Socio-economic benefits in Plan Vivo projects: Trees for Global Benefits, Uganda

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Executive summary

A socio-economic study of the Ugandan project 'Trees for Global Benefits' was undertaken (fieldwork from August – November 2008), with the aim of assessing the ability of the project to address rural poverty. The investigation assessed the accessibility of the project to the rural poor, the socio-economic benefits the project on participants as well as looking at wider benefits which the project brings to local communities.

The research built on methods developed by the Jindal socio-economic studies in the Nhambita Community Carbon Project, Mozambique Plan Vivo project (2004 and 2008). Data were collected from over 168 villages in 3 Districts in rural Uganda, where the project currently operates using a variety of methods. 768 household surveys were used in the analysis, key informants were interviewed and group discussions were led using Participatory Rural Appraisal (PRA) techniques.

The project was found to be accessible to poor small scale landholders, and that barriers to entry would only affect a very small proportion of potential participants. In addition to the payments for carbon sequestration, the project was found to have multiple benefits which it brings to participants, which contribute to food and fuel security at the HH level, and it the project provides social and human capacity building. The payments themselves were found to have an impact on the lives of the participants, and in particular could be used as credit security for loans, which previously would be inaccessible to the rural poor. Spending was found to increase as a result of the project, which leads to community wide benefits for example from the purchase of seedlings and labour to maintain the project trees. As a result the project was found to have a contribution to poverty alleviation in Uganda.

Contents

Abbreviations

ABMP	Area Based Modernisation Programme
C	Carbon
CBFM	Community Based Forest Management
CBO	Community Based Organisation
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CFM	Collaborative Forest Management
CFR	Central Forest Reserve
CO_2	Carbon Dioxide
CSWCT	Chimpanzee Sanctuary & Wildlife Conservation Trust
DFO	District Forest Officer
DRC	Democratic Republic of Congo
ECOTRUST	The Environmental Conservation Trust of Uganda
HH	Household
ICDP	Integrated Conservation Development Project
ICRAF	International Centre for Research in Agroforestry (World Agroforestry Centre)
IDP	Internationally Displaced Persons
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
KIKODA	Kidoma Conservation & Development Association
LC	Local Council
LRA	Lords Resistance Army
MDG	Millennium Development Goals
MBI	Market Based Instruments
NAADS	National Agricultural Advisory Services
NEMA	National Environment Management Authority
NFA	National Forest Authority
NGO	Non Government Organisation
NRM	National Resistance Movement
PEMA	Participatory Environmental Management Programme
PEN	Poverty Environment Network
PES	Payments for Ecosystem Services
PRA	Participatory Rural Appraisal
PV	Plan Vivo
PVF	Plan Vivo Foundation
SEDA	Siiba Environment Conservation & Development Association
SPO	Special Projects Officer
TASO	The Aids Support Organisation
TFGB	Trees for Global Benefits
TIST	The International Small group & Tree planting programme
TLU	Tropical Livestock Unit
UBOS	Uganda Bureau of Statistics
USH	Ugandan Shillings
UWA	Uganda Wildlife Authority
VER	Voluntary Emissions Reduction
WWF	World Wide Fund for nature

1 Introduction

1.1 Background to project

The 'Trees for Global Benefit' Plan Vivo project in Uganda is a land-use change project which targets smallholder farmers through community groups. It was set up in 2002, and allows small scale rural land owners to plant native trees and to gain funds. It was piloted in the Bushenyi district in South west Uganda by the Ugandan based NGO ECOTRUST (the Environmental Conservation Trust of Uganda)[1]. Small scale land holders in rural areas have been involved in tree planting activities since the project's inception in 2002. The project uses the Plan Vivo land use system, which is now operational in four other projects worldwide.

TFGB is a registered Plan Vivo project, and as such uses the Plan Vivo system. The Plan Vivo system is a framework for planning, managing and monitoring the supply of Voluntary Emissions Reductions (VERs) from community based sustainable land-use projects. The PV system and standards are managed and developed by the Plan Vivo Foundation[2]. Eligible land use activities for generating VERs changes are currently afforestation and reforestation[3], agroforestry[4], forest restoration[5] and forest conservation[6]. Land use changes are made by smallholders (producers) who create land management plans for land which they have officially recognised land tenure over. The Foundation are responsible for issuing Voluntary Emissions Reduction (VER)[7] certificates for projects which operate using the Plan Vivo standards.

1.2 Climate change and carbon offsetting

Climate change is a complex issue and it is now overwhelmingly accepted that anthropogenic greenhouse gas (GHG) emissions contribute to the greenhouse effect and therefore global warming. As much as 40% of the observed global warming cannot be attributed to the carbon cycle (Grace 2004). This has led to an international effort to reduce the increasing concentrations of CO_2 in our atmosphere. There is much debate about which way this should be done, there is increasing interest in market based mechanisms which are now widely recognised to be part of the solution. Carbon offsetting refers to the act of reducing a specific amount of carbon which is equal to an activity or production of a good for example. Carbon trading occurs where the reduction or avoidance of units of GHGs are commoditised and sold in carbon markets. Projects generating these units (known as carbon credits) may conduct

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[1] ECOTRUST, Plot 49, Kanjonkya Street, Kamwokya, PO Box 8986, Kampala, Uganda
Tel: 265 41 4343129, Fax: 265 41 4341821, www.ecotrust.or.ug

[2] The Plan Vivo Foundation, 18B Liberton Brae, Tower Mains Studios, Edinburgh EH16 6AE. A Scottish based charity
Tel: 0044 (0)131 672 3782, Fax: 0044 (0)131 672 9299, www.planvivo.org

[3] Reforestation: the establishment of a forest (can be in the form of a woodlot, fruit orchard) where it has previously been deforested.

[4] Agroforestry: crops and trees are grown on the same piece of land at the same time.

[5] Forest restoration: protecting, maintaining and reforesting degraded forest

[6] Forest conservation: protecting and maintaining existing forest.

[7] VERs are reductions made where there are no legal requirements to do so, ie in the absence of the regulatory market and the CDM (Clean development Mechanism) and other Market Based Instruments (MBIs).

activities that reduce emissions at source, for example methane burning or renewable energy, or activities that increase carbon sinks, such as afforestation (sequestration activities). Whilst there has been some debate about the effectiveness (and ethics) of using sequestration activities as a means of mitigating climate change, projects continue to develop with this aim and significant volumes of carbon credits have been traded in voluntary carbon markets that were generated from forestry activities..

Many projects generating VERs through forestry in particular purport to have additional 'co-benefits', and claim other positive impacts over and above climate change mitigation. Projects located in developing countries for example, can be designed to contribute to the achievement of the Millennium Development Goals, for example they may 'promote gender equality and empower women', 'ensure environmental sustainability', and provide a 'partnership for development'.

Figure 1: The Millennium Development Goals

As projects have been rapidly emerging worldwide into the voluntary carbon market, so have standards which can be used to asses and register such projects to test that these projects achieve both storage of carbon credits and any co-benefits claimed. As the carbon market has been steadily growing and development projects are there has been an increasing amount of scrutiny put on projects which claim to achieve both environmental and social benefits.

1.3 Need for this study

Like other projects, the TFGB PV project makes certain claims about the co-benefits it provides. By virtue of being a PV project, it brings certain socio-economic benefits to participants (producers). The rationale of this study therefore, is to test the PV claims against the findings of the fieldwork. The following claims are made by the PV foundation about its projects:

"The Plan Vivo System ensures that payments go directly to communities. It empowers communities to take control of their own resources and work to break negative cycles of poverty and degradation of natural resources."
(Plan Vivo Standards 2008).

Potential socio-economic benefits are therefore:

- Payments ("directly to communities")
- Capacity building and economic gains to local businesses ("empowers communities")

- Poverty alleviation ("break negative cycles of poverty")
- Environmental services ("degradation of natural resources")
- Address the link between rural poor, forests and management of natural resources by encouraging Community Based Forest Management (CBFM) ("take control of their own resources")

"Projects will only succeed if land-use practices implemented are viable over the long-term and provide sustainable economic benefits to communities over and above carbon payments."
(Plan Vivo Standards 2008).

Plan Vivo land-use projects also aim to be successful over the long-term and environmental associated benefits which are promoted by the PV Foundation include:

- *"Increased resilience and ability to adapt to climate change*
- *Conservation of threatened ecosystems and native species*
- *Strengthening of protected areas*
- *Biodiversity maintenance and improvement*
- *Watershed protection*
- *Soil stabilisation*
- *Regulation of regional micro-climates*
- *Poverty reduction and sustainable livelihoods through e.g. improved agricultural productivity, income from timber, fruits, nuts and non-timber forest products, PES*
- *Improved social capital through participatory planning, capacity-building, transfer of knowledge and skills."*
  (Plan Vivo Standards 2008)

The Plan Vivo Standards (2008) also claim that the Plan Vivo System was developed specifically for "*use by rural communities*". The study will also assess whether the project is indeed accessible to the rural poor and if, and what, barriers may exist to participation.

1.4 Aims and objectives

The overall aim of this study is to identify the socio-economic impacts of Plan Vivo projects, and then to compare these with the benefits claimed in the Plan Vivo Standards.

- To determine the impacts of project participation over and above payments on producers and their households (HHs)
- To research the impacts of payments on producers and their HHs
- To assess the community wide (i.e. including non-participants) benefits resulting from project activities
- To identify any barriers to project participation by HHs
- To create standardized methods and tools for assessing socio-economic impacts in Plan Vivo projects.

The objectives were to:

- To undertake field research gathering information directly from Plan Vivo producers
- To use the lessons learned and a similar framework to the Jindal (1998) undertaken for the Plan Vivo project in Mozambique, to assess the impacts of the Trees for Global Benefit project, Uganda
- To develop in country capacity for future studies through training
- To develop standardised methodologies and develop user manuals so similar studies can be easily replicated in other projects
- To ensure that between project analysis (Plan Vivo and other project types) is possible from this study's results.

2 Methodology

Several widely used methodologies exist for the socio-economic analysis of development projects, and elements were chosen for use during this study. Some methodological techniques from the Jindal 2004 and 2008 studies were used and adapted as required. In order to ensure the survey is robust and complete, several different types of data were collected, and collected in a variety of ways from different sources. These data forms will be triangulated to the research questions to increase accuracy. Elements from the Participatory Rural Appraisal (PRA) method, and the IFAD (International Fund for Agricultural Development) Sustainable Livelihoods Framework (SL Framework) were used (see boxes 1, 2 & 3 for more information).

Box 1: The Miombo project: Socio-economic analysis

The Miombo project: Socio-economic analysis
The Nhambita Community Carbon project was the result of an EU funded research project, which was led by the University of Edinburgh and run in country by Envirotrade. This project used the Plan Vivo methodology, and was the focus of two detailed socio-economic examinations in 2004 and 2008. These were led by Jindal using a mixed methodology designed specifically for the project analysis.

Source: www.miombo.org.uk

Box 2: PEN: The Poverty Environment Network

PEN: The Poverty Environment Network
PEN is an international network and research project on poverty, environment and forest resources. Launched in 2004 by CIFOR, this aims to collect household data from a number of locations globally.

Source: www.cifor.cgiar.org/pen/

Box 3: SL Framework: The Sustainable Livelihoods Framework

SL Framework: The Sustainable Livelihoods Framework
This is a very much people-centered participatory discursive technique designed to increase the effectiveness of development assistance. It can also help analyse and understand the livelihoods of the poor as well as assessing the effectiveness of existing projects to poverty reduction.

Source: http://www.livelihoods.org/info/guidance_sheets_pdfs/section1.pdf

2.1 Key terminology

Key terms used in the report are defined as follows:

- **Poverty** – an inability to participate socially, economically, culturally or politically in society. The indicators of poverty which will be used to identify / measure poverty include income, consumption and income diversity.[8]
- **Capacity building** – the potential technical capacity and ability to solve problems within the community. This experience and skills can be put to work once the communities are empowered.
- **Empowerment** - "Empowering communities means that communities should have voice, decision-making powers and access to resources".
- **Natural resources** – these are assets which are often environmental public goods and may be available for use by community members.[9]
- **Livelihood** – "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base".[10]

2.2 Location of study

Uganda: '*The pearl of Africa*'

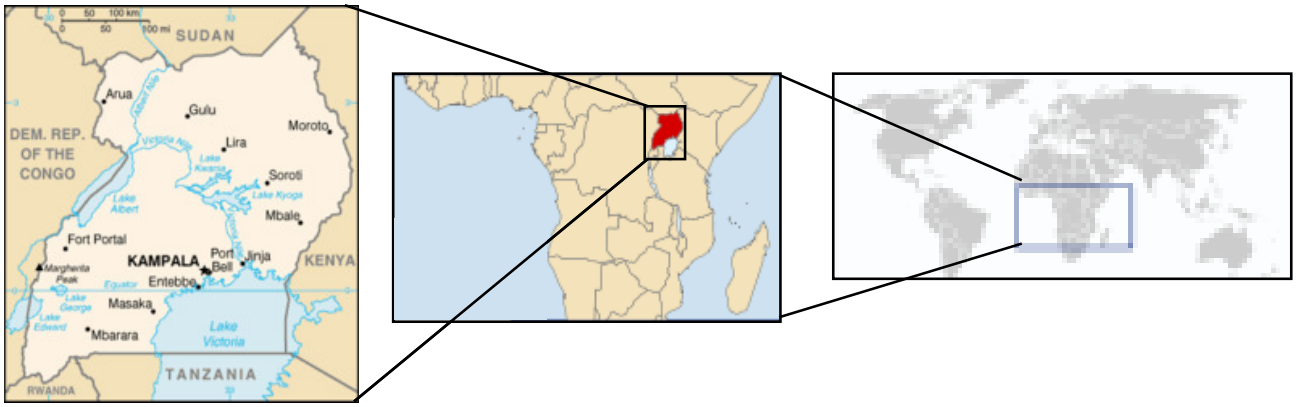

Figure 2: The location of Uganda

[8] ODI Poverty Briefing. The Meaning and Measurement of Poverty http://www.odi.org.uk/publications/briefing/pov3.html

[9] Worldbank.org Community Driven Development: Community Mobilisation and Capacity Building. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTCDD/0,,contentMDK:20384443~menuPK:608222~pagePK:148956~piPK:216618~theSitePK:430161,00.html

[10] Sustainable Livelihood Framework (IFAD) http://www.livelihoods.org/info/guidance_sheets_pdfs/section1.pdf [accessed 02.02.09]

Uganda is a landlocked nation in East Africa. Its area is 241,000 km^2 and its forest cover is 36270 km^2 forest area in 2005, which had fallen from 405090 in 2000 (World Bank 2006). Over 90 percent Uganda's greenhouse gas emissions, in terms of annual flows of Carbon, are attributed to land use change. This is mainly due to deforestation for wood fuel (charcoal and firedwood), and timber. Land use change initiatives including Plan Vivo projects are therefore very important for addressing Uganda's contribution to climate change (Plan Vivo 2009a). Sixty four percent of the land area is dedicated to agricultural (2005) land so the potential for agroforestry projects is significant.

Uganda has a population of 29.9 million (World Bank 2006) and its population growth rate of 3.2% per annum. Table 1 below compares Uganda's Human Development Statistics with the rest of the world.

Table 1: Uganda's human development index 2006 and underlying indicators in comparison with other countries is given in brackets.

Human development indicators HDI value 2006	Life expectancy at birth (years) 2006	Adult literacy rate (% aged 15 and above) 2006	Combined primary, secondary and tertiary gross enrolment ratio (%) 2006	GDP per capita (PPP US$) 2006
0.493 (156 / 179)*	50.5 (160 / 179)	72.6 (106 / 147)	62.3 (129 / 179)	888 (162 / 178)

Source: Human Development Reports (2009) http://hdrstats.undp.org/2008/countries/country_fact_sheets/cty_fs_UGA.html [accessed 29.01.09]
*Position of Uganda in UNDP League Table (position of Uganda / number of countries with available data).

The project is operational in the three districts of West Uganda which were covered by the study, namely Bushenyi, Hoima and Masindi which can be found in Figure 3, below.

Figure 3: Map of Uganda showing Bushenyi, Hoima and Masindi Districts where the TFGB project operates.

Table 2 below shows how Uganda is sub divided in terms of areas and the local government structure, in addition to the number of these areas which were covered by the research.

Table 2: The geographical hierarchy of Uganda and its Local Government Structure

Area	No. covered in study	Local council
Village	>168	LCI Local Council Village level
Parish	34	LCII Local Council Parish level
Sub-county	12	LCIII Local Council Sub-county level
County		LCVI Local Council County level
District	3	LCV Local Council District level

The TFGB project operates in three districts within Uganda, Bushenyi, Masindi and Hoima. The project was initiated in Bushenyi in 2002 and the first producers were allocated buyers in 2003 (i.e. plans were implemented). The introduction to Plan Vivo was given to farmers in Hoima and Masindi in November 2007 during an Ecotrust training visit. In order to increase the potential biodiversity benefits to the project, the sites are all in the buffer zones to national parks, forested

areas and local forest reserves. These include the Queen Elizabeth National Park (Bushenyi), Lake Albert (Hoima) and the Murchiston Falls National Park (Masindi).

These areas all are low for various infrastructural reasons. see box 4 below:

Box 4: The Miombo project: Socio-economic analysis

Electrification: In only 2 villages out of the 23 had any access to electricity, and in total less than 5 HH had access in each village. There were plans for some areas within the project boundary to become electrified.

Health facilities: In Uganda there are a series of private, not-for-profit (charitable) and government run health centres which occur within the survey area. In some areas the nearest health clinic is up to 6 miles away, and it maybe further to a government health centre, which is more likely to be more affordable.

Educational institutions: In almost all villages, there was a primary school within 2 miles, however secondary schools were often much further away – in some cases up to 13 miles away.

Market access: Several of the villages visited were not accessible by vehicles all year round (there are two rainy seasons in Uganda which can render roads impassable). In many villages the nearest district market where larger consumer goods such as tools, mobile phones and bicycles could be purchased were up to 30 miles away. Smaller weekly markets were often closer where fruit and vegetables and other smaller items could be purchased.

Water supply: Water is available in some villages from bore holes and wells. Some communities do not have access to these and collect water from a nearby stream, which is some cases is seasonal so in the dry spells water is collected from other villages that have permanent streams or other sources of water.

Source: Village questionnaire

2.3 Background data collection

Local information

Detailed 'village level' information was gathered from a selection of the villages where inhabitants were being asked to complete the questionnaire. Generally this information was sought from a community elder or village leader (LC I level) using an informal questionnaire. A total of 23 villages were included across the three project locations.

This background information helps to identify any institutional trends (such as the close proximity to a government health centre) which may affect the socio-economic status of the project area. This will also help to build the baseline for the socio-economic status of the community from which the changes can be assessed which have occurred as a result of the project. Information was collected using a questionnaire based on the PEN Village Survey 1 (see appendix 6.5).

2.4 Questionnaire

The largest data set gathered was through a rural livelihood household (HH) questionnaire (appendix 6.5). Participatory Rural Appraisal (PRA) was used to develop the questionnaire. The questionnaire was devised to provide a mixture of both quantitative and qualitative data. It was based on the Jindal (2008) questionnaire used in the socioeconomic impact study in Mozambique, and also incorporated elements of a survey used by ECOTRUST (2006)[11], the project co-ordinator, to gather information about potential project areas.

The questionnaire was administered to rural Ugandans who have been involved as Plan Vivo producers for varying lengths of time, and who have received different numbers and amounts of payments. The survey also covered non participants, some of whom are on a waiting list to join the project should buyers become available. These farmers on the waiting list to join the project have submitted their *Plan Vivo* land management plan. Participants are classed as those individuals who are actively involved in the project, and have signed an agreement with ECOTRUST, which includes a long-term monitoring and payment schedule.

Table 3: Differing scenarios covered for analysis

	With project (an area where the project is currently operating)	**Without** (an area where the project is not yet operating)
Before (questions relating to 2002 – before the project began)	✓ Participants Bushenyi recall, Participants Masindi and Hoima	✓ Non participants Bushenyi recall, ✓ Non participants Masindi and Hoima
After (questions relating to the present (2008) – after the project has been operating)	✓ Bushenyi Participants	✓ Bushenyi Non participants ✓ Non participants Masindi and Hoima recall ✓ Participants Masindi and Hoima recall

Predicting or estimating what the socio-economic conditions in the project area would have been in the absence of the project can be referred to as the 'without project' scenario or the socio-economic baseline. This was achieved through carrying out the questionnaire in several control areas where the project was not operational, and removes macro-economic and socio-political factors for example which impact the community.

Because no comparable baseline data is available, recall data was gathered to determine the 'before project' scenario in project areas. PRA techniques were used to identify a suitable date for the before project scenario, which was established as 2002. This date is the actual year of the project inception, as well as the year a national census took place and the year after the presidential elections of 2001. Linking the year of recall to a specific memorable event with which the community are familiar increases accuracy which can occur from a long recall period. Some surveys suggest a shorter recall period, the PEN study (PEN, 2009) has quarterly surveys for HH income in order to increase accuracy.

[11] Tushabe, B., Turiho, A., Kyerere, C.B. and Kagwa, A. A Report of The PRA Assessment Survey of Hoima and Masindi Districts: Promotion of participatory forest management for forests reserves and private/community forests in Masindi and Hoima Districts. October 2006. Impact Associates Development Consultants. Supported by PRIME West and USAID.

2.5 Semi structured group discussions

Qualitative information was also gathered to support and enhance the mainly quantitative data from the questionnaire. Semi-structured discussion groups were facilitated with communities (in project areas) to discuss the project, identify perceived impacts, discuss wider socio-economic conditions in the area and perceptions of key concepts such as wealth. The concept of wealth was discussed using techniques derived from 'wealth ranking / categorisation' exercises (LADDER 2001). This technique can be used to identify the potential indicators of wealth and poverty in different areas and groups.

Discussions focused on identifying the following (LADDER, 2001)

- Local concepts and language for describing wealth;
- The number of wealth categories which are acknowledged / can be identified;
- A working definition of a HH's wealth.

Two group types were approached for information:

Informal social-group discussions

Informal discussion groups were instigated in different social groups within the project area, in order to discuss research questions which may affect these groups in different ways and to create a better understanding of their needs. Under represented groups were targeted and in this case informal meetings with women, the job seekers and school leavers were targeted. These stakeholders are particularly important to include in this research.

Organised-group discussions

Relevant organised (i.e. pre-established formed groups) groups were targeted for discussions. Discussions focused around the group activities and the background of the group. Questions also assessed how the group interacts with or is effected by the TFGB project. Participating groups are listed in appendix 6.3. Each discussion began with questions adapted from the PEN prototype questionnaire[12], forest user groups section. Discussions were then allowed to develop 'organically' to encourage natural and open discussion.

2.6 Interviews with key project stakeholders

Local experts in forestry and environmental projects were interviewed to establish attitudes toward the TFGB project (see appendix 6.2 for list of interviewees).

2.7 Field visits

Field visits were made to individual producers' small-holdings to discuss issues directly relating to tree planting and management.

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3 Impacts of the project

This section of the report describes the impact that the project has had on participants and on the community.

3.1 Increase in finance

The most easily quantifiable measure of the project impact are the carbon payments. A typical payment is 904 USD (see 3.8.2 for an explanation of this figure) for a woodlot on 1 ha, and the majority of participants have between 0.5 and 2 ha. The questionnaire covered participants who had had between 0 and 3 payments for their carbon at the time of the survey. The payment schedule is discussed in table 7 (section 3.11). The mean individual payment stated by respondents was 415,004 USH (N=101).

Table 4: Information from project participants

No. times paid a carbon payment	No. respondents
0	45
1	20
2	72
3	13

Participants were asked what they would have spent the money on, and for those were yet to be paid, what they intend spending the money on. They were able to select as many as were appropriate.

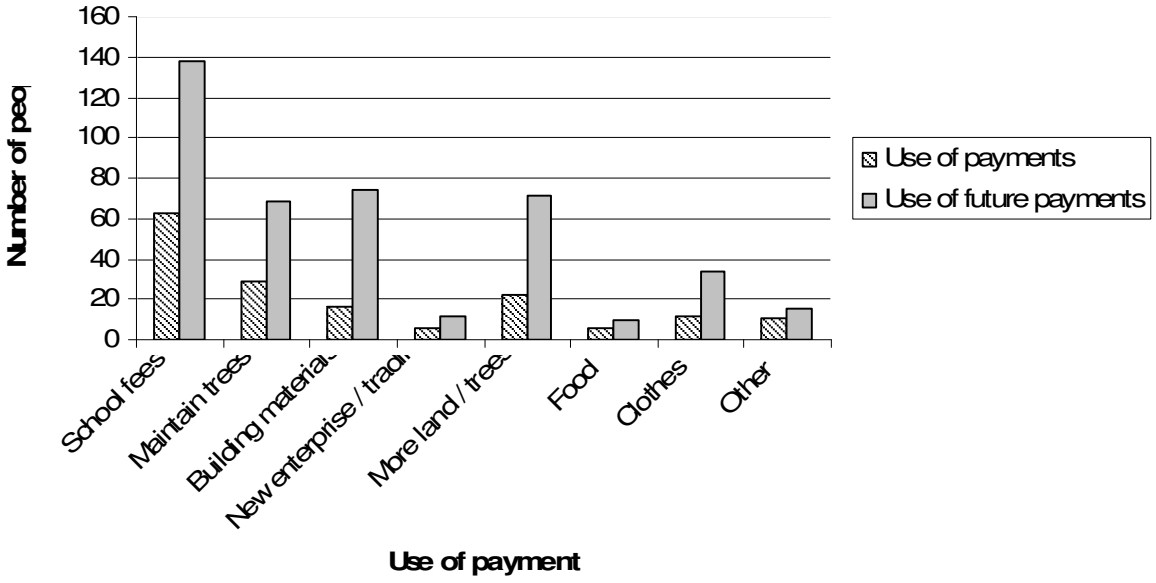


Figure 4: Use of carbon payments by project participants

The majority of people in the discussion groups suggested using their carbon payments for school fees, maintaining the trees (labour, buying building materials (for home improvements),

buying more land, clothes, and food, and building enterprise. Other suggestions included furniture, crop inputs (seeds and fertilizers), durable goods, fencing and livestock.

3.2 Income and wealth indicators

Discussions determined what the community perceived as income and wealth indicators and these including housing, ownership of durable items, livestock and farm area were included in the analysis. A general increase in many of these wealth indicators over time, made it difficult to determine the effect as a result of the project, but since an increase in income can be seen, this extra finance could be used in the improvement in all these – as is suggested by the participants (see section 3.1).

Housing

Generally, over the lifetime of the project, the standard of housing has increased. Figure 5 (below) shows the overall change over time, in housing status from the present (2008) (n=763) to 2002 (recall) (n=762). Increases can be seen in the presence of iron roofs, brick walls and cement floors (signs of wealth) and decreases are in thatch, and by default mud walls, which is the only alternative to brick in the area surveyed.

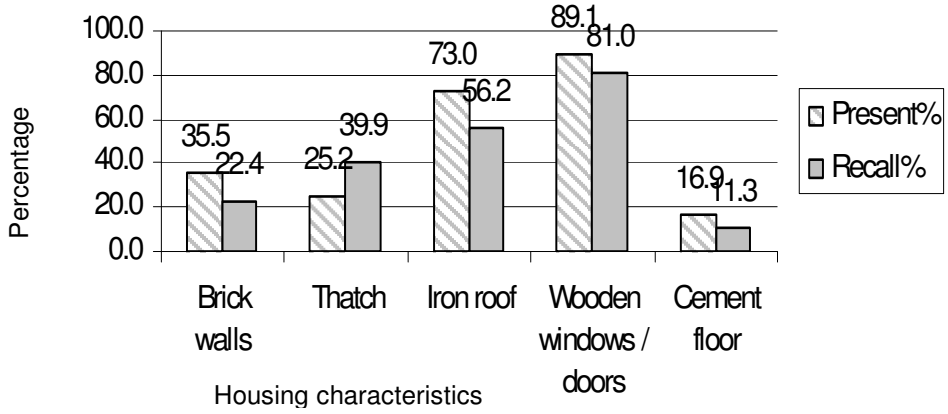


Fig. 5: Status of housing in 2002 (recall) and 2008 (present) within the project area

The difference between the housing types of participants and non-participants was also examined, and a similar trend is apparent, with the participants' housing being more indicative of wealth than the non-participants' housing. Increase in the housing status during the project was more apparent in the participants (Fig 6).

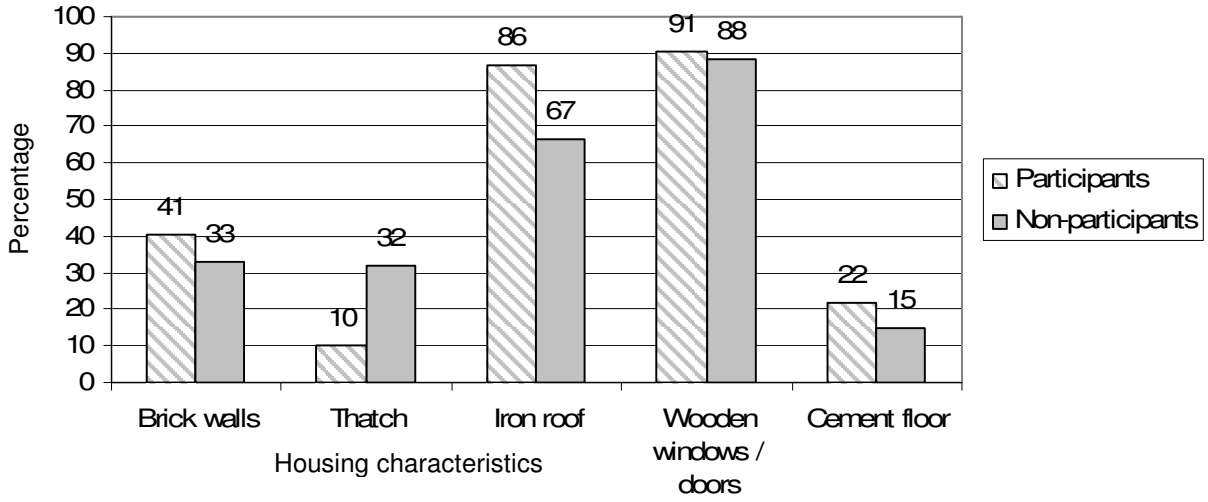


Fig. 6: Status of housing of participants and non participants

Ownership of durable items

The following shows over time the change in ownership of durable items by the HH. The percentage is shown, for present (N=714) and recall (N=649). Generally the trend is for an increase in durable items owned by the HH from 2002 to 2008.

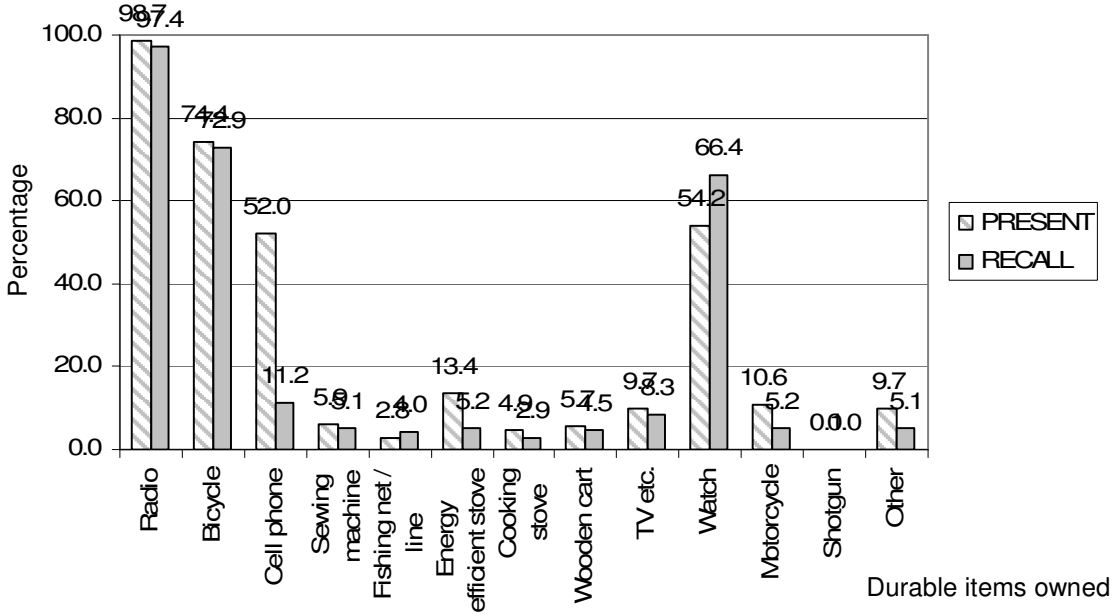


Fig. 7: Ownership of durable items in 2002 (recall) and 2008 (present)

There is a statistical difference in the number of durable items owned by participating and non participating HHs (t=2.118, df=313, p<0.005, two tailed, equal variance is not assumed), which could be due to the increased income to fund these purchases.

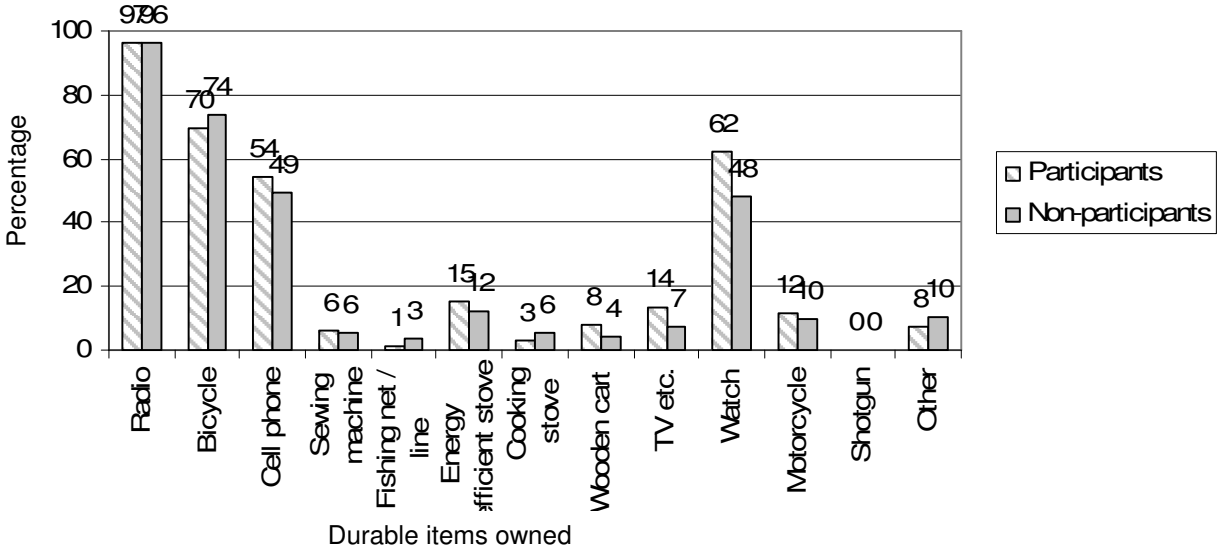


Fig. 8: Ownership of durable items for participants and non-participants

3.3 Institutional participants

Some institutions with available land have joined the project. Most commonly, groups engaged with the project by implementing the mixed native woodlot land use option. Institutions which are participating include churches and schools in Bushenyi district.

Table 5: Participating institutions and land use details.

Organisation name	Total land (ha)	Fruit	Indigenous	Non-native
Shobi Trading Company	109.6	8	3976	426
Turyamureba, Church of Uganda	5	4	1000	0
Ndekye Church of Uganda	40	15	1000	5000
Rugazi Catholic Church	400	20	28,000	0
Bwida Women in Development Group	1.5	-	400	0
Nyakashebeya Church of Uganda	18	40	760	400
Mahungye Secondary School	-	-	-	-

Institutions planted trees, and the carbon finance was cited as being one of the main reasons for participation. This land use choice is often supplementing tree planting which is already going on and the finance allows further seedlings to be bought and for tree planting efforts to be extended. In schools it is, for example, a current governmental initiative to encourage schools to plant trees – and commonly chosen species under this initiative are pine and eucalyptus. TFGB therefore is important as it educates the next generation through the school participants about the benefits of planting native species, and this will help to gain support for the project in the future.

3.4 Farm management

Some differences were recorded between participants and non participants in the way that the land was managed and in the assets they had. It is likely that some of this could be attributed to increased income, and others to the education which is given to the participants. The increase in the number of trees on the participants' land itself would bring benefits and this is also discussed in this section.

Farm ownership

A One-way ANNOVA gave a significant difference between the land area of participants and non participants, the means being 11.4 and 7.47 respectively ($F_{(1,761)}$ = 5.577, p<0.05). In Bushenyi, land area used per household were typically lower than than in Masindi and Hoima, since the area has a larger population density.

A large variety of crops and trees were grown, and PRA discussions in a couple of different locations provided a comprehensive list. Growing multiple crops helps households to ensure they get a balanced diet, and it also protects against crop failure and changes in sale prices of individual crops. Some crops prefer shade or need stakes for stability, and project trees can provide both these so can help to increase crop diversity for households.

Table 6: Crops and trees farmed within the project area

Bananas (savory)	Cassava	Aubergines	Maize
Millet	Pumpkin	Papaya	Carrots
Beans	*Ficus spp.*	Chilli	Ginger
Sweet potatoes	Tea	Bananas (sweet)	Pineapple
Rice	Sugar cane	Coffee	Pine trees
Potatoes	Guava	Pomegranate	Cyprus trees
Sorghum	Peanuts	Tobacco	Neem trees
Yams	Cabbage	Guava	Soya beans
Mango	Tomatoes	Sisal	Peas
Jack fruit	Green leaf vegetables[13]	Avocado	Cashew
Oranges	Onions	Eucalyptus	Sunflowers

Management difficulties

Farmers stated the problems they encountered when managing their farm. The named as many as they thought were significant (figure 9). Participating in the Trees for Global Benefits project can help to reduce some of these issues. Prospective and current participants mentioned they would like to use some of the carbon payments for farming activities, which would help the 27% who suggest that capital is limiting. Nitrogen fixing trees, and manures from tree products can improve fertility, more diverse land use can prevent pests and trees can provide protection for the land from climate variability; heavy rain and hail stones.

[13] Many different varieties were mentioned.

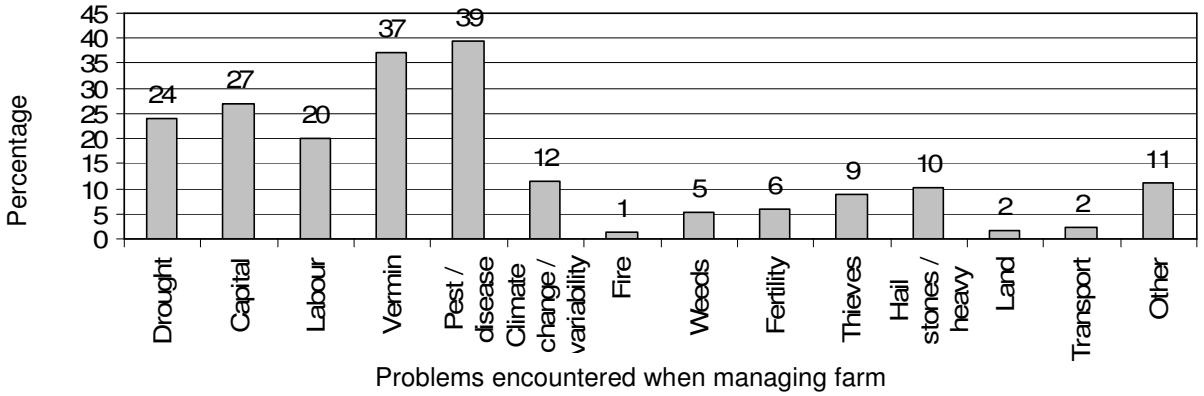


Figure 9: problems encountered whilst managing farms.

Farm inputs

Inputs for farming may be purchased or bartered for by farmers. Since one of the main uses of cash income was found to be for farm inputs, an increase in spending on these inputs indicates an increase in income. The most common inputs are seeds, fertilizer, manure and pesticides and fungicides, and it is assumed that increased spending on inputs would increase the output value. Some farmers also hire labour, purchase or hire new tools and machinery, and also pay for transport. The number of inputs and the value of money spent on farming inputs is statistically different for participants and non participants. The mean amount paid per HH for farming inputs is 651,710 for participants (n=226), and 240,019 USH for non-participants (n=437). An independent sample T-test gave a significant value, suggesting the groups are significantly different (t=4.954, df=271, p<0.005, two tailed, equal variances were not assumed). Farmers have to pay for tree seedlings to participate in the project and this could be part of this increase in spending, however the payments should compensate for this.

Commercial crops

Respondents from the HH livelihoods survey were asked for information on the crops that they grow which would not provide any food for the HH. The PRA discussion groups found that the common crops which were likely to be mentioned were tobacco, cotton, coffee, tea and sugar cane. Although the family may choose to consume all of these products they are grown primarily for their commercial value. The survey was spread about a large geographical area – over three districts, and growing of different commercial crops is region specific. Therefore this information tends to reflect the areas where more surveys were conducted rather than the number of crops which are grown of each type, and for the groups of participants and non-participants.

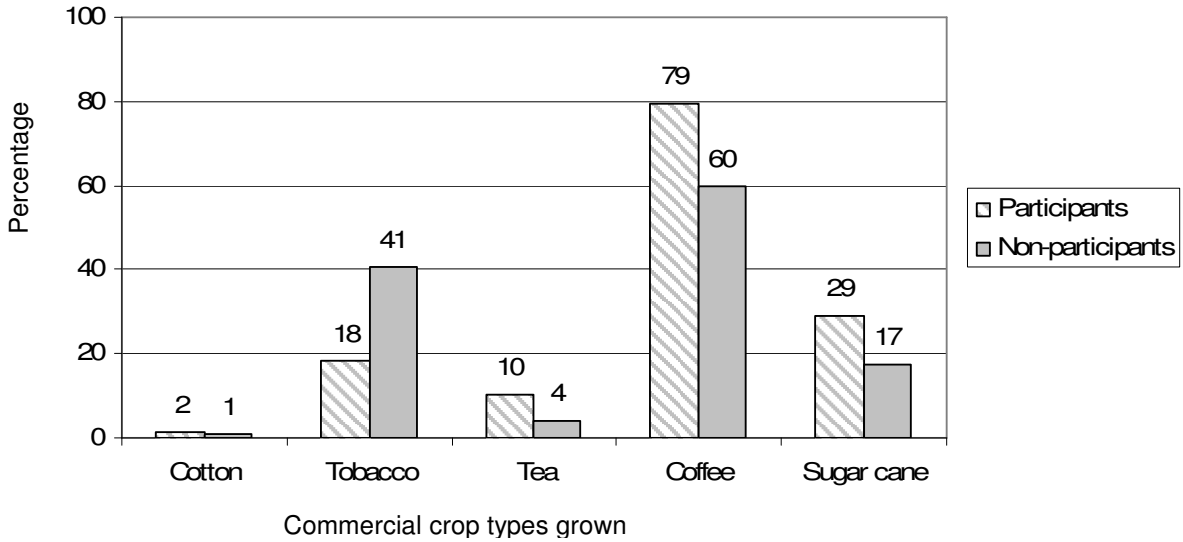


Fig. 10: non-food crops grown by participants and non-participants

Participants were identified however as dedicating a larger area to non food crops which is reflected by the increase in land holding, and also results in a larger income, since this is sold for cash income. In Bushenyi, there was a significant difference between the area given to non-commercial crops in 2008, and in 2002 (T = 10.252, df = 146, p<0.0005, equal variance is assumed), There was no significant difference for those were non-participants, which suggests, that participation in the project had provided opportunity or finance to convert more land to non food crops and that this increase is therefore due to the presence of the project an are not as a result in background development.

Livestock ownership

It was common for farmers to own livestock and birds and PRA discussion groups were used to create a comprehensive list of the animals which were kept within the project area. Livestock ownership was classed in Tropical Livestock Units (TLUs) (ILRI 1995). There was a significant difference between the livestock owned by participants and non-participants ($F_{(1,761)}$=7.375, p<0.05) since participants had a mean of 1.46 units (n=217) and non participants 0.96 (n=412). In Bushenyi, there was a significant difference between the number of livestock per household in 2008, and in 2002 (T = -5.833, df = 146, p<0.0005, equal variance is assumed), There was no significant difference for those were non-participants, which suggests, that participation in the project had provided opportunity or finance for the purchase of more animals.

Table 7: List of animals kept within the project boundaries

Cattle	Goats	Sheep	Doves / Pigeons
Pigs	Chickens	Ducks	Turkeys
Rabbits	Guinea pigs	Donkeys[14]	

[14] Only the presence of one donkey was recorded.

3.5 Benefits of trees

Under the project the most commonly found trees which had been planted included: *Maesopsis emenii, Prunus africana, Khaya spp. (mahogany), Terminalia spp., Funtumia elastica, Ficus spp., Callapa spp., Grevellia spp., Calliandra spp.* and *Sesbenadia spp.* All respondents (n=720) were asked the benefits (marketable or useful for the owner) they were aware of for having trees on their land (see figure 4). It can be assumed that to have a larger number of trees (through participation in the project) would increase the benefits stated below brought by the trees. The questionnaire identified 17 HH (n=492) (amongst the non-participants) who had no trees, so if they were to participate they could also access these benefits. Commonly saleable items, identified in group discussions included timber, poles, fruit, medicines and fibres which would further increase the household income.

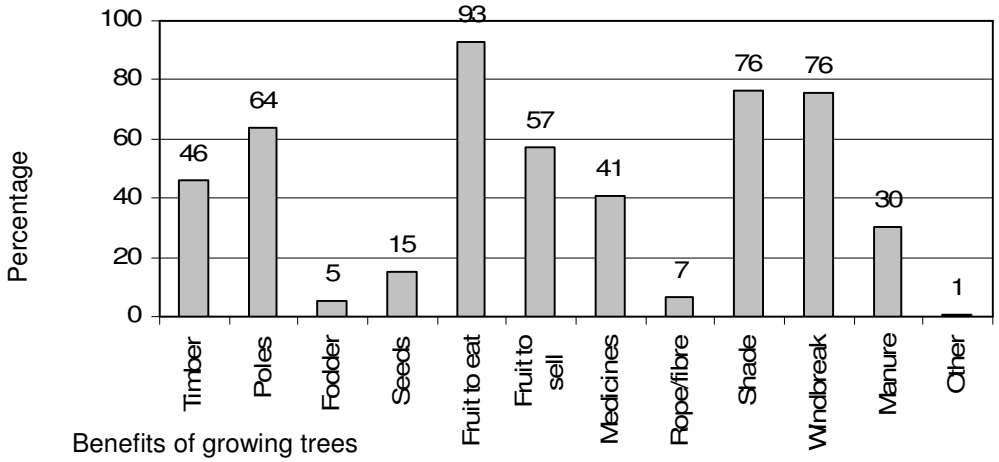


Fig. 11: benefits which trees provide to farmers.

Specific trees and methods of planting bring different benefits, and project participants were asked in the livelihood questionnaire why they had chosen the specific land use in order to join the project. The distribution is similar to in figure 9 discussed above.

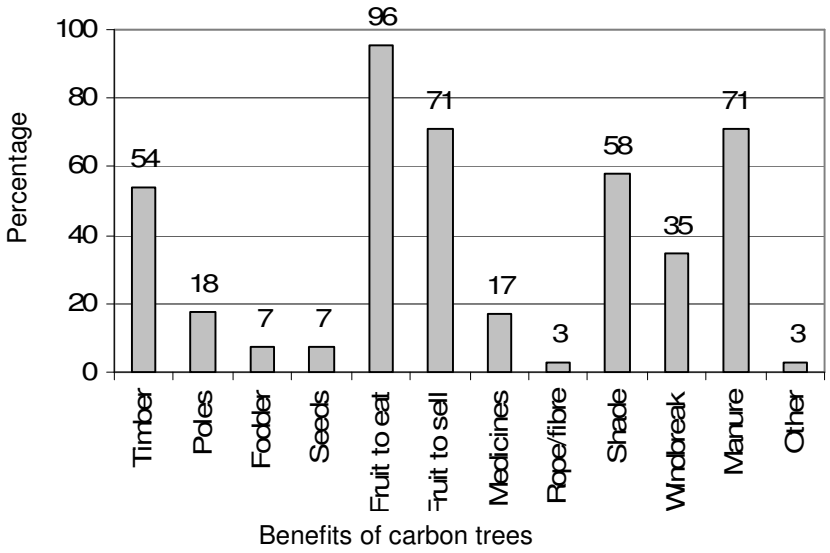


Fig. 12: Benefits of Carbon trees to participants

3.5.1 Firewood

Firewood is the most commonly used tree product (Mwesigwa 2005) and according to discussion groups (in 2008) every HH required and used this resource. Firewood collection is predominantly a women's role in the family, therefore tree planting can benefit women in particular leaving them more time to do other tasks. Energy saving stoves which have been introduced, particularly in the Bitereko region of Bushenyi also result in the reduction in the amount of firewood used per HH. This was a previous ECOTRUST managed project which among other things encouraged individuals to undergo training to build energy saving stoves. In conjunction with growing trees for firewood for the home, this helps to reduce pressure on alternative sources of firewood, for example protected areas. There is also a demand to purchase fuelwood which exists even at the village level. Typically it is institutions who buy fuelwood from individuals at the village level (Mwesigwa 2005). Sale of fuelwood will increase income into the family, and also diversify income sources.

3.5.2 Fodder

Fodder is an important aspect of a farm to consider as people are increasingly acquiring exotic animals and fodder trees provide protein which is required for their development. This feed supplement for livestock is especially important during the dry season. Several fodder crops have been identified as being useful for livestock and native examples include *Sesbania sesban* which can be used within the Plan Vivo system. This is a very suitable tree to incorporate into many farming systems as it is nitrogen fixing, tolerates water logging and is adapted to a variety of soil and climatic conditions.. In areas where there is limited grass, fodder is essential for silvo-pastoral systems such as zero grazing which is becoming more popular within the project area (Wambugu, 2006). The leaves contain 15-20% protein (wet), which is good particularly for goats, cows and sheep. The tree seeds prolifically, so it is easy to collect own seeds, which reduces start up costs for farmers who choose to use this tree.

Box 5: Fodder shrubs for dairy farmers in East Africa: making extension decisions and putting them into practice.

The benefits that fodder shrubs can offer:

- Make money from the sale of extra milk
- Save money by reducing or eliminating the need to purchase supplements such as dairy meal.
- Use land which is not suitable for other crops (along internal or external boundaries, around homesteads, or along soil conservation terraces).
- Save time and energy, as fodder is available within the farm.
- Take the pressure off native wild fodder species and thus conserve them.
- Provide the household with other non-fodder benefits such as fuelwood, bee forage, stakes, erosion control and soil fertility improvement.

Source: Wambugu, 2006 pp19.

The extent to which the benefits can be fully utilised depend on the access to markets for milk and meat, infrastructure (in this case the availability of cooling equipment etc) and also the culture for milk drinking and knowledge and support available for animal keeping. Bushenyi district was however identified as an area with a 'high potential' for adoption of fodder technologies in Uganda (Wambugu, 2006, p27).

3.5.3 Agroforestry

Of the HHs who were surveyed, 26.2% were migrants to the area. They moved from many different areas, and from a range of distances. A large proportion (37 out of 202) migrated from Kabale district, and several stated the availability of farmland as one of the reasons for moving. In areas where there is limited land, it is important to make efficient use of the land which is available. Of those who migrated, 72% stated the availability of land as one of the reasons for moving. Since populations are increasing in all three districts in which the project operates (UBOS, 2005), it is likely that farm ownership per capita will reduce, and therefore increasing further the need for more sustainable and efficient technologies or land use mechanisms. Agroforestry is one such method of increasing output of small areas (diversity and yield).

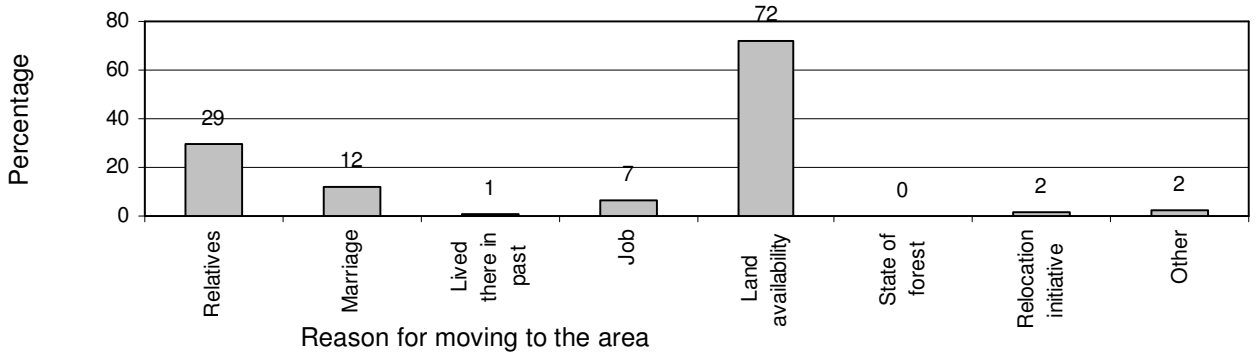


Fig. 13: Motivations for relocating

Mixed land use options including intercropping are good land use choices. In the first few years of planting trees, the land can be usilised as before, and once the seedlings are a couple of years old then shade loving crops and plants can be planted. Of those interviewed for the HH

questionnaire 57% grew coffee (n=564) and this is a good shade tolerant crop which can be grown. If nitrogen fixing (legumous) trees are grown, this can even increase the yield of crops which are grown in an agroforestry setting along with these trees. Legumous species take nitrogen from the air rather than depleting stocks in the soil, which increases farm sustainability and promotes soil conservation as well as increasing nitrogen – which can be a limiting nutrient in these areas.

3.5.4 Bee keeping

Bees are widely kept in East Africa, and are reliant on good quality and abundant nectar at specific times of the year to ensure that honey can be produced. Trees flower at times in the year where bees can utilise the nectar and provide it is quantities large enough for the bee colonies. In all areas of the study there were groups who were engaged in bee keeping activities including many of the CBOs who were interviewed. Some were undertaking beekeeping with assistance from other organizations including NatureUganda and the NFA. In Bushenyi there are several community co-operatives who are processing honey themselves, in order to increase the value of the product which they are producing and to gain more of the profits for themselves. Discussion groups also suggested that bees also deter elephants who are responsible for destroying crops in some areas so this is another potential benefit.

3.5.5 Fruits

Growing fruit trees is already a popular activity amongst the communities within the project area. Fruits add important vitamins to the diet, as they are rich in vitamins A,C and E, when annually 500,000 African children die of vitamin A deficiencies (ICRAF 2008). The provision of fruits for the family was one of the major reasons cited by the farmers (both participating and non-participating) for growing trees. Several species of tree have fruits which become ripe at the time just before harvest which is one of the most difficult season for farmers since the stores from the previous harvest can be running short. Fruits can therefore be essential for providing extra calories. Fruits are popular culturally among children who like to collect fruits from wild growing trees.

The sale of fruits is a good cash earner for small farmers. Modest quantities can be transported to a near-by market and sold, although at low prices, it is still an income source. Some farmers sell to traders at the road side, and can gain cash income quickly when required. Fruit juice can be made in order to add value to any fruit produced, although this is currently not being done in any of the rural areas where the project is operating at present. Mango juice is a popular juice and can be made with the correct equipment, so is a potential industry to be developed in the future, when more of the newly planted fruit trees become mature.

3.5.6 Building materials

Building materials can be produced from whole felled small trees in the form of poles, and also from timber. Trees can also be used as a live fence, which provides a strong barrier for keeping livestock as well as being a deterrent for thieves. It was mentioned in particular that poles are useful for staking Matooke – especially in areas where this is a major cash crop (Mwesigwa 2005, discussion groups).

A project to encourage communities to plant eucalyptus trees was implemented by ECOTRUST pre TFGB. This project provided for those who had a lack of building materials, since eucalyptus is fast growing and produces poles quickly. The project was integrated with a goat keeping initiative, where the eucalyptus trees could be used to build goat pens. Since this project had been handed to the community, TFGB built on these initiatives suggesting native species which can also provide both building materials suitable for animal shelters as well as fodder.

3.5.7 Ecosystem services

Much of the farm land which is used – particularly in Bushenyi District is on extremely hilly areas. Steep slopes are liable to be affected by land slides, soil erosion and more pronounced nutrient leaching. For these areas the benefits of tree planting can be particularly apparent. In communities where water is sourced from streams, trees help to prevent leaching of any chemicals applied to the farm into the water source.

3.6 Financial stability

Because there are few employment opportunities, cash in hand is extremely difficult to get for HHs 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.

3.6.1 Carbon market

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 have 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 which has the following features “it 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 the participants are guaranteed long term financial stability as the payments are set for the duration of the project at that agreed price.

3.6.2 Timber finance

Markets for timber sales were identified by a few community members who had sold indigenous trees previously. It is anticipated that more developed markets will exist by the time that the first timber trees from TFGB are ready to be sold. Although locally markets may not be so profitable, these are easily accessible. Transport was discussed as a potential barrier for individuals who may wish in the future to sell timber to city markets where a better price may be found. Even getting to the nearest main road to sell at a road side price is difficult for many individuals. The original family member who began participating in the project is likely to benefit from the majority of the carbon payments since they are made in the first 10 years. However is it more likely that the next generation will benefit from the timber sales, giving the project a long term vision.

3.6.3 Credit security

Bank accounts and informal credit institutions were the two ways identified to invest money and where loans could potentially be accessed. Savings clubs were a popular informal credit institution, particularly for women and were often community based so were 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). Because 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), this fact alone 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 (pers comm. Bank manager in Bitereko). 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.

3.7 Building human and social capital

Social cohesion has been built as a result of the project. The carbon farmers have for example been brought together through various training and other events. The benefits of meeting other carbon farmers were discussed and it was mentioned that increased dialogue between farmers could lead to knowledge transfer, shared ideas and the creation of a support network for those who need it.

Training events in practical farm management is also important. Seedling selection, site preparation and pest management are all topics which are taught to new project participants. The very fact that farmers are asked to draw a Plan Vivo is also a huge benefit to many farmers who don't usually plan their land area in this way. It often leads to a more efficient use of land.

Other businesses may also be boosted by the presence of the project which as a result is helping to build the business capacity in the project area. Nurseries began to be more

successful shortly after the inception of the project (Mwesigwa 2005), and the supply of native species is almost exclusively for Plan Vivo farmers.

Farmers also have a raised awareness about their stake in the global market of carbon which can be useful for engagement with other globally reaching business initiatives which they may encounter.

3.8 Voluntary participation in the project

The project was designed with a participatory approach PRA style methods were used in its development to understand local communities and farmers, and find their preferences, wishes and concerns. However participation in the project is more difficult or impossible for some individuals.

3.8.1 Barriers to joining

Awareness

Non-participants were asked about their knowledge of the project, and 62% were not aware of the project (n=518). In Bushenyi alone, non-participants were more aware, and only 32% were not aware of the project. As the project expands, more people will hear about it and will have the opportunity to join.

Gender

There was found to be no significance found in participation or non-participation for all female or all male households. In most areas, a typical meeting would be over 80% men, however, women are not excluded, and in Bitereko, Bushenyi where there is a strong network of active women, the majority of participants are women. In order to ensure that women are represented, it was noted that particular attention must be given to encouraging them to join like in Bitereko.

Mewsigwa (2005) suggests that the division of labour is more in favour of men contributing more to tree planting activities. This is in terms of clearing land, acquiring seedlings, planting, weeding and monitoring and management. However during discussion groups in this study it was strongly suggested that women did more of the work. This may not necessarily be a barrier to joining as the men are often the ones who make the decision, but it may put off women who think their work load will increase as a result of participation in the project. Children were also responsible for labour in tree planting (Mewsigwa 2005, group discussisons from this study) so they may also find their work load increases as a result of participation.

Labour

There is a statistical difference between the mean number of HH members in the HH for participants and non-participants ($F_{(1, 758)}$=4.106, p<0.05), (T=2.121 df=758, p<0.005, two tailed, equal variances are not assumed). The household size being slightly larger means were 6.9 (n=243) and 6.5 (n=517) for participants and non-participants respectively, which suggests that there is more available labour, and a shortage of labour may inhibit participation.

Land holding

Only 5 people were landless (n=756) but this is probably not indicative of the true number of landless people as these are more likely to be transient or live in areas outside the village boundaries, for example on marginal land. Most were young people who were yet to get land of their own and they tended to survive as casual laborours. The project can't cater for landless families, since the agreement requires a secure land holding. However it is likely that there will be more demand for labourours who can plant trees and work in the nurseries, so indirectly they may benefit. It is also likely that many of the young and landless will acquire land over time and would then be able to join the project.

Most people in the HH survey were found to have enough land to put some aside for tree growing as options of boundary planting and agroforestry exist which do little to limit the area for growing other things. In addition both participants and non-participants already choose to set land aside from producing food for example growing cash crops, which suggests they had enough land to produce food for the family elsewhere. However the average number of farms was lower for non participants and participants, and 2.51 (n=240) and 1.80 (n=516).

The mean farm age was also much longer for participants, indicating they are more settled and established at 33 years (n=565) in comparison to 11.16 years (n=882). However this is not preventing participation and a number of the project participants (29% - 72 out of 243) were migrants which suggests that the project is easily accessible, and well promoted to those who are new to the area.

Education

There were some HH surveyed who were completely illiterate. It can be assumed that it is more difficult for these families to be part of the project, as they are required to set up a bank account, and understand and sign a contract. 2.9% (n=512) of non participants were illiterate, and only 0.8% of participants (n=241). Some illiterate families are participating, who are provided with the support to complete the application process. There was however a difference in the percentage of participants and non-participants who were educated to tertiary level, it was 32.1% (n=273), and 18.9% (n=502) respectively. Discussions with the key informants about what encouraged communities and individuals to become involved often focused on the lack of knowledge and uncertainty about sustainability issues. Once people are engaged in one project, they can more easily engage in other projects, and often those involved with other CBO are encouraged to join other projects through those networks.

Seedling availability

Initially farmers were required to plant 50% of their agreed target to access their first payment. However discussions revealed some over ambitious farmers who lacked skills to raise / find (wildlings) own seedlings, can't afford to buy and transport seedlings, or lacked time so did not reach the target. In response, farmers were able to renegotiate a lower planting target, to access their first payment, and ECOTRUST planned training days to ensure farmers knew how to access seedlings and that this did not become a barrier to getting started in the project.

During Ecotrust open-meetings with farmers, it was commonly suggested that the capital required to buy seedlings would be difficult and may be a barrier to entry. However, farmers are already spending substantial amounts in some cases on farm inputs (participants a mean of 651,710 USH per HH). Therefore this initial input to managing the farm is an expected expense

for most farmers. Very poor farmers who cannot afford this small input, can often utilize one of several organizations including NAADS and the NFA who can give advice and even supply seedlings to some areas.

Technical know how

Some of the techniques for planting and caring for trees were new to some of the participants, however ECOTRUST provided assistance in the technical knowledge required to participate. Several other sources of information on farm management are available for farmers for example through the Area Based Modernisation Programme (ABMP), NAADS government extension service, and from the District Forest Officer and District Environment Officer, who are involved in existing tree planting projects and also offer advice and training.

Risk aversion

It would be expected that the poorer members are in a weaker position to take a risk when little is known about the project. Some of the original participants admitted that at first they were skeptical about whether the finance really existed so were in effect taking a risk by putting their resources (time and finance) into planting trees. This is also the case for participants in Bushenyi who are statistically more wealthy according to the indicators chosen for this study. This effect is likely to decrease as the project matures and farmers become more certain of its benefits.

3.8.2 Alternative projects

In order to completely voluntarily participate, there must be enough information available so participants can make informed decisions about whether to join the project or not. This may include details of alternative projects so that a comparison can be made. Perfect information about the choices on offer is not always available, however good information is provided about TFGB and about some alternatives. One comparable alternative is to join TIST – The International Small Group and Tree Planting Program which is operating within the project area in Bushenyi.

Box 6: The International Small Group & Tree Planting Program (TIST).

The International Small Group & Tree Planting Program (TIST).

TIST is about empowering small groups of subsistence farmers to engage in activities which accomplish local sustainable development goals. Activities include tree planting and sustainable agriculture, and working under TISH creates a structure of small groups who work together to implement these activities. TIST also expects to provide long-term revenue for the small group participants through the sale of greenhouse gas credits.

Under this system farmers get paid 35 USH per tree every year, in two installments of 17.5 USH per year. Assuming a farmer plants 400 trees on 1 ha under TIST and that the TIST farmer re-negotiates their contract, after 20 and 40 years, with the same price we can calculate how much the farmer would earn. The farmer under TIST will gain 400 trees x 30 payments x 35 USH = 420,000 USH per ha. In addition to this, TIST provide the network of small groups and farmers also benefit from the capacity which is built from this.

Source: www.tist.org

Under Plan Vivo, a comparable woodlot with 400 trees would provide 226 tCO_2 per ha and a conservative price is USD 4.00 per ton for farmers. This is a total of 904 USD. Assuming that the exchange rate is 1 USD : 1950 USH[15], with TIST the farmers get 215.39 USD over 30 years (assuming half renew the contract). This means that it is a financially favourable option to get involved with Plan Vivo. Of course the schemes are very different and each offers a different set of benefits – and a full comparison is beyond the remit of this study.

3.8.3 Alternative land uses

For farmers there is also the choice to engage in other land uses, and the relative economic benefits of other options, including selling the land and growing commercial crops should be considered in order to assess if this is economically beneficial for farmers to engage with TFGB. However, these are difficult to value and this is also beyond the remit of this study.

Group discussions found that to raise funds quickly the best things to do with land could be to sell it, or to grow commercial crops. The fact that these are thought of as financially beneficial alternatives, contributes towards the additionality of the project, in that in the absence of the project, planting indigenous trees would not be the usual land use option, although planting of eucalyptus and pine species in some areas is a popular alternative.

3.9 Complementing the work of other projects

3.9.1 Government initiatives

Existing initiatives which operate in the project area may provide for some of the needs of the community which are not fulfilled by the project. This will help to ensure that the project can contribute to the general livelihood improvement of the participants as they are also supported by other organisations. In Masindi and Hoima, the following projects were identified by Foodnet as contributing towards community development.

Box 7: Development programs under Ministry of Local Government:

Development programs by district:

Masindi:
- Energy for Rural Transformation (2001-2006), which has a mandate to increase access to rural electrification from the current 1% to 10% by 2012 - The Second Local Government
- Development Programme (2001-2007), which seeks to provide support to the government's decentralization policy and the recently adopted fiscal decentralization strategy
- United Nations Development Program on good governance for poverty eradication (2001-2005)

Hoima:
- Energy for Rural Transformation (2001-2006), which has a mandate to increase access to rural electrification from the current 1% to 10% by 2012.
- The Second Local Government Development Programme (2001-2007), which seeks to provide support to the government's decentralization policy and the recently adopted fiscal decentralization strategy.
- United Nations Development Program on good governance for poverty eradication (2001-2005).
- Poverty Action Fund

[15] www.xe.com [accessed 11th February 2009]

- District Development Support Programme (2000-2007), which aims at alleviating poverty by raising standards of living.
- UNDP-UNICEF African Youth Alliance for HIV/AIDS awareness and Prevention.
- Area Based Agricultural Modernization Programme with a mandate to increase rural household incomes.
- FAO's Integrated Support to Sustainable Development and Food Security Programme.
- Bugaya Youth Dairy Farm Project.

Source: Data from CGIAR [accessed 10.02.2009]:

Several key informants from some governmental organizations were interviewed including representatives from the District Environment and Forestry offices, and the National Forestry Authority. Tree planting is high on the agenda for all these informants, and the general awareness which is raised will be another support for those who are participating in TFGB.

Box 8: The National Forest Authority

The NFA: National Forest Authority

The NFA was established in 2004 by the government of Ugand and international development agencies to manage and supervise Central Forest Reserves (CFRs) on a sustainable basis and to supply high quality forestry-related products in accordance with National Forestry and Tree Planting Act, 2003.

Activities:
- Tree and seed centre - provides consultancy services, procures indigenous tree seeds and manages nurseries
- Encroachment prevention – monitors boundary opening, law enforcement and manages legal claims to land
- Land allocated for private tree growing - ecotourism and other licenced land uses in CFRs
- Patrols and fire extingushing

Source: www.nfa.org.ug

3.9.2 NGOs

As above NGOs which are also were actively operating within the project area provide added benefits to participants including The Aids Support Organisation (TASO) who work with families affected by HIV-AIDS. In particular NAADS, who give agricultural advice is a useful service for some farmers seeking advice on farming and also who could also be project participants.

3.9.3 Ecotourism businesses

Several ecotourism initiatives are implemented in the near by area, and participants who would wish to participate in both could increase their benefits. The aims of both TFGB and ecotourism are aligned so could complement each other. Cash from carbon offsets for example could even be invested in a ecotourism business enterprise, and this was mentioned in some of the group discussions as ideas for the future.

In conjunction with CSWCT, some local communities are involved in jewelry making and ecotourism initiatives including guided walks. This is in addition to the tree planting which CSWCT is also promoting. These two initiatives work well together as increased revenue from

ecotourism helps to fund further tree planting. Participants from TFGB also are in good positions to participate in ecotourism which will increase the benefits they get.

Box 9: Ecotourism

Ecotourism means tourism to natural areas which contributes to:

1. Conserving the natural environment
2. Improving the wellbeing of the local people
3. Developing the national economy

Source UWA (2008)

3.9.4 Community Based Organisations

Several community based organisations (CBOs) were interviewed as part of the study. These groups were a great forum for participants of the project to inform others about participating. They are also useful to bring together participants who can share ideas and discuss problems. Some groups such as the women's groups were exceptionally entrepreneurial – they were involved in craft making, bee keeping and running savings clubs for example, and this helps to provide ideas for investment of carbon payments.

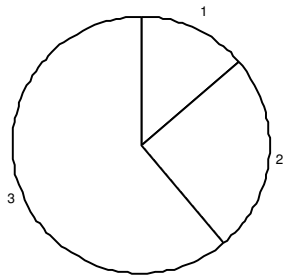
3.10 Mitigation of climate change impacts

As well as being part of the solution to increased emissions, the project participants may also bear the brunt a high proportion of the impacts from the impacts of climate change. IPCC predicts "Smallholder and subsistence farmers, pastoralists and artesian fisher folk will suffer complex, localized impacts of climate change (high confidence)" (IPCC 2007). The project's success is therefore dependent on the farmers who are producing the carbon and they also may be dependent on it to secure their own future.

3.11 Negative impacts

Tree planting does limit the flexibility which farmers have about which land use type they can use, and with so many options (crops, trees, livestock etc.) this could be limiting for farmers as the economics of a different land management strategy may become more favourable in comparison over time. Many farmers will not be able to predict how the carbon market will fare in comparison to other crops, which could be a disadvantage.

Farmers are sometimes not fully aware about how the project runs, so which may influence the farmers' decision to join the project. An analysis of the knowledge of participants of the payment schedule showed that only 61% of participants were able to state the number of payments correctly (see table 9 for the payment schedule). However it was not always the HH member who originally signed the contract who was participating in the survey which may account for some of the uncertainty, although ideally the whole family should be aware of the project mechanisms.



1. Number who did not know how many payments will be made (14%).
2. Number who incorrectly stated the number of payments (25%)
3. Number who knew how many payments would be made (61%) (N=237)

Fig. 14: The knowledge participants had about the payment schedule.

The actual payment schedule, by which payments are triggered by certain criteria being met is as follows.

Table 7: The payment schedule and percent of the carbon payment made each installment

Year	% paid
0	30
1	20
3	20
5	10
10	20

Lack of potential for the project to address poverty drivers

One of the aims of this project was that it would help to improve livelihoods and alleviate poverty in the area. During discussions, other limiting factors were mentioned as contributing to keeping people in poverty in the area. The human development indicators for Uganda (table 1) show that in comparison to other countries the indicators are worse for life expectancy and healthcare than for education and literacy for example. In order to increase livelihoods, to a certain extent these problems need also to be targeted.

The results from the village level data collection indicated that the main problem in many villages is access to water. If this is the major issue in a particular village then the project does not directly lead to solving this problem. However the capacity which is built as a result of the project may make it more likely that the community can do something which will improve the situation in the village.

Global trade regulations which arguably keep output prices for smallholder farmers low will continue to be important for project participants in terms of their development. The project however works in the context of all these issues and the direct benefits of participation reach these farmers whatever other factors are also working against them externally.

4 Conclusion

The main purpose of this study is to answer the aims which are again stated below:

- To determine the benefits for individuals participating in Plan Vivo projects
- To record the use of payments and their contribution to poverty alleviation

- To assess the community wide benefits resulting from project activities
- To investigate the presence of socio-economic disadvantages from the project
- To identify any barriers to project participation by households (HHs).

The major findings were as follows:

The project was found to be accessible to poor small scale landholders, and that barriers to entry would only affect a very small proportion of potential participants. In addition to the payments for carbon sequestration, the project was found to have multiple benefits which it brings to participants, which contribute to food and fuel security at the HH level, and it the project provides social and human capacity building. The payments themselves were found to have an impact on the lives of the participants, and in particular could be used as credit security for loans, which previously would be inaccessible to the rural poor. Spending was found to increase as a result of the project, which leads to community wide benefits for example from the purchase of seedlings and labour to maintain the project trees. As a result the project was found to have a contribution to poverty alleviation in Uganda.

4.1 Further study

It is hoped that there will be a follow up study in Uganda to capture benefits over time. Because of the long term nature of the project it is expected that the scale and type of benefits from the project will change as time progresses. Information from studies can feed back into the project methodology to provide continual improvements to the system.

4.2 Recommendations

- Assist the participants to organize themselves into groups through which they could support each other and also spread the cost of equipment by purchasing together. Potential shared items include a pruning saw and bee keeping equipment.

- Set up avoided deforestation accounting and crediting carefully in order to ensure the needs of the community are prioritized.

- Hold detailed workshops on the markets for timber, methods of felling and transport options in advance of the trees being mature enough to sell.

- Increase collaboration with more groups in the area (CBOs), which provide support networks for participants.

- Collaboration with other training and educational organizations in the area will help to reduce the overlap of effort.

4.3 Supporting documents

One of the outputs from this study are the documents which support a repeat study.

The following documents can be found in the Appendices to this report:

- HH Livelihoods questionnaire
- Village background questions
- Organised group discussion questions (see main report for this)
- Manual for repeat study

The following can be downloaded from the Plan Vivo website:

- Data entry form for HH Livelihoods questionnaire
- Data entry form for village background questions

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6 Appendices

6.1 Location information

Livelihoods Questionnaire

District	Sub County	Number of HH surveyed	Number by S/C
Masindi	Budongo	113	163
Masindi	Karujubu	23	
Masindi	Nyangahya	21	
Masindi	Pakanyi	6	
Hoima	Kabwoya	28	291
Hoima	Kigorobya	81	
Hoima	Kiziranfumbi	72	
Hoima	Kyangwali	110	
Bushenyi	Bitereko	71	308
Bushenyi	Kichwamba	26	
Bushenyi	Kiyanga	89	
Bushenyi	Ryeru	122	
	Total	**762**	

Parish	No. of HH surveyed	Parish	No. of HH surveyed	Parish	No. of HH surveyed
Bubogo	28	Kibwona	11	Ndangaro	10
Bugaya	3	Kichwamba	8	Ndekye	14
Busheregenyi	8	Kidoma	48	Nyabubare	10
Butoha	6	Kigarama	46	Nyakashiwa	4
Butoole	93	Kisiita	12	Nyakatehe	17
Buzinga	20	Kiyanga	74	Nyakiyanja	10
Iraramir	22	Kyakamese	6	Nyangha	3
Kanyara	1	Magambo	9	Rubiriizi	4
Kapapi	79	Mubanda	1	Rugazi	4
Karimbiro	13	Munteme	24	Rumuri	20
Kasenene	115	Mushumba	27	Rwoburunga	12
				34	**762**

Village	No. of HH surveyed	Village	No. of HH surveyed	Village	No. of HH surveyed
Unknown	6	Katwe	1		
Abangi	27	Katwe I	2	Nkoondo (B)	1
Alimugonza	6	Katwe II	4	Nsozi	20
Bikungu	1	Kebiremu	1	Nyabondo	1
Birehe	2	Kegyeya	1	Nyabubare I	3
Bisaju	22	Kibale I	10	Nyabubare II	1
Bitereko	3	Kibare II	1	Nyabunyira	2
Bugongo	2	Kibaya	4	Nyagongoro	1

Bugonyo II	1	Kibengeya	16	Nyakabale	13
Buhera Central	4	Kibumba I	3	Nyakagolo	12
Bukiriro	6	Kibumba II	1	Nyakahama	2
Bukyaba	1	Kibuye	1	Nyakakaka (B)	1
Bururuma	1	Kibwona	11	Nyakakaka (A)	3
Busheregyenyi	1	Kichwamba	1	Nyakasharu	2
Busingo	5	Kidoma	5	Nyakatunga	1
Busyaba	1	Kigabiiro	2	Nyakihanaa	1
Butale	3	Kigarama	3	Nyakinengo	1
Butimba	21	Kihaguzi	11	Nyakiyanja (A)	5
Butoha	3	Kihooko	1	Nyakiyanja (B)	2
Butoole East	17	Kihumaro	1	Nyakshyinga II	1
Buzenga	1	Kiibuye	11	Nyamiko	3
Byasiku	1	Kijurugo	1	Nyamirundi	2
Ejinga	17	Kijweka-Ngaragule	5	Nyamishekye	8
Iramarir II	9	Kikonda II	14	Nyanga	8
Iramarir I	6	Kikwamba I	1	Nyanuwina	1
Kabiriizi	3	Kinogozi	12	Nyauiyanja (B)	1
Kabiriizi II	1	Kinoko	1	Nyaukakaka (A)	3
Kabukiniri	1	Kinywambeho	12	Nyaukakaka (B)	1
Kaburara	3	Kirama	9	Nyerambire II	1
Kagaragora	1	Kiryanga	9	Nzuguto	1
Kakimba	4	Kitojo	11	Ogadra	13
Kamabare I	9	Kituti	17	Omuburembo	5
Kamabare II	3	Kiyanga	1	Omukibare	1
Kamacumu I	3	Kiyora	2	Onieni	25
Kamacumu II	1	Kiziizi	1	Rubaya	1
Kamangara	1	Kyambuzi (A)	1	Rubiriizi	1
Kaniapiha	1	Kyambuzi (B)	2	Rugyenda	3
Kantungu	2	Kyanika I	1	Rukizi	1
Kanyabuhuka	2	Kyanika II	4	Rumuri I	4
Kanyagaramire	13	Kyarujumba	14	Rumuri II	1
Kanyambiriri I	1	Kyarutakoba I	3	Rurama	7
Kanyambiriri II	1	Kyarutakoba II	3	Rusino	3
Kapapi I	12	Kyebumba II	1	Rutakoba I	1
Kapapi II	2	Kyiebumba	7	Rutakoba II	1
Karagara	1	Mburara	21	Rutobo	2
Karangara	2	Mubanda (C)	8	Rutooro	1
Karangaro	1	Munteme	1	Rwamureera	4
Karimba	1	Murambi (A)	2	Rwandaro (A)	9
Karimbiro	2	Murambi (B)	2	Rwandaro (B)	1
Karokarungi	1	Mushumba	1	Rwoburunga	1
Kashabya	2	Muzigga	1	Ryemondo	1
Kasharara	1	Ndekye	2	Ryeru I	3
Kashasha	5	Ndurumu	1	Ryeru II	1
Kashoojwa	2	Nguragule	7	Sherere	1
Katangyemeko	2	Nkombe II	1	Siiba	25
Katujo	1	Nkoondo (A)	1	Wairagaza	21
			Total	**168**	**762**

Livelihoods Questionnaire

Village	Parish	Subcounty	District
Ejinga	Kasenene	Budongo	Masindi
Alimugonza	Kyakamesi	Pakanyi	Masindi
Oneni	Kasenene	Budongo	Masindi
Siiba	Kapapi	Kigorobya	Hoima
Kibengeya	Kapapi	Kigorobya	Hoima
Kihuko	Bubogo	Kabwoya	Hoima
Butimba	Kidoma	Kiziramfumbi	Hoima
Munteme-Kinyambeho	Munteme	Kiziramfumbi	Hoima
Hohwa	Kaseta	Kabwoya	Hoima
Kikonda I	Bubogo	Kabwoya	Hoima
Katwe I	Kigarama	Bitereko	Bushenyi
Karangara	Karimbiro	Bitereko	Bushenyi
Katwe II	Kigarama	Bitereko	Bushenyi
Kamabare II	Kigarama	Bitereko	Bushenyi
Kamabare I	Kigarama	Bitereko	Bushenyi
Kiniogo	Kigarama	Bitereko	Bushenyi
Kihumba II	Buzinga	Ryeru	Bushenyi
Ryeru I	Ndekye	Ryeru	Bushenyi
Nyamisekye	Ndekye	Ryeru	Bushenyi
Kabirizi I	Buzenga	Ryeru	Bushenyi
Kasheshe	Kiyanga	Kiyanga	Bushenyi
Kirama	Kiyanga	Kiyanga	Bushenyi
Iramarir II	Iramarir	Kiyanga	Bushenyi

6.2 Key informants

Interviewees were with the following key project stakeholders:

- Hoima District Environmental Officer
- Hoima District Forestry Officer
- National Forestry Authority Section supervisor and Range Manager for Budongo forest
- Chimpanzee Sanctuary & Wildlife Conservation Trust (CSWCT)
- WWF Conservation of Biological Diversity in the Albertine Rift Forests of Uganda Project Officer
- Masindi District Forestry Officer
- NFA Sector Manager South West region
- Nature Uganda Project Manager for Participatory Environmental Management Programme (PEMA), Special Project Officer (SPO) Agroforestry, SPO Enterprises & SPO Collaborative Forest Management (CFM).

6.3 Organised group discussions

1.	When was the group formed?
2.	How was the group formed?
3.	What is the main purpose of the group?
4.	How many members are there in the group?
5.	How many times per year does the group have a meeting?
6.	Does the group have a written set of rules (where applicable)
7.	Overall, on a scale from 1-5,(1 is the highest, 5 is lowest) how effective would you say that the group is at fulfilling its purpose? And why?

Groups interviewed:

- Kidoma Conservation and Development Association (KICODA)
- Siiba Environment Conservation and Development Association (SEDA)
- Kyangwali Twimukye (development) Association
- Kyangwali Twimukye (development) Drama Group
- Buzenga Environmental Conservation Assocation (BUECA)
    - Kabirizi Tukore (work) Hamwe (together)
    - Kabirizi Widows and Orphans
    - Kabirizi Tukore (work) Namanie (hard) Association
    - Kyiebumba Tokore (work)
    - Buzenga Women
    - Kigarama Twetungure (develop ourselves)
- Bitereko Women's group
- Nyakase Rural Women's groups
    - Women in Development Association
    - Twimukye (development) Tukore (work) Association
    - Twekanse

Tulecibebeko Group D

6.4 Village Questionnaire

1. Informant
2. Position
3 Length of time lived there
4 Village
5 Parish
6 Subcounty
7 District
8 In what year was the village established / how old is it (years)
9 What is the current population of the village
10 How many households live currently in this village
11 What was the total population of the village 10 years ago
12 How many households lived in the village 10 years ago
13 What is the main language (e.g. Lusogo, Luo, Runyankole, Rukiga, Lugbara, Runyoro)
14 What is the secondary language
15 How many households have access to electricity

16 How many households have access to piped tap water
17 What is the main source of water for the village
18 How many households have formal credit / savings such as banks
19 How many households use informal credit institutions - lenders or savings clubs
20 What is the distance from the village centre to the nearest health centre
21 Does the village have at least one road useable by cars during all seasons
22 If no: what is the distance in km to the nearest road usable during all seasons
23 Is there a river within the village boundaries that is navigable during all seasons
24 If no. what is the distance to the nearest river that is navigable during all seasons
25 Is there a perrenial (non seasonal) river / stream in the village
26 What is the distance from the village centre to the district market
27 What is the distance from the village centre to the nearest market for major consumptive goods
28 What is the distance from the village centre to the nearest market for agricultural products
29 What is the distance from the village centre to the nearest market for forest products
30 What is the distance from the village centre to the nearest primary school
31 What is the distance from the village centre to the nearest secondary school
32 What is the distance from the village centre to the nearest small shop
33 What are the major land cover types in the village area
34 What are the major land ownership categories in the village area
35 Has the village faced any major crises over the past 12 months:
flood/excess rain, Drought, Wild fire, crop / pest / animal disease, human epidemic, political / civil unrest, macro-economic crisis, refugee / migration infusion, Other; (specify)
36 What is the typical daily rate for unskilled adult male labour in the village
37 What is the typical daily rate for unskilled adult female labour in the village
38 What is the main staple food in the village
39 What is the second staple food in the village
40 What is the main cash crop(s) in the village
41 What is the high price for a kg of the staple food (i) over the past 12 months
42 What is the low price for a kg of the staple food (i) over the past 12 months
43 What is the high price for a kg of the staple food (ii) over the past 12 months
44 What is the low price for a kg of the staple food (ii) over the past 12 months
45 What is the sale value of one hectare (this is acres) of good agricultural land in the village
46 What is the distance from the village centre to the edge of the nearest natural or managed forest that you have access to
47 Has the availability of firewood changed over the past 5 years
48 Has the village received payments for:
Tourism, Carbon sequestration, Water catchment, Biodiversity conservation, Compensation from timber company, Compensation from mining company, Other (specify)
49 Has the village received any forestry-related external support (technical assistance, free inputs, etc.) from government, donors, NGO's over the past 12 months
50 Has the surrounding forest been cleared in the past 5 years
51 Where has it been cleared from
52 Why has it been cleared? If it was cleared for crops, which crops
53 Who cleared it
54 What was the tenureship on the land which was cleared
55 How well-off is your village today compared with the situation 5 years ago
56 What is the reason for the change:
off farm employment opportunities, land holding, forest resources, output prices, outside support, cost of living, war / civil strife / unrest, conflicts in village (non-violent), access (including transportation and infrastructure), other; specify
57 Any other comments

6.5 Questionnaire

This questionnaire is part of a study to assess the benefits and disadvantages which the Trees for Global Benefits Plan Vivo project brings to communities and participating individuals. Participants will not be named and the results will only be used for research purposes. It will be used to improve the project and allow more people to benefit from project activities.

1. Sub County _____ 2. Parish & Village: _____

3. Name of respondent: _____ (head of household if possible)

4. Respondent head of household (Yes/no): _____ 5. Sex (M/F): _____

6. Have you always lived in this village? _____ (if yes go to Q.10)

7. If not, where are you originally from? _____

8. For how long have you been in this village? _____

9. Why did you come to this village? (tick all that apply)

Relatives		Land available for farming	
Marriage		Good state of the forest	
Lived here in the past		Government / church initiative	
Job		Any other (state _____)	

10. How many are you in this household / home at present: _____

No.	Name	Sex (M/F)	Age (Years)	Literate (Yes/No)	Education: P-Primary, S-Secondary, T-Tertiary
1					
2					
3					
4					
5					
6					
7					
8					

11. How many rooms do you have in your house? _____

12. What type of house do you live in? (tick all that apply)

Brick walls		Wooden windows or doors	
Thatch / grass roof		Cement floor	
Iron roof			

13. Number of farms: _____
14. Year which these farms were opened:
Farm 1. _____ Farm 2. _____ Farm 3. _____ Farm 4. _____
15. Where are they:
Farm 1. _____ Farm 2. _____ Farm 3. _____ Farm 4. _____
16. What size (ha) are they:
Farm 1. _____ Farm 2. _____ Farm 3. _____ Farm 4. _____

17. Farm inputs (tick all that apply):

	Tick	**Cost (USH)**
Seeds		
Fertilisers		
Manure		
Transport		
Pesticides/ herbicides		
Machinery / hired tools		
Hired labour		
Other _____		

18. How many trees do you have:
Fruit _____ Indigenous _____ Not native (Eucalyptus / Pine / Cyprus) _____

19. What benefits do you get from the trees (tick all that apply):

Timber		Fruits to eat		Shade	
Poles		Fruits to sell		Windbreak	
Fodder		Medicines		Manure	
Seeds		Rope / fibre		Other _____	

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20. Are you aware of Trees for Global Benefits ECOTRUST carbon project? (Yes/No) _____

21. Have you earned any income from the project excluding carbon payments (Yes – specify / No)
_____

22. Are you participating in the project? (tick one) If not participating, go to Q30.

Participant – received payment		On the waiting list but not allocated a buyer yet	
Participant – not yet received payments		Not participating (give reason): _____	

23. If participating, how many times have you received a payment: _____ (if 0, go to Q.26)

24. How much did you receive for your previous payment: _____ (USH)

25. What did you use the payment for: _____
(list eg. Food, school fees, clothes, building materials)

26. What do you intend using future payments for: _____
(list eg. Food, school fees, clothes, building materials)

27. How many times are you supposed to get payments: _____

28. What systems do you have? (tick all that apply)

Mixed native species woodlot		Single species woodlot (*Maesopsis emini*)	
Orchard		Mixed farming (agroforestry)	
Other: Specify_____			

29. Why did you select this/these systems? (tick all that apply)

Timber		Fruits to eat		Shade	
Poles		Fruits to sell		Windbreak	
Fodder		Medicines		Manure	
Seeds		Fibre / rope		Other _____	

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30. Do you grow any crops which you sell and **DO NOT** consume – what area do you have (ha)?
Cotton: _____ Tobacco: _____ Tea: _____ Coffee: _____ Sugar cane: _____

31. What are the main problems that you face when managing your farm:
_____

32. Present ownership of animals (please write the number of animals in the blank)

_____ Cows	_____ Goats	_____ Pigs	_____ Sheep
_____ Guinea fowls	_____ Pigeon/doves	_____ Rabbits	_____ Chickens
_____ Ducks	_____ Turkeys	_____ Horses	_____ Donkeys

33. What were the sources of income for your family last year:

Sale / barter of:	**Tick**	**Cash income (USH)**
Agricultural crops		
Processed food (eg. Chapattis, mandazi)		
Animals		
Eggs		
Fish		
Hunting / wild meat		
Wild: fruits, coffee, mushrooms / medicinal plants		
Firewood		
Bamboo		
Rattan cane		
Mats / other crafts		
Poles		
Timber		
Charcoal		
Clay / bricks / pottery		
Honey		
Bees wax		
Other income:		
Carbon payment		
Salaried employment		
Business / shop / retail		
Casual job (ie. Labour on another's farm, specify ____)		
Sale of forest based products (specify _____)		
Remittances		
Government support		
Other_____		

34. Did you buy any food from the market last year (Yes/No): _____ (if no, go to Q37)

35. If yes, then for how many months: _____

36. How much money did you spend buying food last year: _____

37. Do you have (write number):

Radio		Energy efficient stove		Watch	
Bicycle		Stove for cooking (gas / electric)		Motorcycle	
Cell phone		Wooden cart / wheelbarrow		Shotgun/rifle	
Sewing machine		TV/Cassette/CD/VHS/VCD/DVD			
Fishing net / line		Others _____ (Worth more than approx. 50 USD purchasing price)			

Recall: Using a key event which the respondent is familiar with (in 2002), ask the following questions based on that year.

38. How many were you in your household / home: _____

No.	Name	Sex (M/F)	Age (Years)	Literate (Yes/No)	Education P-Primary, S-Secondary, T-Tertiary
1					
2					
3					
4					
5					
6					
7					
8					

39. What type of house did you live in? (tick all that apply)

Brick walls		Wooden windows or doors	
Thatch / grass roof		Cement floor	
Iron roof			

40. Number of farms in that year: _____

41. Farm inputs in that year (tick all that apply)

	Tick	**Cost (USH)**
Seeds		
Fertilisers		
Manure		
Irrigation		
Transport		
Pesticides/ herbicides		
Machinery / hired tools		
Hired labour		
Other _____		

42. How many trees did you have:
Fruit _____ Indigenous _____ Not native (Eucalyptus / pine / cyprus) _____

43. Did you grow any crops which you sold and **DID NOT** consume – what area did you have (ha)?
Cotton: _____ Tobacco: _____ Tea: _____ Coffee: _____ Sugar cane: _____

44. What was your ownership of animals that year (please write the number of animals in the blank)

_____ Cows	_____ Goats	_____ Pigs	_____ Sheep
_____ Guinea fowls	_____ Pigeon/doves	_____ Rabbits	_____ Chickens
_____ Ducks	_____ Turkeys	_____ Horses	_____ Donkeys

45. What were the sources of income for your family in that year:

Sale / barter of:	**Tick**	**Cash income (USH)**
Agricultural crops		
Processed food (eg. Chapattis, Mandazi)		
Animals		
Eggs		
Fish		
Hunting / wild meat		
Wild: fruits, coffee, mushrooms / medicinal plants		
Firewood		
Bamboo		
Rattan cane		
Mats / other crafts		
Poles		
Timber		
Charcoal		
Clay / bricks / pottery		
Honey		
Bees wax		
Other income:		
Carbon payment		
Salaried employment		
Business / shop / retail		
Casual job (ie. Labour on another's farm, specify ____)		
Sale of forest based products (specify _____)		
Remittances		
Government support		
Other_____		

46. Did you buy any food from the market in that year (Yes/No): _____ (if no, go to Q49)

47. If yes, then for how many months: _____

48. How much money did you spend buying food in that year: _____

49. Did you have (write number):

Fishing net / line		Radio		Watch	
Cycle		Sewing machine		Motorcycle	
Cell phone		Shotgun/rifle		Wooden cart / wheelbarrow	
Stove for cooking (gas/electric)		TV/Cassette/CD/VHS/VCD/DVD player		Water pump	
Energy efficient stove		Others _____ (Worth more than approx. 50 USD purchasing price)			

Participant signature: _____

Enumerator signature: _____ Date: _____

Comments: _____