basic framework

We base our approach on the framework proposed in Meijer et al. (2015a)<sup>8</sup> who draws on the above-outlined theories aiming at revealing factors that underlie the Innovation-Decision process. In the framework, similarly to Meijer et al. (2015a), we treat concepts of Rogers (2003) and Ajzen (1991) as complimentary. By explicitly integrating Ajzen's (1991) concepts of *subjective norm* and *perceived behavioural control*, we are able to more closely dissect the influences on the decision to adopt or to reject.

#### 4.3.1 The rationale

The decision-making process is complicated, and many elements have to be taken into account simultaneously. The framework below (subsection 4.3.2) provides a coherent way to classify the multitude of influences leading to the participation decision, as well as accounts for the interdependencies between them, while avoiding a reductionist approach.

The framework guided the data collection and analysis of our case study. Applying such framework allows us to gain deeper insight into the mechanics behind the decision to adopt an innovation in form of woodlot/plantation establishment. This includes exploring adopters' objectives, ideological motivations, perceived benefits, as well as risks and barriers they had to overcome to take part in the project. In a broader view, this exercise also facilitates reflection on the pilot project itself from an *insider* perspective. Through understanding what elements of tree planting under ELCIR+ individuals found attractive, where, in their perception, improvements could be made and whether they were content with their decision to participate we set the stage and give direction to the analysis of the design and implementation of the project.

#### 4.3.2 Decision-making framework

Following Meijer et al. (2015a), we distinguish between intrinsic and extrinsic factors that guide the innovation adoption decision. Figure 4-3 depicts the basic framework applied in this study. In the analysis that follows tree planting under ELCIR+ and innovation are used interchangeably.

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<sup>8</sup> In Meijer et al. (2015a) *perceptions* are included to reflect the outcome of Hassinger's (1995) *selective perception* process. We follow Rogers' (2003) approach, where the *knowledge* is influenced by such process, yet without establishing a new construct.

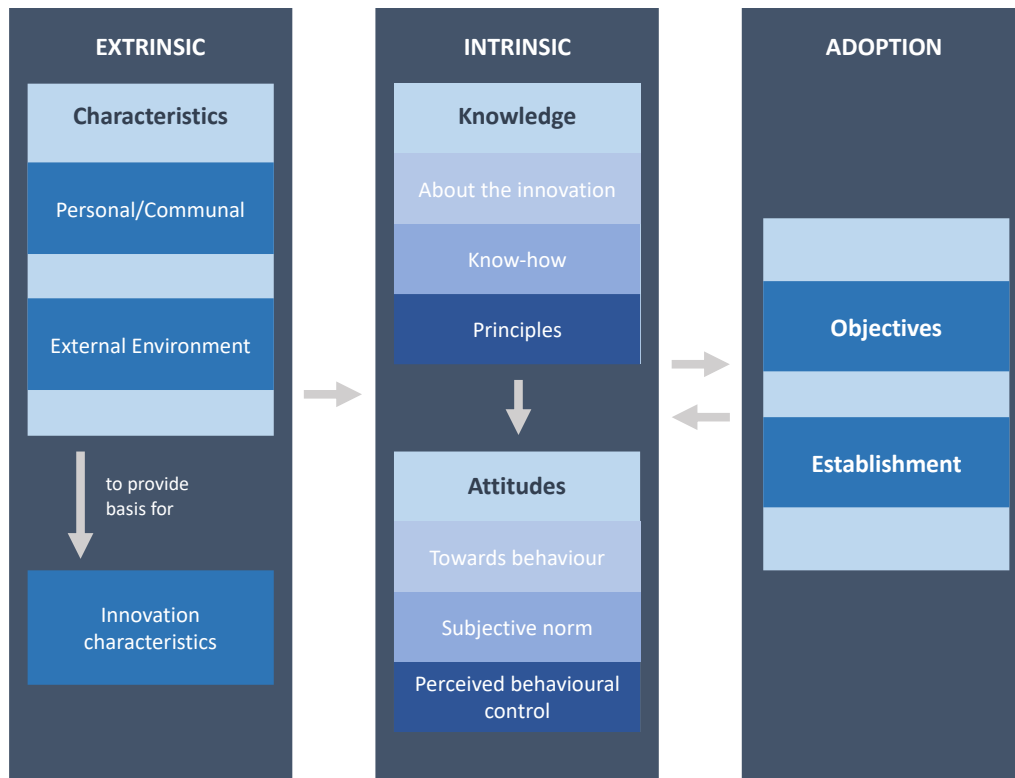


Figure 4-3. The decision-making framework. Own adjustments to Meijer et al., 2015a.

#### Extrinsic factors

Extrinsic factors can be understood as influences on the decision to participate that shape the *knowledge* and *attitudes*. In the above framework such factors are grouped into three categories *Personal/Community* and *External Environment characteristics*, and *Innovation Characteristics*. Table 4-1 below lists some typical *Personal/Community* and *External Environment characteristics*.

Table 4-1. Extrinsic factors - Examples for Individual and Environment characteristics. Source: Own adjustments to Meijer et al., 2015a.

| Personal/Community characteristics   |   |
|--------------------------------------|---|
| Basic                                | gender, age, marital status, place of birth (migrant status)  |
| Socioeconomic                        | income, assets, land ownership status, education  |
| Personality related                  | self-confidence, independence, proactiveness, inquisitiveness   |
| Position in social networks          | network size, connectedness, frequency or interaction, control over political power or resources, relationship with the chief   |
| External environment characteristics |   |
| Geographical settings                | ecology, topology, soil conditions, climate, demography, proximity to markets   |
| Culture                              | language, tribal background, religion, ideologies, norms, values  |
| Political conditions                 | land tenure and access rights, national policies, the structure of government, bureaucracies, the political character of a state and the existence of political freedoms and laws |
| Market conditions                    | prices for timber, prices for competitive goods (e.g. cashew)   |

The *innovation characteristics* refer to the conditions of tree planting under ELCIR+ and encompass not only the building blocks of the project, but also its implementation, ideological background, benefits, costs, risks and challenges as perceived by the potential participants and communication channels used to inform about

the programme details. As pictured in Figure 4-3 above *Personal/Community* and *External Environment characteristics* feed into *Innovation characteristics*. When developing a project like ELCIR+, policy makers often aim to address certain target groups (i.e. groups of people sharing specific characteristics) and tailor the intervention to the local external environment setting. It is therefore important for the project to be communicated in an understandable manner to the anticipated recipients and to ensure that prerequisites are in place for innovation to be received. Some of the *innovation characteristics* will be common for all adopters and non-adopters, such as the proposed design of the project, the time the project was introduced and the trajectory of the rollout (see section 6.1). Yet, some of the aspects treated here may materialise differently for every adopter, depending on the channels it has been communicated through and the support provided to the specific individual. Finally, *innovation characteristics*, just like other *extrinsic factors*, shape the *intrinsic factors* and contribute to the decision-making process.

#### *Intrinsic factors*

Intrinsic factors which lie at the heart of the framework can generally be defined as cognitive and affective elements of a decision-making process. Similar to the Rogers' (2003) framework, *knowledge* is the starting point of the participation consideration. An individual needs to possess basic factual information of a project, potential cost and benefits of adopting the innovation under the project, know how to apply the innovation and have an understanding of the broader concepts underlying innovation. These aspects are encapsulated in three types of knowledge on innovation outlined in the figure above and explained in section 4.2.

*Knowledge*, in an interplay with *extrinsic factors* and already existing attitudes and beliefs (through the mentioned *selective perception* process), determines whether the individual/group has favourable or unfavourable attitudes towards the project. The term *attitudes* comprises not only the *attitude toward the behaviour*, but also the attitudes with regard to the two other constructs from Ajzen's Theory of Planned Behaviour (1991), i.e. the *subjective norm* and the *perceived behavioural control* (see section 4.2 above). Generally, positive attitudes towards the programme increase the likelihood of participation.

#### *Adoption*

Through exploring *adoption*, we observe the decision on whether an individual chooses to establish a woodlot or plantation. Here, the analysis encompasses examining the underlying objectives and motives for participation (i.e. what personal goals do individuals set in adopting the innovation proposed by the project), as well as, in the spirit of Rogers' (2003) *confirmation*, i.e. the willingness to continue adopting the innovation. Moreover, the degree of perceived satisfaction with participation and experience gained from the project will again reshape *knowledge* and *attitudes* and may influence future tree planting decisions, such as plantation expansion.

## 5 Methodology

In this chapter, our approach to the research and the choice of methods will be outlined. We chose tree planting under ELCIR+ in Kintampo Forest District as a case to unveil important factors that influence (non-) adoption decisions. Our analysis follows three steps, as suggested by the SQs, and draws on multiple methods to triangulate the findings. In section 5.1 the case study design will be introduced and section 5.2 presents the methods applied and their respective contributions to answering the overall research question.

By focusing on the micro perspective (non-)adopters in Kintampo Forest District and their decision-making to learn about society and policy implications on a macro scale, our study is guided by a symbolic interactionist perspective (Blumer, 1969) that directs emphasis towards people's individual social situations and the meaning that they attach to it. In line with the assumptions that people act based on the meanings that they give to objects and symbols and that these meanings are (re)constructed through interaction, we apply an inductive approach and propose hypotheses and theories based on our findings (Brockington & Sullivan, 2003).

### 5.1 A case study of Kintampo Forest District

Driven by the motivation to understand complex social phenomena, researchers conduct case studies to capture holistic and meaningful characteristics of real-life events (Yin, 2003). This explanatory case study is centred around the hampered diffusion of innovation and aims at explaining why the tree planting intervention did not yield the desired effects in Kintampo Forest District.

#### 5.1.1 Case study

Following Yin (2003), a case study is a comprehensive research strategy

*“that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident [... and] copes with the technically distinctive situation in which there will be many more variables than data points [... As] one result [of this, a case study] relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis.”* (pp.13f.)

In the social sciences, case studies as opposed to other research strategies such as surveys, experiments, histories, and archival analysis are considered suitable for (i) “how” or “why” research questions (ii) focusing on contemporary phenomena and (iii) referring to situations where behaviours cannot be manipulated. In line with the definition above, this strategy is especially useful when contextual conditions are closely intertwined with the phenomenon at hand since experiments and surveys cannot deal with such situations (ibid.). Experiments purposely remove the influence of the context on the subject (*ceteris paribus* assumptions) and surveys aim at simplifying the matter of research by limiting the number of variables used.

An embedded case study was designed to explain the limited adoption of woodlot/plantation establishment under ELCIR+ in Kintampo Forest District. Within this case, adopters and non-adopters were further sub-units of analysis. In line with the case study design, we employ different data collection methods (see Figure 5-2), while the decision-making framework presented in subsection 4.3.2 provides the theoretical background that guides our analysis. This will allow us to both explain the case of ELCIR+ in Kintampo Forest District and to generate knowledge that can be related back to theory (i.e. generalise analytically).

Four tests for assessing the quality of empirical social research are discussed by Yin (2003). *Construct validity* deals with the establishment of correct operational measures for concepts at the heart of the research. *Internal validity* tests the robustness of the causal relationship proposed, while *external validity* sets the boundary of the generalisation from results. The *reliability* test demonstrates whether the study can be repeated with the same results. Table 5-1 below contains the means we have employed in the study design, data collection, and data analysis to ensure high degrees of validity and reliability.

Table 5-1. Tests for assessing the quality of empirical social research - applied to our case study. Adapted from Yin, 2003, p.34 and Gibbert et al., 2008.

| Test               | Means employed to ensure quality  |
|--------------------|---|
| Construct validity | <ul style="list-style-type: none"> <li>– Triangulation of data and methods.</li> <li>– Composition of a research matrix (see appendix A) and definition of the research problem encapsulated in the research question and specified by three sub-questions.</li> </ul>                |
| Internal validity  | <ul style="list-style-type: none"> <li>– Framework based on well-established theoretical underpinnings.</li> <li>– Application of pattern-matching: Comparing observed patterns with our predictions and causal relationships established in the literature.</li> </ul>               |
| External validity  | <ul style="list-style-type: none"> <li>– Clear rationale for the case study selection and details on the case study context (sample origin).</li> <li>– Framework was used as a template with which empirical results were compared, allowing for analytic generalisation.</li> </ul> |
| Reliability        | <ul style="list-style-type: none"> <li>– Efforts to minimise bias in the application of different methods.</li> <li>– Data used has been coded and organised (database) to facilitate retrieval for replication purposes.</li> </ul>  |

### 5.1.2 Site description

This case study concerns Kintampo Forest District<sup>9</sup> and builds on (non)adopter interviews<sup>10</sup> conducted in June to July 2018 in ten communities (including Kintampo itself) as shown in Figure 5-1. The location for the case study was selected based on tree planting sites under ELCIR+ and preliminary consultations with key informants.

The communities are located in northern Brong Ahafo, i.e. the dry semi deciduous savannah transitional ecological zone that is located in between Ghana's forest landscape in the south and the northern savannah zone. Accordingly, the vegetation can be ascribed to wooded savannah grassland with patches of forests (Danquah, 2015). Low population densities and readily available land characterise this part of Ghana, having attracted a large influx of migrants into this area over the last 20 years (Amanor, 2009). According to the MOFA (2010a), migrants mostly arrive from the northern part of Ghana as settler farmers or herdsmen. Kintampo North and South together host around 200,000 people (MOFA, 2010a&b).

Following the Köppen-Geiger climate classification (1954), the climate is considered an *Aw* - tropical savanna climate, with an average annual amount of precipitation of 1,219.2mm and a mean temperature of 26.9°C (ranging from 29.2°C in March and 25.1°C in August) (weatherbase, 2018). The climate in Kintampo

<sup>9</sup> Forest districts in Ghana do not coincide with political districts, thus Kintampo Forest District stretches across Kintampo North Municipality, Kintampo South District, and Nkoranza North District (Brobby et al, 2018). We conducted interviews in Kintampo North and South.

<sup>10</sup> In addition to the farmer interviews, key informant interviews were conducted in various cities across Ghana, see Table 5-2 for a list of key informants, and appendix B for a more details concerning time and location of interviews.

Forest District is guided by wet and dry seasons. Rain mostly occurs in two periods; from May to July and from September to October. Because of the transitional nature of landscape and climate, the distinction between these peaks is often weak and the first period might be obscured (MOFA, 2010a). Two types of soils are prevalent in the area; ground water lateral soils, generally poor in soil organic matter and nutrients and rather rich savannah ochrosols, suitable for agricultural production (MOFA, 2010a&b).



Figure 5-1. Map of Kintampo and surrounding communities. Own illustration.

Suitable soil conditions, rich water resources, and the vast expanse of flat land in the north makes the region around Kintampo ideal for agriculture, even for large-scale and mechanised cultivation (MOFA, 2010a). Products can be easily transported and sold due to good road access (National Techiman-Tamale Road) to larger markets in the area. Therefore, the region around Kintampo is majorly agrarian, with around 70% of the workforce being engaged in agriculture and animal husbandry and cultivating mostly yam, maize, cowpea, cassava, rice, plantain, egushie, groundnut, and beans. Other crops include cashew, mango, tomatoes, onions, watermelon, garden eggs, soybeans, and sorghum (MOFA, 2010a&b).

Following agriculture, charcoal production constitutes the second-highest source of income in the forest district, contrary to previous studies, Brobbey et al. (2018) find that high-income households obtain higher income from charcoal production than low-income households. The authors additionally point to the importance of the entire value chain connected to charcoal for the district's economy. Charcoal bridges seasonal income gaps and thus appears to be a dominant coping strategy in the area to smooth income and to mitigate economic shocks (ibid.).

## 5.2 Choice of methods

A mixed methods approach has been employed as a part of the case study research strategy, with an aim of data convergence through triangulation. In this study, the primary method of data collection was the SSI, either with key informants or (non-)adopters to obtain qualitative data. Additionally, PRAs, document review and participant observation were used to generate supplementary qualitative data. During our research stay in Kintampo, we had assistance from one interpreter; a male Natural Resource Management graduate from KNUST (Kwame Nkrumah University of Science and Technology) who passed his National



Service at FC Kintampo. In addition, we received complimentary support from a woman who came from Kintampo and was in progress of her National Service at the local FC forest district office, she graduated from Tamale University with a degree in Food Science.



Figure 5-2. Methods applied per SQ. Own illustration.

### 5.2.1 Semi-structured interviews

During the field research in Kintampo Forest District (16/06/18 - 29/06/18), we conducted SSIs with 23 adopters (including four group representatives) and eight non-adopters. Basic socio-economic information on the interviewees can be found in the respective cluster analyses (subsections 6.2.1 - 6.2.4 and subsection 6.3.1). Although some of the interviewees were confident in English, an interpreter was always present to translate and explain, in case communication gaps arose. The majority of the SSIs were held in Twi.

To obtain a more detailed understanding of the rationale behind the decision to plant or not to plant trees under ELCIR+ and specifically to capture villagers' knowledge and attitudes (SQ2 and 3), we performed SSIs as introduced in Bernard (2006). We chose the adopters based on a list provided by FC Kintampo and their availability and tree planting purpose (focussing on woodlot/plantation establishment as compared to trees on farm). We covered about half of the 47 adopters that were listed. The non-adopters were identified through snowball sampling (ibid.), a sampling method that is especially useful, when the target population is scattered over a large area. Both adopters and traditional authorities provided us with interviewees that decided against tree planting under ELCIR+. The interviewees names are kept anonymous and IDs have been created - W for adopters (from "woodlot") and C for non-adopters (from "cashew", as almost all non-adopters were cashew planters). The structure of the interview guides is related to the framework as presented in subsection 4.3.2 (see appendix C for interview guides).

### 5.2.2 Key informant interviews

The key informants were interviewed using a semi-structured method (Bernard, 2006). Table 5-2 below lists the key informant interviews conducted. Some interviews were conducted as a preparation for fieldwork in Kintampo, in order to build a sound network and get extra preliminary information on ELCIR+. All interviews were conducted in English and in the absence of interpreters.

Table 5-2. List of interviewed key informants.

| Organisation                                | Position   |
|---|--|
| <b>Ministries and Agencies</b>              |  |
| FC  | National REDD+ Coordinator for Ghana, Head of Climate Change Unit                |
| FC  | Director of Operations (Plantations)   |
| FC  | Regional Manager Brong-Ahafo   |
| FC  | District Manager Kintampo  |
| FC  | District Manager Sunyani   |
| FC  | Technical Officer Kintampo North   |
| FC RMSC                                     | Manager Plantations Department   |
| FORIG                                       | Research Scientist   |
| MLNR  | Technical Director/ FIP coordinator  |
| MLNR  | FIP Manager, Observing Member of the NSC of DGM                                  |
| <b>Multilateral Development Bank</b>        |  |
| AfDB  | Senior Agriculture & Natural Resource Management Officer, responsible for ELCIR+ |
| World Bank                                  | Private Consultant, Observing Member representing World Bank of the NSC of DGM   |
| <b>NGOs</b>                                 |  |
| Forest Watch Ghana                          | Observing Member of the NSC of DGM   |
| Solidaridad                                 | Knowledge manager  |
| Solidaridad                                 | DGM Project execution/field team (four interviewees)                             |
| <b>Traditional Authorities<sup>11</sup></b> |  |
| Chieftaincy                                 | Sub-chief of the Muslim communities in Kintampo Zongo                            |
| Chieftaincy                                 | Chief of the Babato community  |

All interviews were conducted with the help of interview guides in a face-to-face manner. The questions were tailored to specific interlocutors and prepared in a brainstorming session prior to every interview, here we considered the position held by the interviewee and aimed at addressing our own existing knowledge gaps (see appendix C). This semi-structured approach allowed us to explore the perspective of the interviewee as well as to follow new leads when uncovered in conversation.

The informants were sampled either based on the position held (navigated in documents reviewed, see subsection 5.2.3, or online) or through snowballing. When using snowballing, we often asked the interlocutor to introduce us to the next informants through e-mail or phone conversations, to prepare them for further contact and interview requests.

Interviews with key informants were especially relevant to the analysis under SQ1 and SQ3 and provided us with information on different perspectives held by a variety of stakeholders. This allowed us to reflect on the institutional politics surrounding ELCIR+ design and implementation and compare the actual shape of the project to what was planned.

<sup>11</sup> In addition to these two authorities, the chief of Dawadawa and Queen Mother of the Mo were interviewed in their function of tree planters under ELCIR+.

### 5.2.3 Document review

A number of documents were reviewed for the purpose of this study, as outlined in a Table 5-3 below. The documents, to ensure authenticity, were obtained either online from institution websites or directly from the respective institutions in Ghana when unavailable online. All documents were read in a rigorous manner, with attention paid to their origin, the context in which they were produced and their intended purpose (Bowen, 2009).

*Table 5-3. List of documents reviewed.*

| Source            | Document Title   | Obtained from    |
|-------------------|--|------------------|
| AfDB, 2018        | Aide-Mémoire of ELCIR+ Mid-Term Review   | AfDB, Accra      |
| AfDB, 2013b       | Engaging Local Communities in REDD+/Enhancement of Carbon Stocks (ELCIR+) Project Appraisal Document   | Available online |
| AfDB, 2013a       | Engaging Local Communities in REDD+/Enhancement of Carbon Stocks (ELCIR+) Project Appraisal Document Technical Annexes   | RMSC, Kumasi     |
| CIF, 2009         | Design document for the Forest Investment Program, a targeted program under the SCF trust fund   | Available online |
| CIF, 2012         | Ghana Investment Plan  | Available online |
| FC Kintampo, 2018 | Quarterly and Monthly Reports on ELCIR+ in Kintampo Forest District (quarters: Q1 2018; Q1, Q2 and Q4 2017, months: June 2017, April 2017, November 2016, July 2016) | FC Kintampo      |
| FC RMSC, 2016     | Report on Rapid Baseline Study for Specific Indicators for ELCIR+  | MLNR, Accra      |
| MLNR, 2015a       | ELCIR+ Report on Field Visit to Monitor and Report of Activities (October - December 2015)   | MLNR, Accra      |
| MLNR, 2015b       | Summary of Progress of Implementation of Planned Activities Under The Project Management Unit (January - December 2015)  | MLNR, Accra      |
| MLNR, 2016        | ELCIR+ Report on field visit to monitor and report of activities for Q4 of 2015, Western and Brong Ahafo regions 4 <sup>th</sup> -8 <sup>th</sup> January 2016       | MLNR, Accra      |
| MLNR, 2017        | ELCIR+ Progress Report (January - September 2017)  | MLNR, Accra      |
| MLNR, 2018        | ELCIR+ Mid-Term Report (January 2018)  | MLNR, Accra      |
| World Bank, 2017  | Ghana Dedicated Grant Mechanism for Indigenous Peoples Project.  | Available online |

The document review served two main purposes in this study. Firstly, the documents were analysed in order to gather background information on ELCIR+, as well as the broad context of FIP efforts in Ghana (see subsection 2.2.2). This step further served as a necessary foundation to qualitative interviews conducted during fieldwork. A thorough reading of the relevant documents provided leads for asking questions and allowed us to identify which knowledge gaps would have to be addressed during the interviews. Additionally, post-interview, we used the documents to cross-check statements made by our interlocutors.

Secondly, a method that proved effective to the purpose of our study, was a cross-comparison of Project Appraisal Documents with Progress Reports and Reviews. Through this exercise, along with using key informant interviews, ELCIR+ and DGM timelines were constructed, shedding light on how and why actual trajectories of the projects differed from what was planned (SQ1).

### 5.2.4 Participant observation

One of complementary methods to understand the underlying decision-making process behind tree planting (SQ1) specifically in Dawadawa was participant observation (Bernard, 2006). We intended to observe and join the CIF community meeting held on June 25, 2018. In this way, we gathered in-depth knowledge on

the impact the DGM training played on the villagers of Dawadawa. From internal district office documents, we saw that the adoption of tree planting in Kintampo Forest District was especially high in Dawadawa so it was evident that we should examine this community closely. During the event that was held in Twi, two interpreters assisted us. The results are shown in Text box 6-5.

### 5.2.5 Participatory rural appraisal

#### *PRA with the FC Kintampo*

We organised a “Brainstorming session”, a specific form of PRA (Geilfus, 2008), with six FC district officers that were involved in ELCIR+ implementation (see Table 5-4). The aim of this PRA was to capture opinions and perceptions of the idea behind plantation establishment under ELCIR+, the implementation, and the nature of impacts. Participants were encouraged to enter in discussions with each other to jointly reflect on these issues and to exchange views. With this specific aim, results from the PRA were expected to contribute to answering SQ1, by complementing information obtained through interviews with key informants and review of project documents.

*Table 5-4. List of FC officers participating in the PRA held in the Kintampo district office.*

| <b>Participant</b> (M - male; F - female) |
|---|
| District Manager (M)                      |
| Assistant District Manager (M)            |
| Technical Officer Kintampo North (M)      |
| Technical Officer Kintampo South (M)      |
| Accountant (F)                            |
| Secretary (F)                             |

The group composition was chosen such that it reflected different responsibilities within the ELCIR+ implementation. Based on their tasks and experiences, participants had different touch points and related knowledge on the project. The FC District Manager and his assistant for instance were rather well informed about the overall project rollout including parts of the underlying institutional politics. The Technical Officers worked with adopters under ELCIR+ on a daily basis and had firsthand knowledge of the needs and challenges. Additionally, the Technical Officer for Kintampo South was responsible for the model plantation in Hyireso and being chief the ranger of Bosomoa forest reserve he had knowledge of on-reserve action especially the BSM Modified Taungya System (MTS, see Text box 6-1). Finally, the accountant and the secretary were more

involved in the administration of finance flows and bookkeeping. The accountant further managed and organised community meetings and the seedling supply.

During brainstorming, we took the role of facilitators. Due to the confidence of the participants, the session was held in English, however, to mitigate possible language barriers between facilitators and participants, an interpreter was present during the process.

#### *PRA with Nante community leaders*

This PRA session was conducted with a chief and three elders of Nante community. This community was one of the few who decided to adopt ELCIR+ collectively. The session took form of a “Timeline” development (Geilfus, 2008) and aimed at reconstructing the process of the communal woodlot plantation from the initial idea/underlying motivations to the expected benefits.

At each step (Motivation and Idea, Decision, Establishment, Maintenance) we inquired about the trajectory of the process, as well as the associated challenges and positive aspects encountered. In the last step of the PRA we asked participants to elaborate on the benefits the community hopes to derive from adopting tree planting under ELCIR+. The purpose of the timeline construction was to trace the adoption decision process in a community setting and to understand what kind of benefits communities can derive from tree planting (see presentation of results in Text box 6-6). During the timeline construction session one of the

authors played the role of a facilitator and the other was responsible for note taking. The exercise was conducted in Twi with help from two interpreters.

#### *Transect Walk on Model Plantation*

We used the transect walk (Chambers, 1994) method to explore the model plantation in Hyireso. We were guided by three participants (listed below in Table 5-5) engaged in the daily maintenance and protection of the plantation.

*Table 5-5. List of FC officers and community members participating in the transect walk.*

| <b>Participant</b> (M - male; F - female)                                       |
|---|
| Technical Officer Kintampo South and Chief ranger of Bosomoa Forest Reserve (M) |
| Secretary of the model plantation and the Head of the voluntary fire squad (M)  |
| Senior Resource Guard and Ranger of Bosomoa Forest Reserve (M)                  |

The goals of the walk were to understand whether, so far, the model plantation has served its purpose in strengthening extension services in FC for off-reserves and to collect spatial and land use information on the plantation. The results of the walk are analysed in Text box 6-2.

The transect walk was conducted in a semi-structured manner as we allowed the participants to guide us, but also had prepared broad conversation topics. Along the way we asked questions and the walk was finalised by a discussion, to ensure that the necessary data was collected. The PRA has been conducted in English, with occasional assistance from an interpreter when clarifications were needed.

#### *Transect Walk with W16*

W16, an adopter from Apesika, invited us to visit his land and see the status of his tree planting activities. We found this an interesting opportunity, as we knew from an interview within him that W16 had experienced illegal tree felling on his land and had past tensions with FC. W16's cousin, W26, also joined the transect walk.

The walk was conducted in a non-structured manner and we allowed the farmer to guide us and show us sites that were of interest to him. We asked clarifying questions but did not set conversation topics or facilitate the PRA in any predetermined way, rather, we let by the trajectory of the transect shape the conversation. The main result of the transect walk, encapsulated in Text box 6-3, is the description of land encroachment and illegal logging experienced by the farmer. It also allowed us to understand the farmer's perspective on the rules that guide naturally occurring versus planted trees. The conversation during the transect walk was conducted in Twi, assisted by an interpreter.

## 6 Results and analysis

In this chapter results of the data collected during field research are presented and analysed, with an aim of exploring the reasons behind the limited adoption of tree planting under ELCIR+. The analysis follows three steps, as suggested by the research questions and in line with the framework developed in chapter 4. To set the scene, project characteristics common to all adopters will be outlined by rolling out the ELCIR+ and DGM interventions and by subsequently sharing the views of FC Kintampo as the local project implementers (section 6.1). In a second step, interviews with adopters will be analysed using the full framework (section 6.2). Finally, the decision-making process of non-adopters and reasons for lack of participation as suggested by stakeholders are analysed and contrasted in section 6.3. In this chapter, the establishment of plantations and of woodlots are treated as one single activity. This is because neither FC Kintampo district officers, nor any of the interviewees have made any distinction between them in practice.

### 6.1 Common innovation characteristics (SQ1)

This analysis starts off with extracting the project characteristics that are common to potential adopters in Kintampo Forest District<sup>12</sup>, before applying the framework to each potential adopter individually (see section 6.2). By first retracing the trajectories of ELCIR+ and the complimentary DGM project and then providing the perspectives of implementing FC officers from Kintampo, the reader will gain an understanding of the shape that ELCIR+ and awareness creation under DGM have taken in the Kintampo Forest District.

#### 6.1.1 ELCIR+ and DGM

##### *The trajectory of ELCIR+*

In November 2012, Ghana, through applying to the Climate Investment Funds (CIF), received an approval for the Forest Investment Programme (FIP) implementation (MLNR, 2015b). As a result, three pilot projects were designed, ELCIR+ being one of them. In December 2013, the Project Appraisal Document for ELCIR+ (AfDB Group, 2013b) was released. The document includes a detailed timeline of planned activities, a simplified version of it is pictured below in Figure 6-1a. As outlined, the schedule assumes that “All Activity Implementation and Monitoring” begins in the year 2014, while “Authorization of 1<sup>st</sup> Disbursement” takes places later on within the 1<sup>st</sup> quarter 2014. As described in subsection 2.2.2, the FC district offices are responsible for the implementation of tree planting under ELCIR+.

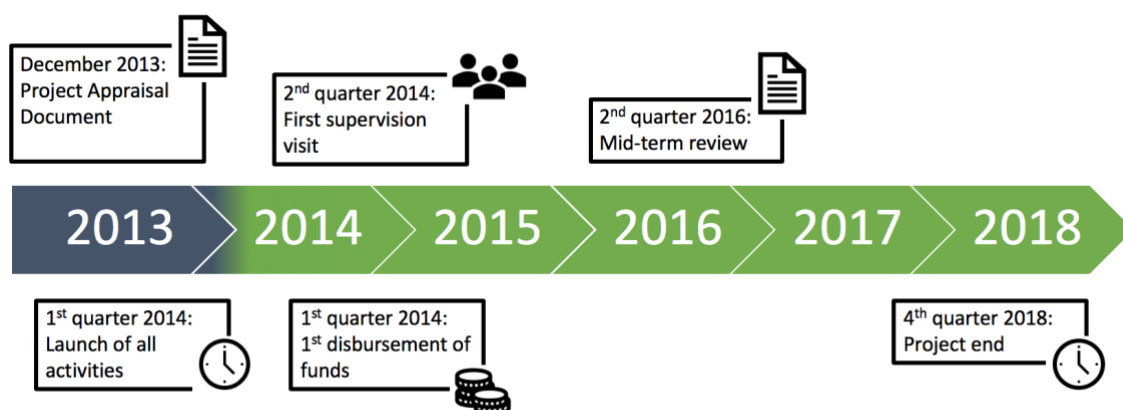
However, as pictured below on the actual timeline (Figure 6-1b), the project activities were delayed by approximately two years. A part of the delay, as explained in an interview by FIP coordinator at MLNR, was due to the need to apply for a parliamentary tax waiver. According to the interviewee, AfDB has a policy in which funds do not cover tax payments, which was only realised after the project was budgeted and signed, leading to a delay of approximately one year.

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<sup>12</sup> For the common external environment characteristics, please refer to the description of study site in subsection 5.1.2.



## (a) Projected timeline



## (b) Actual timeline

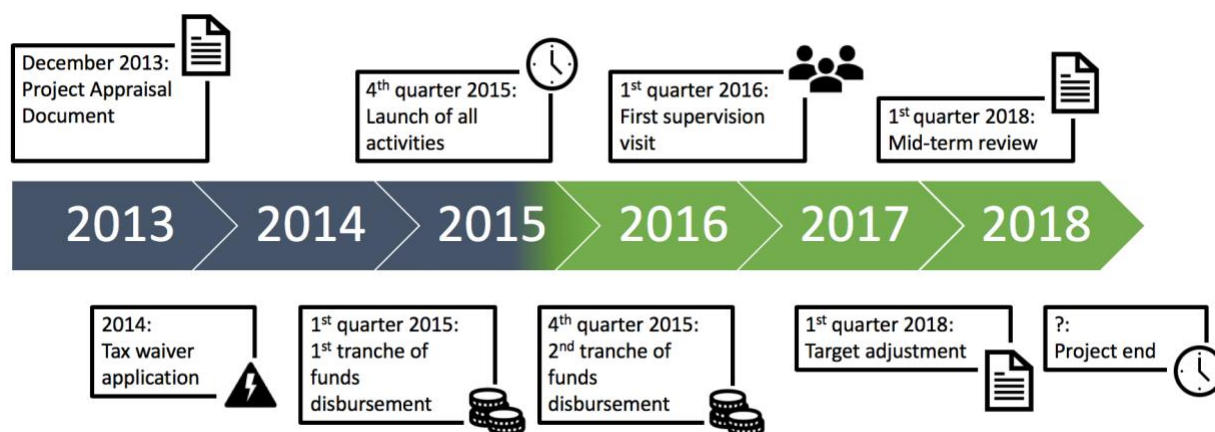


Figure 6-1. Projected (a) and actual (b) timeline of ELCIR+. Own illustration.

Another factor contributing to the delay, was the disbursement of funds. The Summary of Progress of Implementation document states that the ministry received two tranches of disbursement from the Strategic Climate Fund (SCF) and one tranche from the African Development Fund (ADF) (MLNR, 2015b). The first tranche was received in February 2015. However, the disbursement was problematic:

*“funds received during the first disbursement under both SCF and ADF were largely earmarked for activities which were dependent on outputs of consultancies and procurement of goods for that matter those funds could not be disbursed. [...] The operational activities for which funds were released during the first disbursement were to be undertaken in the 3rd and 4th Quarters of 2015 therefore the Ministry couldn’t disburse those funds.” (ibid., p. 7)*

Additionally, the Ministry requested to replenish the SCF account in August 2015, which was only fulfilled in December 2015, as, according to the MLNR, details were missing and AfDB did not prompt MLNR in a timely manner to provide them (ibid.), leading to further delay in the ELCIR+ process.

Non-chronological earmarking of funds and delayed payments had direct impact on the way FC district offices commenced ELCIR+ activities. According to the Director of Operations (Plantations) in FC, the first funds trickled down to the district offices in September 2015, close to the dry season i.e. a time not suitable for tree planting. Moreover, tracing the disbursements in the FC Kintampo district office’s financial reports, still in November 2016 no funding for support of plantation and woodlot establishment had been available to provide assistance to planters. Not surprisingly, the first supervision visit from the M&E team



of the Project Management Unit (PMU) in January 2016 concluded that activities in the field were lagging behind (MLNR, 2016).

The new project end date was not made explicit in any of the progress documents. Given the timing of the mid-term review, it is assumed that the project would run its projected course and therefore would finish in 2020. When asked about a possible extension, the Director of Operations (Plantations) in FC, said that he was *“hopeful the project receives at least another year extension”*. However, to his knowledge, AfDB will not commit to any extension yet.

#### *Setting targets; the 6,200 ha of woodlots and plantations*

Key informants agreed that the target was ambitious and not realistic. Table 6-1 below shows the opinions of MLNR and FC officials concerning the target setting.

*Table 6-1. Views of key informants on the target.*

| Key informant                              | Statement   |
|--|---|
| FC District Manager<br>Kintampo            | <i>“I can understand why the target was set so high. The amount of wood extracted in this area and the degraded nature is big, so they wanted to plant a lot.”</i>                        |
| FC Regional Manager<br>Brong Ahafo         | <i>“The target stemmed from the project development stage. The reality turned out to look different, that is why they had to adjust goals. ELCIR+ is more successful in other areas.”</i> |
| MLNR FIP Manager                           | <i>“The carbon targets were based only on theoretical calculations not practically determined.”</i>   |
| FC Director of Operations<br>(Plantations) | <i>“The target is too high and not realistic. Drawing on experiences on off-reserve planting we already knew that tree planting, especially in Brong Ahafo is complicated.”</i>           |

The statements reveal that the target was set without reflecting on local circumstances and considering what would be realistic. According to the MLNR FIP Manager, no feasibility study had been conducted and data was not collected prior to the start of implementation and target selection. Section B2.3.5 of the Technical Annexes to ELCIR+ Project Appraisal Document notes that baseline studies were planned to be conducted at the beginning of the project as basis for implementation of a results-based M&E framework. (AfDB Group, 2013a). However, the MLNR reporting states:

*“This activity which was supposed to be among the first to be undertaken during the beginning of the project was not part of the line items the Ministry received funds for from the Bank. To avoid misappropriation of funds, the Ministry had to wait for a Supervision Mission in July to clarify that funds received in the ADF special Account could be applied to undertake this activity. This led to delay in setting up the system.*

*During the inception workshop, it was identified that the results framework as agreed and captured in the Project Appraisal Report had a lot of challenges including lack of baselines and annual targets for some of the outcome and output indicators. This slowed down the process coupled with the fact that funds had run out of the SCF to collect the baseline data.”* (MLNR, 2015b, p.8)<sup>13</sup>

In May 2016, Forestry Commission’s Resource Management Support Centre (FC RMSC) finally released a document “Report on Rapid Baseline Study for Specific Indicators for ELCIR+” which provided bases for project indicators at the end of 2015 (FC RMSC, 2016).

<sup>13</sup> The inception meeting took place in August 2015.

*Incentives to woodlot/plantation establishment under ELCIR+*

As stated in subsection 2.2.2 on the ELCIR+ design, the following activities shall accompany plantation establishment:

- ♦ Reconnaissance and sensitisation of beneficiaries;
- ♦ Model plantation establishment;
- ♦ Surveying, mapping, and registration of degraded plots; and
- ♦ Provision of high-quality seed and equipment for plantation development.

Moreover, the project shall also provide hand tools for establishing the tree plantations, as well as haulage and other services such as extension supervision, lining, pegging etc., during the planting of the seedlings.

The FC Technical Officer for Kintampo North described the process of woodlot/plantation establishment and inherent incentives as follows:

*“Before people start coming to us, we have to raise awareness and inform them about the benefits and possibilities under this programme. We have to encourage them to plant trees. We do that in community meetings or visit farmers individually. Some farmers accept the offer. They prepare their lands themselves. In case they are not able to the FC helps out at times with plowing and weeding. FC usually plants for the farmer. After planting, FC visits on a regular basis to advise them. [...] Sometimes FC would offer money for land preparation to convince farmers to include Cassia as well or mix Cassia with Mahogany, since Cassia is a major feedstock for charcoal which leads to deforestation in the area.”*

Analogously, the FC District Manager for Kintampo said that FC raised awareness in communities and when farmers showed interest, FC surveyed the land, provided seedlings, and assisted with planting. Sometimes, they would supervise the pegging, whereas the District Manager in Sunyani stated for instance that FC Sunyani always supported the site preparation and that charcoal producers could receive cash support for weeding. Concerning the budget allocation to forest districts MLNR’s Technical Director stated: *“Financial allocation is discussed based on effectiveness. In terms of plantation establishment, you have to compare growth rates. FC wanted to meet a target. In Kintampo they have lost a lot of the first seedlings. You have to put the money where the best success is likely.”* Hence, these incentives during woodlot/plantation establishment and maintenance seem to vary across and within districts. In section 6.2, the different ways ELCIR+ can materialise for tree planters will be further analysed.

In addition to the services FC district offices can provide, a BSM ought to be established to guarantee long term benefits (AfDB Group, 2013a). The BSM for off-reserve tree planting was named as an important component to ensure access to long-term benefits for community members and migrants with insecure land tenure. Further, it ought to yield sustainable project outcomes, preparing for the tree tenure reform (CIF, 2012). When asking MLNR and FC officials whether such BSM materialised, they negated, as shown in Table 6-2 below.

Table 6-2. Views of key informants on the BSM under ELCIR+.

| Key informant                           | Statement  |
|---|--|
| FC District Manager Kintampo            | <i>“There is no clear-cut benefit-sharing mechanism - not even under ELCIR+.”</i>      |
| FC District Manager Sunyani             | <i>“There is no benefit-sharing mechanism. Everything stays with the owners.”</i>      |
| MLNR Technical Manager                  | <i>“On-reserve there is BMS, whereas in the off-reserve it stays with the people.”</i> |
| FC Director of Operations (Plantations) | <i>“The rights to planted trees are straightforward.”</i>                              |

*The “target redirection” from off- to on-reserve*

The mid-term review conducted in January 2018 by MLNR finds slow progress in the tree planting component of the project. The AfDB mid-term mission states that only 422ha of plantations and 290ha of woodlots had been established since the project began (AfDB Group, 2018). Lack of achievement in the component prompted the ministry to reduce the original off-reserve target of the component from 5,000ha down to 1,000ha for plantations and from 1,200 to 700ha for woodlots (ibid.). Additionally, a new activity “Provide incentives” (land preparation and planting for tree planters to undertake small to medium size plantation development off-reserve) was proposed to incentivise participation. Project documents do not contain further details on what these additional incentives could entail or how they will be different from what assumed in the projected design pre-target change. The FC Director of Operations (Plantations) said concerning this matter: “*We set aside some money to increase incentives especially by supporting site preparation.*” and MLNR’s FIP Manager confirmed this statement. The FC District Manager Kintampo reported that so far, neither clear directions on how the new incentives would look like, nor money to implement them, have been delivered.

To offset the target deficit that resulted from the off-reserve cut, it was decided that 4,500ha of on-reserve plantations under MTS were to be established as a new activity (“Undertake community based plantation development on-reserve”). Text box 6-1 below provides a brief introduction to this BSM.

*Text box 6-1. Modified Taungya System (MTS). Sources in text.*

The **Modified Taungya System (MTS)** was created by the Government of Ghana, with support from FAO and the World Bank. In this system farmers are allocated land in degraded parts of forest reserves and are given seedlings to reforest the area (PAB Consult, 2016a). They own the forest plantation products with the FC, landowners, and local communities acting as shareholders (Agyeman et al., 2003). MTS does not put in place strict ownership, control, management and use rights structures governing the timber resource, as it is not mentioned in legislation on forestry in Ghana (PAB Consult, 2016a). However, the proposed share of benefits is 40% for farmers for management activities, labour and maintenance of trees, 40% for the FC on the basis of providing MTS Farmer Group with good quality seedlings and training, 15% for landowners for guaranteeing access to land and 5% to local communities for monitoring, preventing illegal activities and wildfires (Dumenu et al. 2014, PAB Consult, 2016a).

As shown in Table 6-3 below, except for the ministry’s Technical Director, all interviewed FC and MLNR officers supported the idea of shifting the carbon targets from off- to on-reserve under MTS. Whereas FC officers stressed the maturity of the MTS concept, the impact it played on livelihoods and the advantage of a better control on-reserve as compared to off-reserve, a representative of Forest Watch Ghana found fault with the focus on quick timber production and the inclusion of exotic species such as Teak. He further criticised FC for not being able to effectively protect the reserves and pointed to the degraded lands on-reserve as a result of bad forest management.

MLNR’s Technical Director disapproved the target redirection due to the concern of ELCIR+ not fulfilling its policy objective (see Figure 2-2). As a pilot programme under FIP, ELCIR+ was supposed to prepare Ghanaians for the tree tenure reform and promote tree planting through including inherent rights. The Technical Director stated accordingly:

*“Tree tenure is one of the things that made FIP choose Ghana as a pilot country. This distinguishes Ghana from other countries. Tree ownership and benefit-sharing have been responsible for deforestation and forest degradation. [...] Changing policy, not only the impact of the policy. [...] We from the Ministry knew that the FIP target will be reached, but the policy target will not be met.”*

According to another key informant from the ministry; the FIP Manager, the target redirection - he insisted on not referring to it as target change - was decided on quickly and with a large majority: *“We agreed that instead of ‘wasting time’ we should move to on-reserve. There we also have a lot of degraded areas and achieve higher marginal impact.”*

Table 6-3. Views of key informants on MTS and on on-reserve action.

| Key informant  | Statement  |
|--|--|
| FC RMSC Manager<br>Plantations Department <sup>14</sup>          | <i>“But the good thing is that the target has been reduced for the off-reserve trees and has been put to the MTS which is a very unique system, where the farmers get benefits from the beginning till the end.”</i>   |
| FC District Manager<br>Kintampo                                  | <i>“The other 4,000 ha will be established under MTS, which is easier to manage. FC is well staffed in the on-reserve. There are officers and guards that give security. [...] Off-reserve, there exists a big wildfire problem. The on-reserve can be protected better. Most of on-reserve are degraded lands. It is better to improve the governmental property rather than taking risk improving something outside.”</i>  |
| FC District Manager<br>Sunyani                                   | <i>“MTS is doing very well. On-reserve is more under control, whereas off-reserve action is more complicated, we have less control and less staff on the field and there is more land use change.”</i>   |
| FC Director of Operations<br>(Plantations)                       | <i>“In order to a) meet the FIP carbon goals and b) enable livelihood enhancement, we decided to plant on-reserve by implementing MTS. MTS is most appropriate to achieve these goals, farmers will have arable land available and receive the short-term benefits of their farming, as well as get the 40% of the long-term benefits from activities such as thinning and minor logging. Moreover, it allows for landscape restoration of on-reserve degraded areas. This is especially welcomed by forest fringed communities.”</i><br><br><i>“Mainly [...] the Technical Director of MLNR] was against the output shift as he saw it as a ‘defeatist approach’, but I disagree – on what basis was the target actually designed?”</i> |
| MLNR Technical Director  | <i>“The redirection of fund to MTS caused a big discussion. FC made that proposal. We from the Ministry knew that the FIP target will be reached, but the policy target will not be met. On-reserve there is benefit-sharing, whereas in the off-reserve it stays with the people.”</i>  |
| Observing Member of the<br>NSC of DGM from Forest<br>Watch Ghana | <i>“Fringe societies have not benefited from the forest in the past and they cannot feed on fresh air only. Forest management is supposed to deliver benefits to the people around it. Sadly, MTS is sadly focused on quick timber production to feed the timber industry. [...] FC tends to claim that the reserves are well protected, but in fact off-reserve areas are actually better protected in principle. [...] Off-reserve is a necessary focus to ensure that the trees benefit the local people.”</i>  |

### *The trajectory of DGM*

As stated by a key informant, the World Bank representative on DGM NSC, the preparation to bring DGM to the Ghana started in 2009. On July 7, 2009, a *Design document for the Forest Investment Program, a targeted program under the SCF trust fund* was released outlining the basic principles of FIP involvement in Ghana. As a part of the design, FIP calls for establishing a dedicated grant mechanism for “indigenous peoples and local communities” (CIF, 2009, p.14). Paragraph 38 of the document states: *“The full and effective, continuous participation of indigenous peoples and local communities in the design and implementation of FIP investment strategies is necessary. [...] At the implementation stage grants to indigenous peoples and local communities should be an integral component of each pilot.”*

<sup>14</sup> The informant while holding her position in FC RMSC Manager of Plantations Department had also been employed as an external consultant to design the project.

(ibid., p.14), thus explicitly stating the necessity of DGM to FIP success, as well as the strong interdependence between the programmes.

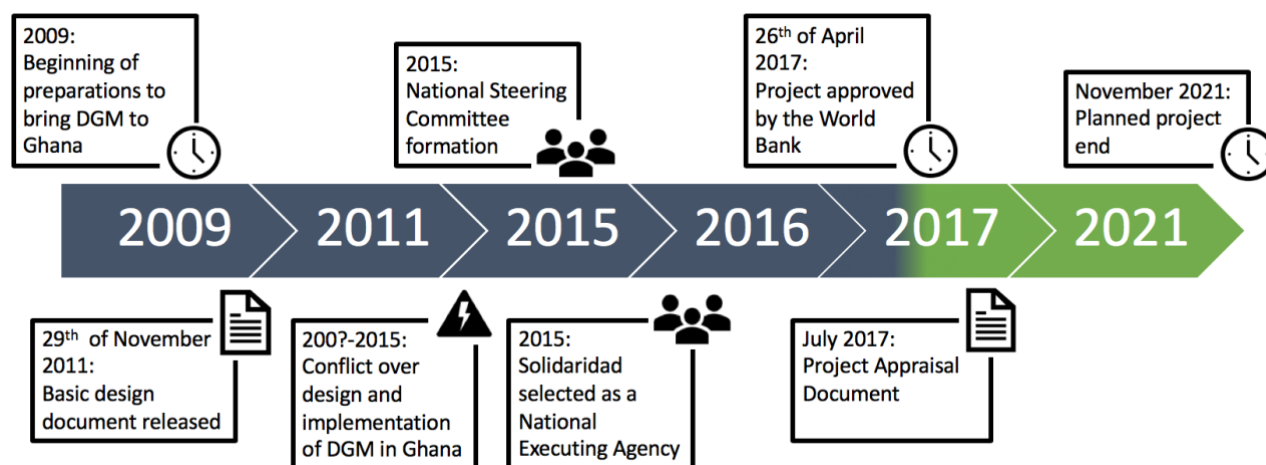


Figure 6-2. The timeline of DGM. Own representation of various sources.

Based upon the *FIP Design document* basic design of DGM was drafted. The FIP Subcommittee approved it on October 31, 2011 (World Bank, 2017) and a document outlining the objectives and early design provisions was released on November 29, 2011. The process of introducing DGM to Ghana was led by two representatives, members of the DGM Transitional Committee<sup>15</sup> who at the time were associated with African Union’s Economic, Social and Cultural Council (AU-ECOSOCC) and the Centre for Agroforestry Business Development (CABUD) respectively.

According to the World Bank key informant, The DGM was planned to start shortly before or at the same time as ELCIR+, however a conflict arose around operationalisation of the project. Specifically, a disagreement arose regarding the definition of “indigenous”. Since the DGM is designed to specifically empower and enable “*indigenous people and local communities*” (DGM Global, 2018a), the definition of indigenous was important for shaping the project and determining who would benefit from the DGM in the end, i.e. who would reside in the NSC. As explained by the same key informant, in Ghana the word “indigenous” is related to family lineage and is often applied to people of higher influence in rural communities. Thus, in contrast to other countries where DGM is implemented to support vulnerable groups, “indigenous” people in Ghana are often found in power positions.

As stated by a Forest Watch Ghana observer on the DGM NSC, the conflict boiled down to who should have decisive powers: “*one believed it should be only civil society representatives, the other wanted chiefs to be NSC members*”, later referring to the conflict as “*petty politics*”. Both, the World Bank key informant and the Forest Watch Ghana representative believed that there was a strong interest in personal benefits underlying this conflict. The two adversaries were hoping for managing positions and financial gain.

As pointed out in the FIP Pilot Countries Meeting in 2015 “*the Process [of bringing DGM to Ghana] has been very slow and painstaking due to the diverse nature of the stakeholders and entrenched positions adopted by some.*” (Nsowah, 2015, p.8) Moreover, two informants, an observer on DGM NSC from MLNR (at the same time FIP Manager) and the Forest Watch Ghana observer on the NSC, state that no information on the

<sup>15</sup> A global committee of the DGM created to set a common framework and agree on operational guidelines allowing the DGM activities in the eight FIP pilot countries.



implementation progress was shared throughout the process - the two adversaries claimed not to be accountable for providing information on the process.

The way the World Bank behaved and responded during the conflict was criticised by some key informants. The World Bank key informant pointed to a lack of clear direction in the DGM process and a lack of direct control over the actions of the two Transitional Committee members. Similarly, the Forest Watch Ghana observer on the NSC, saw the fact that DGM was directed from the US and that the senior direction had changed over the course of the implementation as a major problem, as it prevented a timely response from the World Bank to the prolonging conflict. He explained, that as a result, in 2015 Forest Watch Ghana contacted the Senior Director responsible for managing DGM in World Bank at that time, highlighting the need for more information and insight into DGM process and requested that the members of Transitional Committee would become accountable to the Civil Society Organisations in Ghana. World Bank decided to remove the two adversaries from the DGM process to move forward with the implementation.

After World Bank's intervention, the term indigenous has been crossed out from the Project Objective Document (POD). In the later issued Project Appraisal Document the following explanation is provided:

*“The G-DGM [DGM in Ghana] differs from other DGM projects in nomenclature. In Ghanaian parlance, one is either an indigenous person (native to that particular locality) or a migrant (moving in from other parts of Ghana and not native to that locality). Indigenous, therefore, in the Ghanaian context, is very different from the ‘indigenous’ term used in Latin America. Indigenous to areas in the Ghanaian context means that one is from that locality as a result of one’s family/ancestors coming from that area. It excludes all others living in the area who are not, by lineage, from this area. Indigenous people are often more powerful than the nonindigenous living in the area and in a mixed society, tend to be the rural elites of that society. For this project, therefore, the word Local Communities is more significant and will be highlighted instead of indigenous communities to ensure inclusion of the most poor and to avoid the confusion of the Latin American term and the Ghanaian term. In addition, migrants (as well as women and youth) will be targeted to ensure the participation of the most disenfranchised.”*  
(World Bank, 2017, p.4)

Having clear definitions of project beneficiaries, NSC had to be established. Communities were visited relying on the existing network of FIP-selected sites. The consultation process was based on stakeholder engagement applying focus group discussions and key informant interviews. Discussions were carried out with FC Regional Managers of Brong Ahafo and Western regions, FC District Managers and Technical Officers, as well as local communities. In community meetings nominees were selected and to ensure their readiness to participate, their nomination was followed by an assessment of their background and past forest-related activities through interviews with key informants (such as already mentioned local FC officers) and the nominee themselves. In all 38 locations visited, 50 nominees were proposed and out of them 13 were chosen to form NSC and elect NEA. The newly formed NSC then received training from World Bank staff on project proposal evaluation to produce a shortlist of top agencies. The World Bank representative interviewed facilitated the process and had to ensure that the selected body fulfilled the criteria outlined in project design. One major criterion was an NGO status of the potential NEA. The organisation that was ranked first, was the Global Environment Facility (GEF), which could not provide a certificate proving the NGO status, and hence it was disqualified. The second was Solidaridad, which became the NEA. The World Bank approved the project in November 2016. On July 5, 2017, the Project Appraisal Document was issued and on-field implementation of the project commenced in 2017 (World Bank, 2017).

#### *DGM's impact on FIP*

As outlined in subsection 2.2.3, in its conception DGM had been envisaged as an essential part of FIP piloting efforts. However, as presented in Table 6-4 below, key informants' opinions on the nature and function of DGM vary.

Table 6-4. Views of key informants on DGM.

| Key informant  | Statement   |
|--|---|
| MLNR Technical Director/<br>FIP Coordinator                              | <i>“With every project implantation we experience this pre-excitement which fades after a few years. But these impacts are direct, but not lasting. The true impact is about changing the attitudes. DGM does awareness rising, but only FIP can create lasting change.”</i>  |
| MLNR FIP Manager   | <i>“DGM and FIP are the same programme I would say. [...] DGM was supposed to begin before FIP, which did not happen it has started 2 years after FIP. FIP in fact had to do the pioneer work and took over the capacity building in intervention areas. Now in fact DGM is relying on FIP, they have even received financial support from us to do workshops.”</i> |
| Observing Member of the<br>NSC of DGM from the<br>NGO Forest Watch Ghana | <i>“DGM was supposed to proceed ELCIR+ and that created confusion. There is a lot of misconception about the function of DGM because, often, what is not being delivered by ELCIR+ is now promised by the FC and the Government to be delivered by DGM. Many people understand that DGM will give out money for land preparation and other activities.”</i>         |
| FC Director of Operations<br>(Plantations)                               | <i>“DGM is coordinated by the Ministry. I am not at all aware what they are doing. Awareness creation should be done by the FC. There are meetings, announcements and radio jingles. I don't know what DGM's role is.”</i>  |

The FIP Manager at MLNR, says that the delay of DGM has not affected harmonised delivery of CIF funded projects as there is cooperation: the safeguards, communication strategy of both programmes match. Similar statement can be found in the DGM Project Appraisal Document:

*“Despite the delay, the time lag has, to some extent, helped prepare communities for the arrival of the DGM. In addition, the two project preparation teams were able to make a distinction between the communities to be supported by the DGM (off-reserve) and those to be supported by the FIP (on-reserve and off-reserve). This has allowed a much more targeted preparation process for the DGM. [...] Despite the complementarity, the two projects have different implementation arrangements and schedules and the delay of one project should not be allowed to affect the rollout or successful implementation of the other.”*  
(World Bank, 2017, p. 24)

The above paragraph raises questions in light of the design of both DGM and FIP's Investment Plan for Ghana. The initial idea was intuitive - DGM as an awareness raising element was to sensitise communities, create a sound knowledge base and a sense of environmental urgency prior to the FIP projects, such as ELCIR+ whose success largely depends on active engagement of local population. Yet, it is rather unclear why the selection of communities that do not receive benefits from FIP projects<sup>16</sup> would allow a more targeted rollout of DGM, apart from avoiding the doubling of support. If that is the case, it is therefore debatable whether the general implementation of the two is still characterised by “complementarity” i.e. “a relationship or situation in which two or more different things improve or emphasize each other's qualities.” (Oxford University Press, 2018), rather than exclusion.

<sup>16</sup> As read in DGM Project Appraisal “[t]he selection criteria was based on complementarity to the FIP so these were selected communities that were off-reserve, in the FIP areas and were not already slated to directly benefit from the FIP.” (World Bank, 2017, p.6) It is however not specified what types of benefits the policymakers had in mind.



### 6.1.2 The implementer's perspective

In the previous subsection, we developed planned and actual timelines of ELCIR+ and DGM and found that major shortcomings during the project process include a substantial delay, a missing feasibility study (leading to a weak incentives structure and an unrealistic target), and that funds were only slowly trickling down to the implementing district offices. This subsection contains the results of a PRA conducted with staff of the FC district office Kintampo (for lists of participants, see Table 5-4). The results as presented in Figure 6-3 are compared to relevant official project documents and voices from other key informants.

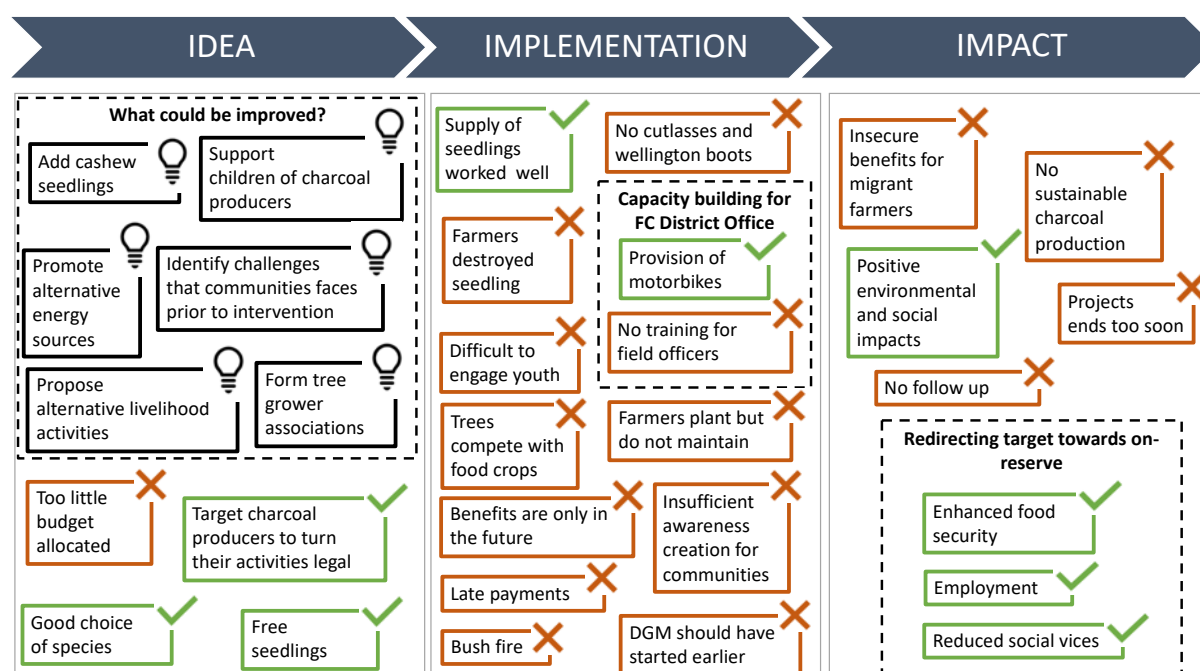


Figure 6-3. Results from the PRA with FC Kintampo officers. Own illustration.

#### The idea behind ELCIR+

According to the participants, ELCIR+'s purpose was to positively impact climate change, by promoting tree planting. Here, the following target groups were addressed:

- ♦ Farmers
- ♦ Charcoal producers
- ♦ Schools
- ♦ Religious bodies
- ♦ Whole communities
- ♦ Youth

The target group of ELCIR+ as per Project Appraisal document is very openly defined as the population in 14 districts in Western and 24 districts in Brong Ahafo (AfDB, 2013a). Concerning the plantation establishment under component 1, however, solely communities were targeted for plantation establishment and charcoal producers (not specified whether whole communities or individually) for woodlot creation under component 3. When reflecting on target groups, the PRA participants named the groups that actually adopt tree planting (see section 6.2) despite the initial focus on communities. When asked why communities did not participate, the interviewees mentioned reasons such as lack of spare land (sometimes the community land is already subdivided, or chiefs do not want to devote free land to long-term use due to future potential lease income), problems with pulling communal labour for land preparation, planting and later maintenance, little financial income from tree planting and lack of clear cut BSM.

One participant claimed: *“Youth are not participating, but they should be the one making an investment for the future. They want quick money. Usually older participate, as they are the ones doing farming.”* Another participant remarked that prior to the project’s start, policy makers should have conducted a more detailed assessment of community specific needs because - from their experience - such needs differed widely across communities.

Participants agreed that free seedlings were an adequate way of engaging people in tree planting and that tree species were well chosen for the area, as it is important to offer native species like Mahogany, Wawa, and Ofram on the one hand and to enhance Cassia and Neem planting to provide future feedstock for charcoal on the other hand. Mahogany and Cassia were the most popular species among tree planters.

Figure 6-3 includes some ideas, that participants shared concerning the project design and its activities (marked with a bulb icon). An interesting idea concerned the formation of Tree Growing Associations. Participants remembered that farmers showed interest in such concepts. One participant proposed to offer cashew seedlings, as experience showed that it was easy to encourage farmers to grow cashew. On this, FC Regional Manager of Brong Ahafo stated in an interview that cashew and charcoal were not interchangeable. People needed energy which cashew did not provide unlike wood and charcoal, therefore cashew planting did not remove existing pressure from the forest. Hence, according to the FC Regional Manager, offering cashew would address charcoal production as a major driver of deforestation. To address logging due to charcoal production, one participant proposed to support children of charcoal producers and some other participants stressed that it would be more effective to promote alternative energy sources, i.e. using a demand driven approach.

Although ELCIR+ component 3 already includes the introduction of alternative livelihoods, the participants proposed that the project should promote alternative livelihoods, such as

- ♦ Shoemaking, leather works (since there is a lot of cattle in the region)
- ♦ Factory work (production)
- ♦ Beekeeping
- ♦ Soap making
- ♦ Dye production

Such initiatives, in their opinion, should target youth, and again especially the children of charcoal producers.

#### *Tree planting under ELCIR+ - Project implementation*

From the participants’ perspective, ELCIR+ started only in 2016, when they received the funds to finally start tree planting activities (see also Figure 6-1b). Participants blamed the Project Management Team in Accra for that.

A major challenge to implementation for the district office were the delayed and irregular flow of funds. One participant complained: *“Funding was released incorrectly. It was supposed to be received quarterly, instead released three times a year. Uncertainty and poor timing sometimes put the project on standstill and didn’t allow for timely maintenance of the model plantation.”*

Apart from the seedling supply and the provision of motorbikes, no further positive points on the implementation were made. Instead, participants raised several points concerning the lack of support for farmers. They criticised that neither cutlasses nor wellington boots were delivered to the district office for further distribution to the tree planters. Since support for maintenance of the plantations was not included in the activities, farmers would neglect their plantations after establishment. Either because they simply could not afford to maintain the plantation, or - according to the participants - because farmers were unsatisfied with the programme and destroyed seedlings maliciously. So, if the participants had to design

such a project, they would ensure support for farmers, who struggle to maintain woodlots after the plantations and would apply tailored approaches that took into account individual needs.

During the PRA some of the other reasons for non-adoption (for the opinion of other stakeholders see subsection 6.3.2) were raised, including competing land uses, the risk of bushfires, and a lack of awareness creation for communities. The participants said that education was crucial to mitigate risks stemming from bushfires. The information had to be distributed before the dry season and by radio announcements to inform people about causes and ways of control. Community fire volunteer squads were created as well. According to the participants, awareness creation meeting and training organised by either DGM or FC Kintampo were highly popular. The PRA participants appreciated the work of DGM and lamented that DGM kicked off two years too late since they could see the positive effect of DGM training on plantation establishment under ELCIR+. The participants further criticised that the budget allocated was generally too low and that delayed payments complicated the successful project implementation even more.

Lastly, the participants stated that the promised capacity building for FC would only address the top management and exclude field officers. In the report on the field visit for the fourth quarter of 2015, recommendations guiding in a similar direction were given:

*“Further sensitization and awareness will be required for the Technical and Ranger Supervises to increase their capacity and understanding of the Forest Investment Program. The Forestry Commission should provide office equipment and machines to the project districts to facilitate their work. Generally, periodic training should be provided for key project staff to enhance their capacity.” (MLNR, 2016, p. 15)*

#### *Impact of ELCIR+*

When discussing the impact of ELCIR+, some participants made positive comments on the target redirection towards MTS on-reserve (for details see subsection 6.1.1). The participants had positive experience with MTS as intercropping was allowed on the model plantation (see Text box 6-2 below). They have pointed out that it created employment for forest fringe communities, enhanced food security, and reduced social vices since the youth was occupied.

*Text box: 6-2. Transect walk with FC Kintampo staff and a community representative. Figure: Own illustration.*

As mentioned in the subsection 2.2.2, six model plantations have been planned to be established and maintained under ELCIR+ with an aim of improving extension services of FC off-reserve in form of farmers' field schools and demonstration of good silvicultural practices. We visited the model plantation in Hyireso, assisted by Technical Officer for Kintampo South, a Senior Resource Guard for Bosomoa forest reserve and the head of a voluntary fire squad in Hyireso and at the same time secretary of the model plantation.

The model plantation spans over 100ha and is divided into four 25ha plots, see map below. The FC District Manager Kintampo designed the plantation, with an aim of observing how teak grows with different indigenous species. Hence, each quarter of the plantation is a different combination and the plot mix species combines all - Teak, Wawa, Ofram and Emeri. On all plots Teak is a dominating species, as only every 4<sup>th</sup> tree (or every 12<sup>th</sup> meter) is an indigenous tree.

The Technical Officer sees in the model plantation a study opportunity for the FC and an educational opportunity for the people of the forest district. People can come voluntarily, but usually FC does not organize visits or workshops in the plantation. During SSIs, we learned about one seminar that included visit to the model plantation, in November 2017.

Despite the above function, MTS is also practiced on the model plantation. Local farmers are allowed to grow certain crops, such as maize, beans and yam. Other crops, such as cassava are not allowed, as they could outcompete seedlings (by e.g. creating shadow, taking up much space, having long roots). The interviewees stated that so far there are no plans of felling trees yet, but if so the MTS benefit- sharing mechanism will be implemented



In our interviews we asked farmers if they had visited the model plantation. Of 23 adopters, only three (W4, W17, W22) visited the plantation. W4 did so voluntarily, W17 was invited by the FC District Manager Kintampo personally, as they are friends and W22 went as a part of the mentioned seminar. In fact, the significant majority of interviewees did not know about the model plantation's existence.

Concerning tree planting off-reserve, the participants mentioned a number of social and environmental benefits listed in Table 6-5. Participants hoped that in the long-run, climate improvements would lead to enhanced farming outcomes. The participants agreed that the educational value of ELCIR+ in connection with DGM was high, since people came to realise the importance of trees and change their behaviour.

*Table 6-5. Environmental and social benefits of ELCIR+ as mentioned during the PRA.*

|                               |  |
|-------------------------------|--|
| <b>Environmental Benefits</b> | <ul style="list-style-type: none"> <li>– Climate Change mitigation</li> <li>– Biodiversity</li> <li>– Landscape restoration</li> <li>– Enhanced rainfall patterns</li> </ul> |
| <b>Social Benefits</b>        | <ul style="list-style-type: none"> <li>– Engaging youth</li> <li>– Improves livelihoods</li> <li>– Knowledge and consciousness on climate change</li> </ul>                  |

One reason farmers would not adopt tree planting, according to adopters and key informants, was the difficulty of acquiring land for migrant farmers (see subsection 6.3.2). During the PRA this point was raised concerning project impacts. One participant stated *“Migrants are afraid they will not have land for agriculture, especially off-reserve migrants. They are afraid they will make an investment and lose their land, e.g. a change in chieftaincy would put their land danger.”* The participants showed concern about the insecure benefit

situation of migrants which leads to inequality and might jeopardise the overall project impact. Furthermore, the participants agreed that ELCIR+ in its current shape had not led to a more sustainable charcoal production.

The participants closed the PRA with stating that the project would end too soon. Due to the above-mentioned problems the tree planting had not fully launched yet and there were some interested farmers



still. Without future funding, the free provision of seedlings and technical advice would not be possible anymore. In this context, participants also mentioned that it would be a good idea to include a possibility for FC Kintampo to follow up on plantation development of tree planters so that long-lasting and sustainable effects could be ensured. One participant explained: *“As soon as the project ends and everything stops, plantations will be neglected. We don’t do anything to see how things are going. When project ends it may all collapse. There should be a follow-up.”*

### 6.1.3 Summary of SQ1

From the above analysis several key design and implementation factors arise that have influenced the low adoption of tree planting. Firstly, the scattered trickling down of earmarked funds have prevented the forest district office from implementing the tree planting activities in a timely manner, together with the provision of necessary support. From the account of FC Kintampo, the issue of incorrect funding flows had been pervasive and at times put the implementation of the tree planting component at a standstill.

The support seems also to be an issue in itself - the project documents do recognise the failure of the project to incentivise communities and individuals yet give as a reason insufficient communication of support available to the public, rather than a general shortage in its availability. FC Kintampo, however, claimed there were not enough incentives created to encourage participation in the first place, as well as insufficient support during and after the establishment of woodlots and plantations.

Furthermore, the lack of the feasibility study had reflected strongly on the adoption of tree planting under project. The volume of the planned target was not based on an analysis of collected data and an assessment of the participation potential and the needs of communities, but rather arbitrarily chosen. A feasibility study could also have helped with a more accurate definition of target groups and the provision of a tailored approach. As exposed in PRA with FC Kintampo the de facto target groups of largely individual participants that have materialised through the project, were not consistent with the project’s goal of attracting communities. This fact also influenced a low hectare volume of plantations and woodlots created, since whole communities have more lands disposable than individuals.

As discussed, FC Kintampo officials saw increased adoption of ELCIR+ after DGM, indicating that the presence of DGM in the community had an important effect on the adoption of tree planting under ELCIR+. This impression is contrasted by statements of other stakeholders collected in Table 6-4 above. DGM will not always create change - some communities visited, due to reasons such as internal conflict or lack of support from chief, did not choose to receive the environmental education and participate in workshops. However, where well received, DGM has been a significant influence, as in the case of Dawadawa village.

## 6.2 Participants’ response to ELCIR+ (SQ2)

The aim of the framework applied, is to dissect the decision-making process behind project participation, so as to understand how both extrinsic<sup>17</sup> and intrinsic factors came together and resulted in engagement in the programme. Knowledge gained from this exercise will allow for a reflection on the reasons for the project acceptance among the participants and the objectives that individuals set for themselves in tree planting, to be later contrasted with the objectives of ELCIR+ (see chapter 8). Interviewees were clustered into one communal and three individual clusters. Individuals in our sample have been clustered according

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<sup>17</sup> The external environment of the entrepreneurial, environmentalist and communal clusters, due to geographical proximity of locations is treated as unanimous and is described in subsection 5.1.2. Political conditions, when relevant to the tree planting decision (as only such data has been gathered) are dealt with as a part of subjective norm.

to their objectives. The *entrepreneurial cluster* consists of six participants that have precise ideas about how tree planting can benefit them by contributing to their income in the long term. The *environmentalist cluster* consists of five participants that planted with environmental motivations. The *charcoal producer cluster* comprises a group of eight farmers and charcoal producers that all live in the village of Dawadawa and aim at mitigating their adverse effects on the environment while at the same time ensuring their future feedstock for charcoal production. A fourth cluster of communities and organisations consists of interviewees who represent groups that jointly established a plantation.
















### 6.2.1 Entrepreneurial cluster

#### *Objectives*

The common objective shared by all of the representatives within this group was to generate income from the trees once they matured (see Table 6-6). Two interviewees saw the woodlots as an old age security, a source of income, as well as an inheritance for future generations, both as an asset, but also as a contribution to a better ecological environment for future generations. Half of the tree planters in this cluster had the additional environmental objective of landscape restoration. Two out of six tree planters mentioned household uses. Timber from the woodlot/plantation would come in handy for roofing or furniture for example and leaves and the bark from Mahogany trees were appreciated for their healing properties.

Within these broader objectives, interviewees mentioned more specific goals. W17, who sold wooden planks in his shop, aimed for example at securing his business against future scarcity - “*I decided to participate for future benefit. In the future, I will rely on these trees and there will be less trees in general, so it is good to have one’s own.*”. The carpenter W27 and plantation owner W21 shared a similar objective to W17, together with landscape restoration goals. Another planter, W23 was a retired government official who worked in the Ministry of Agriculture and had extensive knowledge of agricultural practices. Therefore, he knew exactly how the woodlot would benefit him. He established the woodlot as a protection belt for his mango plantation, and additionally planned to start beekeeping under his Cassia trees once the canopy would be closed. W1 took a similar approach through planting Mahogany that can be used to produce medicine for sale, but also through using Cassia seedlings to create a fire belt to protect his new investment.

Table 6-6. Tree planting objectives within the entrepreneurial cluster.

| Objective                          | W1  | W4   | W17   | W21   | W23   | W27   |
|------------------------------------|---|--|---|---|---|---|
| Source of income                   |  |  |  |  |  |  |
| For future generations/inheritance |  |  |   |  |   |   |
| Climate Change mitigation          |   |  |   |  |   |   |
| Landscape restoration              |   |  |   |  |   |  |
| Enhanced agricultural practices    |   |  |   |   |  |   |
| Household uses                     |  |  |   |  |   |   |

Participants in this cluster chose the species with care (see Table 6-7 below for individual species choices). W1 and W23 chose Cassia for being very suitable for boundary planting. W27, who owned 15 acres of cashew, when asked why he planted 2 acres of Cassia trees rather than extending the cashew plantation said:

“Cashew is more beneficial, but Cassia trees bring other benefits, such as future security”, planning to sell it to charcoal producers. Planters in this cluster realised that Mahogany was overused in the area, so that W1, W4, and W21 chose this species. Although W4 was not left with much choice: “By that time Mahogany was the only species available. I would have taken other species as well. If I had the choice, I would have picked Wawa, Ofram and/or Sapele, because these species grow well here. Cassia is a big tree, but here it grows only small. So, when FC offered Cassia, I refused.” W17 chose species that were suitable for timber and grew fast. He waited until Mahogany, Ofram, and Wawa seedlings became available.

#### *Personal characteristics*

The participants in this cluster were all male and aged between 34 and 61. All of them completed Junior High School, one completed Senior High School and two held a Bachelor diploma. All of the men were engaged in farming activities to some extent. For four of them, agriculture was a main occupation, while the remaining two participants, W17 and W27, in this cluster were respectively a shopkeeper and a carpenter. All of them had access to land, sizes varying from 14 acres up to over 2,000 acres. Two of the farmers reported growing mango, two cashew and one corn and beans. All of the farmers in this cluster apply agroforestry methods.

Table 6-7. Personal characteristics within the entrepreneurial cluster.

| ID  | Gender | Age | Education (years) | Migrant farmer | Area of land, ownership (acres)   | Woodlot, Plantation size (acres), species |
|-----|--------|-----|-------------------|----------------|-----------------------------------|---|
| W1  | M      | 41  | 9                 | No             | 2,560, caretaker                  | 10, Cassia and Mahogany                   |
| W4  | M      | 39  | 9                 | Yes            | 14, permission for use from chief | 6, Mahogany                               |
| W17 | M      | 51  | 10                | No             | n/a, family land                  | 11.6, Mahogany, Ofram and Wawa            |
| W21 | M      | 38  | 16                | No             | 24.7, family land                 | 7.4, Mahogany                             |
| W23 | M      | 61  | 16                | Yes            | 37, own land                      | 2.5, Cassia                               |
| W27 | M      | 34  | 9                 | No             | 20, family land                   | 5, Cassia                                 |

All entrepreneurial tree planters except W1 were open and highly motivated. W1 was very protective of the vast land he was taking care of and refused to show us the plantation or to provide more details on the nature of the medicinal usage of Mahogany. He showed great concern that neighbours would encroach on his plantation. Whereas other tree planters in this cluster were passionate about their plantation, W17 did not remember the exact size of his plantation or the cost of maintenance. W21 and W23 were both soft spoken. W27 was very religious and socially committed with the Methodist Church Kintampo which established a woodlot under ELCIR+ (see section 6.2.4).

#### *Innovation characteristics<sup>18</sup>*

The individuals in this cluster learned about the project in different ways: two in official informational meetings held by FC Kintampo, one approached the district office himself, one was informed by an FC Technical Officer, one learned from a friend, and W17 was friends with the FC District Manager Kintampo. The latter told him about the opportunity, helped him with the design of the plantation, and invited him to see the model plantation in Hyireso. Another interviewee (W4) visited the model plantation on his own to

<sup>18</sup> The tree planting under ELCIR+ project materialises differently for every tree planter. Under this heading we are outlining the support that tree planters in each cluster received.



gain further knowledge on tree planting. Four participants took part in training or information sessions held by FC. On the topic of support, three interviewees did not receive any form of assistance apart from the seedlings and, for two out of the three, training. Two participants, W4 and W23, had the seedlings transported to them and planted for them by labour organised by FC Kintampo, at the cost of a transportation fee and food provision for the workforce. Another participant received cash support along with a map of his plantation<sup>19</sup>. Post-planting inspection by FC was mentioned by two planters.

### *Knowledge*

In general, all adopters in this cluster had a high level of the *principles knowledge* and were aware of climate change mitigation properties of tree planting. The most often mentioned environmental benefit of trees was supporting rainfall. A statement, representative of the cluster's knowledge on climate change, was made by W23: "Deforestation is a major contributor to climate change which is affecting farming practices. Rainfall decreases, wildlife is affected as their habitats are getting destroyed and most importantly global warming. This is a threat to humankind."

Despite DGM being present in the communities of W4 and W21, neither of them had heard about it and their environmental knowledge stemmed from other sources. Individuals in this cluster all had similar level of knowledge about ELCIR+ and understood how the innovation can bring a potential source of income, especially in the light of reducing tree cover around them. Moreover, within this cluster the *know-how* on tree planting was high –four out of six tree planters had broad knowledge of tree species and their properties, as well as previous experience in tree planting. W21 and W23 had experience in timber tree planting, W1 and W27 were maintaining mango and cashew plantations respectively. W4 and W17 were knowledgeable about their rights pertaining planted trees<sup>20</sup> and knew what steps they should undertake when/if they decided to harvest.

### *Attitudes*

All of the participants in this cluster had a positive *behavioural attitude* towards the tree planting under ELCIR+. They believed that tree planting was overall beneficial for them and that it contributed positively to their lives (positive *instrumental attitude*). W4, W21, and W23 further enjoyed the act of tree planting. For instance, when interviewing W23, he looked back on a successful and satisfying day, where he helped his extended family with their woodlot establishment displaying a favourable *affective attitude*.

The *subjective norm* in the planters' environment can be described as favourable. As mentioned, W17 is a friend of the FC District Manager, who encouraged him to participate and offered help with the technical details of establishing a plantation. Similarly, W1 explained that the responsible FC Technical Officer came by his farmland a lot and provided suggestions. Both W23 and W27 had close social connections with other tree planters. W23 was friends with W16; and W27 belonged to a church that decided to participate in the programme (W3). However, two farmers belonged to communities where woodlot/plantation establishment was not a common practice, reducing the favourability of their *subjective norm*. W4 explained that in his community people mostly produced charcoal and did not see the benefits of tree planting. The situation was similar for W21, who lived in a village with an ongoing political conflict and where the environmental education by DGM was received very poorly, according to the DGM field team.

Both farmers acknowledged the attitudes pertaining to the project in their communities, however they also exhibited high degrees of *perceived behavioural control*, which contributed to their adoption. W4 and W27 were self-motivated and driven and before planting and ensured that they had sufficient knowledge and capabilities to establish the plantation (W4 by visiting the model plantation and W27 by approaching FC Kintampo staff). As mentioned above, a majority of planters had high level of *know-how* on tree planting,

<sup>19</sup> Other participants had not received maps at that point.

<sup>20</sup> Other four participants have not been asked questions on this topic.

which positively influenced their confidence in adoption. W17 due to his good connections to FC Kintampo could rely on experience of others which reduced the risk in the investment, reducing the riskiness of the investment. W23 boasted a high level of capability - as a retired employee of Ministry of Food and Agriculture he was aware of issues surrounding tree planting and had an easy access to any additional information needed.

#### *Feedback into intrinsic factors*

All of the participants maintained a positive view of ELCIR+, even though they faced challenges. The main challenge mentioned is the cost of maintenance (weeding, chemicals, labour hiring). Three farmers (W21, W23, W27) believed that it was FC's responsibility to provide assistance in dealing with these expenses. Moreover, W27 and W4 would like to see more technical support in protection from bushfire.

No planter in this cluster reported willingness to expand their woodlots/plantations. W17 and W23 had their specific objectives that were fulfilled with the size of the plantation established. Being a migrant W4 faced land availability constraints and W27 worked as a carpenter so that he could only devote a limited amount of efforts to his plantation project. W21 started his first plantation of Ceiba trees in 2009 and already had extended it using Mahogany seedlings from FC.

### **6.2.2 Environmentalist cluster**

#### *Objectives*



















As outlined in Table 6-8, the objectives of tree planters in this cluster stem majorly from environmental concerns, including creating a better environment for future generations. All five interviewees embraced the supporting and regulating ecosystem services of trees, especially their water protection quality and contribution to biodiversity. W16, similarly to W2, W12 and W26, showed concern about the state of water bodies and biodiversity: *"When I was young there were so many species and a lot of water. I am planting for the next generation, my children, so they can benefit from diversity, too."* His cousin, W26, also mentioned environmental inheritance and climate change mitigation: *"I do this for my children and my grandchildren and for the country. I am doing this for the entire world."* W12 and W16 were additionally troubled by decreasing yields.

W2 founded an NGO for the purpose of planting trees for water body protection<sup>21</sup> and was currently concerned about the river *Pumpum* that fed the Kintampo waterfalls and had a cultural and historic relevance for the area. Concerning his own woodlot project, he changed his objective during the process. At first, he wanted to have it merely as a woodlot, to generate some income. More recently he decided to establish a community centre and develop ecotourism on this plot and plans to use the trees for construction as well as to provide shade and beautify the environment. W12 and W16 included the trees on their farmland to enhance their agricultural practices. Apart from environmental benefits, W12 saw the trees as an old-age provision and W22 saw the trees as a security for future generation, which will pay his children's school fees. None of the tree planters in this cluster stated that they adopted tree planting for their own income generation. W12 however expressed hope that trees would in the long run contribute to income diversification through the use of non-timber forest products and through enhanced agriculture practices: *"I hoped that by increasing biodiversity and planting more different tree species people in Danadava will be able to abandon charcoal production in future and would enjoy the same benefits that they used to. [...] Including trees on farm will increase yields and diversify crops."*

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<sup>21</sup> Prior time of the interview, W2 applied to receive more seedlings in the name of his NGO.

Table 6-8. Tree planting objectives within the environmentalist cluster.

| Objective                          | W2   | W12   | W16   | W22   | W26   |
|------------------------------------|--|---|---|---|---|
| Source of income                   |  |   |   |   |   |
| For future generations/inheritance |  |  |  |  |  |
| Climate Change mitigation          |  |  |  |  |  |
| Landscape restoration              |  |  |  |   |  |
| Enhanced agricultural practices    |  |  |  |   |   |
| Household uses                     |  |   |   |   |  |

*Personal characteristics*

This group is very diverse concerning age (range of 36 years), education (from Junior High school to bachelor's degree) and land endowment, as summarized in Table 6-9.

Table 6-9. Personal characteristics within the environmentalist cluster.

| ID  | Gender | Age | Education (years) | Migrant farmer | Area of land, ownership (acres) | Woodlot, Plantation size (acres), species |
|-----|--------|-----|-------------------|----------------|---------------------------------|---|
| W2  | M      | 30  | 15                | No             | 6.2, family land                | 6.2, Cassia                               |
| W12 | M      | 42  | 10                | No             | n/a, family land                | 11.5, Cassia, Mahogany, Neem              |
| W16 | M      | 66  | 12                | No             | 48.5, family land               | 27.2, Cassia and Mahogany                 |
| W22 | M      | 42  | 9                 | Yes            | 7, leased from chief            | 4, Cassia and Mahogany                    |
| W26 | M      | 64  | 6                 | No             | vast family land                | 6, Mahogany                               |

W2 was the youngest and most educated member of this cluster. He held a BSc in Engineering and was an active and motivated citizen of Kintampo, being an environmental NGO activist and assembly member. W12 was from Dawadawa and spoke about feeling the direct impact of the climate change. He was open about his family's low material status and affected by uncertainty surrounding agricultural activity. W12 supported the DGM project team a lot with their training and the organisation of the community meeting on June 25, 2018 (DGM Global, 2018b; see Text box 6-5). W16 was an enthusiastic and proactive farmer from Akora that tried to expand his knowledge on climate change and agricultural practices in many ways. For instance, he often visited FC Kintampo and the local Ministry of Agriculture extension office and was well-read. As an experienced farmer, besides cultivating yam, papaya, and cassava, he was preparing the land for further agricultural uses by planting nitrogen fixing legumes and did beekeeping. W12 and W16 were both critical of charcoal production due to its detrimental environmental impacts.

W16 thought that the government should implement stricter laws to constrain charcoal production and that officials should make sure that felled trees would be replanted. W16 exhibited low trust in the politicians and believed that the money that was not entirely transferred to the communities. He also held an unfavourable opinion on FC Kintampo, based on his experience with illegal tree logging and land encroachment, described in Text box 6-3 below.

Text box 6-3. Transect walk with W16. Figures: Own illustration based on data from FC RMSC and picture taken by the authors.



W16 farmed on family land in Apesika that was divided between him and his siblings. The plots were of substantial size (W16 had 48.5 acres accessible) and due to his age, W16 did not use the whole plot. He decided to enter an agreement with his neighbouring farmer and allowed him to use a part of land to plant cassava, until he needed it to plant more Cassia trees.

During that agreement the lessee felled a 40-year-old Mahogany tree that was grown naturally on W16's land, without asking for permission. We had asked him to take us to his field, to conduct a transect walk and see the damage. A part of the Mahogany tree was still there, lying next to the stump. This led to a conflict – W16 argued that the land use agreement did not allow for such action - *"I would not sell any of my trees, even for 10,000 cedi!"*.

W16 went to seek help at the FC Kintampo office. However, based on his recount he did not receive any advice or support. In his words *"all they asked me was whether I have planted the tree myself"*. W16 was desperate to solve this situation, pursued other sources of help, however, there was no help coming his way, even though he was certain that he deserved to be compensated. When prompted, W16 did not see the difference between planted and naturally occurring trees from the ownership perspective - he did not understand why it mattered whether he had planted the tree himself. Yet, from his recollection, it seems that the FC Kintampo employees did not explain to him the underlying reasons behind the question and why he could not expect any personal compensation for the cut tree. This led to disappointment on W16's part, as he felt his issue was simply being neglected by the FC and since then he has held an unfavourable opinion about FC Kintampo.



W16 was very emotional and persistent concerning the naturally occurring trees on his land. His cousin, W26, being a church preacher, was well known in his community and aimed to be a role model, as a beekeeper and an adamant tree planter. W22 was a migrant from Abase and followed his uncle to Zambrama 15 years ago. When he arrived, he started to farm yam and saved money to invest in TIENS, a private company that sells medicine and offered workshops on climate change and the importance of tree planting.



W22 additionally received Teak seedlings from them and planted them around his house ten years ago. He started cashew farming in 2014 and added six acres of Mahogany in 2017. He lost all his cashew and Mahogany trees due to a bushfire in early 2018 but he was planning to replant as soon as possible. W22 was a very open-minded, interested, and a motivated tree planter that spoke with passion about the climate mitigating effects of trees being proud about his knowledge.

#### *Innovation characteristics*

W16 got interested in tree planting through a newsletter he had received from the US in which different tree planting programmes were introduced and went to FC Kintampo to inform himself on local opportunities. Afterwards, he further advertised it to W26 among others. W12 was one of the first tree planters and established a woodlot after a community meeting in Dawadawa in 2015. W2 got a recommendation from a friend and went to FC Kintampo to acquire further details. W22 learnt about ELCIR+ through the FC radio jingle. He also positively commented on the DGM radio programme.

W2 approached FC himself for seedlings, whereas W22, W12 and other tree planters in Dawadawa (see subsection 6.2.3) were informed that FC would come visit their community to start their registration for the project and obtain seedlings. W2 participated in two meetings; one on woodlot/plantation establishment and one on fire protection. W22 was invited to meetings at FC Kintampo three times. One of the meetings included a visit to the model plantation in Hyireso.

Other than free seedlings and training, W12 and W2 did not receive any support. W2 had the possibility to hire labour at an extra cost of 151.50GHS per acre. W16 received 400GHS for the clearing and for the first weeding each. W22 received 50GHS to buy cutlasses and FC promised financial support for maintenance. Finally, FC Kintampo pegged W26's plot free of charge. Yet he commented: *"I did not receive any support! Honestly, I have to say this here!"*

#### *Knowledge*

All tree planters in this cluster were characterised by a high level of knowledge of environmental benefits of trees (*principles knowledge*) and knowledge of the properties of different tree species and how to maintain them (*know-how*). They mentioned the general effects of trees on the microclimate and their protection function (wind, fire, and disease). W2 pointed to the good canopy and wind resistance of Cassia. W22 could name species that were suitable for construction and furniture and W26 emphasised the medicinal uses of the Mahogany tree. Whereas W16 read on these benefits, W22 learnt about them at a workshop organised by a private company and W12 received training under the DGM. W26 was taught at school. W12 and W16 had high knowledge of the application of agroforestry and practised such techniques. W16, W22, and W26 had previous experience in tree planting.

W2 explained how the procedure of woodlot establishment worked under ELCIR+: First, he had to apply for seedlings in written form. After that, FC would announce themselves to survey the land. FC RMSC mapped the land and checked the ownership to avoid litigation. He had to clear and peg the plot to receive and plant seedlings. FC Kintampo would supervise and monitor, displaying good *knowledge about the innovation*, which was generally representative of this cluster. An exception would be W12's confusion, as he thought that DGM and ELCIR+ were the same programme and he was unsure as to whether the DGM project team or FC Kintampo organised community meetings.

#### *Attitude*

Members of the environmentalist cluster held positive *affective* and *instrumental behavioural attitudes*, as they embraced the benefits of tree planting and found it enjoyable and important. W2 established the woodlot, because "[his] heart told [him] to". He and W22 described tree planting even as a pleasurable activity that yielded satisfaction. Based on their knowledge of the benefits of tree planting, the participants in this cluster

were convinced that they could contribute positively to environmental protection and enhancement. W2 saw the tree planting activity as rewarding in itself: *“My reward is plenty, because I planted many trees. It could not be counted.”*

Tree planters in this cluster lived in different communities so that the *subjective norms* surrounding them differed. W22 said that there was a lack of awareness in his community so that not many participated in the project. Some, however were interested, like his uncle who wanted to follow W22’s example and waited for FC Kintampo to visit Zambrama. W26 from Apesika realised: *“All I can do is preach to my neighbours!”*, as in his environment most people did not consider tree planting important. Adding to this, W16 said: *“Most people call me crazy”* implying an unfavourable *subjective norm*. However, the two cousins (W16 and W26) had each other’s support and W16 further convinced some friends outside his village, Akora, to adopt tree planting under ELCIR+. W16 was well connected to institutions such as FC Kintampo and the Agricultural extension office. W2 and W12 faced favourable *subjective norms*. With his social commitment as assembly member and NGO activist, W2 received encouragement in his tree planting activities. W12 was from Dawadawa, where tree planting became popular due to the good reception of the DGM training (for a more detailed description of the *subjective norm* in Dawadawa, see section 6.1.3).

Except for W12 with his low material status, the environmentalists had a high level of *perceived behavioural control* being capable and confident in adopting tree planting under ELCIR+. However, W12 was motivated and confident due to the training of DGM and could get advice from other tree planters in Dawadawa. W2 was highly educated and relied on other sources of income. It was not difficult for him to undertake the initial investment. W16 and W26 knew where to get advice from and were determined to get answers. W16, W22, and W26 relied on their previous experience in tree planting.

#### *Feedback into intrinsic factors*

The five participants either already applied for a new batch of seedlings or aimed at doing so. For them, the protection of the environment was a crucial mission and the more they could contribute, the better. W12 already extended his woodlot once and showed interest in planting Wawa, Ofram, and Odum as they are species indigenous to the region. He wanted to contribute to biodiversity and knew about the home uses. He said that he would add these species to his plot as soon as FC Kintampo would be able to provide him with seedlings. Despite negative experiences with bushfire - W16’s house burnt down and W22 lost his entire cashew, and Cassia and Mahogany plantation, the participants would still like to continue/establish their woodlots/plantations. Building on his experiences with illegal land and tree encroachment and the unsatisfactory reaction and lack of support from FC Kintampo (see Text box 6-3), W16 would like to see more support from them concerning the protection of his newly planted trees as well as the naturally occurring ones on his plot. W2 evaluated household waste and pollution as well as cattle grazing as major threat to tree planting. He was worried about protecting his woodlot.



















### **6.2.3 Charcoal producer cluster**

#### *Objectives*

Adoption of tree planting among charcoal producers was both financially and environmentally driven. Cassia and Neem woodlots were established to provide a legal and reliable feedstock in future. At the same time, the participants were conscious about their adverse effect on the environment and tried to mitigate climate change. W6 for example believed: *“Having the woodlot will benefit me financially and it is important that I contribute to the climate change mitigation.”*. W10 added to this chain of reasoning that in the future it would be important to have one’s own wood for charcoal production because otherwise FC Kintampo would not allow selling it. Table 6-10 provides an overview of individual objectives within the Dawadawa cluster.



Table 6-10. Tree planting objectives within the charcoal producer cluster.

| Objective                          | W6  | W7  | W8  | W10   | W11   | W13   | W14   | W15   |
|------------------------------------|---|---|---|---|---|---|---|---|
| Source of income                   |  |  |  |  |  |  |  |  |
| For future generations/inheritance |   |   |   |   |   |   |   |   |
| Climate Change mitigation          |  |  |   |  |  |  |  |  |
| Landscape restoration              |   |   |   |   |   |  |   |   |
| Enhanced agricultural practices    |   |   |   |   |   |   |   |   |
| Household uses                     |   |   |   |   |   |  |  |   |

All of the participants saw tree planting as a way of rendering their livelihood strategies more sustainable. W8 hoped to receive cashew seedlings, but FC Kintampo only offered Cassia. W13 emphasized how through including trees on the farm, they would contribute to income diversification.

The cluster members were constrained by what FC Kintampo offered them, however, they selected their species with care. Four out of eight participants decided to grow different species on their plot; Cassia, Mahogany, and Neem. The remaining planted solely Cassia (see Table 6-11). The participants that went for Cassia aimed at growing their own feedstock for charcoal. The participants that planted three different species were additionally concerned about landscape restoration and biodiversity. W11, W13, and W14 included Mahogany as they observed a decrease in Mahogany trees around them as, in their perception, villagers were overusing this species for the healing and health enhancing attributes of its leaves and bark.

#### Personal characteristics

Table 6-11 provides an overview of the charcoal producer cluster. All of them were small-scale farmers and charcoal producers from the Dawadawa community. W10 stood out in this group of participants; she was the only woman, did not receive any formal education, and migrated from the Eastern region. Despite this, she devoted  $\frac{2}{3}$  of her available land to a Cassia woodlot. The age within the cluster ranged between 38 and 58, except for two participants that were around 30 years. The education level differed across this cluster.

Since nearly everyone in Dawadawa is producing charcoal, there was no social stigma connected to this activity. However, charcoal production as such is perceived as a strenuous occupation, that villagers had to do to gain income and feed the family. The chief stated accordingly: *“Charcoal production is tough work and no one likes it, but it brings safe income and farming doesn’t.”* and W8 added: *“It is really hard work, and no one deserves to do such work. It is a work for poor people. I would like to engage in other income generating activities. This work makes you sick, your back starts hurting, and the heat is bad for you!”*.

Table 6-11. Personal characteristics within the charcoal producer cluster.

| ID | Gender | Age | Education (years) | Migrant farmer | Area of land, ownership (acres) | Woodlot, Plantation size (acres), species |
|----|--------|-----|-------------------|----------------|---------------------------------|---|
| W6 | M      | n/a | n/a               | Yes            | n/a, sharecropper               | 2.5, Cassia                               |
| W7 | M      | 58  | n/a               | No             | vast family lands               | 1.5, Cassia                               |

|     |   |    |     |     |                       |                             |
|-----|---|----|-----|-----|-----------------------|-----------------------------|
| W8  | M | 49 | n/a | No  | n/a                   | 0.85, Cassia                |
| W10 | F | ?  | 0   | Yes | 5.5, granted by chief | 3.7, Cassia                 |
| W11 | M | 38 | 12  | No  | 10, family land       | 5, Cassia, Mahogany, Neem   |
| W13 | M | 40 | 12  | No  | 15, granted by chief  | 5, Teak, Cassia             |
| W14 | M | 30 | 12  | No  | 5, family land        | 2.5, Cassia, Mahogany, Neem |
| W15 | M | 28 | 9   | No  | 6, family land        | 3, Cassia, Mahogany, Neem   |

In general, participants in this cluster were active members of the community; open-minded and committed. W6 emphasized that he volunteered at a local health centre and in other communal activities. W11 offered to walk us around the village and introduced us to all ELCIR+ participants in Dawadawa. W13 used his shop to run an information centre on climate change so that the message spread fast and more people would get involved in tree planting. He asked DGM staff for the official DGM jingle and a megaphone to scale up his efforts. W10, W11, and W13 were very active during the DGM event on June 25, 2018 (see Text box 6-5). During the meeting, W10 and W13 stood up and shared their perceptions on climate change and their experiences with tree planting with the entire community and W11 and W13 helped the DGM staff to organize the event.



Figure 6-4. The woodlot/plantation plots of the tree planters of Dawadawa. Own representation of data from FC RMSC. \* FC RMSC has not yet completed surveying of plantations/woodlots, so not all fields are presented.

### Environment

All the charcoal producers were living in Dawadawa, a small community located 40km in the North of Kintampo at the National Techiman-Tamale Road. The community is hence well connected to Kintampo, but also to the bigger cities Techiman (100km distance) and Tamale (150km distance) and their markets.

According to the DGM project team, there was a considerable number of migrant farmers in Dawadawa. The migrant farmer W6 explained that in order to acquire land, he had to meet the chief on arrival to ask if he could lease land. The chief granted permission and selected a plot. After each farming season, he had to give the chief some of the produce. Recently, new migrants had to pay a yearly lease fee to the chief as well.

W6 had to give away a tenth of the rice harvested, nothing of maize, and dedicated a portion of yams to the communal yam festival in the community.

As outlined in the site description (subsection 5.1.2), Dawadawa is located in the transition zone of Ghana. Around Dawadawa, there are scattered patches of forest and separate trees. The interviewees all agreed that Dawadawa had experienced a forest loss and the chief of Dawadawa (W5, see subsection 6.2.4) explained that this mainly stemmed from commercial scale charcoal production that emerged around 2000. The chief also indicated that climate change had changed farming activities in Dawadawa. Six out of the eight cluster members mentioned the irregular rainfall patterns<sup>22</sup>. W10 and W11 pointed out that they were planting trees to reverse this trend in particular. Two interviewees reported that people were getting sick from too much sun (W10, W11) and water bodies around Dawadawa were drying up, so that good water sources were far (W10) and the quality of drinking water decreased (W12 from Dawadawa see subsection 6.2.2). As a consequence of decreasing and unstable yields, two of the interviewees explained that they moved away from farming to charcoal production 30 years ago, as it provided a steadier income source (W7, W8). W11 and W13 also complained about diminishing and unreliable yields. Before, they used to harvest twice but now they had only one productive season per year. Even for the one harvest season, yields were low and uncertain (W11).

When entering Dawadawa, one can see huge amounts of charcoal bags piled on one another by the roadside. Charcoal production is the major occupation for the villagers. W8 pointed out that it is a secure income source and it did not require high investments: He acquired the knowledge of producing charcoal by himself and the equipment was not expensive. W14 observed that the forest loss around Dawadawa affected charcoal production, as producers needed to travel great distances to collect wood. Text box 6-4 captures the charcoal production, sale and associated income as described by W7, W8, and W11.

*Text box 6-4. Producing and selling charcoal in Dawadawa.*

*“There are two ways of producing charcoal, for wood extraction you can either use the axe or a chainsaw. I hire a chainsaw. After cutting trees, I pack all the wood together and cover it first with grass and leaves and then with sand. After that, I dig a hole in these two layers and set fire there. For producing 20 bags of charcoal, the wood needs to burn for five days. Once this time passes, I make another hole so that the rest will burn well. It takes me five turns like this to produce 100 bags. As soon as I produced this amount, I will hire a tractor to pick up my charcoal. I can make between 12-14GHS per bag by selling them to women. These women are acting as middlemen and sell them to people in Kumasi.” (W7)*

*“For producing charcoal, I use an axe to fell. I don’t possess a chainsaw, because it is too expensive. I fell trees for two days all around Dawadawa and then I pack the wood and cover it with leaves and grass. In the end, I cover everything with sand, make a hole and set it on fire. It takes me two weeks to produce 50 bags. For 5 bags, he needs to collect wood for one day and it will burn for two days. I sell one bag for 12-14GHS mostly to other community members, to Kumasi or to middle-women.” (W8)*

*“I produce charcoal myself and sell it directly to my customers in Accra for 20GHS. If I sold it to the middlewomen in Dawadawa, I’d only receive 15GHS. The customers come to Dawadawa and pick the charcoal up.” (W11)*

Dawadawa is one of the selected communities under DGM. At the time of the interviews, DGM was conducting their training on climate change awareness in the village (see subsection 2.2.3). The chief of Dawadawa acknowledged: *“Before the DGM training people thought that it didn’t rain because of God. Now they know that it’s because of tree-cutting.”* The DGM project team reported that many dialects and tribal languages were used in Dawadawa. Nevertheless, DGM evoked a lot of enthusiasm among villagers. The community

<sup>22</sup> W6 and W7 were not asked about climate perceptions.



decided to establish a 77ha community forest on common land with the help of DGM at the end of their training. DGM Ghana chose Dawadawa for hosting the visit of Mafalda Duarte, head of the CIF on June 25, 2018. Text box 6-5 contains the observations made from attending the festivities.

A major reason for the great reception of DGM is the chief of Dawadawa's attitude. He himself participated in the DGM training and held a favourable opinion on the message of the programme. The chief indicated that there were vast lands available for tree planting and that he was happy to enter into benefit-sharing agreements with migrant farmers. W6 for instance would direct 10% of the charcoal revenue from the trees grown under ELCIR+ to the chief. Some migrants already showed interest in participating, but most had not planted yet.

*Text box 6-5. Before the CIF community meeting in Dawadawa, June 25, 2018. Figures: Pictures taken by the authors.*

The community meeting was supposed to start at 3 pm so we decided to arrive at Dawadawa a few hours earlier to get a better idea about the villagers' attitude towards DGM. The chief of Dawadawa welcomed us, evidently nervous in light of the importance of the upcoming event and the little speech he was supposed to deliver there. He also asked us to not engage in too long conversations with villagers, since everyone should be present and on time.



We joined a group of 15 people that was about to participate in the event. They were sitting under the shade of a tree at the roadside. Three of them were charcoal producers and two of this group recently quit charcoal production – one of them because of DGM, one because of wood shortages. Almost everyone from the community went to the DGM training. The group was telling us how they changed practices due to DGM's presence in Dawadawa. People had left charcoal and stopped killing trees, some even started planting trees. They further stated that charcoal production was tough work, and no one liked it, but it brought safe income which farming did not. DGM had promised them to support cashew farming.



After this, we jointly walked to the school, where the meeting was held. The DGM staff welcomed the villagers and us and we engaged in a conversation. Looking at the crowd of approximately 120 villagers, mostly female, the DGM team stressed how special the case of DGM was, since the active participation of women during the training was very high here. The DGM field team was tense and concentrated. They wanted to demonstrate how well the training was received here. Furthermore, they just learnt that the invitees would only reach

Dawadawa at 5 pm, so that the DGM staff was concerned whether they would be able to maintain the level of energy and enthusiasm among the crowd. They perceived the delay as disrespectful towards the villagers, who took a day off from farming to be present.

Everyone brought chairs from the school building to the courtyard and the DGM field team started to animate the crowd. People got engaged in conversation and chanting. The DGM slogan “*Knowledge improves livelihoods*” was repeated constantly. The villagers were extremely involved and shared how they changed their farming practices or how they planted trees. It was a religious atmosphere, people seemed unified. Commitment to climate solutions seemed to be tied to personal reputation.



When the guests (representatives of CIF, MLNR, FC, Solidaridad, and the Ghanaian rapper and appointed DGM’s Climate Change Ambassador Okyeame Kwame) arrived, around 300 villagers were present. The meeting began with a speech by the chief of Dawadawa and a rehearsed welcome dance performed by the villagers of Dawadawa. Afterwards, Okyeame Kwame performed a few songs, and Mafalda Duarte addressed the villagers and appreciated their efforts. In the end, the villagers voted on their project under DGM (see subsection 2.2.3): a community forest.

### *Innovation characteristics*

ELCIR+ seemed to be very present and widespread in Dawadawa. FC Kintampo introduced ELCIR+ in 2015 for the first time and had been coming every year and several times they were further supported by radio announcements. The interviewees decided to join the project at different times: W15, for example, started right after the first meeting, whereas the migrant farmer W6 got only interested in 2017. To support the implementation of ELCIR+, FC Kintampo had been organising workshops and trainings, both, in their headquarters and in the village. Participants remembered trainings on plantation/woodlot establishment, the function of species, the importance of tree planting, information on rights regarding planted trees. FC Kintampo had already distributed maps and a financial support of 100GHS to W6, W7, W11, W15 and W17 (see Figure 6-4 for the mapped plots<sup>23</sup>). Besides seedlings, trainings, and the map, the tree planters of Dawadawa did not receive any other type of assistance. Only W11 was given weedicide when starting the plantation. W15 learnt from FC Kintampo how to plant trees and the importance of adequate planting distances.

<sup>23</sup> Due to the vast distances of the plots in other clusters, we were not able to illustrate their plots.

### Knowledge

The tree planters of Dawadawa were in general well informed about the state of the environment around Dawadawa, the impact of charcoal production and climate change. The interviewees were concerned about their current situation and felt a strong need to fight climate change. W7 said *“Everyone here in the area cuts trees. The more people engage in tree planting, the better will we be off in future.”* The villagers explained how and to what extent they suffered from the effects of climate change such as irregular rain patterns and strong sunlight affecting their farming practices. Every interviewee here could relate the change in rainfall patterns to climate change. W10, however stated as a main reason for choosing to plant Cassia species that *“it grows fast, so it will help the rainfall sooner”*, displaying unrealistic time expectations.

W11, W13, and W14 proved to have knowledge on indigenous species; especially on their occurrence and benefits. All adopters in this cluster had a basic *know-how*, yet, none of them had previous hands-on experience with tree planting. As already mentioned in 6.2.2 tree planters in Dawadawa did not know that they could approach FC Kintampo for seedlings on their own accord and so all of the planters waited until the officers came to the village to register the number of seedlings demanded. Additionally, the farmers did not perceive the free seedlings as a limited opportunity that would finish with project’s end date.

### Attitude

The tree planters in this cluster showed a positive *behavioural attitude* towards tree planting under ELCIR+. They all embraced the woodlot/plantation establishment and its inherent environmental benefits, displaying a favourable *instrumental attitude*. However, they did not find the activity enjoyable, but perceived it as a burden (negative *affective attitude*). W14 shared his view about FC’s responsibility to contribute to Ghana’s reforestation: *“Before there used to be plantations on government lands and it was up to government to take care of the trees. Many fires caused damage and now the burden of tree planting is put on individuals, so now they can own trees and need a permit only to fell.”*

Dawadawa is highly vulnerable to climate variability and together with DGM’s education on climate change and awareness raising programme the interviewees felt an urgent need to take action. For W14, tree planting constituted a burden that needed to be done for society’s sake and the ownership of trees was a way of transferring responsibilities. Despite being very motivated and dedicated, W11 saw tree planting as *“a waste of time, basically”* for not generating any income. These views are especially interesting in light of the concrete investment and income objectives that were formulated in the entrepreneurial cluster.

The great reception of DGM and the chief’s support created a favourable *subjective norm* in Dawadawa. During the DGM community meeting, villagers stated that there were a lot of people in Dawadawa willing to plant trees under ELCIR+. Some were waiting to receive seedlings. Tree planting became a new status symbol as it made the participants become role models for other villagers. The DGM community meeting (see Text box 2-1) fed in positively to existing *subjective norm*. The villagers felt that their efforts were being recognised and all saw the DGM meeting as a landmark event for their community. W10 used this opportunity to share insights into her tree planting project with the entire community. She received approval for her efforts, was proud of herself and wanted to encourage others to participate.

None of the interviewees in this cluster had any experience with tree planting prior to the programme so that planting trees was entirely new for them, leading to a rather low *perceived behavioural control* and high level of uncertainty surrounding the success of the undertaking. However, they had each other’s backs and attended seminars and trainings from FC Kintampo and through DGM so that they felt empowered and enabled to engage in this new activity. W14 received the seedlings and set up his plantation right after the first information meeting in August 2015. Due to lack of rain, he lost all his seedlings and had to start all over again. This event had not discouraged him, as he later understood that he had received the seedlings at the wrong time.



*Feedback into intrinsic factors*

The tree planters in Dawadawa were generally satisfied with their decision. Four out of the eight charcoal producers considered extending their plantations/woodlots in the near future. W6 for instance held a 2-acre woodlot and said that: *“because of what I have learned about environment, I would even go for 10 acres”*. The two migrants in the Dawadawa cluster were dependent on the chief’s willingness to provide land for the tree planting project. W6 has the impression that it would be easy to obtain more land for this purpose. He further thought that the chief would make sharecropping arrangements that benefit the community. W10 confirmed his view; the chief would be willing to release communal land for tree planting. W15 wanted to double his plot size and hence using his entire farm land available to plant trees. W10, however, related future woodlot extension to the constraints she was facing: *“I cannot plant more trees, if I get no support with weeding”*.

Every participant in the Dawadawa cluster was facing serious problems concerning the maintenance of the plantation/woodlot, especially weeding, just like W10. Everyone wished for more financial assistance on the part of FC Kintampo. W11, W14, and W15 would like to see more support with building fire belts to protect their trees. Furthermore, W14 faced a tremendous problem with cattle grazing and requested help from FC Kintampo: *“FC did not take action, so I was so disappointed.”*











Another source of disappointment for the participants in Dawadawa were unkept promises. W10 remembered: *“When the community met with FC, they have promised tools, boots, and chemicals. So far, we haven’t received any of that. The woodlot is already growing, but I cannot weed.”* Four out of the eight interviewees mentioned FC’s promises. Among them was W11 who hoped to get more support in future, but he was optimistic saying: *“The project has just started”*, despite the project being past mid-term.

#### 6.2.4 Communal cluster

*Objective*

The main objectives in this cluster are communal, rather than personal, in nature. Within this group, the main goal of woodlots/plantations was to create a good and healthy environment for future generations by combating climate change. Additionally, the communal woodlots/plantations were seen as a sustainable source of timber and other products (see Table 6-12). Individuals who were a part of these communities, and who were contributing to the common good with their labour, would in theory be able to extract goods upon permission from the community or group leaders under certain benefit-sharing agreements. Concerning this, the community representative emphasised the initial stage of the woodlot/plantation without providing details on future benefit-sharing arrangements.

Table 6-12. Tree planting objectives within the chiefs and communal cluster.

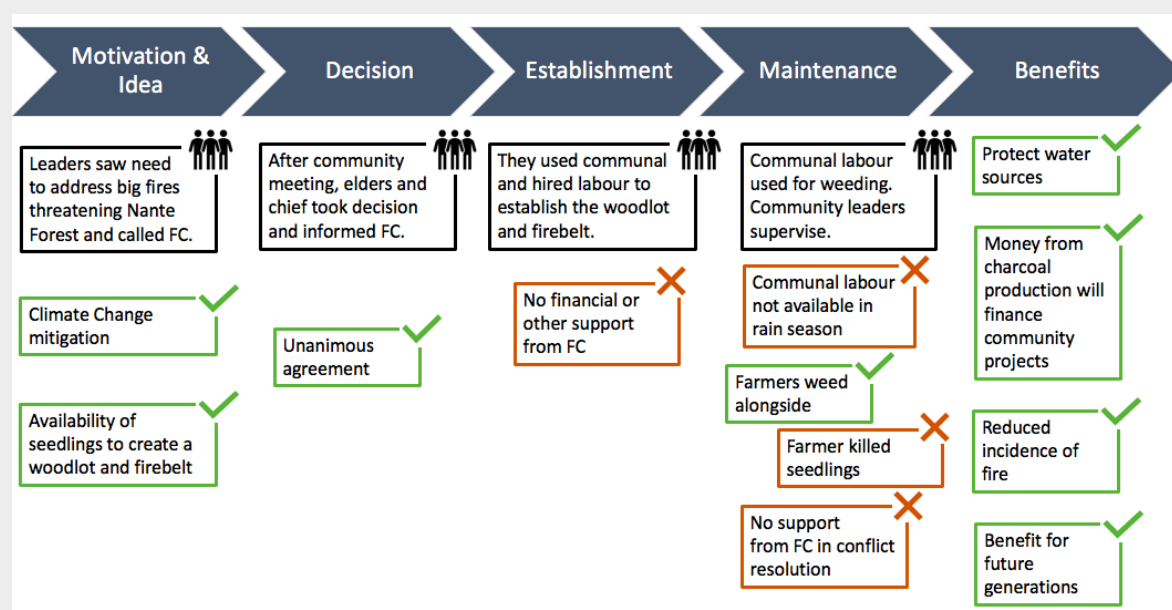
| Objective                          | W3  | W5  | W9  | W18   |
|------------------------------------|---|---|---|---|
| Source of income                   |  |   |  |   |
| For future generations/inheritance |   |  |  |  |
| Climate Change mitigation          |   |  |  |  |
| Landscape restoration              |   |  |   |  |
| Enhanced agricultural practices    |   |   |   |   |
| Household uses                     |   |   |   |   |

*Community characteristics*

As mentioned this cluster is built upon four interviews. Two of them represented groups (the Methodist Church Kintampo W3 and the Buagblen Student Union W9<sup>24</sup>) and the other two were in chieftaincy positions – W5 was a chief of Dawadawa and W18 was a Queen Mother of Mo. Additionally, the results of the PRA with the Nante community on their tree planting project is added here (see Text box 6-6).

Text box 6-6. PRA with Nante community representatives on communal woodlot establishment. Figure: Own illustration.

A PRA with a chief and three elders of Nante community was conducted on the establishment of a communal woodlot and fire belt. As a part of this exercise, the group was asked to explain the process and to provide their reflections on positive and negative aspects of each step including their expectations concerning future benefits. Results are depicted in the flowchart below.



<sup>24</sup> This interview was conducted as a group interview with four representatives: President, vice-President, secretary, and a member.

The process for Nante community had started with a decision made by the elders to address a recurring bushfire problem threatening Nante forest, one of the biggest forests in the region. The community leaders contacted FC Kintampo who informed them about the possibility to plant trees under ELCIR+ and use them for fire protection. The decision to create a 150-acre fire belt and a woodlot was made in a meeting, where chief, elders, and community members were present. The decision to plant trees was unanimous.

Nante did not receive support from the FC Kintampo in planting and used a mix of hired and communal labour on establishment of the woodlot and fire belt. In the interview, one of the elders stressed *“It is a community project. Everyone in the community should take part and acknowledge what they are doing.”* At the same time, the leaders noticed that in the rainy season there was shortage of community labour, as people would rather commit time to their own undertakings than contribute to the common good, which could result in a poor state of the woodlot and the fire belt in the long run. As a solution the chief released parts of land under the woodlot and the fire belt and allowed for intercropping. The farmers could use this extra land until the canopy closes, which solved the problem of weeding. However, as leaders pointed out this solution is only temporary, and they did not know how to solve maintenance problems in the future.

The community also faced other challenges in maintenance. The elders spoke of a situation where a farmer accidentally damaged seedlings, while applying chemicals on her crops, as her land was adjacent to the woodlot. The chief reported this incident to the FC Kintampo, which advised him to call police, but he decided against, stating: *“We are all family”*. As a solution the farmer was asked to nurse seedlings on her own and replace the ones she had damaged. The leaders would have expected more support from FC Kintampo in solving this situation.

When asked what benefits the woodlot and the fire belt would bring to the community, the elders mentioned protecting the water source and reduced risk of fire. They also saw the woodlot as an opportunity to generate cash through charcoal production for investment in community shared goods, such as a hospital or piped water. The charcoal would be produced by migrant residents of Nante: *“For the charcoal production, we want to use the existing expertise within our community. The Sisala, a tribe that is not native to Nante, but has been living here for some time, are charcoal producers. They will be paid, but less than people from outside would get. They will also profit from the communal benefits.”* Finally, the elders pointed out that they would like to see the next generation continuing their efforts.

All of the participants in this cluster were characterised by secure access to a considerable amount of land (see Table 6-13) in comparison to other clusters. The woodlots and plantations established were of shared responsibility. W5 and W18 as chieftaincy held decisive power regarding the extraction and developments on the woodlots/plantations, whereas in the case of W3 and W9 decisions were made by the board of representatives.

Table 6-13. Personal characteristics within the communal cluster. Sources: \*SAL Consult (2014), \*\*Brobbe et al., 2018.

| ID  | Community        | Community size      | Area of land, ownership (acres) | Woodlot/Plantation size (acres), species |
|-----|------------------|---------------------|---------------------------------|--|
| W3  | Methodist Church | 525 members         | 25, own land                    | 3.7, Cassia                              |
| W5  | Dawadawa         | 3,254 inhabitants*  | “Vast land”, vested in          | 29.7 Teak, Cassia, Mahogany              |
| W9  | Student Union    | 100 members         | 18, granted by the chief        | 10, Cassia and Mahogany                  |
| W18 | Asantekwaa (Mo)  | 1,586 inhabitants** | 100, vested in                  | 20, Cassia                               |

*Innovation characteristics*

The participants heard of the project through different channels. W5 and W18 had been contacted by the FC and informed about tree planting opportunities. Moreover, the FC organised the planting – delivered the seedlings, provided free labour to plant and offered supervision. In the case of W3, the church steward heard about the opportunity on the radio and proposed the initiative to the church leader board. The FC District Manager being a church member and one of the leaders, explained the details of the project at invitation of the council and assisted in the establishment of the woodlot. The planting was carried out by church members with the help of labour provided by FC Kintampo, at a fee. W18 did not have to pay for the planting service provided by FC Kintampo. W9 reached out to the FC themselves with the help of one union member who was doing an attachment at FC Kintampo during that time. The representatives of the union mentioned they had experienced problems with the availability of the seedlings in time for the planting season and had to postpone the establishment. The union, W9, did not receive any assistance with the transport or planting of the seedlings.

The training opportunities the participants mentioned also varied. W9 and W18 explained they neither received any training, nor participated in meetings. The church representative (W3) spoke about meetings organised for tree planters by FC in the Kintampo Assembly Hall, as well as sporadic visits from the FC Kintampo to provide advice and education. In contrast to the above, W5 explained there had been a lot of training offered, including workshops on forest regeneration and tree planting. The whole village was invited and informed about climate change and its effects, as well as improved methods of charcoal production.

*Knowledge*

All of the respondents had high knowledge concerning matters of climate change and environmental degradation. W18 talked about trees' carbon storage capabilities and how they supported rainfall. Similar points of *principles knowledge* were brought up by W5 and W3, who additionally talked about knowledge of the negative impacts of charcoal production on the environment. W3 was a strong advocate for a ban on charcoal production, seeing it as a significant threat, because, as he explained - "*When the last tree dies, the last man dies*". As a chief of a community, where charcoal production was a main source of income, W5, was conflicted on that matter. Even though he knew of the negative consequences of this livelihood strategy, he "*cannot be all against it, because people depend on it and it helps them to deal with poverty*". In his perception, the tree planting project offered a new opportunity to reduce the pressure on forest by rendering Dawadawa's charcoal production more sustainable. In W9's and W18's perceptions, tree planting efforts were a good way to alleviate the increasing food insecurity, seeing low yields as a primary problem the local populations were facing. All of the interviewees were confident that knowledge of climate change was prevalent within the groups and communities they represented and that the individuals knew about the benefits stemming from tree planting, even if they chose to pursue different land uses.

W9 representatives, apart from high environmental awareness had underlying *know-how*: expertise in tree planting, broad knowledge of tree types, and conditions that different species required to thrive. Additionally, the representatives of communities could rely on the collective expertise of the community members when needed.

All participants knew about the ELCIR+ workings, however they were sometimes not directly involved in the process of tree planting (W5 and W18). W5 treated ELCIR+ and DGM as strongly interrelated, to the point of inseparability. He explained how the knowledge gained in the DGM training contributed to tree planting and at times was not able to distinguish whether the specific knowledge he gained came from FC Kintampo held workshops or from DGM.

*Attitude*

The interviewees had positive *behavioural attitudes* towards tree planting under ELCIR+ and all spoke about encouraging members of their communities to pursue tree planting on their own lands as well. W5 had been advocating among the villagers that they should “*plant a tree for every single one that they cut*”. All respondents saw tree planting as a positive contribution to their communities (*instrumental attitude*), however, they were facing workforce constraints so that the plantation/woodlot constituted another burden that community representatives had to manage (negative *affective attitude*).

In terms of the *subjective norm*, this cluster consisted of community representatives with high decision-making power and thus an ability to influence the prevailing norms. By taking the initiative, they set a certain example to their communities and put forward a new set of priorities on the one hand. On the other, communities expected a certain behaviour and commitment. Villagers in Dawadawa had already been educated on climate change matters and so they acclaimed the decision of the chief to dedicate community land to tree planting. Similarly, one of the W9’s purposes as the student union was advocating for sustainable practices and so the members participation in ELCIR+ closely aligned with the union’s ideology and they were supportive of the undertaking. The long-term nature of tangible benefits from trees helped representatives not to pin down the benefits yet, leaving the benefit-sharing still insecure. This was especially relevant for W5 and W18 in their role as community leaders.

The community representatives were confident that they could participate in the project and that the undertaking was feasible (high *perceived behavioural control*). For all of them, tree planting constituted something new and innovative, however they could rely on existing knowledge in their communities. W5 and W18 had good social networks due to their high positions and knew where to get support if needed. All the community representatives had to account for the fact that members dedicated time to their personal farming projects, but they still positively perceived a general ability of adopting tree planting. All plantations/woodlots would be tended by communal labour and so the issues of maintenance, even of large plantations, were, in theory, not posing an obstacle.

*Feedback into intrinsic factors*

In line with experiences from Nante (see Text box 6-6), W9 and W18 mentioned that communal labour was sometimes scarce and that the burden was higher than anticipated. W3 and W9 mentioned how the fact that the members shared objectives in the woodlot made them motivated and enthusiastic about the project, so they readily dedicated their time to the common good. Some respondents talked about challenges after the establishment of woodlots/plantations. Bushfire had been mentioned by W18 as the most significant threat, especially since her community could not count on FC’s assistance with construction of a fire belt. Other issues mentioned were cattle grazing and draught (W9). Three out of four communities (W3, W5, W18) still had fallow land available and considered extensions of woodlots/plantations. W5 already had 190 acres surveyed by the FC for the purpose of establishing a community forest, motivated and supported by the DGM. W18 also planned to expand the variety of species on the woodlot, despite not exactly knowing about the species that were planted on the plot. Yet, she had not decided on the size of extension.

**6.2.5 Summary of SQ2***Underlying objectives, time horizons and plans to further expand*

Clustering tree planters according to their nature (individual or group) and to their objectives allowed streamlining the analysis of the decision-making process. *Figure 6-5* shows the objectives per cluster. In the entrepreneurial cluster, plantations/woodlots were established to generate income.

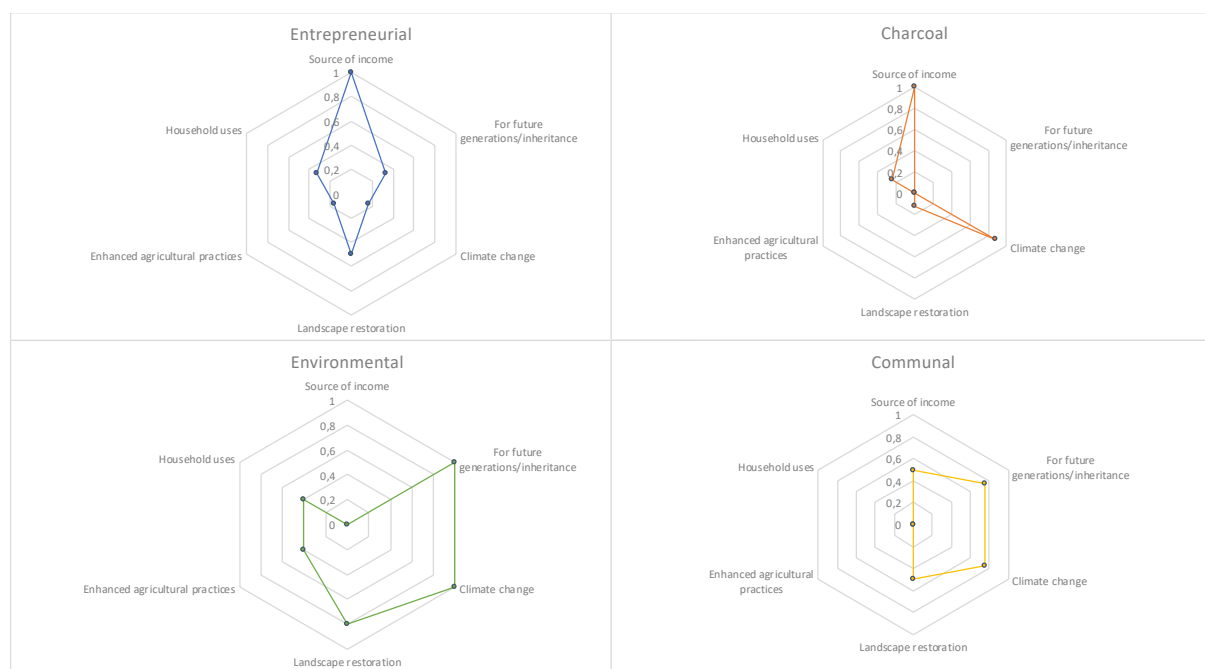


Figure 6-5. The objectives to tree planting within the four clusters. Own illustration.

Half of the adopters in the cluster additionally mentioned landscape restoration. The environmentalist cluster planted trees to mitigate climate change and restore the landscape so that future generations could benefit from a healthier environment. None of the adopters in this cluster aimed at earning income from the trees and their products. The charcoal producers established the woodlots to secure future feedstocks and render their production more sustainable. By planting trees, they wanted to reverse the negative effect they have on the environment. Future generations and enhanced agriculture practices were not a concern, however some mentioned that DGM taught about the importance of keeping trees on their farmland and W13 for instance included trees to ensure income diversification. Objectives of community projects were not as straightforward, but climate change mitigation and generational concerns motivated most community projects. Enhanced agricultural practices and household uses were sometimes mentioned as positive side effects of plantation/woodlot establishment but never constituted the major reason behind it.

With the different objectives, the time horizons to achieve these range from a few years to cross-generational time spans. The charcoal producers that wanted to mitigate their adverse effect on the climate grew the fast maturing Cassia to collect the benefit in three to four years. The entrepreneurs were not as pressed for time. Cluster members mainly expect to harvest timber and medicine from their trees so that it might take around 15 years for them to collect the first benefits on a larger scale. For the environmentalists, time spans were cross-generational. They knew that climate change mitigation and landscape restoration take time and they had a clear vision that future generations should profit from today's efforts. The time dimension for the communal cluster was similar, except for the Methodist church W3.

Potential plans to further expand plantations were also aligned with cluster assignment and tree planting objectives. The entrepreneurial cluster had a precise and well-defined vision of what to achieve with their plantation/woodlot. After erecting it, they did not express the wish to further expand. They often looked at trees as an additional investment and were not willing to dedicate more land to them, especially since they could achieve higher gains from other land uses. In contrast, the environmentalists all considered expanding, since their environmental objectives could be scaled up. The charcoal producers were torn between the perceived need to combat climate change and their personal, mostly financial limitations. Half of them considered expanding. For the communal land, representatives considered planting more trees, where land was still available.



*Intrinsic factors*

Across all adopters, there was a relatively high degree of knowledge regarding climate change. Everyone understood that the change of weather patterns related to this phenomenon and that humans with their adverse behaviour were exacerbating climate change, showcasing a good level of *principles knowledge*. Even though, climate concern did not directly feed into the objectives of the entrepreneurial cluster, every member knew about the environmental benefits of tree planting. The *principles knowledge* of the cluster of charcoal producers has not been as well established as in the case of the environmentalist cluster. Both clusters had strong climate change mitigation objectives, but the charcoal producers of Dawadawa were hoping for quick results, seeing tree planting as an “easy fix” to reverse the damage done. The reason for this is that the *principles knowledge* exhibited by adopters in Dawadawa had been obtained only recently through DGM workshops and is not as well established as in the case of the *environmentalist cluster* (subsection 6.2.2). DGM in their education focuses on creating an emotional reaction across the teaching groups and creating a sense of urgency in pursuing environmental action. The teaching emphasises strongly the causal relation between tree planting and climate change, however it is not clear whether the tree planters have been explicitly informed about the time required to revert the global environmental degradation.

Regarding *knowledge of the innovation* two findings emerge. Across clusters at times individuals were not able to distinguish between actions undertaken by DGM and FC Kintampo, blurring the lines between two agencies, which could affect their attitudes towards the innovation (e.g. on the amount of educational services available under ELCIR+). Additionally, the fact that the availability of free seedlings was not indefinite i.e. that the project has a limited time span was not recognised by some.

*Know-how* was strong in the environmentalist and entrepreneurial clusters where majority of adopters had previous experience in tree planting, as well as knowledge of the purposes of different species and their maintenance. The charcoal producers did not have experience in tree planting. In the communal cluster the leaders either were confident in tree planting themselves or knew that they could rely on knowledgeable members of the groups.

All tree planters developed a positive attitude toward tree planting under ELCIR+, however based on different reasons. Concerning the *behavioural attitude*, the environmentalists and the entrepreneurs both embraced the benefits of tree planting and found the activity enjoyable (positive *affective* and *instrumental behavioural attitude*), although to different degrees. This enjoyment was not shared by the charcoal producers that saw tree planting as a necessary, though burdensome undertaking (negative *affective behavioural attitude*). They were constrained by material shortcomings and a rather strenuous livelihood. In light of community specific challenges, community representatives appreciated the benefits of tree planting for their respective situations, displaying mostly positive *instrumental behavioural attitude*. Due to labour constraints at times, the representatives did not particularly enjoy tree planting. The plantation/woodlot was just adding to already existing duties.

The *subjective norm* surrounding tree planters differed across clusters. Both entrepreneurial and environmental clusters found support for their activities among family and friends. For some of the environmentalists, the *subjective norm* was less favourable, as they were the only ones interested in tree planting and environmental issues in their communities. In the case of the communal cluster, given the high status of leaders, they received acclaim from the members of the community, while setting an example for others to follow. The influence of the *subjective norm* was especially visible for the charcoal producers. In Dawadawa, the training and omnipresence of DGM created a widespread excitement about tree planting and made a big group of villagers interested in tree planting.

For the *perceived behavioural control*, it was generally quite high in the environmentalist and entrepreneurial clusters. The sources of high confidence and perceived high capability were the support that planters could

expect from FC Kintampo, the training they received and for some of the tree planters former experiences. In Dawadawa the training from DGM was a major source of confidence, even though there was little technical information on tree planting included in the workshops. However, tree planters knew their personal and financial constraints and were afraid their woodlot maintenance was endangered by the lack of support. The community representatives with their high level of available land and communal labour showed high levels of *perceived behavioural control*, additionally they could rely on existing knowledge and expertise within their communities.

#### *Certainty of benefits, migrants and communities*

As shown in the subsections 6.2.1, 6.2.2, and 6.2.3, five of the 19 individual farmers that planted trees under ELCIR+ were migrant farmers. Most of them did not face any difficulty in obtaining land for tree planting. However, even though the region around Kintampo hosts a lot of migrant farmers from northern Ghana (Amanor, 2009; MOFA, 2010a), the share of migrant farmers in our sample was relatively low. Migrant farmers, just like all other tree planters received cadastral maps of their plots as a proof of tree tenure, however as they are sharecroppers, the project does not guarantee any assistance if ownership conflicts arise. It became evident through conversations with sharecropping farmers that the project had not mediated on the matters of benefit-sharing or implemented a coherent system of division of proceeds, as the existing agreements varied from participant to participant. A similar point can be raised for communities, where decisions on benefit-sharing had been made internally. Section 6.3 contains further details on the difficulty of acquiring land and the uncertainty of benefits stemming from short-term leases.

Establishing tree plantations on communal land can give rise to a number of potential conflicts. The establishment of communal woodlots like any other common good, places an additional burden of managing maintenance for community leaders. Community representatives reported that there was a shortage of communal labour, as in the work intensive seasons, villagers also needed to ensure that they could work on their own plots. Having to divide their time, some farmers may pursue free riding behaviour, which is a well-known problem connected to common goods. The case of Nante showed how lack of knowledge or care for the shared good could create damage.

However, communal woodlots also create a source of power, since community representatives decide on the exact distribution of benefits. None of the three interviewed community members had arranged any BSM yet. Instead they postponed decisions since benefits only arise in future. In case of a lack of solid contractual agreements, the distribution of benefits within communities may be largely dependent on relationships and status. The charcoal producing tribe of Nante, will have access to the benefits conditional on them providing an additional service below market price, compared to the indigenous community members. Additionally, from the perspective of people in potential adopter communities, the risk of elite capture exists, which would nullify the common benefit of the investment. In light of this, benefits could appear less certain for some villagers which again decreases the likelihood of dedicating labour to the common project and thus increases free riding.

#### *Innovation characteristics*

As outlined in each of the clusters, the project materialised quite differently for each tree planter. Tree planters heard about the opportunity of receiving free seedlings via different communication channels. It seemed that the two main methods of advertisement: community meetings and radio jingles worked well, as respectively 9 and 5 adopters learned about ELCIR+ through these channels. The remaining were either informed by FC officers (4) or by befriended tree planters (3), and three planters approached FC Kintampo themselves.

Looking at the received support for each tree planter neither a spatial nor a temporal pattern could be identified, except for the tree planters in Dawadawa that all received a very low level of support, despite the

quite frequent meetings that FC Kintampo held in this community. Only one tree planter (W16) got significant monetary support for clearing and weeding. W11 received weedicide in the beginning and W22 cutlasses. It seemed that those planters who received free planting service from FC Kintampo were either community representatives (W5 and W18) or had special connections to FC Kintampo (W17) or the Agricultural ministry (W23). However, despite not having such networks, W4 and W26 received free services from FC. Concerning post-plantation visits, it seems that Technical Officers or other FC staff would pay you a visit, if you requested it. Many planters, especially in the charcoal producer cluster, referred to promises made by the FC, such as provision of agro-chemicals, land clearing and weeding services, that were never delivered for the majority of them.

### 6.3 Non-adopters (SQ3)

The four clusters analysed in section 6.2 represent farmers and communities who decided to plant trees on their lands. The analysis revealed extrinsic and intrinsic factors that lead to the adoption of tree planting, including relevant knowledge of tree planting and climate change, and favourable attitudes. However, as outlined in subsection 6.1.1, the project component failed at reaching its target group and only 11.5% of the 6,200ha plantations/woodlots that were originally aimed at could be established so far.

After having explored the decision-making project underlying tree planting in the context of ELCIR+, this section moves the focus to the large majority of non-adopters in Kintampo Forest District. By first applying the framework to a fifth cluster of interviewees that either passively or actively decided against tree planting under ELCIR+ and then triangulating this data with the perspectives of stakeholders (i.e. adopters and key informants) on non-adoption, the reasons for not planting trees under ELCIR+ will be revealed.

#### 6.3.1 The fifth cluster: Non-adopters

##### *Personal characteristics*

The four individuals in this cluster were between 27 and 60 years old and all male. The education varied between primary school completion and university degree. All interviewees in this cluster cultivated cashew, except for C14 who was planning to establish a cashew plantation soon. C3, and C15 additionally planted other food or cash crops (see Table 6-14).

Table 6-14. Personal characteristics within the non-adopter cluster. \* established outside the scope of ELCIR+.

| ID  | Gender | Age | Education (years) | Migrant farmer | Area of land, ownership (acres) | Occupation  |
|-----|--------|-----|-------------------|----------------|---------------------------------|---|
| C3  | M      | 60  | 15                | No             | 23.5, own land                  | Retired teacher, farmer (mainly cashew, other food crops)       |
| C13 | M      | 27  | 6                 | Yes            | 6, granted by chief             | Farmer (cashew)   |
| C14 | M      | 58  | 9                 | No             | 10, own land                    | Former charcoal producer, farmer (maize, yam, and rice)         |
| C15 | M      | 43  | 9                 | No             | 38, own land                    | Rents out tractors and farms (mango, cashew, orange, and Teak*) |

C3 for instance planted cashew in 2011 when he was about to retire, bearing his children inheritance in mind when making the decision. He bought the first cashew seedlings and extended his plantation later on

with seedlings from his brother. C14 had been producing charcoal until two years ago, when he moved back to agriculture. During the interview, C15 shared that he just recently made the decision to plant orange trees on 3 acres by the river and was waiting for the seedlings. C3 stated that he owned vast lands and C14 confidently stated: *“I come from this place, I can get land very easily to do whatever I decide.”*

#### *Innovation characteristics*

The four non-adopters in this cluster heard about the possibility of obtaining free tree seedlings from FC Kintampo through similar channels. C3 from Kintampo Zongo said that his neighbour told him about this opportunity and C13 knew about the project from tree planter W4 (clustered under entrepreneurs, see subsection 6.2.1). C14 from Dawadawa and C15 who rented out tractors to the charcoal producers of Dawadawa found out about ELCIR+ from the villagers there (see subsection 6.2.3). In addition to the four non-adopters that knew about the project, we show the case of four cashew farmers from C3's community Kintampo Zongo in Text box 6-7 below. The four farmers did not know about the opportunity of obtaining seedlings from FC Kintampo and thus passively decided against adoption.<sup>25</sup>

*Text box 6-7. Farmers in Kintampo Zongo that did not know about ELCIR+.*

C1, C2, C11, and C12 were farmers from the Muslim community Kintampo Zongo that had not heard about the opportunity of obtaining seedlings from FC Kintampo. They ranged between 45 and 73 years of age and did not receive formal education but were attending Arabic school once a week. Being native to the area, all villagers farmed on family land. The farmers devoted a big part of their land to a cashew plantation, since they had a reliant buyer; a company in Techiman with an extension in Kintampo.

Except for C12, all farmers were realizing changes in the landscape and/or climate around them. C1 complained that the timber and charcoal production led to deforestation so that the sunshine was stronger affecting, flowers and fruits. C11 also noticed the ongoing desertification. For C2 the change in rainfall patterns was apparent.

C1 showed general distrust in organisations that promote tree planting, remembering: *“There was an organisation that encouraged to plant a tree called sunflower in the past and was supposed to find a buyer. The initiative was not completed, and in the end, it was a waste of time.”* C1 was referring to the sunflower as a tree which shows the lack of knowledge and from this statement, it becomes evident that C1 would only engage in activities that promise income. Due to this incident, it would be hard to convince C1 to engage in tree planting.

The sub-chief of this community (P6) acknowledged the general importance of trees but believed that naturally growing trees are better than planted ones because of natural strength and purpose: *“God planted trees where they should be planted”*. He talked about deforestation due charcoal production and criticised the chiefs subordinate to him for felling too many trees. People would not consider how long it takes for the tree to mature and cut premature trees. The sub-chief did not know about ELCIR+, but criticised FC for not doing enough for afforestation.

#### *Knowledge*

Since the four non-adopters learnt about ELCIR+ from either friends or neighbours, they all obtained a certain degree of *knowledge of the innovation* and had access to a greater pool of knowledge, in case they had questions or doubts. However, nobody in this cluster had direct contact to the FC officers and they did not hear the official radio jingle.

The *principles knowledge* in this cluster was rather high. The retired teacher C3, being well educated knew

<sup>25</sup> We do not apply the full framework to the four cashew farmers from Kintampo Zongo, since the framework primarily aims at uncovering the intrinsic factors underlying active decision-making. The four farmers for instance, cannot hold any attitudes towards tree planting under ELCIR+. Other types of knowledge and attitudes are presented in the textbox along with information on extrinsic factors.

about the environmental benefits of trees and changing weather patterns. C13 knew about the negative effects that go along with tree cutting and said that people should “*please trees*”. He named FC’s role as follows: “*FC gives advice to not cut trees and when people still cut, they are advised to plant a new tree.*” Despite stressing the importance of future generations knowing where trees stood, he told us about a naturally occurring Mahogany tree, that was disturbing his cashew plantation. He considered cutting it down, without asking FC for permission, since the probability was low that FC would come and check on the tree. Analogously to the tree planters from Dawadawa (see charcoal producer cluster in subsection 6.2.3 and the environmentalist W12 in subsection 6.2.2), C14 learnt about climate change from DGM and as a consequence stopped producing charcoal. He stopped, because: “*DGM trainers told me that when last tree dies last man dies.*”, using the same wording as W3 (see subsection 6.2.4). C15 embraced the double-edged nature of charcoal production: “*Charcoal is a good source of income for people and a good source of devastation for the community. Climate Change disturbs local agriculture by interfering in rain patterns.*”

Concerning *know-how*, all non-adopters except for C14 had experiences with tree planting, since they cultivated cashew plantations, orchards and/or Teak plantations. C14, however, knew how to obtain cashew seedlings and could get advice from his neighbours who established woodlots and plantations under ELCIR+. C13 knew about the importance of favourable soil conditions and inferred from observing the neighbouring plots that his soils were not eligible for the species FC Kintampo offered. One neighbour planted Teak trees 15 years ago and another neighbour had been cultivating cashews for 5 years. Both farmers weeded and cared for their crops equally. He compared the plots and found that the revenue from cashew was higher and the plants grew better. He has concluded that the soil is unsuitable for other trees. Moreover, he stated that cashew would already generate income three years after planting and trees would take more time. From the size and state of the above mentioned Mahogany tree, he established that his soils were also suitable for Mahogany, but he found the time the tree takes to mature to be too long. C15 was well aware of the bureaucracy that accompanies the harvest of timber, despite the respective tree ownership: “*When you plant your own trees and cut them without FC permission, they catch you on the road, ask questions where you got the trees from and bring you to their office. They ask whatever money they want for the permission.*” In general, C15 thought that it was good that FC Kintampo wanted to stay informed, but without collecting money: “*I plant the tree and take care of it so why should I pay? For cashew, orange and mango, I don’t need any permit.*”

### *Attitude*

Whereas C3 had a rather negative attitude, the other cluster members were fairly positive towards tree planting under ELCIR+. C3 perceived planting timber trees as a labour-intensive activity that would not bring future income accordingly (unfavourable *instrumental attitude*). C15 observed the change in landscape with concern and generally approved the idea behind ELCIR+. He established his Teak plantation because of this and as an old age provision. For him, the bureaucratic burden connected to timber trees, however, was too high, so that he instead established cashew and fruit tree plantations, without having to pay fees or apply for permits. C13 and C14 actively chose cashew over tree planting under ELCIR+, driven by the financial benefits.

In C3’s community, no one participated in the project and as shown in Text box 6-7 above, the sub-chief of Kintampo Zongo, thought that naturally occurring trees were superior to planted ones. The *subjective norm* of the other non-adopters was more favourable. C13 from Babato lived in a community that received training from DGM and that was often visited by the Technical Officer Kintampo North. Furthermore, community members showed interest, or already adopted tree planting. C14 from Dawadawa and C15 in constant contact with its villagers, were surrounded by a lot of adopters and the general DGM excitement as described in subsection 6.2.3. In contrast to the tree planters from Dawadawa, C14 reacted to the DGM education by stopping charcoal production and stated that both cashew and timber trees delivered environmental benefits. He would then instead establish a cashew plantation to also collect higher monetary benefits.



C14 had a low level of *perceived behavioural control*, since he had no experiences with tree planting and was strongly concerned about his financial situation. He told us he could not afford to plant timber trees, although he had no land constraints. C3 on the opposite would have had a high level of *perceived behavioural control*, since he was well educated, experienced in tree planting and knew where to seek help, yet he simply did not consider the option to plant timber trees (i.e. passively rejected it). C13 and C15 had a rather high *perceived behavioural control*. C15 had a strong network and was not constrained financially. Furthermore, he gained experiences and *know-how* from his teak plantation. C13 considered the option of adopting tree planting under ELCIR+ and rejected it after an informed and thorough thought process.

### 6.3.2 The perspectives of project stakeholders

Figure 6-6 below illustrates reasons for non-adoption given by participants (n=23) and key informants (n=24, for full list of interviews see appendix B). It becomes obvious that the majority of reasons given for non-participation either concern competitive land uses such as cashew or food crops, too little support to engage in tree planting under ELCIR+, or lacking knowledge of the benefits that trees bring. Insufficient support is strongly connected to the high costs associated with tree planting, such as transportation or maintenance costs. These three major barriers could have been mitigated by an informed project design through adequate activities, enhanced awareness creation, and an effective support system. By developing the project characteristics that are common to all adopters and non-adopters, section 6.1 uncovered the extent to which the project design and implementation failed at addressing barriers that led to low adoption rates.

#### *Competitive land uses*

According to tree planters and key informants, the most prominent reason to not plant trees under ELCIR+ were competitive land uses. The long-term nature of tangible benefits from trees, low market prices compared to cashew, and high initial costs of transport, land preparation and weeding in the first years, render tree planting less attractive than cash or food crops. Nine participants and six key informants raised the issue of competitive uses. All six key informants and three planters stressed here that cashew outcompeted tree species offered by FC Kintampo. The remaining six participants found that food crops were more relevant for farmers<sup>26</sup>.

The Senior Agriculture & Natural Resource Management Officer managing ELCIR+ at the AfDB Ghana country office pointed to advantages of cashew compared to timber trees: *“Cashew production was more attractive than tree planting due to high demand for cashew and fast benefits. Trees take time to grow, whereas cashew delivers benefits in 2-3 years.”* This coincides with the statement made by FC District Manager Kintampo (as quoted in Figure 6-6). Market conditions for cashew were very favourable in Kintampo with good road access to Techiman, where a cashew processing company was located. The FC Regional Manager of the Brong Ahafo region stated in line with this: *“Cashew became just now successful. President has boosted production and people are enthusiastic. Cashew production promises fast returns to investments.”* The tree planter W27 said: *“People see cashew as a better alternative and they want benefit quick. The need for quick money is a major reason why people do not plant trees. In Kunsu community this is a main reason why people do not engage in tree planting.”*

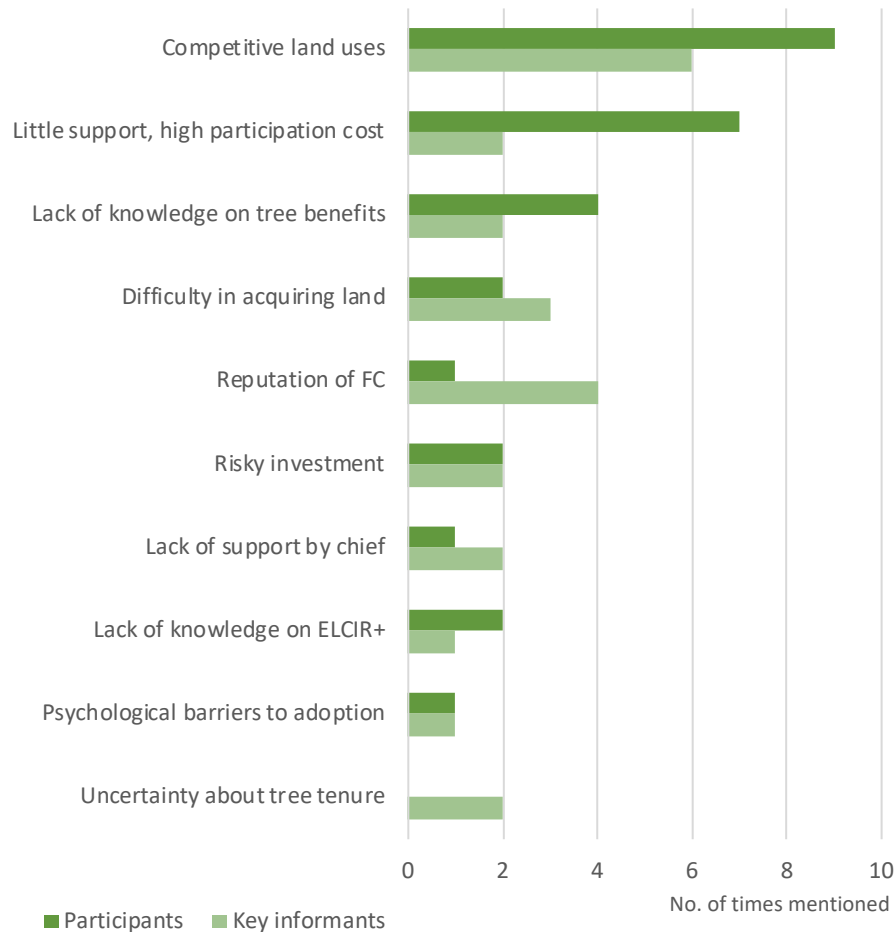
The Manager of the Plantations Department FC RMSC, as well as the two tree planters W16 and W21 mentioned in this regard the perennial nature of trees. According to them, people decided against planting trees because they could not deliver instant cash flow and would occupy the land for a long time before producing tangible benefits.

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<sup>26</sup> The Manager Plantations Department FC RMSC mentioned both - cashew and food crops.



### What are reasons for not participating in ELCIR+?



### Selected quotes

*“Cashew brings much more benefit faster. After 3 years, the farmer can gather cashew twice a year and earn 300 cedi. A teak tree takes 20 years to mature and a farmer will get 10 cedi for one tree.” (FC Forest District Manager Kintampo)*

*“Three people who wanted to plant **couldn’t arrange the transport** on their own, so they did not start the plantations.” (W9, Buagblen Student Union )*

*“Farmers do not see, **how they can benefit** from planting trees.” (W21)*

*“It is **expensive to buy right to land** from the chief if you are a migrant. It wouldn’t be a complicated or long process, just very expensive and have to give away part of produce.” (W14)*

*“People don’t expect to get the benefits from the planted trees. **They think that FC** will just come and cut and **keep all benefit.**” (W15)*

*“People are afraid to make investment, because **fire can take it all.**” (W14)*

*“It is important to get the **chief and elderly on board.**” (DGM field team)*

*“If they know **little about the programme**, they wouldn’t participate” (W3)*

*“Some people are **too lazy.** Those who are farming anyways often participate.” (W13)*

*“They [Farmers] were afraid that if you plant the tree, it will be felled just like the naturally occurring ones. [...] So, what the project aimed to do was to encourage people to continue planting trees because now, when **you plant the tree you own it.** So, a lot of communities **did not know about that.**” (Manager Plantations Department FC RMSC)*

Figure 6-6. Reasons for non-adoption given by project stakeholders. Own illustration.

Without particularly pointing to cashew, the Queen Mother of the Mo (W18) and W10 said that people generally showed more interest in cash crops. W4 and W23, however, thought that food crops outcompeted trees, W4 said to this: *“I have been hearing that people in his village fear that they could not continue with food crops. I try to tell them that they could still include trees on farm.”*

#### *Little support, high participation cost*

Two representatives from FC admitted that the provided incentives were insufficient. FC District Manager Kintampo asked: *“How can people leave their farms and take time to grow the trees? People need more support. [...] There were only seedlings and technical assistance, but no additional support”*. FC’s Director of Operation (Plantations) said that they learnt from this experience and that the main incentives provided, i.e. free seedlings and availability of technical advice were not adequate. Majority of tree planters agreed on this. W2 used a metaphor here: *“You can’t give a hungry man food without water, otherwise he chokes.”* The Queen Mother of the Mo (W18) and three tree planters from Dawadawa also quoted lack of support as a major reason why other community members did not adopt tree planting under ELCIR+.

As cited in Figure 6-6, representatives of the Buagblen Student Union in Gulumpe remembered that there were three members who wanted to devote their private land to tree planting could not organise transport and W21 from Anyima explained in line with this: *“The barriers for getting the seedlings are too high. Even though they are free, you have to take care of transport cost. The small costs of going back and forth all the time accumulate. You need to find a car for transporting seedlings.”*

#### *Lack of knowledge of tree benefits*

Another often mentioned reason behind non-adoption of tree planting under ELCIR+ was the lack of knowledge of tree benefits. Two key informants and four tree planters mentioned that issue. The Manager of the Plantations Department in FC RMSC recapitulated: *“Farmers cannot really understand that the trees provide the carbon and so on. The programme is expected to do a lot of awareness programmes. Radio programmes, Community debates, billboards, posters, all talking about the importance of tree planting. [...] Which means that the awareness creation has to be intensified in the field.”* And some of the tree planters agreed to this statement, as W9’s quote in Figure 6-6 shows. W22 complained that the education on climate change was insufficient in the Zambrama community and W21 from Anyima also thought that farmers did not understand how they could benefit from trees. W2 also expressed: *“People should be more informed about the impacts of lack of tree planting, it changes the land.”*

As outlined in subsection 2.2.3, DGM was supposed to sensitise the farmers to the importance of tree planting and in section 6.1 we reproduced different opinions and perceptions of DGM’s role and the synergies between DGM and ELCIR+ from key informants. In an interview, the DGM field team stressed the importance of awareness creation and remembered: *“Once we have started education, people were walking to the FC to get seedlings. Even whole communities have decided to plant.”* In their view, the lacking awareness creation prior to DGM presence in the field constituted a key barrier to successful ELCIR+ implementation.

#### *Difficulty in acquiring land*

Some of the adopters and key informants remarked that the share of migrants was quite low among tree planters. The FC Regional Manager of the Brong Ahafo Region gave one reason for the low participation of migrant farmers: *“If you are a landowner, you are ok, but if you are a migrant farmer then you have to be lucky with your landlord to be able to plant trees on his or her land. Some landowners feel threatened and might think that the migrant wants to acquire his or her land.”*

In addition, the FC Technical Officer for Kintampo North pointed to land release from chiefs to migrant farmers as a major barrier to tree planting. Migrant farmers had little land anyways and did not want to devote it to activities that did not bring income. W14 stated that it would be costly but not complicated to

obtain land whereas W17, another tree planter stated that it would not be easy to acquire land for a migrant farmer. The conditions for migrants to be able to acquire land differ across and even within communities (see quote in Figure 6-6). Text box 6-8 below contains the conditions for tree planting for landless farmers in three communities.

*Text box 6-8. Benefit-sharing in different villages.*

Dawadawa - The chief offered to release land to migrants on the basis of benefit-sharing agreements. W6 for example will have to transfer 10% of the future charcoal revenue stemming from the woodlot. Only recently, new arriving migrants to Dawadawa would have to pay a yearly lease, W6 added.

Zambrama - The chief also recently altered the sharecropping system, but more specifically for perennial crops. If a migrant wanted to plant trees, they would have to either pay a lump sum of 500GHS or share 50% of the future revenues. These high charges only apply to tree plantations as the land cannot be used for food crops, as explained by W22 and his uncle C18. Before that, farmers could lease an acre for 300GHS for 25 years regardless of the use.

Babato - C19, a migrant farmer from Babato who showed interest in ELCIR+ said that there were fixed crop dependent shares that had to be directed to the chief. He pointed out that people in good relationship with the chief could decide themselves how much yield they would give away.

#### *Reputation of FC*

The FC manages the tree planting activities under ELCIR+ in the field and is hence responsible for project promotion, seedling distribution, and technical and tangible support. As quoted in Figure 6-6, W15 believed that people did not expect to obtain benefits from planted trees, since FC would come and appropriate them. Several key informants from institutions such as MLNR, FC RMSC, DGM/Solidaridad, and the traditional authorities shared their views on the reputational problems of FC in connection to the programme's implementation. MLNR's Technical Director stressed: *"FC suffers bad reputation and it is an obstacle to FIP implementation. You always blame people based on the past. The farmers had bad experiences with FC. FC embraces this, and they know where the communities are coming from. Despite this obstacle they have had a lot of successful projects as well."* The DGM field team highlighted the conflicting role of FC district offices, being the punishing agency on the one hand and educating and encouraging on the other hand. The DGM field team concluded that outsourcing the awareness creation and capacity building to DGM with Solidaridad as implementing unit, was a good idea as DGM came without stigma and could approach communities more effectively. The FC RMSC Manager of the Plantations Department connected the bad reputation of FC to the tree tenure situation and underlying bureaucratic structures: *"So, if you want to fell this tree, there is a procedure that comes with it. Because of this, the FC had the authority over the trees. A lot of things happened in the past that made the communities not to be interested in trees off-reserve."*

#### *Risky investment*

Analysing the decision-making processes of tree planters in subsections 6.2.1, 6.2.2, and 6.2.3, it became evident that plantation establishment was a risky undertaking. Bushfires especially presented a challenge to tree planting projects across all clusters. The tree planters presented in these subsections decided despite this risk of fire to establish a woodlot/plantation; some (Nante community and W23) with the specific purpose of erecting a fire belt. However, W14 and W17 pointed out that for some farmers the risk of fire constituted a major reason to not engage in tree planting. People would be afraid of losing their investment. As the FC Regional Manager of the Brong Ahafo Region put it: *"Fires defeat efforts of the project."* According to the tree planters and lower FC officers, other risks included free cattle grazing, and land encroachment.

#### *Lack of support by traditional authorities*

As outlined in *Difficulty in acquiring land* above, the chiefs play an important role and their general support of

ELCIR+ and a conviction that tree planting was good, could create beneficial conditions for migrant farmers. Furthermore, being in good relations with the chiefs could yield in favourable benefit-sharing arrangements. Apart from that, the DGM field team leader said that it was important to have the chief's support to permeate a community and conduct successful awareness creation and capacity building. The FC Regional Manager of the Brong Ahafo Region similarly stressed: *"FC targets opinion leaders that play a massive influence on people. Providing education is a part of ELCIR+."*

#### *Lack of knowledge on ELCIR+*

In the previous section, Text box 6-7 presented the case of four farmers from Kintampo Zongo, who did not know about the opportunity of obtaining seedlings from FC Kintampo. Although the FC District Manager Kintampo confidently stated: *"Everyone is informed about the opportunity in a communal meeting and on radio."*, two participants questioned whether the outreach of ELCIR+ was sufficient.

#### *Psychological barriers to adoption*

As elaborated in section 4.1 tree planting under ELCIR+ constitutes an innovation to the target group. To adopt such new practices, people have to change their habits, which as such constitutes a barrier. The FC Regional Manager of the Brong Ahafo Region commented in relation to that: *"Whenever you introduce something new, it will take a lot of time. People have to step out of their comfort zones and apply a concept that they might have not fully understood yet."* One participant (W13) observed this phenomenon calling it simply laziness (see quote in Figure 6-6). A family member of W17 stated that everyone knew about the impact of charcoal on the environment, but people would still continue cutting trees, because it was easier than ensuring sustainable feedstock.

#### *Uncertainty about tree tenure*

Uncertainty about tree tenure was mentioned as a reason to not participate by two key informants, yet they highlighted different angles. The Manager of the Plantations Department at FC RMSC stressed that some community members were reluctant to adopt tree planting since they were insecure about the ownership and user rights of planted trees (see quote in Figure 6-6). This relates to the above-mentioned distrust in FC (as outlined above in *Reputation of FC*) and uncertainty about the bureaucratic processes related to felling permits. The FC District Manager Kintampo stressed the long-term nature of benefits stemming from trees that are at risk when facing insecure land tenure: *"Migrants are insecure the woodlots will be theirs long term. They are not land owners, so land with the new trees may be taken away from them. The conflict is solely between the landowner and the planter. And there is no clear cut BSM – even under ELCIR+."*

### **6.3.3 Summary of SQ3**

Through presenting the case of eight non-adopters and triangulating the findings with perceptions and opinions from project stakeholders, the reasons for non-adoption of tree planting under ELCIR+ in Kintampo Forest District are revealed.

#### *Communication channels and community penetration*

The cluster analysis indicated that information on the project reached communities to different degrees. Despite being located close to the centre of Kintampo and the FC district office, in Kintampo Zongo not even the sub-chief knew about ELCIR+ and from our insight, the official communication channels did not reach them. C3 was the only non-adopter from Kintampo Zongo that we interviewed who knew about the project. Even he was not actively considering this opportunity and rejected passively. In the case of Kintampo Zongo, it seems that insufficient information on the project was present for community members to form an opinion on ELCIR+. None of the eight non-adopters either heard the radio jingle or spoke to FC district staff about the project. The four non-adopters who knew about ELCIR+ heard it from neighbours or friends and thus did not obtain official information. These findings from the cluster analysis

are in line with some of the mentioned reasons for non-adoption in subsection 6.3.2; lack of knowledge on ELCIR+, and lack of support by traditional authorities.

#### *Competitive land uses and economic rationale*

The cluster analysis showed that active rejection of tree planting under ELCIR+ mainly stemmed from economic reasoning. The non-adopters conducted a cost-benefit analysis informed by observations or experiences and decided for cash crops (cashew and orange). C13 compared his neighbouring plots and the time dimension of benefits, C14 the future revenue and for C15 the bureaucratic burden was a decisive factor. Additionally, he did not trust FC Kintampo. ELCIR+'s stakeholders agreed that competitive land uses were a major reason not to adopt tree planting. They stressed the existing and good market structure for cashew, and the quick nature of its benefits. The non-adopters' cost-benefit considerations were informed by the risky nature of investment and the rather weak support structure that ELCIR+ offered, as also mentioned by stakeholders. In this regard the few incentives offered by FC, as compared to rather high participation costs were outlined.

#### *Other reasons*

The project stakeholders mentioned a myriad of reasons that - in their opinion - keep people from engaging in tree planting under ELCIR+. These reasons were not revealed in the cluster analysis. Clustered non-adopters seemed to have sufficient knowledge of the benefits of trees and, neither difficulty in acquiring land, nor uncertainty of benefits (the only migrant without their own land did not mention these as a decisive factors). Neither did we identify psychological barriers to adopt innovation during the cluster analysis.

## 7 Discussion

This paper sets out to explain the limited adoption of woodlot/plantation establishment under ELCIR+ in Kintampo Forest District. In order to answer the research question, we synthesise our findings and relate them to the relevant literature on tree planting and decisive factors. This chapter also contains critical reflections on the overall study design and outlines the main limitations of the work presented.

### 7.1 Adoption of tree planting under ELCIR+

#### *Community woodlots and policy design*

“Engaging local communities in REDD+” is the title of FIP’s second pilot undertaking in Ghana. By involving communities in land and forest management, policy makers wanted to achieve an increase in carbon stocks and reduce poverty in the off-reserve areas in the regions of Brong Ahafo and Western. During the mid-term review in January/February 2018, it became evident that the engagement has not materialised (see section 6.1). Plantations and woodlots were not established to the planned extent and mostly on private instead of communal lands, for reasons outlined in subsection 6.1.2. Often, there were only a few or single adopters per village and their neighbours showed little interest in their tree planting efforts and participation in the project (see section 6.2) - a risk mentioned as part of ELCIR+ design, which have materialised despite outlined mitigation measures (see Table 2-3).

There are different implications underlying private versus public plantation/woodlot establishment. As revealed in subsections 6.2.4 and 6.2.5, community projects usually imply a higher hectare volume, since land is more abundant and communal labour can be compiled. Yet, such projects place the additional challenge of communal management and create the risk of elite capture and uncertain distribution of benefits as compared to private undertakings. The few community projects that materialised under ELCIR+ in Kintampo Forest District did not pre-agree to/on any BSMs, justifying this by benefits only occurring in the remote future. In order to mitigate this risk, the project design included the development of guidelines for best practice in benefit-sharing (see Table 2-3), yet, so far, they have not come into operation.

The activity design of ELCIR+ and the definition of targets were done without conducting a feasibility study, resulting in arbitrary and unrealistic targets and poorly defined beneficiary groups. Due to the lack of a pre-study, there was no specific needs assessment that would lead to a tailored and inclusive way of addressing drivers of deforestation and forest degradation (see subsection 6.1.2). Additionally, in the case of ELCIR+, policy makers displayed a superficial understanding of the participatory aspect of the intervention and employed traditional top-down approaches. We argue that “engagement” should not be measured by mere rates of adoption, but by deeper involvement of communities giving them agency over project outcomes. By better considering communities and directly including them in the decision-making processes, ELCIR+ could potentially have contributed to the reinforcement of communities’ stewardship of forest landscapes.

#### *Reasons behind low adoption*

At first glance, ELCIR+ seems to have the potential to constitute an innovative way of achieving higher afforestation rates. Yet, due to several flaws in the ELCIR+ conception and implementation, as identified in section 6.1, the overall quality of intervention has been affected, rendering the project less attractive to potential adopters.

ELCIR+’s main objective (subsection 2.2.2) claims that the project will contribute to poverty reduction and bring financial benefits for the communities and individuals engaged. Indeed, many participants in the clusters (subsection 6.2.5) have planted trees for income generation purposes, either for sale of timber or



charcoal. However, many interviewees did not see a significant financial potential in tree growing (section 6.3) and preferred alternative uses of land, e.g. cashew or food crops. The income from timber trees is low and only occurs in the future, as compared to benefits from cashew (as explained in subsections 6.2.3 and 6.3.2). Additionally, there is a high degree of bureaucracy surrounding the production of timber for sale. The project neither addresses such barriers, nor provides any business advice to allow farmers to become smallholder entrepreneurs. The project has no provisions on the creation of market incentives or a favourable environment for future sale and processing of timber. The low potential financial benefits and, at the same time, high costs of establishment and maintenance of woodlots/plantations in presence of more profitable alternative land uses, have deterred communities and individuals from engaging in ELCIR+.

The analysis performed in 6.2 has highlighted the important role of *perceived behavioural control* on the adoption of innovation actually materialising. Especially, the issue of perceived sufficiency of means and resources has proven important. The designers of the intervention have not adequately taken into account the land constraints people face. This is especially significant for a region such as Brong Ahafo, that hosts a high population of migrants who generally have to rely on land leases and sharecropping contracts, as they do not have access to family land. The same problems affect landless farmers. Long-term land leases require capital, and sharecropping systems are variable and dependent on intra village relations, making the investment more costly and riskier for many individuals. ELCIR+ does not provide security of gains, since it does not assist in determining benefit-sharing between parties or mediate in present or future conflict resolution. The project does provide cadastral maps serving as a proof of ownership and giving some degree of security. The maps constituted an added value to adopters who were often proud and eager to show us the maps during interviews.

By design, the project was supposed to provide establishment and maintenance support (e.g. land preparation and weeding), transport, and technical assistance, which would significantly reduce the costs of woodlot/plantation establishment. However, the project document and technical annexes (section 6.1) define the support provision in a vague manner, without explaining what specific activities should be undertaken by the implementer over the course of the project, leaving the decisions to the FC district offices. The slow trickling down of project funds further exacerbated the poor support provision, limiting the agency of FC Kintampo. As a result, in the field, we found a haphazard pattern of assistance being delivered to the adopters. Additionally, the majority of the tree planters were disappointed with the aid received during the establishment and were calling for some form of financial or hands-on support to help with the cost of maintenance (section 6.2). The project design has not sufficiently addressed some of the challenges of holding a tree plantation/woodlot, such as unconstrained cattle grazing, risk of fire or illegal logging (section 6.2). We find that a higher sensitivity to the target population's needs at the design and implementation stages would encourage adoption (section 6.3). When addressing low-income rural populations, it is crucial to remove barriers to adoption. Our analysis revealed that, in fact, policy makers initially thought that the provision of seedlings and occasional workshops motivated farmers enough to adopt tree planting under ELCIR+. As outlined in subsection 6.1.1, the mid-term review changed this perception and an enhanced incentive package was decided upon, to support the achievement of the remaining off-reserve targets. However, up to this point neither do documents contain details on new adjustments to incentives, nor have district officers been informed about any new measures.

The capability aspect of the *perceived behavioural control* has proven to be important in the decision to adopt tree planting. Section 6.2 made it clear that having knowledge on tree planting, tenure, and benefits gave people confidence and motivated them to pursue their objectives. An important element identified was also the *principles knowledge*. Environmental awareness played an important role in the decision to adopt. Further, our findings suggest that the delay of DGM largely contributed to the limited interest in ELCIR+. The strong commitment to tree planting in Dawadawa seems to a large extent to stem from the education gained

and enthusiasm sparked by the DGM training. In addition, our results suggest that environmentally-oriented adopters were often willing to expand established plantations/woodlots.

As stated above, the community engagement that ELCIR+ aimed at, did not materialise for tree planting. Having a common project, where everyone can contribute, and benefit is likely to create a strong sense of community and hence lead to a favourable *subjective norm* towards the project activities among individuals. Our results suggest that the decision-making process behind the adoption of tree planting is strongly influenced by *subjective norms* for individuals with low levels of *perceived behavioural control* i.e. those who have little confidence and see themselves as not capable of adopting an innovation successfully. This finding is based on a comparison of the cluster of charcoal producers with clusters of entrepreneurs and environmentalists. The latter clusters had a high degree of *perceived behavioural control*, driven by strong confidence and experience despite being often the only individuals in their communities who decided to adopt tree planting under ELCIR+. Maintaining and planting trees became a dominant *subjective norm* in Dawadawa, due to the activities of DGM in the village. We argue that it is the newly sparked interest in environmental issues in the village and people observing each other's tree planting behaviours that lead to high to participation in Dawadawa, despite people's low resources and no previous experience in tree planting.

#### *The risk of discontinuation*

From the point of our research it is complicated to conclude whether the project will have a lasting impact on the adopters' livelihood and their region. Tree planting under ELCIR+ was initiated in 2015 and although there is no definitive project end yet, it is probable that activities will continue for another year at least (see subsection 6.1.1). As witnessed, several elements at play increase the risk of *discontinuation of adoption* among the planters (see Figure 4-1). Firstly, as explained by the FC Kintampo district officers (subsection 6.1.3), once the project is over they have no funds to follow up with the adopters. Additionally, the success of the project is measured by the adoption target, i.e. ha of woodlots/plantations established and does not account for whether the trees are actually being maintained. Hence, the implementing offices of FC have little incentive to provide continuous support and/or monitoring, especially since this function is imprecisely defined in the project document. This has been reflected in the worries of planters, who were not sure whether they can manage maintaining the plantation/woodlot next season without support, especially given the high risk of fire and cattle grazing.

We hypothesise that the clusters analysed (section 6.2) have different adoption continuation potentials. The risk of discontinuation seems especially high in the case of the charcoal producer cluster, who were highly motivated to pursue environmentally conscious action by the DGM engagement (see Text box 6-5), which is in its last phase and will conclude soon. However, tree planters in this cluster also at times had an unrealistic expectation regarding the timespan of benefits delivery, hoping that their tree planting can quickly reverse the effects of climate change, a belief that was not sufficiently corrected for during the DGM training. The charcoal producers dedicated big shares of their disposable money, time and land to their tree planting projects and so when the results do not come as quickly as anticipated they may face disappointment, especially once the positive reinforcement from DGM is gone. Given the outlined points, we believe that a follow-up study on continuation of established woodlots/plantations could provide an interesting research matter and help validate whether the scheme created a long-term carbon storage potential.

## **7.2 Comparison of results**

In this section, our findings will be compared and contrasted with the results from reviewed literature in chapter 3. The findings below are grouped into ones concerning the design and implementation of environmental interventions, cost and benefit considerations of prospective tree planters, issues of

competition between land uses, impacts of existing tree and land tenure systems and influences of attitudes and environmental awareness on tree planting.

#### *Design and implementation*

Hansen et al. (2012) point to a limited success of tree planting projects in West Africa, doubting the appropriateness and sufficiency of such an approach. As a reason the authors cite a lack of site-specific analyses and a limited understanding of local communities' realities. The authors state that programmes should address matters of dependency on indigenous trees for fuelwood, food, fodder, construction materials, and other indirect uses. At the same time, local tree practices should be integrated in the development strategies and farmers should be reinforced in their role as managers of tree resources. In line with our findings, Appiah et al. (2015) report that collecting baseline information contributes to the project design through enhancing the development agent's understanding of the technical, socioeconomic and environmental status of the project areas. The authors underline the necessity of participatory approaches, where local people are directly engaged and involved in decision-making and have agency over the project outcomes. Additionally, Peskett et al. (2008) and Griffiths (2008) (as cited in Appiah et al., 2015) state that developing equitable and secure BSMs through participatory approaches is a crucial element of any afforestation activities under REDD+. Kulindwa (2016) points to the importance of ensuring that households are aware of the scheme and its elements and that their preferences and needs for specific tree types are taken into consideration. Appiah et al. (2015) agree, and stress that good communication of project information allows potential participants to become "*active and constructive stakeholders who need to be heard rather than just being objects of public policy*" (p. 88). Hansen et al. (2012) claim that often the policy makers harbour a preconceived negative image of a rural approach to tree management and that operating under such narratives can lead to approaches that fail to build on existing *know-how* and inhibit communication and collaboration. We agree with such statements, as in our case we found that due to the lack of a feasibility and need recognition study, ELCIR+ does not target communities accordingly and fails to create genuine engagement in the cause.

Matters of support in tree planting have been cited as essential to address through policy design. Oduro et al. (2018) state that "*technical assistance, supply of free seedlings and other farming inputs motivate farmers to engage in on-farm tree planting and management; and that farmers would plant and manage on-farm trees if the financial benefits were more attractive.*" (p. 408). Krause et al. (2007) and Aoudji et al. (2014) also stress the importance of strong tree planting support services as a part of the project design, as they increase the overall benefit of participation (see section 7.2, *Cost and benefits*). Amanor (2009) points towards the capacity of the implementing party as a crucial element of a successful afforestation intervention. The author stresses the importance of the agencies coordinating the project to be well-staffed and their activities to be transparent. Similarly, Kassa et al. (2011) note an instance of poor communication between different levels of the implementing body as a source of problems in scheme execution. We have reached a similar conclusion through analysis of the trajectory of implementation of ELCIR+, additionally finding that lagged and uncertain funds dispersion constituted a key obstacle to efficient implementation. Appiah et al. (2015) see educational elements as key components of reforestation schemes, such as updates on skills in silvicultural techniques. Environmental awareness raising campaigns, as a part of schemes, have been found to positively influence the decision to plant by Oduro et al. (2018) and Ndayambaje et al. (2012). The insufficient community capacity building component was in our results a significant influence on low adoption of tree planting, corroborating the cited findings. Two papers, by Oduro et al. (2018) and Kulindwa (2016) point towards the fact that schemes, in the eyes of local communities, end rapidly and with them the supply of seedlings runs out, emphasising the one-off nature of afforestation projects.

Hansen et al. (2012) discuss the advantages and disadvantages of tree planting schemes. According to the authors, such activities are easy to plan, monitor and they provide measurable outputs (Amanor, 2001, as cited Hansen et al. 2012). Additionally, projects providing free seedlings are usually well received by local

communities. On the other hand, the authors criticise such solutions for not being enough to compensate for the problems of forest degradation and desertification. Hansen et al. (2012) question the long-term impacts of tree planting interventions given the low survival rate of trees planted, as we have emphasised in the discussion of the risk of disadoption (section 7.1).

#### *Development strategies and policy environment*

Land use is a cross-cutting topic that requires an inter-institutional policy approach. Kassa et al. (2011) for instance conclude that “*change in land cover is influenced by a number of factors such as poverty, lack of agricultural intensification, agricultural expansion policy and institutional failures that create tenure insecurity.*” (p.477) and further reveal that political and institutional instability, as well as abrupt and radical changes in rural development strategies were discouraging tree planters in Ethiopia over the years. Developing a policy framework that addresses local needs in a holistic and long-term oriented way, seems to be an approach that finds support in the literature. Gessesse et al. (2015) call for an integrated land resource management strategy that connects socio-economic benefits to landscape restoration and secure property rights. Ndayambaje et al. (2012) find that policies that improve food security and encourage income diversification would likely result in increased tree planting activities. The authors further state that tree planting decisions in their sample were influenced by agriculture and forestry development projects that had promoted and widely disseminated agroforestry technologies in the region since the early 1970s. Finally, Kassa et al. (2011) propose the proliferation of alternative energy sources, since fuel wood constitutes the major primary energy source in Sub-Saharan Africa and thus, drives local deforestation and forest degradation. Our findings corroborate previous research. Our case shows how efforts might be to no avail, due to a lack of coordination across institutions and superficial targeting of drivers of deforestation by not encompassing social and policy objectives.

#### *Costs and benefits*

The importance of making tree planting a viable economic endeavour has been highlighted throughout the literature. As pointed out by Appiah et al. (2015) in a review of reforestation approaches in Ghana, projects with a high poverty reduction potential evoke the biggest interest by local communities. Others (Ndayambaje et al., 2012; Aoudji et al., 2014; Kulindwa, 2016; and Oduro et al., 2018) report similar findings showing the importance of making tree planting schemes economically attractive, as it results in a higher engagement in tree planting, because people tend to plant for money. Our findings corroborate such statements. Opposite conclusions have been made by Hansen et al. (2012) who asked respondents in northern Ghana to rank various objectives in tree planting and found that most interviewees considered tree planting for cash income generation as their last priority. At the same time, the authors report that for the communities they visited the sale of tree products – charcoal, wood for fuel, herbal products and sale of seedlings to nurseries – constitutes a major source of income.

Authors have identified the existence of domestic markets for tree products as a key element of the decision to plant (Krause et al., 2007; Ndayambaje et al., 2012; and Aoudji et al., 2014) and show that access to markets increases the probability of participation in tree planting activities. Kulindwa (2016) pointed out that efforts to promote tree planting behaviour should include clear transfer of rights of tree products to the market, as it would increase the perception of tree planting as a secure business among farmers. Kassa et al. (2011) find excessive and complicated bureaucracies to be an important factor hampering tree planting. Given such evidence, removing barriers to a market is important for a tree planting scheme’s success, as it allows the financial benefit of tree planting to be realised.

Appiah et al. (2015) point to the importance of cost-effectiveness of reforestation approaches. Easy to manage schemes with low initial investment have a higher probability of being adopted, which is confirmed by our ELCIR+ case study, where the costs of establishment and maintenance were not removed. Amanor (2009) points specifically to the cost of weeding as a major constraint on the volume of trees being planted. The importance of schemes addressing potential risks threatening investment in woodlot/plantation

creation, has been discussed in the literature, due to the high risk aversion of rural populations stemming from lack of insurance or access to credit facilities (Frito et al., 2006, Kgosiemang & Oladele, 2012, as cited in Appiah et al., 2015). Abiyu et al. (2015) and Kassa et al. (2011) discuss the significant risk of cattle grazing and stampeding seedlings, due to de facto open land access (typically there are no fences and no authority takes on a policing function with respect to cattle herding). Amanor (2009) cites fire as a main hazard to plantations and woodlots in Ghana. In our study farmers spoke about being exposed to these risks as well and saw it as a factor deterring them from establishing woodlots/plantations.

#### *Competitive land uses*

There seems to be an agreement across the literature that access to large landholdings is conducive to the establishment of woodlots/plantations (Krause et al., 2007; Gebreegziabher et al., 2010; Ndayambaje et al., 2012; Danquah, 2015; Abiyu et al., 2015; Gessesse et al., 2015; and Kulindwa, 2016). Danquah (2015) reports that farmers who have access to larger land plots face lower the opportunity cost of tree planting. As explained by Ndayambaje et al. (2012) tree planting activities are competing for land with food cropping, especially for farmers with small farms and low incomes. In our study we have found some evidence supporting this statement, however tree planting was mostly in competition with cash crops, predominantly cashew farming. Abiyu et al. (2015) hypothesise that the establishment of woodlots, being a long-term commitment “*may pose a long-term sustainability challenge in terms of land allocation to alternative uses including food production*” (p.201). Hence, Appiah et al. (2015) state that it be should kept in mind that a smallholder farmers’ priority is generally to produce enough food to sustain their families and they therefore claim that reforestation schemes should focus on integrated systems that also lead to increases in food production. Additionally, Abiyu et al. (2015) recall Von Thünen’s theory on land use. Given their findings the household’s decision on how to allocate its available land is guided by which use gives the land the highest economic rent, which is affected *inter alia* by spatial location in relation to roads and markets. Our paper corroborates this finding, where cashew planting was an often-chosen land use given the good market access and availability of a cashew processing plant in a nearby location.

#### *Land and tree tenure*

In line with our findings, several authors have considered land and tree tenure important to the decision to plant trees, either in empirical studies (Amanor, 2009, Aoudji, 2015, Danquah, 2015, Gebreegziabher et al., 2010, and Oduro et al., 2018) or through meta study and policy analysis (Appiah et al., 2015 and Kassa et al., 2011).

Through empirical research the underlying reasons were revealed. Amanor (2009), for instance, stressed the long-term nature of land use in connection with the investment function of tree plantations: “*Plantations take land out of cultivation for many years and give their developers new rights in land. The land now acquires a value it did not hold previously.*” (p.148). According to the author, people are increasingly interested in formally registering their land ownership status, rather than relying on informal arrangements. We have also witnessed that farmers saw great value in cadastral maps under ELCIR+. The investment that planters undertake on the land in the form of trees comes along with benefits that only occur in the future. In this regard Gebreegziabher et al. (2010) conclude that due to the inter-temporal nature of benefits from trees, the degree of security of land tenure impacts the decision to plant trees. Whereas Aoudji (2016) finds that in Benin, claiming and securing land tenure is a key motivation behind tree planting, our study does not corroborate such findings.

Analogously to other studies in Ghana (Oduro et al., 2018 and Danquah, 2015), we found that not many migrants have engaged in tree planting, as they do not have access to large plots of land compared to individuals with family land holdings. Danquah (2015) finds evidence that “*individuals with a [land] title [...] will readily participate in the voluntary tree planting exercise, in contrast to other forms of land tenure arrangements, such as sharecropping, leasing and renting, as well as those with restricted property rights to the land.*” (p.185) Comparing two



planting schemes, Oduro et al. (2018) infer that migrants have a higher preference of schemes where they are granted full future control over the land they cultivate. These results indicate that explaining to adopters that they hold full ownership over planted trees acts as a motivation to establish woodlots/plantations.

#### *Attitudes*

Shifting the focus from a mere extrinsic determinant analysis to the decision-making process behind tree planting, our study aims at stressing the role of intrinsic factors that lead to tree planting, attitudes being one of them. With a clear definition given in the framework (chapter 4), our study focused on three components of attitudes; *attitude toward behaviour*, *subjective norm*, and *perceived behavioural control*. Few studies on tree planting in Africa consider factors of similar nature. Kulindwa (2016) includes the household's perception toward tree planting and finds a negative effect on the number of trees planted, however the author provides no further specification on how perceptions were measured and quantified. We do not corroborate this finding, and instead conclude in line with Krause et al. (2007) that the perceived utility of trees guides the decision to plant trees and the selection of species being planted. This perception is shaped by knowledge and capabilities; thus, the perceived utility of trees increases if people are conscious about the land degradation and tree species loss around them. In addition to that, the authors conclude that the "*perceived shortage of land resources and seedlings are chief decision determinants that continue to hinder farmers from growing woody plants in the homestead.*" (p.15), highlighting the role of *perceived behavioural control*. In Oduro et al. (2018), farmers identify their own low knowledge about plantation management as one of main constraint to tree planting. Finally, when reviewing research on reforestation projects in Ghana, Appiah et al. (2015) find that capacity-building measures of local communities increased their confidence and perceived capability to plant trees. According to the authors, "*the projects boosted local peoples' self-confidence in forest resource management by increasing the feelings of both understanding and having the capacity to manage their own land resources.*" (p.90). We come to the same result, as *perceived behavioural control*, i.e. the perceived sufficiency of owned means and confidence in ability to perform tree planting, constitutes an important factor in the decision-making process for the adopters in our study.

Our study finds for the case of DGM in Dawadawa that direct engagement and campaigning among local communities can contribute to a favourable *subjective norm*. Additionally, we have found that even for participants with high *perceived behavioural control*, the *subjective norm* was important in adoption decisions. Oduro et al. (2018) do not support our results, since only a small share of their sample claimed to be motivated by the influence of their peers. However, they contrast their findings to studies in the USA (Ruseva et al., 2014; Sagor & Becker, 2014; and Ruseva et al., 2015, as cited in Oduro et al., 2018) and Pakistan (Zubair and Garforth, 2006, as cited in Oduro et al., 2018) that support the role of significant others and communities at large in the decision to plant trees.

#### *Environmental awareness*

Apart from contributing to a favourable *subjective norm*, DGM provided training and sensitised target communities to forest degradation and climate change. In line with our findings, several authors concluded that environmental awareness is an important factor influencing the decision to plant trees (Danquah, 2015; Gessesse et al., 2015; Ndayambaje, 2012; Kulindwa, 2016; and Oduro et al., 2018). Kulindwa's (2016) results show that very few households engage in tree planting without a programme's sensitisation and concludes that households with better knowledge of the short- and long-term benefits of having trees are more likely to plant trees. Similarly, Ndayambaje et al. (2012) find that various benefits of trees are poorly understood by Rwandan farmers and conclude that awareness raising and environmental education should be enhanced to maximise benefits of tree planting. Oduro et al. (2018) deduce that knowledge of environmental issues positively influences farmers' attitudes towards tree planting, based on evidence from the Western region. In their paper, Gessesse et al. (2015) include a measure of awareness of the problem of deforestation and its relation to tree planting and find that understanding the negative effects of deforestation increases the likelihood of participation in tree planting activities. Finally, Danquah (2015) uses the preservation of



naturally occurring trees on-farm as an indicator of environmental awareness. The author finds that farmers retaining such trees on their holding were more likely to participate in the reforestation programme investigated and concludes that farmers' perception of environmental issues and the impact on their livelihood significantly influences their decision to become involved in environmental conservation measures.

### 7.3 Reflections on the study design

In this section, reflections on the limitations of the conducted study are gathered. The inherent shortcoming of applied theories and methods have been critically analysed and where possible addressed to reduce their influence on the research presented. Below the critique is divided into “Reflections on Framework” (subsection 7.3.1) encompassing the limitations of underlying theories and the analytical framework applied, and “Reflections on Methods and Data Collection” (subsection 7.3.2) outlining the key limitations of the case-study research and data collection process, as well as ethical considerations.

#### 7.3.1 Reflections on the framework

The theoretical framework applied in this paper is grounded in innovation literature. This has several implications to our study. The Rogers' (2003) theory has been criticized on several grounds, which the author himself collected and reflected upon. The first key point of critique is *the Pro-Innovation Bias* which assumes that the spread of innovation is always positive and that it should happen more rapidly. Additionally, the strictly positive attitude towards innovation tends to ignore *the Issue of Equality* i.e. the tendency for innovations to be adopted by those of high economic status, further widening the gap between the rich and the poor. We do see the general purpose of the innovation at the heart of this paper as positive, however we also believe that the climate change mitigation efforts should be included as a part of food security and poverty alleviation policies or interventions, which enhance local communities' wellbeing. The responsibility for mitigation of climate change should not rest solely on those who are the most vulnerable to its effects, e.g. smallholder farmers in low/middle income countries, but constitute an integrated national and global effort. *The Individual-Blame Bias* could be described as “*if the shoe doesn't fit, there's something wrong with your foot*” (ibid., p. 103), implying a narrative of siding with change agents, rather than the potential adopters. As a part of our research we have discussed ELCIR+ with various policy makers engaged in its development and implementation, often confronting them on matters of poor design or roll-out of the project activities. Additionally, we challenge this bias through an extensive and critical description of the innovation characteristics, showing its strengths and weaknesses, as well as questioning whether its adoption is a viable opportunity for everyone. Finally, *the Recall Problem* is related to the fact that theory is applied post-decision, leading to distortions in adoption time and making it harder to track causality. We have not been able to fully mitigate this problem, however, by using the SSI method, we ensured that the interlocutors had time and felt comfortable to fully elaborate on their situations as remembered and, when transcribing, we have accounted for hesitations and uncertainties in answers.

Another issue in applying innovation theory to our case is the question whether the respondents themselves saw the opportunity as an innovation. We argued that since tree planting under ELCIR+ addresses a number of risks and uncertainties surrounding tree planting in Ghana, it has a potential of being perceived as an innovative solution for income generation, and therefore fulfils Rogers' theoretical criteria. However, if some of the respondents did not perceive it as such, their thinking process may differ from the one envisaged in innovation diffusion theory. In the future research, this caveat should be addressed, by explicitly controlling for perceived innovativeness of the intervention.

Elements of Ajzen's Theory of Planned Behaviour (1991) have been employed in the construction of our framework. The theory has often been criticised for reflecting a “rational” agent's point of view, not taking

sufficient account of cognitive and affective processes, as well as intention-behaviour discrepancies (Meijer et al., 2015a, Sniehotta, 2009). These shortcomings, pose a risk of reductionist analysis, not encompassing the variety of influences shaping the behaviour. By embedding Ajzen's Theory of Planned Behaviour alongside the Diffusion of Innovation theory in our framework and use of qualitative data we have partly addressed the mentioned criticism.

Apart from the critique stemming from baseline theories, the framework faces several limitations. Firstly, we do not include measures of income in the analysis. Financial status constitutes an important extrinsic characteristic and is likely to influence decision to invest in adoption of an innovation. Instead of gathering data on the interviewees' wealth, we made observations and asked for their formal education and profession. Often, the interviewees provided indication of their financial situation during the SSIs.

Secondly, the intrinsic variables analysed tend to be of a cross-cutting nature and feed into each other. For example, *perceived behavioural control* which reflects the capabilities and confidence in performing a behaviour as perceived by the potential adopter, is highly dependent on previous experience with tree planting, i.e. an element of the *know-how* intrinsic variable. Hence, the framework at times did not allow us to disentangle specific influence of individual variables.

The framework, being innovation oriented in Rogers' tradition, was less effective in analysing non-adoption through the inclusion of variables such as *knowledge about the innovation*, objectives in tree planting and feedback into intrinsic factors. The latter two were not applied in the analysis of the cluster of non-adopters, making analysis in 6.3.1 uneven in comparison to the clusters in section 6.2. Additionally, non-adopters characterised by lack of *knowledge about the innovation* were excluded from the full analysis by framework application (the results are contained in Text box 6-7), as, naturally, we could not extract their attitudes towards the innovation.

Finally, few points raised by Meijer et al. (2015b) also apply to our adaptation of their framework. The authors point to a lack of clarity in how extrinsic variables are related to each other and how they shape the intrinsic variables. The risk exists that important factors influencing the decision-making process have not been included in the analysis, and that the relationship between intrinsic factors and the behaviour may not be linear and "*continued reinforced motivation is needed for tree planting interventions to be successful*" (p.10).

### 7.3.2 Reflections on methods and data collection

In social research, case studies have attracted criticism and were downgraded to second class research strategies for their apparent lack of rigour, insufficient precision and missing objectivity. Yin (2003), in his work, addresses such complaints and aims at improving the overall quality of conducted case studies by providing comprehensive guidelines for their design and implementation. According to Hyett et al. (2014), differences between published case studies can make it difficult for researchers to define and understand case study as a methodology. However, the authors argue that the degree of diversity gives the case study a high level of flexibility that is not offered by other approaches. By following the guidelines made by Yin (2003), we ensure that our research does not lack rigour (see also Table 5-1). Furthermore, we embrace the value of case studies to develop an analytical rather than statistical generalisation (ibid.). Comparisons between case study and statistical research fail to recognise this inherent value of case studies that provide an in-depth analysis of a concise case.

Measurement of attitude poses several challenges (Meijer et al., 2015b). Firstly, in interviews a risk of *social desirability bias* exists, meaning that respondents are likely to exaggerate their positive feelings towards tree planting, hoping to be viewed in a favourable light (Oppenheim, 1992). Additionally, an *acquiescence bias* is possible, where respondents by default agree with questions. We aimed to minimise these biases to secure

accurateness of our data through mindful design, initial testing of our SSI guide and by explaining to our respondents that we are interested in their honest opinions and that there are no right or wrong answers to our questions. Analysing attitudes of different individuals as a part of our study was challenging, as no fixed baseline to what constitutes e.g. “a positive attitude” exists. We have addressed this risk of incorrect classification, by cross-comparing answers across (non-)adopters and by thoroughly discussing every interview.

In our research we did not measure the true adoption rate of tree planting under ELCIR+ in Kintampo Forest District. Firstly, we have not controlled for the state of maintenance of already established plantations (i.e. the discontinuation of adoption) when speaking to adopters. Secondly, since we did not perform statistical sampling, we were not able to approximate how many non-adopters there are, as compared to adopters. It is however certain, that in our sample, the non-adopters are underrepresented, comparing to the actual population of Kintampo Forest District. As noted in 7.3.1, our framework is more applicable to non-adopters who knew about ELCIR+ yet decided not to participate. During data collection we have tried to identify such individuals using snowballing, however this method did not prove especially effective. We do acknowledge the small number of non-adopters interviewed as a shortcoming of our study, as it would allow to support the emerged reasons for non-adoption with more evidence. However, through the triangulation of data sources, we have managed to compile an exhaustive record of reasons behind non-adoption. Furthermore, given the case study nature of this research, we are not aiming at a statistical generalisation of results, therefore the underrepresentation of non-adopters does not affect our overall study results.

When conducting fieldwork, several ethical challenges may arise, such as power relations, sensitive information or unexpected outcomes (Reyes-García & Sunderlin, 2011). Unequal power relations between villagers, us researchers, and authorities such as chiefs or FC district officers might occur. With the help and support of trustworthy interpreters who possessed both, a thorough understanding of rural hierarchies and community structures as well as good knowledge on internal FC district office relations, we developed a critical awareness of our own position and potential biases. Further, we were sensitive to the local context and norms and were conscious about how power dynamics might have influenced the interaction with communities and the data gathered during field research.

Respecting the concept of informed consent, we briefed our interlocutors concerning the study’s objective and the time and effort it would presumably take from their side. Additionally, we explained our status as students independent of any governmental bodies and the fact that we cannot provide any reward for participation. Prior to the field visit and adopter interviews, we presented ourselves and the research project to FC’s Regional Manager Brong Ahafo. The obtained data is used for learning outcomes and was collected under the premise of anonymity, which has been communicated to the interviewees. Hence, to protect their identities, we decided to refer to (non-)adopters as IDs in our report, rather than invent alternative names for the sake of brevity and legibility.

Lastly, it is important to recognise the neo-colonial character of donor-led interventions in so-called development countries. Neo-colonialism refers to a situation of infringed national sovereignty and intrusive influence by external elements, either international cooperatives or development aid (Langan, 2017). According to the author, neo-colonial power relations in which co-opted elites, rather than serving their country, consider the interests of foreign beneficiaries and thus avert “*self-determination via policies that meaningfully meet indigenous concerns and local needs.*” (p. 26). Since our study is centred around an international donor intervention and since we are foreign researchers coming to Ghana, we run into the risk of reproducing similar patterns. During the field research in Kintampo, we faced situations, where people expected us, to give advice or offer some kind of tangible help. By communicating our study purpose and trying to develop critical awareness of how our own assumptions and actions may perpetuate neo-colonial

structures, we tried to mitigate eventual adverse effects. We hope that the results of our research reflect such efforts and that they will inspire policy makers to employ bottom-up approaches in REDD+ interventions that serve the local population in the first place.

## 8 Conclusion and lessons learned

In this paper we have analysed the reasons behind the low adoption of tree planting under ELCIR+. Our results indicate that community engagement under ELCIR+ has not materialised and large volume woodlots/plantations on common community lands were not established, as desired by policy makers. The attempt for participatory development was not rooted in a prior needs assessment and, so far, did not render tree planting a viable income generation activity in Kintampo Forest District. This resulted in the failure to improve the social resilience of local populations. Furthermore, through poor timing of DGM's complimentary environmental awareness programme, the opportunity to create broader interest in ELCIR+ was missed.

To plant, or not to plant? The decision-making process underlying tree planting seemed to be guided by individual cost-benefit considerations, *perceived behavioural control*, and the *subjective norms* surrounding tree planters. The long-term nature of the benefits, combined with the high costs of establishment and maintenance and a high burden of bureaucracy connected to timber products, made cashew or food crop cultivation a better alternative. *Perceived behavioural control* in terms of confidence and perceived capability was identified as a major intrinsic factor in our analysis. Land constraints, little tangible support, and threats such as cattle grazing, or bushfire lowered the *perceived behavioural control*, whereas environmental awareness and *principles knowledge* had an empowering effect. Lastly, we have found that a favourable *subjective norm* could compensate for limited *perceived behavioural control*.

Several policy lessons arise based on the analysis and discussion presented. The fact that the intervention's target has been largely shifted to on-reserve means that the goal of encouraging off-reserve woodlot/plantation establishment through changing attitudes towards tree planting has been significantly reduced. This changes the nature of the project and removes its off-reserve piloting value, preparing for change in tree tenure and BSM legislations. Whereas FC officials favour on-reserve action for ease of implementation, they seem to not consider the full scope of the original project objectives. In conversations with MLNR's Technical Director and civil society representatives it was evident that they saw ELCIR+'s target redirection as a lost opportunity for laying grounds to reforms in natural resource management. An implication for future policies arises, to ensure that all agencies share a similar perspective on the nature of intervention and that their integrated efforts are directed towards a common goal.

By design, ELCIR+ aimed at creating a source of financial benefit for the population, contributing to poverty reduction. However, the barriers to the sale of timber, such as unclear and complex legislation and high initial investment have not been addressed. Our analysis proved that the mere provision of free seedlings was not sufficient to render tree planting financially viable in Kintampo Forest District. Many adopters in our sample were interested in financial benefits from trees planted, yet they were left to find their own solutions on how to obtain these gains. This issue could be addressed in future interventions by offering extension services that provide education on how to commercialise smallholder tree planting. As per our analysis, it became evident that reducing the costs of establishment and maintenance, policy reform (e.g. more market incentives and simplified bureaucracy) and the creation of favourable environment for future sale and processing of timber would contribute to tree planting becoming an economically viable option for smallholder farmers. Given our findings we conclude that, so far, ELCIR+ did not address its poverty alleviation goals and in future policies aiming at smallholder tree planting more attention should be dedicated to assistance in securing the financial benefits from plantations/woodlots.

ELCIR+ in its design set out to address multitude of drivers, yet only superficially. The tree planting activities under the programme aimed at tackling over-extraction of fuelwood and timber more specifically, through enabling the development of sustainable supply sources in the form of woodlots and plantations.

The interviews with the charcoal producers in Dawadawa showed that the actual force driving charcoal extraction is the unavailability of alternative and reliable livelihood strategies, as well as widespread lack of access to other sources of energy, keeping the demand for charcoal high. The interviewees often indicated that charcoal production was not a choice but a necessity. At the same time, being exposed to emotionally loaded awareness programme carried out by DGM appealed to their environmental consciousness, pushing them to make an investment, despite their often dire financial situations. This situation highlights the moral dilemma of environmental policy that relies on individuals dedicating their own personal resources. The policy should ensure that it does not produce a heavy burden to carry, but engages communities and individuals in a positive manner, through the development of opportunities for sustainable livelihoods and bottom-up approaches.



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# Appendices

Appendix A

Appendix B

**Research matrix**

**Lists of interviewees**

List of interviewed adopters

List of interviewed non-adopters

List of interviewed key informants

Appendix C

**Interview guides**

Interview guide for adopters

Interview guide for non-adopters

Interview guides for key informants



## Appendix A: Research matrix

| Research Question  | Sub-questions   | Variables to investigate/<br>Categories  | Data required  | Methods for data gathering |
|--|---|--|--|----------------------------|
| Why was the adoption of the woodlot and plantation establishment under ELCIR+ limited? | What were the trajectories of ELCIR+ and DGM and how did they influence common innovation characteristics?                | Common project characteristics   | ◊ Factual (secondary) data on programme design including relevant adjacent interventions (DGM)   | Document review            |
|  |   |  | ◊ Qualitative data on the views, insights, role, interaction, and commitment of relevant stakeholders                                      | Key informant interview    |
|  |   | Perception of the implementer  | ◊ Qualitative data on the views, insights regarding project design and implementation  | PRA                        |
|  | What is the underlying decision-making process behind adoption of tree planting under ELCIR+ in Kintampo Forest District? | Adopters' and individual project characteristics   | ◊ Qualitative data on the adopters' characteristics, knowledge, perceptions, attitudes and objectives regarding tree planting under ELCIR+ | SSI                        |
|  |   | Adopters' knowledge and perceptions about ELCIR+ and the effect of trees                               |  | PRA                        |
|  |   | Adopters' attitudes  |  | Participant observation    |
|  |   | Adopters' objectives   |  |                            |
|  | What are the reasons for non-adoption of tree planting under ELCIR+ in Kintampo Forest District?                          | Non-adopters' individual characteristics, knowledge and attitudes about ELCIR+ and the effect of trees | ◊ Qualitative data on the views, insights, role, interaction, and commitment of relevant stakeholders                                      | SSI                        |
|  |   | Reasons behind non-adoption  |  | Key informant interview    |

## Appendix B: Lists of interviewees

### *List of interviewed adopters*

| ID  | Description   | Time and Place              |
|-----|---|-----------------------------|
| W1  | Care taker in Suronause   | 18/06/18; 10.00 in Kintampo |
| W2  | Landowner in Asante Akura (Kintampo)  | 18/06/18; 13.00 in Kintampo |
| W3  | Methodist Church Kintampo Society Steward   | 19/06/18; 13.00 in Kintampo |
| W4  | Migrant farmer from Babato  | 19/06/18; 15.00 in Babato   |
| W5  | Chief of Dawadawa   | 21/06/18; 8.30 in Dawadawa  |
| W6  | Migrant farmer in Dawadawa  | 21/06/18; 9.30 in Dawadawa  |
| W7  | Charcoal producer from Dawadawa   | 21/06/18; 10.30 in Dawadawa |
| W8  | Charcoal producer from Dawadawa   | 21/06/18; 10.30 in Dawadawa |
| W9  | President, Vice-President, Secretary, Member of Buagblen Student Union                | 21/06/18; 13.00 in Gulumpe  |
| W10 | Female migrant farmer and charcoal producer in Dawadawa                               | 22/06/18; 9.00 in Dawadawa  |
| W11 | Farmer/ charcoal producer in Dawadawa   | 22/06/18; 9.45 in Dawadawa  |
| W12 | Farmer/ charcoal producer in Dawadawa   | 22/06/18; 10.30 in Dawadawa |
| W13 | Farmer/ charcoal producer and shop owner in Dawadawa, runs the DGM information centre | 22/06/18; 10.30 in Dawadawa |
| W14 | Farmer/ charcoal producer in Dawadawa   | 22/06/18; 11.15 in Dawadawa |
| W15 | Farmer/ charcoal producer in Dawadawa   | 22/06/18; 11.15 in Dawadawa |
| W16 | Farmer in Akora   | 23/06/18; 10.00 in Akora    |
| W17 | Shop owner in Kintampo  | 23/06/18; 14.00 in Kintampo |
| W18 | Queen Mother of Mo, farmer in Asantekwaa  | 23/06/18; 18.00 in Kintampo |
| W21 | Plantation owner from Anyima  | 26/06/18; 10.00 in Anyima   |
| W22 | Plantation owner in Zambrama  | 27/06/18; 10.00 in Zambrama |
| W23 | Farmer and plantation owner in Kintampo/Derebo  | 27/06/18; 17.00 in Kintampo |
| W26 | Farmer and beekeeper in Apesika   | 29/06/18; 13.00 in Apesika  |
| W27 | Farmer and carpenter from Kintampo with land in Kunsu                                 | 29/06/18; 17.00 in Kintampo |

### *List of interviewed non-adopters*

| ID  | Description                     | Time and Place                    |
|-----|---------------------------------|-----------------------------------|
| C1  | Cashew farmer in Kintampo Zongo | 19/06/18; 11.30 in Kintampo Zongo |
| C2  | Cashew farmer in Kintampo Zongo | 19/06/18; 12.00 in Kintampo Zongo |
| C3  | Cashew farmer in Kintampo Zongo | 19/06/18; 12.45 in Kintampo Zongo |
| C11 | Cashew farmer in Kintampo Zongo | 19/06/18; 13.30 in Kintampo Zongo |
| C12 | Cashew farmer in Kintampo Zongo | 19/06/18; 14.00 in Kintampo Zongo |

|     |   |                             |
|-----|---|-----------------------------|
| C13 | Cashew farmer in Babato   | 19/06/18; 16.00 in Babato   |
| C14 | Migrant farmer in Dawadawa, former charcoal producer                            | 21/06/18; 9.30 in Dawadawa  |
| C15 | Farmer who rents out tractors/trucks from Kintampo                              | 22/06/18; 11.45 in Dawadawa |
| C16 | Mother of W17   | 23/06/18; 15.30 in Kintampo |
| C17 | Logging contractor  | 25/06/18; 11.00 in Kintampo |
| C18 | Farmer and teak plantation (non-ELCIR+) owner in Zambrama, interested in ELCIR+ | 27/06/18; 11.00 in Zambrama |
| C19 | Cashew farmer in Babato, interested in ELCIR+                                   | 28/06/18; 9.00 in Babato    |

*List of interviewed key informants*

| Organisation                          | Position   | Time and Place              |
|---------------------------------------|--|-----------------------------|
| <b>Ministries and Agencies</b>        |  |                             |
| FC                                    | National REDD+ Coordinator for Ghana, Head of Climate Change Unit                | 11/06/18; 11.00 in Accra    |
| FC                                    | Director of Operations (Plantations)   | 9/07/18; 14.00 in Accra     |
| FC                                    | Regional Manager Brong-Ahafo   | 20/06/18; 10.00 in Sunyani  |
| FC                                    | District Manager Kintampo  | 16/06/18; 10.00 in Kintampo |
| FC                                    | District Manager Sunyani   | 20/06/18; 12.00 in Sunyani  |
| FC                                    | Technical Officer Kintampo North   | 21/06/18; 15.00 in Babato   |
| FC RMSC                               | Manager Plantations Department   | 14/06/18; 13.00 in Kumasi   |
| FORIG                                 | Research Scientist   | 13/06/18; 14.00 in Kumasi   |
| MLNR                                  | Technical Director/ FIP coordinator  | 25/06/18; 20.00 in Kintampo |
| MLNR                                  | FIP Manager, Observing Member of the NSC of DGM                                  | 9/07/18; 10.00 in Accra     |
| <b>Multilateral Development Banks</b> |  |                             |
| AfDB                                  | Senior Agriculture & Natural Resource Management Officer, responsible for ELCIR+ | 12/06/18; 13.30 in Accra    |
| World Bank                            | Private Consultant, Observing Member representing World Bank of the NSC of DGM   | 09/07/18; 16.15 in Accra    |
| <b>NGOs</b>                           |  |                             |
| Forest Watch Ghana                    | Observing Member of the NSC of DGM   | 10/07/18; 10.30 in Accra    |
| Solidaridad                           | Knowledge manager  | 03/07/18; 10.00 in Accra    |
| Solidaridad                           | DGM Project execution/field team (four interviewees)                             | 22/06/18; 14.00 in Kintampo |
| <b>Traditional Authorities</b>        |  |                             |
| Chieftaincy                           | Sub-chief of the Muslim communities in Kintampo                                  | 17/06/18; 16.00 in Kintampo |
| Chieftaincy                           | Chief of Babato community  | 28/06/18; 8.00 in Babato    |

## Appendix C: Interview guides

### *Interview guide for adopters*

|                                       |   |
|---------------------------------------|---|
| <b>A. Interviewee characteristics</b> | Gender, Age, Years of formal education, Land ownership status, Acres of land accessible   |
| <b>B. ELCIR+</b>                      | <ul style="list-style-type: none"> <li>◇ How did you hear about the programme?</li> <li>◇ When was the woodlot/plantation established? How big is it? What types of trees?</li> <li>◇ Motivation behind participation and choice of species.</li> <li>◇ Support and training received.</li> <li>◇ Ideas for improvement of the project.</li> <li>◇ Would you recommend this project and why?</li> <li>◇ Do other people in your community participate? Why, in your opinion, some people decided not to participate?</li> </ul> |
| <b>C. Knowledge</b>                   | <ul style="list-style-type: none"> <li>◇ <i>Know-how</i>: Experience with tree planting.</li> <li>◇ <i>Principles knowledge</i>: Do you think trees bring other benefits than money? Explain.</li> </ul>  |
| <b>D. Monetary costs and benefits</b> | <ul style="list-style-type: none"> <li>◇ What are the money and time costs of plantation/woodlot establishment and maintenance (clearing, weeding, machinery, labour etc.)</li> <li>◇ (if <i>motivation financial</i>) Do you have an expected revenue from the plantation? Will you need to get any permits to sell timber/wood products?</li> </ul>   |

### *Interview guide for non-adopters*

|   |   |
|---|---|
| <b>A. Interviewee characteristics</b>                         | Gender, Age, Years of formal education, Land ownership status, Acres of land accessible   |
| <b>B. ELCIR+</b>  | <p><i>Prompt for whether they know about the project, if not move on to another section</i></p> <ul style="list-style-type: none"> <li>◇ How did you hear about the programme?</li> <li>◇ Do you know people who got free seedlings from FC?</li> <li>◇ Why have you decided to not participate?</li> </ul> |
| <b>C. Knowledge</b>   | <ul style="list-style-type: none"> <li>◇ <i>Know-how</i>: Experience with tree planting.</li> <li>◇ <i>Principles knowledge</i>: Do you think trees bring other benefits than money? Explain.</li> </ul>  |
| <b>D. Monetary costs and benefits of alternative land use</b> | <ul style="list-style-type: none"> <li>◇ What are the money and time costs of your current land use?</li> <li>◇ (if <i>motivation financial</i>) Do you have an expected revenue from your land use? Will you need to get any permits to your products?</li> </ul>  |

### *Key informant interview guides*

|   |
|---|
| <b>National REDD+ Coordinator for Ghana, Head of Climate Change Unit (FC Ghana)</b>   |
| <ul style="list-style-type: none"> <li>◇ REDD+ in Ghana (understanding the strategy change from “<i>earning from the ground up</i>” to a “<i>dual national-jurisdictional approach</i>” and its impact on ELCIR+)</li> <li>◇ Implementation of REDD+ - roles of FIP and FCPF</li> <li>◇ FIP pilot projects in light of existing tree and land tenure systems</li> <li>◇ BSM legislation change</li> </ul> |
| <b>Senior Agriculture &amp; Natural Resource Management Officer, responsible for ELCIR+ (AfDB)</b>  |
| <ul style="list-style-type: none"> <li>◇ AfDB and its oversight responsibilities</li> <li>◇ MRV</li> <li>◇ Progress of ELCIR+ (redirection of target, opinion on project design and implementation)</li> <li>◇ Reasons for delay of ELCIR+ and implications of the delay</li> </ul>   |
| <b>Research Scientist (FORIG)</b>   |

- ♦ FIP pilot projects in light of existing tree and land tenure systems
- ♦ Sustainability of tree planting projects - creating long lasting change
- ♦ BSM legislation change and BSM under REDD+

#### **Manager Plantations Department (FC RMSC)**

- ♦ BSM assumed under ELCIR+
- ♦ Progress of ELCIR+ (redirection of target, opinion on target redirection)
- ♦ Reasons for inability to secure land
- ♦ New incentives after target change
- ♦ Mapping of ELCIR+ plots

#### **District Manager Kintampo (FC Ghana)**

- ♦ ELCIR+ in Kintampo Forest District
- ♦ Support to farmers provided under ELCIR+
- ♦ Progress of ELCIR+ (redirection of target, opinion on target redirection)
- ♦ Reasons for poor performance in Kintampo Forest District
- ♦ Capacity building in FC as a part of FIP funding

#### **Sub-chief of the Muslim communities in Kintampo Zongo**

- ♦ Opinion on tree planting
- ♦ Knowledge on ELCIR+
- ♦ Reasons for poor reception of ELCIR+

#### **Regional Manager Brong-Ahafo (FC Ghana)**

- ♦ Progress of ELCIR+ across forest districts in Brong-Ahafo
- ♦ Opinion on target redirection
- ♦ Reasons for poor performance
- ♦ New incentives after target change
- ♦ Reasons for delay of ELCIR+

#### **District Manager Sunyani (FC Ghana)**

- ♦ ELCIR+ in Sunyani Forest District
- ♦ Support to farmers provided under ELCIR+
- ♦ Opinion on target redirection

#### **Technical Officer Kintampo North (FC Ghana)**

- ♦ Supply of seedlings to the Kintampo Forest District office
- ♦ Training received as FC staff under FIP
- ♦ Why so many participants in Dawadawa comparing to other places?
- ♦ Is the woodlot component successfully targeting charcoal producers?
- ♦ Challenges in ELCIR+ implementation in the field

#### **DGM Project execution/field team (Solidaridad)**

- ♦ Relationship between DGM and FIP projects (synergies, cooperation)
- ♦ How is DGM received in different villages?
- ♦ How is the teaching conducted?
- ♦ Reasons for delay of DGM and implications for FIP

#### **Technical Director/ FIP coordinator (MLNR)**

- ♦ Progress of ELCIR+; opinion on target change (from off- to on-reserve)
- ♦ Delay of ELCIR+
- ♦ Opinion on DGM and implications of its delay for FIP
- ♦ FC reputation and its possible implications for ELCIR+
- ♦ FIP pilot projects in light of existing tree and land tenure systems

#### **Chief of Babato community**

- ◇ Engagement of the community in ELCIR+
- ◇ DGM reception in Babato
- ◇ Role of a chief in encouraging tree planting

#### **Knowledge manager (Solidaridad)**

- ◇ Delay of DGM
- ◇ How is DGM implemented?
- ◇ Solidaridad's perspective on DGM and FIP synergies

#### **FIP Manager, Observing Member of the NSC of DGM (MLNR)**

- ◇ Delay of ELCIR+
- ◇ Progress of ELCIR+; opinion on target change (from off- to on-reserve)
- ◇ FIP pilot projects in light of existing tree and land tenure systems
- ◇ Opinion on DGM and implications of its delay for FIP

#### **Director of Operations (Plantations) (FC Ghana)**

- ◇ Progress of ELCIR+; opinion on target change (from off- to on-reserve)
- ◇ New incentives after target change
- ◇ Delay of ELCIR+
- ◇ Opinion on DGM and implications of its delay for FIP
- ◇ FIP pilot projects in light of existing tree and land tenure systems
- ◇ FC reputation and its possible implications for ELCIR+

#### **Private Consultant, Observing Member representing World Bank of the NSC of DGM**

- ◇ Bringing DGM to Ghana
- ◇ Reasons for delay
- ◇ Impact of DGM

#### **Observing Member of the NSC of DGM (Forest Watch Ghana)**

- ◇ Delay of DGM
- ◇ Opinion on DGM
- ◇ Off-reserve forest management in Ghana
- ◇ FIP pilot projects in light of existing tree and land tenure systems