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CHANGE  
AGRICULTURE AND  
FOOD SECURITY

**CGIAR Research Program on  
Climate Change, Agriculture and Food Security (CCAFS)**

## **Institutional innovations in African smallholder carbon projects**

### **Case Study: Trees for Global Benefit Program: Environmental Conservation Trust (ECOTRUST) of Uganda**

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## Project's capacity to produce verifiable credits

This section of the report consists of a description of the capacity of the project participants in the Trees for Global Benefits project, of ECOTRUST, to sequester or reduce greenhouse gases (GHGs). The description consists of the interventions implemented under the project, roles played by the different project participants and discussion on emerging issues as a result of the participation in the project, related to carbon sequestration and technologies employed.

### SLM interventions implemented

The Trees for Global Benefits project was designed as a cooperative community-based carbon offset scheme with livelihood components emphasizing sustainable land-use practices. The aim of the project is to produce long-term, verifiable Voluntary Emission Reductions (VERs) by combining carbon sequestration with rural livelihood improvements through small-scale, farmer led, forestry/agroforestry projects while reducing pressure on natural resources in national parks and forest reserves (Plan Vivo.org, 2003). Carbon sequestration or emission reduction benefits are generated by a suite of land-use activities involving afforestation and reforestation as well as agroforestry. This mainly involves the planting of native and / or naturalized hardwood and fruit tree species on private land. The communities are currently planting native trees such as *Maesopsis eminii*, mahogany (such as *Khaya anthotheca*), *Melicia excelsa* and *Terminalia spp.* The fruit trees include Jackfruit, avocado and mangoes. The farmers choose the land-use system they would like to use in their individual Plan Vivos (management plans). Currently there are two options; *Maesopsis eminii* woodlots or mixed native woodlots.

International NGOs, The World Wide Fund for Nature (WWF) has supported conservation activities through funding activities undertaken by the National Forestry Authority (NFA), with regard to boundary management and interaction with communities. In Hoima district WWF has been involved with conservation activities for the biodiversity in the Albertine as well as watershed conservation areas. The Chimpanzee Sanctuary and Wildlife Conservation Trust (CSWCT) is conducting project activities for the conservation of habitat for chimpanzees and other wildlife

### Project targets and progress towards targets

The Trees for Global Benefits Program aimed at: raising awareness of climate change and related issues; increasing household incomes through carbon payments; offering the farmers technical advice and allow them access to other markets such as timber- fuel wood, fruit, fodder and poles; and conserving biodiversity by promoting indigenous tree species. The project works through new and established groups of farmers to plan agroforestry and small scale plantations. The activities include: planting of mixed native woodlot for timber, including mahogany, cedar, African cherry; boundary planting for fuel wood and fruit and timber; and protection of wildlife and native forest remnants

**Table 1: Targeted rewards and avoided emissions from GHGs**

Technical specification	Estimated long term potential carbon benefit tco <sub>2</sub> e Estimated realizable potential
<b>Woodlots mixed native AFM-TB01-01</b>	2,000 ha over first 10 years with an estimated 400,000 t co <sub>2</sub> in 25 years
<b>Woodlots <i>Measopsis emini</i> AFM – TB02-01</b>	2,000 ha estimated over first 10 years of project estimated 400,000 co <sub>2</sub> e in 20 years
<b>Fruit orchards (mango, avocado, jack fruit)</b>	1,000 ha established in project's first 10 years with estimated 100,000 t co <sub>2</sub> e in 20 years

Source: ECOTRUST (2003)

The progress towards project targets is delineated below based on the project verification reports (Rainforest Alliance, 2009), and progress of the project (<http://www.forestcarbonportal.com/project/trees-global-benefits/Forest Carbon Portal/>):

- Project Type: Afforestation or Reforestation
- Area planted: 1000 Hectares
- Tenure: Communities/farmers under customary tenure, Individual farmers/private landowners
- Species Planting Mix: Native and exotic plantings: more than 50% native
- Credit Status: Actively selling and seeking additional support; buyers
- Market: Voluntary Over-the-Counter Market (OTC)
- Currently, Total Reductions: 200,000
- Crediting Period: 25
- Registry: Markit. Plan Vivo register

- Credit Buyers: TetraPak UK; Future Forests, INSAP, Katoomba Group (one-time buyer)
- Investors: UKDFID and USAID

## **Actors for the implementation of carbon-friendly SLM practices**

### **Project manager: ECOTRUST**

The overall objective of the ECOTRUST TFGB program was to develop and operationalise a model for carbon trading with small land holders. ECOTRUST undertakes institutional and technical capacity building of institutions that implement carbon projects, participates in determining the baseline of agroforestry and/or forestry activities, establishing an institutional structure for administration of land uses, land cover and forestry projects for carbon trading, and provide technical specifications for different forestry systems developed and tested.

### **Technical Partners**

The World Agroforestry Center (ICRAF) helped develop technical specifications and carbon monitoring protocols including: definition of selected forestry/agroforestry systems; specification of tree management requirements; definition of baseline biomass conditions to establish carbon stocks; and compilation of biomass data for specified forestry systems. Edinburgh Centre for Carbon Management (ECCM) provides technical backstopping and capacity building consisting of: carbon modeling and carbon baseline specifications; training of partners in carbon accounting, establishment of database Plan Vivo documentation; providing guidelines for project implementation; marketing of carbon; and providing ongoing technical backstopping.

United States Agency for International Development (USAID), Wildlife Conservation Society (WCS), START, CARE-Uganda, ASARECA support baseline studies and mobilization of communities. USAID, WCS, DFID-(Through UFSS), ASARECA, ECCM, NFA, ICRAF, START supported production of Project Design Documents (PDD). Plan Vivo Foundation carries out project registration and management of the Plan Vivo Standard. Rainforest Alliance are the third party verifiers

Academic Institutions including Institute of Tropical Forest Conservation, Makerere University Institute of Environment and Natural Resources (MUIENR) and the Faculty of Forestry and Nature Conservation also provided technical support.

From the private sector, Bugambe Tea Estates is providing a learning opportunity, but not directly involved with the ECOTRUST project. Bugambe is a private company under James Finlay Tea Company, which took over from the parastatal in 1994. The company has 300 ha of forest estate, and is currently pursuing a Rainforest Alliance Certification, working with Unilever in Kenya, Unilever Tea Estates.

### **Private sector**

The companies that have cooperated with ECOTRUST in its initiatives include: Camco, Tetra pak, U&W, Ecosecurites, Live Climate, Climate Path, City of London, Future Forests, Classic Africa Safaris, Uganda Breweries, Geo Lodges Uganda, Alam Group of Companies, AON Uganda

### **Government stakeholders**

The Local Government in Hoima District provides the governance framework under which NGOs and private sector as well as local government staff or agents operate. However, with regard to PES, the Local Government technical staff have limited knowledge on PES activities or transactions and often have to rely on the expertise of the NGOs. Nevertheless, the local governments at district and sub-county levels are responsible for administration and in some cases management of natural resources and natural resource use rights. Lead Agencies include:

- National Agricultural Advisory Services (NAADS)
- National Environment Management Authority (NEMA)
- Uganda Wildlife Authority (UWA)
- National Forest Authority (Uganda)

### **Non-governmental organizations**

WWF, World Land Trust, IUCN, ICRAF, Africare, ECCM, Plan Vivo Foundation, EcoAgriculture Partners, Uganda Society, ACODE, UWS, CARE, FORRI, AEE, Nature Uganda and numerous community-based organizations.

### **Community based organizations**

Farmers associations act as the sellers of carbon. They manage nurseries, plant and manage trees. They participate in trainings, monitoring and verification of the carbon stored and other activities of compliance such as ensuring secure tenure of land and trees, and signing MOUs.

### **Credit Buyers**

The carbon credit buyers are Max Hamburger restaurant AB, U&W (you & we), Tetrapak UK, EcoSecurities, Camco UK, It's the Planet, Future Forests, In 2 Technology, Emil Ceramica Spa, Ceramica Sant Agostino Spa, Classic Africa Safaris, City of London, Blue Green Carbon, International Lifeline Fund, International Institute for Environment and Development – IIED, Straight Plc, Geolodges Uganda, Standard Chartered Bank Uganda, Uganda Breweries Ltd., Uganda Carbon Bureau, Embassy of Denmark

### **Donors**

- USAID Kampala
- NEMA/World Bank, Kampala
- UNDP/GEF Small Grants Programme, Uganda
- French Embassy Kampala
- WWF
- CARE International in Uganda
- Aqua for All, Netherlands
- Saxion University, Netherlands
- Bioclimate Research & Development (BR&D), UK
- Plan Vivo Foundation
- EcoAgriculture Partners, USA
- ICRAF/IFAD
- ASARECA

### **Other conservation partners**

- The Catholic Church and Church of Uganda are engaged in tree planting and nursery production and management activities. For instance, under MUNTEME Technical College (MUNTECO) in Hoima District, the Catholic Church has a private forest and also undertakes nursery forestry practices from which trees are distributed to the communities through a compensatory arrangement.
- Navigators for Development (NAVODA) are a community-based conservation organization that is engaging with communities mostly on issues of soil and water conservation and watershed management. Specifically, in Waki and Wambabya sub-catchments near Lake Albert, NAVODA has undertaken awareness sessions on the receding levels of the water. This is being undertaken under the Integrated Water Management of the World Wide Fund for Nature (WWF). Encourage the planting of indigenous trees in sub-catchments and also planting of non-indigenous trees such as pine and eucalyptus in landscapes for income purposes.
- Kyamalera Wildlife Education Centre provides facilities where the private forest farmers' group meets and organizes its training activities, as well as nursery management activities.
- Educate Uganda is involved in initiating and nurturing private forest owners associations, transforming owners into representative groups. Also train groups on key elements of group dynamics, elements of grassroots advocacy and marketing. Educate Uganda was also involved in the development of Collaborative Forestry Management (CFM) in Hoima District. These are not part of the TGB, but we have worked with some of them.

## **Carbon measurement methodology**

### **Technical specifications**

There are two Technical Specifications used in planting trees under the TGB (Rainforest Alliance, 2009). They are the Mixed Species Woodlots and Single Species Woodlots. Both were prepared with expertise from the World Agroforestry Centre (ICRAF), ECOTRUST, the Edinburgh Centre for Carbon Management, and others, beginning in 2003. These do

not state a clear carbon baseline. The Technical Specifications were developed through the efforts of the START project in 2004 (Systems Analysis, Research and Training). In 2007, a START survey helped to collect baseline socioeconomic and carbon data for the Bushenyi District. It is not evident how this information factored into the technical specifications.

The Single Species Woodlot technical specification does state explicitly, and apparently very conservatively, the carbon storage that can be expected over 20 years, which is estimated at 125 TC/ha. The specification states that carbon is 58% of biomass volume, which is an over the more commonly-accepted figure of 50%. The amount of the carbon offset (i.e., net carbon removals) which is stated in the specification is 61 TC/ha. It is not clear how this amount is derived, though it is about 50% of the total accumulation. This amount is also different than the value the project is using to calculate carbon payments, which is 62.8 TC/ha. It is also different than the value on the Plan Vivo website of 70 TC/ha. The graph in the specification would apparently start at zero and accumulate biomass carbon storage over the 20 years, but if the baseline is zero it should be stated. And if it is something other than zero, that should be stated.

The Mixed Species Woodlots specification does not state the amount of carbon to be accumulated in the written explanation of the technical specification. There is a graph of the total carbon storage over a period of fifty years. But the graph is not sufficiently explained in the text.

Taken together, the Technical Specifications, TGB Operational Manual, and other reports of ECOTRUST (i.e., Annual Reports) on the means of establishing project baselines (for farmer plots or average for Bushenyi) are not clearly stated or explained. The explicit rationale that will be applied for selecting the baseline for pre-project carbon for the Plan Vivos in the TGB project is not stated.

### **Additionality**

The Third Party Verifiers were informed by the District Forest Officer in Bushenyi that there was no government program supporting the growing of indigenous tree species. The only government program supporting tree-growing in the district was for pines, eucalyptus and caliantra. During the audit, there was no evidence of farmers in the TGB project planting those species for their Plan Vivo.

The technical specifications and other reports indicate that costs incurred from tree planting would be outside the means of participating farmers, which would indicate a financial additionality test passed. The START report and other progress reports of the project, as well as auditors' observations, indicate that there are technical barriers to planting indigenous species, a hurdle the project is overcoming. The without-project scenario would not likely include planting of indigenous trees species. Trees were observed to have been planted only on agricultural and degraded lands.

There were some possible instances where some participants had previously cut down some trees of their Eucalyptus woodlots to make way for planting other trees for the project. The auditors had this confirmed verbally in one interview with a farmer (but not witnessed firsthand). The Project Coordinator stated that this practice is not permitted and emphasized that the stated rules of the project are to plant only bare areas with trees, although admitted that some poorly performing eucalyptus woodlots were thinned and planted with new trees. The START Draft report mentioned clearing Eucalyptus and planting indigenous as a problem, but this report seems to overstate the prevalence of what appeared to be a limited occurrence.

With the possible exception of a few Eucalyptus woodlots that were replaced with *Maesopsis*, the auditors view this project as additional. The project documents do not explicitly state why this project is additional, which should be within a PDD. The report further detailed measures aimed at preventing future re-occurrence. These measures include the development of guidelines that are already part of the recruitment and monitoring criteria as follows:

- Land with any evidence of cutting trees in the past five years will not be recruited into the programme.
- Any farmer who is found cutting trees in order to plant carbon trees will be automatically disqualified from the programme.
- The short term (fuel, building poles) woodlots will be kept separate and distinct from the carbon woodlots.
- The farmers that have the fuel and/or building poles trees scattered within the carbon woodlots will be guided to only harvest trees in accordance with the thinning practice as indicated in the Plan Vivos.

According to the report, these rules are being implemented as follows. Awareness raising meetings took place, during which the rules and guidelines of the programme are explained to the farmers. Farmer baseline information is collected and Plan Vivo conducts ground-truthing visits. During these visits, the project staff gives advice on the species and makes a record of whether there is any evidence of cutting of trees in the past five years, records the current land use, etc. The project staff also monitors carbon activities, verifying whether the activities are according to the information in the plan.

### **Permanence**

Potential risks to permanence of carbon stocks were identified in project technical specifications and effective mitigation measures implemented into project design, management and reporting procedures.

There are elements of project management that would enhance the permanence of planted trees, but these have not been defined clearly. Thus risks are not clearly identified with management measures to address them. For example, risks like fire, pest, or disease damage, all of which ECOTRUST staff acknowledges in discussions, may not be readily managed through the existing protocols. There is an absence of a PDD that identifies risks and these within the project design.

Producers enter into legal sale agreements with the project coordinator agreeing to maintain activities, comply with the monitoring, implement management requirements and re-plant trees felled or lost. The farmers enter into legal sale agreements, which have fifty-year duration. These are stored in the ECOTRUST files. The farmer payments are completed in a ten-year period. The project has been conducting monitoring of the Plan Vivos prior to determine whether conditions permit payment prior to transactions being concluded.

As a minimum, a 10% risk buffer is deducted from the saleable carbon of each producer, where the level of buffer is recommended in the technical specifications according to the level of risk identified, and subsequently reviewed annually following annual reporting. There has not been any case where the 10% risk buffer has been used as yet. Up until recently, farmers' sales agreements entitled them to payment in full (100%) of carbon at year ten.

### *Leakage risk*

According to the technical specification, risk analysis conducted indicated that the overall risk is very low. Consequently, a 10% risk buffer equivalent to 22.6 tCO<sub>2</sub>/ha on all project carbon produced is set aside as insurance against any future unforeseen event that might affect the amount of carbon already sold.

Potential sources of leakage have been identified and effective mitigation measures implemented. The ECOTRUST Operational Manual indicates that the primary safeguard taken by the project to confront activity shifting leakage is to establish that the farmer has sufficient land for their activities and will not clear other landholdings with tree cover to make up for land/cropping needs. From the Operational Manual: "The farmer to participate should have enough land for all his/her household food demands. Otherwise the farmer will be tempted to cut down the trees in future, before maturity to plant food crops; which cause a carbon leakage." ECOTRUST has not calculated their project emissions from fossil fuel combustion to implement the project (primarily vehicle use) and other sources. There may be some positive leakage, which should be accounted for.

### *Traceability of carbon sales*

A sample taken (by Third Party Verifier) of the payment records between ECOTRUST and the local community banks demonstrated clear traceability of payments to farmers. A review of available contracts and correspondence between ECOTRUST and the purchasers also demonstrated traceability of purchases.

ECOTRUST had recently begun using a new database platform to replace an older database. The sales figures provided tracing transactions with buyers, as mentioned, are difficult to follow, because there is not consistent reporting for TC and TCO<sub>2e</sub>. The reported sales statistics vary between units (as contracts with purchasers and producers use different terms), which lessen transparency of the transactions for outside parties.

### *Monitoring*

The monitoring is taking place prior to payments as specified in ECOTRUST documents. The following monitoring targets had been met so far, as applicable:

Year 0: 50% Plot planted as described in Plan Vivo; 30% payment of total agreed carbon value  
 Year 1: 100% Plot planted as described in Plan Vivo, 20% payment of total agreed carbon value  
 Year 3: Survival not less than 85%, 20% payment of agreed carbon value

Year 5: Average DBH not less than 10 cm; 10% payment of agreed carbon value

The team inspected a sample of farmers records and saw that they all contained carbon sale agreements and monitoring forms. Reconciliation of monitoring records with payments confirmed that in all cases monitoring occurred before payment and payments were based monitoring reports.

### *Plan Vivos*

Plan Vivo is a voluntary and participatory process that organizes proposed land-use activities. Plan Vivo's projects require a third party verifier. These all had been approved by the ECOTRUST project officers. The team inspected a sample of farms to verify that the Plan Vivo was being implemented as planned. In some cases, there were modifications from the original Plan Vivo (e.g. in terms of the number of species or spacing planned versus the amount planted and actual planting density).

The Plan Vivo sketch map appeared to be underutilized and possibly only a marginally effective management planning tool. The Plan Vivo does not have reliable area information or project maps, which could be of great interest to investors if the project was spatially explicit, so that maps from an actual GPS delineated boundary could be prepared (RA, 2009).

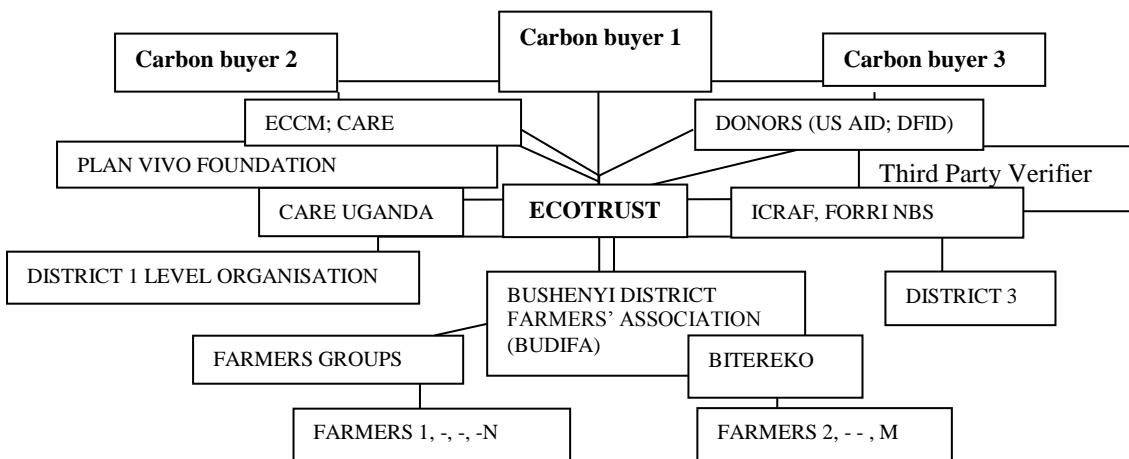
## Project management capacity

This component of the baselines survey reviews the management capacity of the project; that is the ability of the project to delivery regularly on the carbon finance commitment it has undertaken. This includes institutional arrangements, partnerships and relationship with farmers groups, among others.

### Organization of project participants

The envisaged structure for the Trees for Global Benefits Program (and projects) put ECOTRUST at the centre of linking farmers with carbon buyers. The farmers were organized through Community Based Organizations (CBOs) at local level and District Farmers Associations at District level. At different levels, ECOTRUST and the farmer associations cooperates with technical service providers such as CARE-Uganda, the World Agro-forestry Centre (ICRAF), the Forestry Resources Research Institute (FORRI) and the National Biomass Survey office (under the National Forestry Authority). CARE International and the Edinburgh Centre for Carbon Management (ECCM) were involved in development of the program concept while the United States Agency for International Development and the Department for International Development (DFID) provided funding for mobilization and creation of awareness through CBOs. Although ECOTRUST has evolved and undertakes most of the technical capacity building, it still maintains relationships with ICRAF, CARE-Uganda and ECCM among others. Also, the Plan Vivo Foundation is now a more significant partner in terms of the carbon standard used and the support in obtaining and keeping access to buyers. Many of the other envisaged structures are still as they were proposed.

**Figure 1: Envisaged project organization structure.**



Source: Adapted from ECOTRUST PDD (2003)

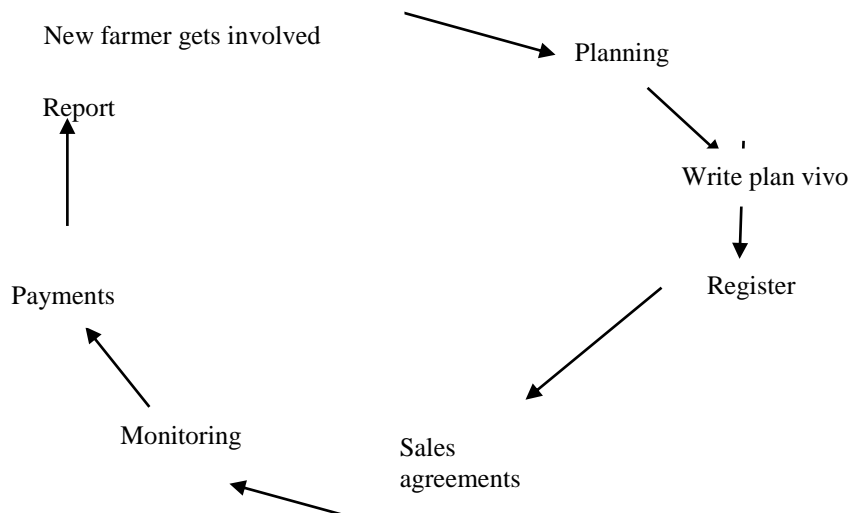


## Project process and timeline

### Case study: Kidoma Conservation Development Association<sup>1</sup>

1. The process starts off with scoping and establishing baselines first, then creating awareness, and finally attracting and training local residents in carbon trade.
2. A member voluntarily makes an application (only interested members are encouraged to make application).
3. The member has to first agree with family members; that is a wife or spouse and one of the children
4. If the family agrees, a letter is written to the Local Council of the area-all this information is on the application form; and through the Local Council One of the area acknowledgement is made that the member does own land and resides in the area. The applicant is required to take the application form and the land use map or plan vivo to the chairman. The chairman is expected to endorse if the applicant is from his village and that the land is his
5. Then a request is made to ECOTRUST to start planting trees.
6. ECOTRUST support and also encourages farmers to develop their nursery beds and acquire high quality seed.
7. The other stages are adapted according to the plan vivo cycle

**Figure 2: Plan Vivo cycle.**



Source: ECOTRUST (2007)

## Risks and opportunities

The project risks and opportunities are summarized in Tables 3 & 4 below. The risk and opportunities to the project developers and promoters, as well as risk and opportunities for the farmers and CBOs undertaking tree planting and management for carbon sequestration, respectively.

**Table 2: Project risks and opportunities**

Risks	Opportunities
1. tenure security amongst farmers	1. enhancing farmers tenure security using demarcations developed as part of carbon projects
2. Policy and legal environment sometimes is vague	2. piloting components of the policy and laws on forestry that have not been explored
3. Financing failing to meet demands of farmers	3. coming up with innovative financing solutions such as village banks, revolving funds
4. Market risks	4. Opportunity to promote niche voluntary carbon markets
5. initial investment in developing concept,	5. implementing the UNFCCC and Kyoto Protocol

<sup>1</sup> Procedures for members to access carbon finance from ECOTRUST in the Plan Vivo Project (Agaba Medard, Coordinator Kidoma Conservation Development Association – Carbon Farmers – PERS. COMM) and Mutabazi Fred Chairman Kidoma CDA.

**Table 3: Farmer risks and opportunities**

<b>Risks</b>	<b>Opportunities</b>
1. Eligibility basis	1. enhancing farmers land tenure and security of tenure over other assets
2. Ability to generate capital to start up	2. Benefit from early payment schemes, innovative techniques of keeping production costs down in nurseries through own labor and seed sourcing
3. Limited forest production knowledge	3. Opportunity to learn and practice best practice forestry production
4. Opportunity cost of lost income	4. learning how to enhance land use both for conservation and livelihoods
5. competition within the household and family over land	5. settling differences over land through community action
6. long periods without cash income, very little cash income from carbon trees	6. long-term planning for sustainable livelihoods

### **Project management capacity**

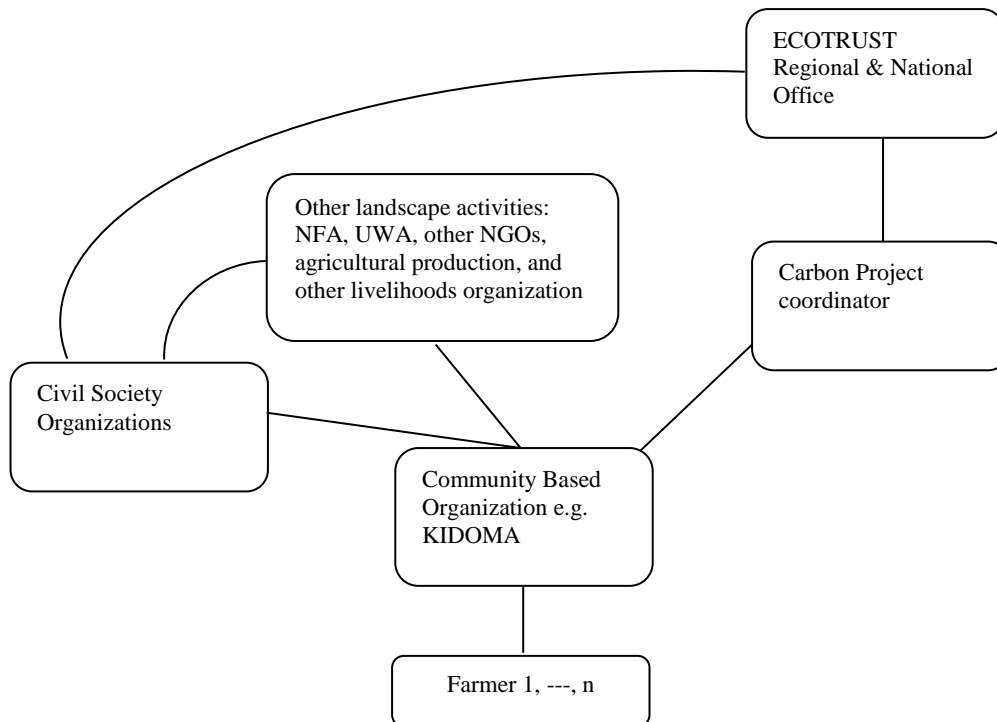
The project management capacity for the TGB project is reflected in the staff capacity of ECOTRUST, as well as the institutional partners participating in the project (stated in the previous chapter). The total number of staff at ECOTRUST working on the project is eight in addition to Executive Director (Ms. Pauline Kalunda Nantongo), 2 Program Officers, Accounts/Admin, and Database Manager (ECOTRUST, 2010). Three staff members have postgraduate education (qualifications) in environment and natural resource management, and climate change. At least five staff members have over six years experience with ECOTRUST and similar organizations engaged in carbon sequestration. ECOTRUST staff have been the beneficiaries of several training programs organized by CARE, USAID, DFID, ECCM, the UNFCCC Secretariat and several other organizations and institutions engaged in climate change issues. Moreover, ECOTRUST has opportunity to obtain further technical capacity enhancement from the Plan Vivo Foundation, the Rainforest Alliance and ICRAF, among others.

The other six technical staff at ECOTRUST comprise of three environment and natural resources management specialists, one business management specialist, and a management specialist. The core finance team is developed around the business management specialist and the Executive Director and the key field staff who are environment and natural resources management specialist with at least six years experience in managing Plan Vivo carbon projects.

### **Community structure and governance**

Based on discussions held with farmers of Kidoma Conservation Development Association, the Hoima District Environment Officer and other project participants in Hoima District, carbon related community activities are organized along the structure proposed (Figure 2). There are several production activities, including the activities of the District Environment officer that influence carbon activities, however, many of these are only indirectly linked to the carbon project. The carbon farmer community structure consists of the farmers at the lowest level who are engaged in tree planting. The farmers are mobilized and meet in groups. The groups are united by the need to be grouped as a carbon group. However, for the most part are engaged in several other activities, many of which are unrelated to carbon sequestration. The CBOs are coordinated by a trained farmer leader who acts as the carbon project coordinator on behalf of ECOTRUST but also represents farmers' interest. The coordinators are selected by ECOTRUST through the regional office. The regional coordination office usually covers at least three districts with active ECOTRUST support, Plan Vivo, projects.

**Figure 3: Organizational structure for carbon-related activities.**



Source: Adapted for study

### Community role in project decision making process

In Hoima district ECOTRUST has promoted limited carbon sequestration activities among members of Community Forest Associations such as Kidoma Conservation Development Association. ECOTRUST initiated support for the community to form groups based on three main additional sources of livelihoods: (a) bee keeping group (so far 120 bee hives), (b) tree planting group, (c) nursery tree management group. They embarked on planting trees with ECOTRUST and also approached NFA, as they did not have enough land for planting trees, and NFA gave them the grasslands in the Forest Reserve in which to plant their trees.

ECOTRUST then introduced the Plan Vivo scheme where they plant indigenous trees, some members were trained on this and also received trainers from the UK. This generated some interest in Plan Vivo and farmers began participating in the carbon trade.

The Group's carbon activities with ECOTRUST are coordinated by one Mr. Agaba. So far the group has planted 10 ha in the reserve as part of the Collaborative Forestry Management (CFM) arrangement with the NFA.

- ECOTRUST has been championing PES and encouraging people to plant fruit trees (e.g. Avocado, mangoes etc in Kiziranfumbi, Kidoma Parish).
- ECOTRUST encourages growing indigenous trees and keeping the current ones. Also the Plan Vivo guidelines indicate that if communities cut trees then there is no additionality.
- Some people are not compliant. While it is important to keep sub-catchments for water, people still see tobacco as lucrative and do not want to give this crop up.
- Community engagement has been in the form of proactive actions such as creating awareness for other community members on management of wetlands or watershed.
- The community is developing a collaborative sub-catchment management framework so that there is sustainability in the management of sub-catchment.
- In addition, even the people who gain money from trade of trees are able to use some money to manage the sub-catchment.
- Community Based Organisations such as NAVODA (Navigators for Development) have emerged to make additional contributions to ensuring group strength and flexibility.

## Gender

### Gender and Land Tenure

The Trees for Global Benefits program targets all people, men and women who have land and are willing and able to plant trees. However, land tenure arrangements in Uganda disadvantages women. Women's rights to land under the vast majority of land holding systems are largely limited to usufruct rights. Also land held under mailo customary tenure is generally inherited by an heir of the deceased person who in most cases is male. This acts as a major barrier to women's participation in decision making to activities which require proof of land ownership (Tukahirwa, 2002). Proof of land ownership hinders the participation of women since most of them do not own land and have to first seek for consent from their spouses.

### Gender and participation

In most areas in the project, a typical meeting would be over 80% men, however, women are not excluded. In Bitereko, Bushenyi where there is a strong network of active women, the majority of participants are women (Carter, 2009). In Bitereko this is a result of the fact that all tree growers in Bitereko sub-county are members of Bushenyi Women in Development Association (Rainforest Alliance, 2008).

In order to ensure that women are represented, particular attention must be given to encouraging them to join as they do in Bitereko. Mwesigwa (2005) suggests that men do more of the work in tree planting activities in terms of clearing land, acquiring seedlings, planting, weeding and monitoring and management. However, Carter (2009) found out that women did more of the work. This may discourage women who think their workload will increase as a result of participation in the project. Children were also responsible for labour in tree planting so they may also find their work load increases as a result of participation.

### Gender and benefits

Firewood is the most commonly used tree product, and every household in the project area uses it. Firewood collection is predominantly a women's role in the family, therefore tree planting benefits women in particular by leaving them more time to do other tasks. In addition, energy saving stoves which have been introduced, particularly in Bitereko region of Bushenyi, also result in the reduction in the amount of firewood used per household (Carter, 2009).

## Internal and external evaluation process

Reports from the Verification showed that the Trees for Global Benefits Projects became the [first voluntary afforestation carbon project validated by Rainforest Alliance](#) (RA). The Rainforest Alliance a leader in [carbon offset project validation and verification services](#) provided independent third-party assurance that the "The Trees for Global Benefits" project meets the Plan Vivo Standard. After a comprehensive evaluation of the pilot project site, validation showed that the project activities for TGB are on track to deliver the 50,000 tonnes (55,115 tons) of carbon dioxide over a 20-year period- from the farmers validated (at time of validation). Verification is continuous process which is done annually. The Bushenyi district is a patchwork of subsistence farms planted with bananas, corn, coffee, sugar cane, sweet potatoes and other crops. In addition to the benefits of carbon sequestration, TGB will help the region recover some of its native highland tropical vegetation. The 138 farm plots included in the original audit cover 258 hectares (637 acres) planted with native and naturalized trees, ranging from one to five years of age. Since the audit, further activities have been carried out with the view to generate over 110,000 further Plan Vivo Certificates.

The project's focus on agro-forestry systems and small-scale woodlots will lead to improved and diversified incomes and increased access to fuel wood and basic building materials, which will reduce the deforestation pressures on nearby natural forests.

The afforestation, reforestation and agro-forestry activities included in the project will be a great boost for biodiversity and surrounding ecosystems. The use of native tree species will expand habitat islands and biological corridors for elephants and chimpanzees. Reforested lands will improve soil stabilization and growing conditions on steep hillsides of the Bushenyi District, an important benefit for the areas' farmers.

ECOTRUST also ensures farmers participate in internal monitoring processes and evaluation activities on a number of occasions, the participating farmers have testified on how the project has changed their lives (RA, 2010). Additionally, there are also socio economic studies that have brought out this fact. Internal evaluation of the Trees for Global Benefit Program is provided by both staff, through staff papers based on desk assessments and research and the numerous studies conducted by independent researchers. This ECOTRUST managed project is the most researched voluntary carbon sequestration project in East and Southern Africa (Pers. Comm. Executive Director ECOTRUST). The Edinburgh Centre for Carbon Management and the Plan Vivo Foundation developed the modus operandi for the project, based on previous experience in Mexico with a similar Plan Vivo project, and has helped to market the voluntary

carbon credits. The World Agroforestry Centre (ICRAF) developed technical specifications for the tree planting regime (Swallow *et al.*, 2010).

## **Key policy issues**

In Uganda, natural resource management is based on the Constitution of Uganda (1995), and national laws such as the National Environment Management Act Cap 153 the Land Act Cap 227, and the National Forestry and Tree Planting Act (2003). Other concerns are articulated below:

### **Property and natural resource rights**

The management of natural resources is legislated under the Constitution of Uganda that guarantees access of Ugandans to natural resources either in form of those managed on their behalf by the government and those they govern on their own. In the Local Government Act, the natural resources that are under the stewardship of local governments such as local forest reserves and other resources such as sand, stones are defined. The National Forestry and Tree Planting Act (2003) established forest governance under the National Forestry Authority (NFA), and that to be managed by the District Forest Services (DFS) under the District Forest Officer (DFO). The DFS manages both local forest reserves as well as forests on individual land. However, the owners of the land on which forests are, own the forests and have the right to make decisions on how the forests will be managed. These decisions include whether or not to sell goods and services from their forest. The rights of access to watershed and biodiversity are different.

### **Rights of community organizations**

ECOTRUST has organized communities to participate in voluntary carbon trade arrangements with private buyers from Europe and the United States. Some of these deals are built first on introducing principles of sustainable forest management, such as using indigenous trees delineated under the Plan Vivo arrangement and also as part of collaborative forestry arrangements. However, carbon sequestration projects have also been introduced in Bushenyi district (The TGB Program) under arrangements organized purely between ECOTRUST and farmers' groups. The groups have been educated on the trade arrangement, and they are recruited on the basis of willingness and ability to participate based on whether or not they own land and can plant trees. Other considerations include ensuring that the projects do not interfere with the food security of locations. The arrangement, which is contracted over a number of years includes offering farmers a purchase plan for the emission credits they generate over an agreed number of years, usually 10 years.

### **Regulatory and managing government agencies**

In general, no government agency exclusively regulates compensation or restitution for ecosystem services. However, under the United Nations Framework Convention on Climate Change (UNFCCC) the Minister of Water and Environment and the Department of Meteorology coordinate the government's engagement in actions regulating emissions of green house gases. In 2009, the Climate Change Unit (CCU) was established in the Department of Meteorology to deal with carbon sequestration and provision of advice, supervision and registration for all projects dealing in carbon emission reductions. Thus far, the CCU has had limited functionality. There are many institutions that are trying independently to initiate PES activities in sectors of energy, forestry, water and agriculture; however, there is generally no coordination of these activities. A new Bill before the Ugandan parliament seeks to convert the meteorology department into a semi-autonomous agency to register, monitor and support the activities of carbon projects.

## **Interaction with landscape scale processes**

In Hoima District, the case study site area, tobacco production is one of the major farmer-owned activities. These activities are supported by British American Tobacco (BAT) through farm inputs supplied to farmers engaged in tobacco production. These are farmers who have been individually registered within Hoima district and produce tobacco. Tobacco production and curing poses a significant concern through the excessive tree cutting for fuel for curing of tobacco as well as cutting down of forests to expand land for tobacco production. In recent times BAT has been promoting forestry production on farms as well as planting its own wood lots to meet the wood fuel demands of the tobacco processing. However, there is still evidence of unsustainable wood fuel use associated with tobacco production and processing. Whereas the wood fuel production activities of BAT are unrelated to the Trees for Global Benefits project, the high rate of deforestation is in part associated with tobacco production and therefore one of the justifications for the increased need for tree planting.

Conservation for the biodiversity in the Albertine rift has been a major pre-occupation of international and national NGOs and local CBOs in Hoima, Bushenyi and Masindi. Organizations such as Nature Harness Initiatives (NAHI), together with the Chimpanzee Sanctuary and Wildlife Conservation Trust (CSWCT), CARE-Uganda and several others are engaged in biodiversity foot printing, as well as community-led biodiversity conservation. These activities are linked with the carbon sequestration activities in terms of reduced deforestation and new forest or tree plantations

providing habitat for wildlife and conserving the biodiversity of the Albertine. Therefore, farmers are encouraged by the opportunity to contribute to biodiversity conservation as well.

At the District Natural Resources office, a working committee on natural resources issues was formed and it consists of the Resident District Commissioner (RDC), the District Local Government (V) chairperson, the District Natural Resources Officer, the District Lands Officer, the District Forestry Officer, the National Forestry Authority (NFA) representative, Uganda Wildlife Authority (UWA) representative, and relevant NGOs and private sector groups like timber dealers. The aim of this working group is to maintain records on persons who carry out illegal activities in National Parks and Forest Reserves. Secondly, it conducts conflict-management for boundaries with UWA and NFA, as were need on the part of the communities and government agencies. At the beginning in 2000, meetings were held quarterly. Then NFA received financial support from the WWF for biodiversity conservation and programs, and this funding program covered the working group strategy. When the support concluded, the meetings were no longer held regularly and eventually stopped, although the working arrangement remains and can be resuscitated.

Further private estate activities include large tea estates such as Bugambe Tea Estates. The company grows and processes tea, and plant trees for factory and domestic use for workers. The company has a 300 ha of forest estate. Forestry practices consist of forestry management cycle that takes 8 to 9 years for eucalyptus. The tea area has been expanding in proportion to the forest estate. The biggest challenge is that most community members do not understand the importance of conservation and easily drain wetlands or cut forests.

## **Project challenges**

### **Technical assistance**

At the national level, there has been considerable focus on carbon payments projects as delineated in the report on potential investment areas by the Uganda Investment Authority (UIA, 2007). The establishment of the Climate Change Unit (CCU) in the Department of Meteorology of Ministry of Water and Environment and the novel CDM projects run by the NEMA and NFA provide considerable evidence of this focus.

### **Capacity building at community level**

At the community level, however, capacity building has been limited to the effort of non-governmental organizations such as ECOTRUST, NAHI, the Katoomba Group, among others. Whereas, for instance, some of the Collaborative Forestry Management (CFM) arrangements between NFA and communities have also resulted into carbon projects, these results have been mostly due to the efforts of the NGOs engaged in developing the CFMs. There is little evidence that NFA, UWA or NEMA and other government departments are investing in technical capacity building beyond the efforts taking place within these organizations themselves.

### **Monitoring, compliance and enforcement**

As market arrangements for ecosystems services, carbon payment schemes often have measurement, verification and monitoring plans. Voluntary market and CDM market credits are measured, verified and certified in compliance to the start under which the credits are being sold. In Uganda, Plan Vivo, Verified Carbon Standard (VCS), Climate, Community and Biodiversity Standard (CCBS), and Carbon Fix are involved in the certifying and selling of credits. Enforcement for the voluntary market is often undertaken within the associations or groups that are linked to the supporting or service-providing organization. For the CDM market, the monitoring, compliance and enforcement roles have been left to the agencies that are part of the agreement such as the NFA and NEMA.

### **Laws, regulations, and policy**

At the national level, the National Forestry Policy (2001) mentions the need to consider markets for carbon sequestration. In addition, both the National Forestry Policy (2001) and the National Forestry Business Plan (2003) describe other activities within the Community Forestry Management (CFM) arrangements and revenue generation that would be used as a basis for developing payments or compensation for carbon sequestration and biodiversity conservation. However, it does not mention the roles or types of participants in such markets.

### **Deforestation and forest degradation**

The biggest danger to forestry within the district is the expansion of farmlands for upland rice under Uganda National Agricultural Advisory Services (NAADS) and tobacco. The greatest threat is to watersheds. People still see tobacco as lucrative and do not want to give it up. However, community resistance to degradation of wetlands and watersheds is growing. There are examples where people sought to sell trees at the riverbank but the community resisted. Moreover, there is limited and inadequate knowledge about payments for ecosystem services and carbon trade, even among technical officers such as the District Environment Officer and the District Forestry Officer.

## Demand for carbon financing

The project continues to receive requests to be part of TGB from an overwhelming number of farmers from communities all over the country (ECOTRUST, 2010). This is a challenge, because the project has not yet mobilized enough resources to carry out all the baseline surveys as well as the sensitization required to recruit all these communities into the programme. Furthermore, the organization does not have staff on the ground to promote and monitor the project among all these communities. Finally, ECOTRUST cannot guarantee that there will be a large enough market to sell all the credits that would be generated from these projects. The project has addressed this challenge by identifying local partners that could take on some of these responsibilities. Also ECOTRUST identifies biodiversity hot spots and areas of conservation importance as priority areas.

## Project innovations

### Partnerships and synergies

The project has established partnerships with local and international organizations for the purpose of extending the project to other parts of the country. The project has revised its partner share to increase the farmer share from 58.5% to 60% for purchases of more than 1,000 tCO<sub>2</sub>. This increment resulted from the reduction in the required contribution to third party verification. Also as the project grows, it is able to benefit from economies of scale (ECOTRUST, 2010).

**Table 4: New partnerships under the TCG project**

Organization	Nature of organization	Partnership
Tree Talk	National NGO	Implementation of the project in Northern Uganda
ICRAF	International NGO	Development of additional technical specification in western Uganda
ASARECA	International NGO	Preparation of expansion of Eastern Uganda (Mt. Elgon area)
Ecosecurities	International NGO	Brokerage agreements for purposes of marketing of TGB credits

Source: ECOTRUST (2010)

### Peer monitoring

The project has continued to involve the farmers in the carbon activities such as peer group monitoring. In addition, the project continues to solicit ideas on how to improve. ECOTRUST encourages a group approach for both capacity building and sustainability. Therefore, members of the group are able to monitor the behaviour of the members of the group since performances are usually assessed by group. However, these same farmers are now being used as peer monitors for other groups as long as their own practice is considered to be good. Guidelines of how communities carry out the monitoring have been developed and are available.

### Training of Trainers (ToT)

Increasingly, ECOTRUST is working through group leaders and lead farmers who have long experience, employ best practices, and have been well trained. The farmers are authenticated to work as project coordinators for the groups in their areas. These Community Carbon Coordinators have been useful in recruiting new farmers as well as new groups in the villages and sub-counties of operation.

### Payments to farmers

The Trees for Global Benefits project introduced an innovative mechanism of paying farmers, where farmers can receive payments as early as year one in advance, if their practices have been verified. This early payment, which continues based on the memorandum of understanding between ECOTRUST and the farmers in years 0, 1, 3, 5, 10, enables the farmers to have some additional financial support for their investment. However, it also ensures that farmers have the carbon credit payments available to them early enough to motivate maintained positive practice.

### Land tenure settlement

One of the preliminary benefits of ECOTRUST in the communities was the enhancement of land tenure security. Before the carbon project transactions, many farmers did not know the demarcations of their land.

### Co-benefits and improved financial management

Carbon projects such as the TGB project rely on presence of local institutions to ensure transmission of revenues to farmers. In addition, because there is a regular evaluation process and need to assess the benefits from the project, farmers are encouraged to use their revenues positively (e.g. paying school fees for children or investing for income generation). In many of the operational areas, village banks run by the communities and projects exploiting farmer entrepreneurship have emerged (e.g. small shops, community schools), drawing their foundation from the TGB project.

## Project finances and equity for farmers

### Project financial life cycle

The Trees for Global Benefits project has undergone a pilot phase of limited offset sales. One of the first buyers of the credits generated by the pilot project was an international, UK-based packaging company, TetraPak, who bought the first credits (11,200 tons of CO<sub>2</sub>) in December 2003 and an additional 9,000 tons of CO<sub>2</sub> in 2004. Carbon sales increased steadily between 2004 and 2007. The carbon offset price has oscillated between USD 3.8 and 5.5/tCO<sub>2</sub>eq, with one particularly high-priced transaction of USD 10.45/tCO<sub>2</sub>eq. The average volume weighted carbon price in the period 2004–2007 was about USD 4.5/tCO<sub>2</sub>eq (Nakakawa *et al.*, 2010).

The most easily quantifiable measures of the project impact are the carbon payments. A typical payment is 904 USD for a woodlot on 1 ha, and the majority of participants have between 0.5 and 2 ha (Carter, 2009). The majority of people in the discussion groups suggested using their carbon payments for school fees, maintaining the trees (i.e. supplying labour), buying building materials for home improvements, purchasing more land, clothes, and food, and building an enterprise. Other suggestions included furniture, crop inputs (seeds and fertilizers), durable goods, fencing and livestock.

### Farmer financial life cycle

Participating farmers enter individually into an agreement with ECOTRUST. Starting with 33 carbon farmers in 2003 (ECOTRUST *et al.* 2007), the number of farmers with contracts who had received payments increased to over 170 by the end of 2008. Some farmers have now received their third payment. Contract terms cover a 10-year period and specify the amount of carbon to be sold, the price per ton to be paid (negotiated on a case-by-case basis), targets to be met within each of five established monitoring periods, and a schedule of payments. Disbursement of funds to farmers is conditional on the farmer meeting the targets within the specified time. In addition, farmers must set aside an additional 10% of their total carbon offset potential to cover shortfalls in the event that they fail to meet objectives. The pilot phase (2003–2006) acted as a platform for expansion of the project to other parts of the country. The project has been extended to Hoima and Masindi Districts, where new Plan Vivos are yet to be reviewed and new contracts signed, depending on the availability of more carbon buyers (ECOTRUST 2007).

From a financial stability perspective, because there are few employment opportunities, cash in hand is extremely difficult to get for households within the project areas (village surveys). However many community members are involved in casual employment, which can provide between 1,500 and 2,500 USH per day, depending on the type of work and gender of the employee (since it is manual labour – often on a farm, the wage for males is higher than women). Participating in the project diversifies income which helps to mitigate risk in the loss of one or more income sources. In Bushenyi, amongst participants, they have a statistically higher number of income sources than non participants, which is partly as a result of carbon payments.

### Strategies for enhancing marketability of carbon

Carbon is largely demand rather than price driven (Harley, 2007) and the price fluctuates for a variety of reasons. This means that producers (smallholder carbon farmers) get different payments per ton of carbon depending on which sale they are allocated. This can cause uncertainty between producers; however, ECOTRUST has regular question-and-answer sessions for participants in addition to the information and training they receive on joining the projects (discussion groups). Viability constraints come from the fact that the market is an immature one that “is relatively small; the flow of transactions is neither predictable nor steady; and transaction costs are relatively high” (Harley 2007). This means for new participants, the contracts they are offered may be at a lower value than anticipated based on observations if the price falls. However, once a price is agreed upon, the participants are guaranteed long-term financial stability as the payments are set for the duration of the project at that agreed price.

### The project costs and benefits

#### Community financial benefits

As much 60% of the price of the carbon can be given to the farmer. During the design phase, the price structure is aimed towards that, and while it is sometimes not 60%, the price is often above half the value. The projects have a sliding cost where if a buyer is buying less, they pay a higher price, to cover cost of administration. Carbon prices range from 6 USD to 20 USD per ton of carbon, and a farmer can generally get about 4 USD per ton.

The community as a whole benefits, as re-investment of carbon finance accumulates. Socio-economic benefits accrue in the form of village banking, where carbon farmers are members of the village branch, buy shares, and foster a culture of savings and credit. The money from carbon credits can be used for emergencies, school fees, etc. In fact, one farmer



bought a primary school from Bitereko. Farmers' preference is to use carbon money for more input expenditures, but instead often use the little savings for nurseries and tree seedlings. The expected carbon payments serve as collateral. One drawback to handing out money in cash is that it can lead to corruption problems.

### **Co-benefits**

Carbon is a means of conservation and livelihoods improvement. Participants usually do not go for carbon, but go to rehabilitate degraded landscapes. Capacity building in land management is a large part of the project. Every farmer is taught to design a management plan; the farmer gets ex ante payment before they get credits, and uses the money to invest into landscape management. Farmers also invest in other income-generating activities, such as bee keeping, medicinal extracts, fodder, and fuel wood branches before they benefit from timber. Farmers participate in group marketing schemes, using the structure that has been established.

To maximize environment benefits, sites are identified where tree planting will provide additional benefits, controlling for soil erosion and siltation of rivers (e.g. River Mobuku) that feed into Lake George and River Rukindagye. Generally, indigenous species are planted, in addition to improved (mangoes, pawpaw avocado) species with no known effect on soil. Eucalyptus and pines are excluded.

### **Investment**

ECOTRUST does not give any farmers initial money to plant. Only those who have demonstrated commitment receive a payment in the first planting year, after planting. Institutional awareness raising, information, and capacity building help with this first step. There is an arrangement for already participating farmers to get seedlings on credit. Guidelines are available to ensure the process is not abused. When you have planted, you are part of the payment round, and buyers are allocated on a first-come-first-served basis. But if you plant before you have been given a go-ahead, those trees are not cleared.

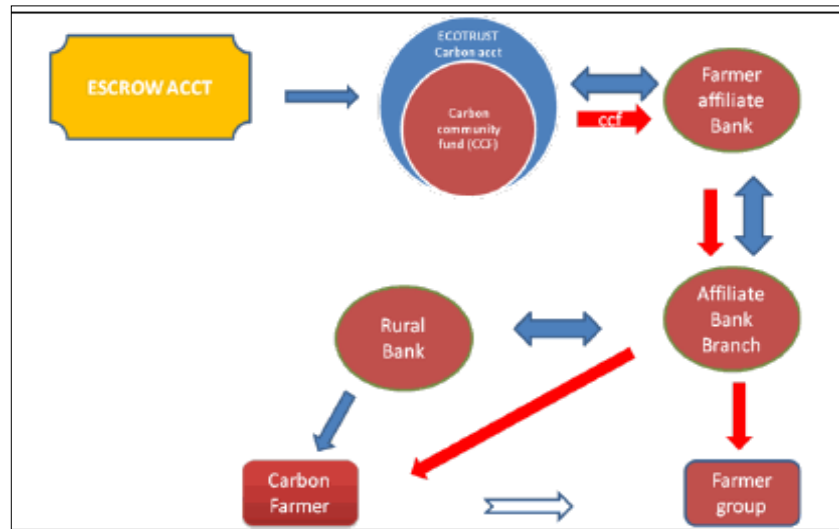
The creation of a bank for carbon credits is also planned. The credits are currently issued by Plan Vivo and Market Registry. ECOTRUST will start buying from all who have trees starting in 2010. However, some buyers want credits that are already in the registry. It is also necessary to plan whether to increase or decrease payment, however ECOTRUST will have to put up a lot of capital to buy credits and to pay the registry.

### **Payment mechanism for farmers**

Bank accounts and informal credit institutions are the two ways identified to invest money and where loans could potentially be accessed. Savings clubs are a popular informal credit institution, particularly for women and are often community-based so are more accessible than banks, which are based in the district town. In some villages it was estimated that less than 10% of people used either a bank or an informal credit institution (village surveys). The fact that one of the criteria for joining the project is to have a bank account (ECOTRUST facilitate this for those who need assistance to get an account) is a great benefit to a number of participants. Capacity in terms of financial planning is expanded, and the way the payments are fixed allows future planning to take place.

In order to qualify for a loan from a village bank, it is necessary to have a guarantee. The carbon finance contract which is between the participant and TFGB is acceptable security. This was considered one of the major indirect benefits to project participation. Many respondents stated capital as the limiting factor in terms of farm development alone, so the availability of a loan allows development on farm as well as in other areas for example to expand a business (Nakakawa *et al.*, 2009).

**Figure 4: Lineage of financing mechanisms for TGB Project farmers.**



Source: ECOTRUST (2010)

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