EASTERN AFRICA – FOREST CARBON PROJECTS STUDY
FOREST CARBON, MARKETS AND COMMUNITIES (FCMC) PROGRAM

MARCH 2014

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The US Agency for International Development (USAID) launched the Forest Carbon, Markets and Communities (FCMC) Program to provide its missions, partner governments, local and international stakeholders with assistance in developing and implementing REDD+ initiatives. FCMC services include analysis, evaluation, tools and guidance for program design support; training materials; and meeting and workshop development and facilitation that support US Government contributions to international REDD+ architecture.

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<tr>
<td>A/R</td>
<td>Afforestation/Reforestation</td>
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<tr>
<td>CAAC</td>
<td>Clean Air Action Corporation</td>
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<td>CBD</td>
<td>Convention on Biological Diversity</td>
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<tr>
<td>CBO</td>
<td>Community-based organization</td>
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<td>CCAFS</td>
<td>Climate Change, Agriculture and Food Security program</td>
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<tr>
<td>CCBA</td>
<td>Climate, Community and Biodiversity Alliance</td>
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<td>CDM</td>
<td>Clean Development Mechanism</td>
</tr>
<tr>
<td>CFA</td>
<td>Community Forest Association</td>
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<tr>
<td>CO₂</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>DCA</td>
<td>USAID’s Development Credit Authority</td>
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<td>E3</td>
<td>USAID’s Economic Growth, Education and Environment</td>
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<td>EAMK-FRP</td>
<td>East Aberdare/Mount Kenya Forest Rehabilitation Project</td>
</tr>
<tr>
<td>ECOTRUST</td>
<td>Environmental Conservation Trust of Uganda</td>
</tr>
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<td>ERPA</td>
<td>Emission Reduction Purchase Agreement</td>
</tr>
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<td>FCM</td>
<td>Finance and Carbon Markets</td>
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<td>GBM</td>
<td>Green Belt Movement</td>
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<tr>
<td>GCC</td>
<td>Global Climate Change</td>
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<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
<tr>
<td>GMO</td>
<td>Genetically Modified Organism</td>
</tr>
<tr>
<td>Ha</td>
<td>Hectare</td>
</tr>
<tr>
<td>HANRP</td>
<td>Humbo Assisted Natural Regeneration Project</td>
</tr>
<tr>
<td>HHS</td>
<td>Household Survey</td>
</tr>
<tr>
<td>I4EI</td>
<td>Institute for Environmental Innovation</td>
</tr>
<tr>
<td>ICRAF</td>
<td>World Agroforestry Centre</td>
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</table>
IR Intermediate Result
KFS Kenya Forest Service
KII Key Informant Interviews
LEDS Low Emission Development Strategies
LOE Level of Effort
MRV Measurement, Reporting and Verification
NGO Non-governmental organization
NTFP Non-timber Forest Product
PA Protected Area
PDD Project Design Document
PES Payment for Environmental Services
PRA Participatory Rural Appraisal
REDD+ Reducing Emissions from Deforestation and forest Degradation
SACCO Savings and Credit Cooperatives Societies
SES Social and Environmental Soundness
SO Strategic Objective
SOW Statement of Work
Tonne
TFGB Trees for Global Benefits Project
TIST The International Small Group and Tree Planting Program
UNFCCC United Nations Framework Convention on Climate Change
USAID United States Agency for International Development
VCS Verified Carbon Standard
EXECUTIVE SUMMARY

This study of four forest carbon projects in eastern Africa was conducted under the auspices of the United States Agency for International Development’s (USAID) Forest Carbon, Markets and Communities (FCMC) Program. The main purpose of the study was for USAID to understand the challenges and successes of such projects that combine climate change, biodiversity conservation and community development objectives, and to understand their applicability to future USAID program development, including those related to reducing emissions from deforestation and forest degradation (REDD+).

The four projects studied comprise:

1. Trees for Global Benefits project (TFGB) implemented by Environmental Conservation Trust of Uganda (ECOTRUST), a Ugandan non-governmental organization (NGO);
2. Humbo Assisted Natural Regeneration Project (HANRP) in Ethiopia, implemented by World Vision through its Australian and Ethiopian affiliates;
3. The International Small Group and Tree Planting Program (TIST) in Kenya implemented by Clean Air Action Corporation (CAAC) and Institute for Environmental Innovation (I4EI); and
4. East Aberdare/Mount Kenya Forest Rehabilitation Project (EAMK-FRP) implemented by Green Belt Movement (GBM), a Kenyan NGO.

Besides national differences in policy, biophysical and socioeconomic settings, the projects differ in carbon standards used, as well as the approaches to afforestation/reforestation (A/R) within internationally recognized systems. TFGB uses Plan Vivo as its standard-setting organization, HANRP and EAMK-FRP use the Clean Development Mechanism (CDM), and TIST uses the Verified Carbon Standard (VCS). In addition, the last three projects have used the Carbon, Community and Biodiversity Alliance (CCBA) standards, while Plan Vivo has built-in requirements regarding social and environmental benefits. The projects began operations between 2003 and 2007, so have up to 10 years of experience as forest carbon pioneers. All of the projects have produced carbon credits except EAMK-FRP, which experienced seedling survival and growth rate problems from frosts and grazing livestock.

Table 1 summarizes and compares several aspects of the projects related to forest carbon sequestration. Communities managing A/R are organized into legally recognized entities as registered community-based organizations (CBOs) or Cooperatives except for TIST, where the farmer groups are currently informal, except in the sense of signing collective contracts for carbon credit delivery.
### Table 1: Summary of forest carbon characteristics of study projects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>UGANDA</th>
<th>ETHIOPIA</th>
<th>KENYA</th>
<th>KENYA</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TFGB</td>
<td>HANRP</td>
<td>TIST</td>
<td>EAMK-FRP</td>
</tr>
<tr>
<td>Predominant A/R method</td>
<td>Indigenous on-farm (some exotic)</td>
<td>Indigenous regeneration</td>
<td>Exotic on-farm (some indigenous)</td>
<td>Indigenous in Forest Reserves</td>
</tr>
<tr>
<td>Biodiversity/ Habitat</td>
<td>Small fragmented farm plots</td>
<td>Large contiguous plot</td>
<td>Small fragmented farm plots</td>
<td>9 medium-size plots</td>
</tr>
<tr>
<td>Total Area (ha)</td>
<td>2750</td>
<td>2728</td>
<td>14,000</td>
<td>720 (10 - 200 ha)</td>
</tr>
<tr>
<td>Farmers</td>
<td>2,100</td>
<td>5,100</td>
<td>53,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Land Tenure</td>
<td>Customary, individual</td>
<td>Government/formal community usufruct</td>
<td>Formal, individual mostly titled</td>
<td>Government, community usufruct</td>
</tr>
<tr>
<td>Carbon rights</td>
<td>Individual farmers</td>
<td>Cooperatives</td>
<td>CAAC</td>
<td>GBM</td>
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<tr>
<td>Community institutions</td>
<td>CBOs</td>
<td>Cooperatives</td>
<td>CAAC/(USAID non-carbon aspects)</td>
<td>Community Forest Associations</td>
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<tr>
<td>Investment Funding</td>
<td>USAID, UK</td>
<td>World Vision; World Bank</td>
<td>CAAC/(USAID non-carbon aspects)</td>
<td>World Bank</td>
</tr>
</tbody>
</table>

The study findings are reported in detail comparing the four projects in the body of this document with respect to: Measurement, Reporting and Verification for carbon standards (MRV); financial costs, risks and benefits, and co-benefits; natural resource management practices; biodiversity conservation; and intersection with host-country government policies (including REDD+). This summary focuses on the conclusions.

Each of the four projects has distinguishing successful aspects worthy of consideration for future projects. Three highlights from each project are listed below.

**TFGB:**
- ECOTRUST as the proponent, carbon credit aggregator and market interface is a wholly Ugandan institution and therefore locally accountable to project participants and laws;
- Plan Vivo is well-suited to working with local organizations and smallholders because of its acceptance of project-specific standards and ex-ante payments; and
- Requires (when applicable) that both spouses sign the carbon agreements thereby enhancing household transparency and equity.

**HANRP:**
- Potential for natural regeneration of indigenous vegetation in eastern Africa, which has significant cost and biodiversity benefits compared with tree planting;
- Well-organized farmers can play a leading role in forest rehabilitation and management on state land without intrusive supervision and regulation (something that many governments are skeptical of); and
- Agreement to prioritize use of carbon revenues for community well-being rather than individual payments (and spreading some direct benefits to non-members, too).

**TIST:**
- Effective mobilization and motivation of large numbers of farmers in a short time (achieving a scale 10 to 25 times that of the other projects) and indicating that a long prior engagement with communities is not always essential;
- Largely “paper-free” project management through uploading monitoring information directly from the field, and operating this system with locally trained farmer-participant staff; and
• A donor-private sector model where the former finances “non-carbon” social and biodiversity benefits and a private company finances forest carbon (and other compliance) aspects.

EAMK-FRP:

• As with TFGB, GBM is an indigenous organization that is building capacity for forest carbon management in Kenya and is currently experimenting with other carbon standards;

• High-quality vegetation/carbon baseline that yields scientific research quality ecological and forest stand data and an appropriate design for biodiversity conservation among the tree-planting projects; and

• Commitment to A/R in Forest Reserves, and consequent engagement with government and the need to address co-management, responsibilities, cost and benefit-sharing issues.

This report presents broad conclusions relating to specific aspects of project design and implementation, which are summarized below. Given the early stage of forest carbon finance (relative to length of commitments), evaluations and comparative studies are important to gain understanding for improving future projects.

MEASUREMENT, REPORTING AND VERIFICATION

Challenges include:

• Conservative carbon sequestration estimates favor buyers over farmer-producers, especially with low-incentive carbon prices. As more applicable and accurate data become available, farmers will obtain fairer payments for their environmental services;

• Compliance methods require technical expertise, consistency and quality control for monitoring, and proponents use technically trained staff to make routine tree measurements. Three of the projects use headquarters staff for this purpose, but TIST has trained local farmers as quantifiers in its purpose-built process; and

• Although HANRP and TIST are verified by CCBA at Gold level, both projects have limited biodiversity and community impact monitoring in place.

Long lead time is another factor. Projects typically took at least five years to validation, though Plan Vivo’s ex-ante payments allow revenues to flow earlier in the process. Project proponents who considered or used CDM compliance now favor and use VCS or Plan Vivo in new projects.

FINANCIAL ASPECTS

Several financial challenges distinguish forest carbon projects from other development projects addressing land use.

• Investment costs including compliance are high (often upward of $1 million for CDM and VCS) and typically require international consultant expertise from few approved carbon (or CCBA) auditing firms. Compliance costs continue throughout the project;

• Some standards are more rigorous and therefore expected to accrue higher carbon prices, in the order CDM, VCS and Plan Vivo. However, among study projects, those funded by World Bank BioCarbon (HANRP and EAMK-FRP) have discounted credits ($4.40 per tonne \([t]\) compared to CAAC’s VCS (up to $7.50) and ECOTRUST’s Plan Vivo (up to $6.30);
• Operating costs are kept relatively low, as all projects lean heavily on volunteer labor and the promise of future gain from carbon revenue, timber and other co-benefits;

• At current carbon prices, carbon revenues seem insufficient incentive for tree-planting. Co-benefits alone seem to provide sufficient rewards to compensate costs for many, but carbon revenue is a behavioral incentive to each tree-grower; and

• Understanding details of carbon contracts signed by farmers/groups is typically low despite concerted awareness efforts by project proponents.

AFFORESTATION/REFORESTATION AND BIODIVERSITY CONSERVATION

The relationship between biodiversity conservation and tree planting or regeneration is not straightforward. Several factors significantly affect how the study projects are likely to impact biodiversity.

• On-farm planting of exotic trees is unlikely to have more than marginal value in enhancing biodiversity;

• Most farmers prefer certain exotic species because of rapid growth for timber or carbon credits. TFGB insists on indigenous species primarily with a few less harmful exotics. TIST encourages indigenous species, but leaves the choice to farmers who tend to prefer exotics;

• Where feasible, natural regeneration is the most effective A/R method on larger contiguous areas that also enhances biodiversity and restores ecosystem functions;

• The extent to which small plots of trees on scattered farms enhances biodiversity through forming corridors or “stepping stones” is unclear and depends on many factors. There are few data relating density and dispersion of such plots to enhanced conservation for a range of species; and

• Many farmers see little benefit in biodiversity per se, and see disadvantages resulting from human=wildlife conflict.

COMMUNITY ENGAGEMENT

All projects have effectively engaged thousands of farmers to either plant trees on their own land or to plant/regenerate forest on public or communal land. Institutional arrangements at community level vary, but all projects recognize that intense engagement is essential to develop sufficient understanding of the esoteric nature of climate change related to growing trees and forest carbon markets. Three of the projects feel that their long prior engagement with the same communities on other activities was crucial in building trust, though TIST is able to recruit large numbers of farmers in areas where they have not operated previously.

Challenges and conclusions regarding community engagement include:

• Managing expectations is critical regarding carbon revenues and attribution of some carbon benefits (improved rainfall in particular) directly to trees grown;

• Most farmers planting on private land have not engaged their children in assuring continued responsibility for trees inherited for these contracts spanning decades; and

• All projects encourage gender equity. Except for HANRP, where female participation is increasing but low, there is close to 50 percent women in membership and leadership roles.
SCALING-UP AND SUSTAINABILITY

TFGB and TIST continue to expand within their current areas and in new areas. World Vision and GBM have initiated new carbon projects in other areas, though not as part of HANRP or EAMK-FRP.

Moving from a few thousand hectares (ha) to tens or hundreds of thousands as a project starting point is not straightforward. Some costs will benefit from economies of scale, such as design and compliance auditing (assuming project areas are somewhat uniform). For community projects, economies of scale are less likely because of the extensive and intensive engagement needed, and optimum size of community groups from administrative, logistical and social perspectives. The new and complex nature of forest carbon projects requires intense and continued building of awareness, technical capacity and social capital.

Sustainability of A/R related to carbon credits is uncertain beyond the initial crediting period, especially for on-farm projects. Timber is more valuable than carbon at current prices, so much will depend on whether farmers replant a decade or more from now. The balance of monetary and non-monetary incentives influencing farmers’ land-use decisions at that time is unknowable. Forest regeneration on communal and public lands seems likely to remain intact provided the regulatory regimes remain in place and are respected, and especially if local inhabitants recognize the value of environmental and economic co-benefits accrued.

RELEVANCE FOR NATIONAL REDD+

In each country the study projects are well known to, and recognized as important by, the REDD+ focal points. These pioneer projects provide diverse lessons for A/R, many of which are also applicable to avoided deforestation. Among potential areas of interest described in this report are:

- Baseline and monitoring requirements (forest, environmental, social);
- Leakage and permanence issues;
- Benefit-sharing arrangements;
- Risk mitigation;
- Stakeholder engagement;
- Natural regeneration versus planting for A/R;
- Smallholder contribution to carbon sequestration;
- Community management of forest carbon and capacity for MRV; and
- Awareness, extension and co-benefit facilitation.
1.0 INTRODUCTION

1.1 RATIONALE AND BACKGROUND

The United States Agency for International Development (USAID) launched the Forest Carbon, Markets and Communities (FCMC) Program to assist in implementing and informing its 2012 Climate Change and Development Strategy worldwide. FCMC focuses on building capacity of USAID staff, host country governments and civil society to develop programs intended to support implementation of reducing emissions from deforestation and forest degradation (REDD) and REDD-Plus (REDD+) activities. The “Plus” formulation adds “the role of conservation, sustainable management of forests and enhancements of forest carbon stocks.” REDD+ (as part of the United Nations Framework Convention on Climate Change [UNFCCC]) may include afforestation and reforestation (A/R) activities as well as avoided deforestation in obtaining credits (each equivalent to one tonne [t] of sequestered carbon dioxide) through international compliance regimes or on the voluntary market.

FCMC has three components related to different aspects of REDD+: Social and Environmental Soundness (SES), Finance and Carbon Markets (FCM), and Measurement, Reporting and Verification (MRV), and one on broader aspects of Low Emission Development Strategies (LEDs). FCMC also has several cross-cutting activities that combine one or more of these components. Within this last element, USAID requested that FCMC study a group of pioneer forest carbon projects in eastern Africa. Even though initiation of such projects precedes REDD+ frameworks in each country, it was felt that learning from field activities will help inform USAID and host country institutions in developing and implementing REDD+ strategies and programs.

USAID’s Economic Growth, Education and Environment (E3) and Africa Bureaus, in conjunction with country Missions and FCMC, chose four projects, with different characteristics, for the study: one in Uganda; one in Ethiopia; and two in Kenya. USAID was especially interested in how these community-based projects might enhance biodiversity conservation while accruing financial benefits from the sale of carbon credits.

The goal of the study was to learn from these projects for improved USAID forest carbon and biodiversity programming in the future (see Appendix A, study Statement of Work [SOW]). Specifically, the study was to determine whether these projects:

1. Contribute to and provide sound bases/methodologies for reducing greenhouse gas (GHG) emissions in the sense of USAID Sustainable Landscapes framework for scaling-up/applying elsewhere;

2. Contribute to national thinking on REDD+/Global Climate Change policy and practice development;

3. Contribute to biodiversity conservation in the sense of USAID biodiversity code or broader biodiversity benefits and provide sound methodologies for scaling-up/applying elsewhere;

4. Provide effective experience and synergies between USAID forest carbon and biodiversity conservation objectives and requirements; and

5. Contribute other co-benefits (such as Global Climate Change adaptation, socioeconomic, gender, livelihoods).
The four projects chosen are listed below and presented throughout this report in sequence of field visits.

1. Trees for Global Benefits project (TFGB) implemented by Environmental Conservation Trust of Uganda (ECOTRUST), a Ugandan non-profit, non-government organization (NGO);

2. Humbo Assisted Natural Regeneration Project (HANRP) in Ethiopia, implemented by World Vision, an international non-profit NGO through its Australian and Ethiopian affiliates;

3. The International Small Group and Tree Planting Program (TIST) implemented by the US for-profit Clean Air Action Corporation (CAAC) and US public charity Institute for Environmental Innovation (I4EI); CAAC is also registered in Kenya under the Companies Act; and

4. East Aberdare/Mount Kenya Forest Rehabilitation Project (EAMK-FRP) implemented by Green Belt Movement (GBM), a Kenyan non-profit NGO.

In all cases, the “implementer” listed above is the project proponent with the standard-setting organizations, the coordinator of project activities, and the aggregator/marketer of accrued carbon credits. This report refers to these organizations as the proponent or aggregator (depending on context) rather than implementer to avoid any confusion with farmers or farmer groups, who are also project implementers at the field level.

1.2 STUDY METHODS AND TEAM

Carbon accounting methods in forest carbon projects require significant effort in collecting and documenting somewhat rigorous baseline and monitoring information to a degree often not apparent in other development projects. Further, these documents are readily accessible on the internet. Donors’ broad programmatic documents are often similarly available. At country level, and to a greater extent at project implementer level, documents are harder to obtain and require field visits to obtain current information. For a study of this type, which relies on voluntary inputs from funding and implementing entities, it is unusual to see detailed financial information, and sometimes little internal documentary information is offered such that interviews are the main source of information. Several of the study projects have other studies, evaluations or other accessible external sources in the public domain, or made available to the study team, many of which are referenced in this report.

A range of appropriate methods provided focused information for analysis of each project and for comparison across projects so that consistent analysis of lessons and emerging best practices emerged. The comparative aspect of the study is crucial and serves to emphasize that this is not a set of project evaluations, but an attempt to critically understand positive and negative experience in implementing A/R projects linked to biodiversity conservation with differing forest carbon standards, community-based approaches and benefit arrangements and in different countries.

The main methods comprised:

1. Document review (project documents and other key sources such as country-specific strategies, policies, plans, projects, laws, and other relevant framework and project documents);

2. Key informant interviews with stakeholder representatives;

3. Structured focus group discussions;

4. Structured community and household/farmer dialogues;

5. Informal group/individual discussions as opportunities arose;

6. Field observations by the study team to capture relevant undocumented aspects, and to assess quality and effectiveness of field methods employed;
7. Presentations/validation workshop in each country at the end of in-country study (USAID and/or stakeholder workshops); and

8. Presentation/validation meeting for USAID/Washington prior to submission of the final report.

Use of satellite imagery to assess land-use change – specifically tree cover – was considered, but budget constraints precluded the time series of cloud-free high resolution images necessary for the smallholder plots involved in some projects. Also for budgetary reasons, a quantitative sample survey of households was not undertaken (two of the projects had such survey information available).

Key stakeholders engaged during the study include: USAID officers, project implementing institution(s) staff, community organizations/members at project sites, relevant government officers (including REDD+ focal points and field officers at project sites), and, where relevant, other donor officials and knowledgeable organizations and individuals. Appendix B lists key discussion points and questions used, as appropriate relative to their roles) with informant groups and individuals.

1.2.1 Team

A five-person team collected information in each country comprising three international consultants who traveled to all projects and, in each country, two national consultants as follows.

**Core Team** (all countries)

- Ian Deshmukh: Team Leader; policy, biodiversity.
- Karin Sosis: Deputy Team Leader; financial aspects (carbon, project, community)
- Guy Pinjuv: Measurement, reporting and verification

**Country-specific Team Members**

<table>
<thead>
<tr>
<th>Country</th>
<th>Forestry/agroforestry/natural resources</th>
<th>Socioeconomic/community institutions</th>
</tr>
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<tbody>
<tr>
<td>Uganda</td>
<td>Levand Turyomurugyendo</td>
<td>Ivan Tumuhimbise</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Mekuria Argaw</td>
<td>Senait Seyoum</td>
</tr>
<tr>
<td>Kenya</td>
<td>Robinson Ng’ethe</td>
<td>Lucy Mungai</td>
</tr>
</tbody>
</table>

1.2.2 Schedule

The field study took place between March and August 2013. See Appendix C for an outline of the schedule and informant groups engaged.

As several programs expand in area (TFGB and TIST) and carbon credits accumulate, data change through time. Findings presented here are based upon information gathered up to the end of July 2013, with answers to a few additional queries from project implementers coming in between August and December 2013.

1.3 REPORTING

Although the study is ultimately intended to provide information pertinent to USAID programming in forest carbon and biodiversity conservation, the excellent collaboration provided by the participating projects was contingent on what they might learn from studying of each project. As the study projects, except for TIST, are not currently USAID-funded, it was agreed to provide this separate report focused on findings intended for rapid distribution among stakeholders in Uganda, Ethiopia and Kenya, and provide a separate report addressing concerns specific to USAID programmatic interests listed in the SOW. Although both these reports by and large address the same study questions, this “stakeholder report” is less specific about findings relevant to the requirements of USAID global funding streams for climate change and biodiversity conservation programs.
The following sections of this report describes the four study projects (Chapter 2), provides a comparative review and discussion (Chapter 3) and presents broader conclusions (Chapter 4). Attachments comprise the study SOW, the guide used in gathering oral information and the study schedule and itinerary.

1.4 ACKNOWLEDGEMENTS

The study was only possible because of the outstanding cooperation and logistical support provided by the project proponents. The team heartily thanks the ECOTRUST, World Vision Ethiopia, CAAC/I4EI/TIST and GBM teams for their guidance, time and insights into their experiences in pioneering forest carbon projects in their respective countries. We hope this report will connect the four projects at a distance (they are already well aware of each other) and that this comparative study will provide encouragement and new insights into successfully continuing and expanding their work in combatting climate change while providing other social and environmental benefits. A draft of this report was shared for review with the four project proponents. World Vision and CAAC provided feedback on factual (corrected) and analytical issues (taken into account during finalization). The team is grateful for interest, support and encouragement from the three USAID Missions in countries where study projects operate.
2.0 STUDY PROJECTS

The four projects studied allow comparison of a range of characteristics related to national policy, differing carbon standards and reforestation strategies, and different institutional and beneficiary profiles. Field-based A/R activities are carried out by community members in all cases – either legal entities as community-based organizations (CBOs) and cooperatives, or informal community groups. In addition, each has objectives and activities related to environmental and socioeconomic improvement for the community members engaged in the tree-management activities.

Each project has extensive internet references (provided in References section) through the carbon project registration processes with Plan Vivo, the UNFCCC Clean Development Mechanism (CDM) and Verified Carbon Standard (VCS) as well as the Climate, Community and Biodiversity Alliance (CCBA) standards. Readers seeking more details on the study projects are advised to review the Project Design Documents (PDDs), supporting documents and validation and verification reports on these websites.

Several previous studies of these projects are available given their status as pioneer farmer-implemented forest carbon activities in their respective countries. Most pertinent, the Climate Change, Agriculture and Food Security (CCAFS) program of the Collaborative Group on International Agricultural Research covers similar ground and several of the same projects (TFGB, HANRP, TIST, plus three other projects in Africa) focusing in particular on institutional innovations related to their long-term nature that increase likelihood of success and reduce risk to participants. A synthesis of findings of the six projects (Shames et al. 2012) and the relevant individual case studies are incorporated into our own findings and conclusions.

Table 2 shows key geographical variables, though these are only indicative because of the many specific sites for most projects and lack of adequate rainfall records in all areas. The Kenya sites in particular cover a range of rainfall and elevation locations, two factors that are likely to have marked effects on tree species suitability and growth rates.

Table 2: Comparison of some approximate geographical characteristics

<table>
<thead>
<tr>
<th>Project</th>
<th>Site</th>
<th>Latitude</th>
<th>Elevation (m)</th>
<th>Approximate mean annual precipitation (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFGB</td>
<td>Bushenyi</td>
<td>+/- equator</td>
<td>1000-1500</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>Hoima</td>
<td>10 N</td>
<td>+/- 1100</td>
<td></td>
</tr>
<tr>
<td>HANRP</td>
<td>Humbo</td>
<td>70 N</td>
<td>1700-1800</td>
<td>700-1000</td>
</tr>
<tr>
<td>TIST</td>
<td>Meru</td>
<td>30N</td>
<td>1300-1600</td>
<td>1350</td>
</tr>
<tr>
<td></td>
<td>Laikipia</td>
<td>+/- equator</td>
<td>1800-2000</td>
<td>500-700</td>
</tr>
<tr>
<td>EAMK-FRP</td>
<td>Mt Kenya</td>
<td>+/- equator</td>
<td>2100-2500</td>
<td>800-1200</td>
</tr>
</tbody>
</table>

The four study projects are briefly introduced below. An outline comparison of forest carbon aspects is given in Table 3. All engage local farmers in A/R efforts either on their own farms close to conservation protected areas (PAs) or on degraded government land inside PAs or degraded land set aside for community management.
### Table 3: Comparison of key forest carbon characteristics of study projects

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>UGANDA</th>
<th>ETHIOPIA</th>
<th>KENYA</th>
<th>KENYA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TFGB</td>
<td>HANRP</td>
<td>TIST*</td>
<td>EAMK-FRP</td>
</tr>
<tr>
<td>Characteristic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementer</td>
<td></td>
<td>Ugandan NGO</td>
<td>International NGO</td>
<td>US for-profit</td>
<td>Kenyan NGO</td>
</tr>
<tr>
<td>Predominant A/R method</td>
<td></td>
<td>Indigenous on-farm (some exotic)</td>
<td>Indigenous regeneration on communal land</td>
<td>Exotic on-farm (some indigenous)</td>
<td>Indigenous in Forest Reserves</td>
</tr>
<tr>
<td>Carbon standard</td>
<td></td>
<td>Plan Vivo</td>
<td>CDM (+CCBA)</td>
<td>VCS (+CCBA)</td>
<td>CDM/VCS (?CCBA)</td>
</tr>
<tr>
<td>Biodiversity/Habitat</td>
<td></td>
<td>Small fragmented farm plots close to PAs</td>
<td>Large contiguous plot distant from PAs</td>
<td>Small fragmented farm plots close to PAs</td>
<td>9 medium-size (10 - 200 ha) degraded plots inside PA</td>
</tr>
<tr>
<td>Total Area (ha)</td>
<td></td>
<td>2750 (expanding)</td>
<td>2728</td>
<td>14,000 (expanding)</td>
<td>720 (1763 originally planned)</td>
</tr>
<tr>
<td>Number of farmers</td>
<td></td>
<td>2,100 (expanding)</td>
<td>5,100 (expanding through joining coop)</td>
<td>53,000 (expanding)</td>
<td>1,500</td>
</tr>
<tr>
<td>Land Tenure</td>
<td></td>
<td>Customary, individual, verified by local government</td>
<td>Government/formal community usufruct</td>
<td>Formal, individual mostly titled, not verified by project</td>
<td>Government, limited formal community usufruct</td>
</tr>
<tr>
<td>Government Role</td>
<td></td>
<td>Legal compliance (largely “hands-off”)</td>
<td>Legal compliance/advisory, land rights allocation</td>
<td>Legal compliance (largely “hands-off”)</td>
<td>Formal management agreements</td>
</tr>
<tr>
<td>Carbon rights^</td>
<td></td>
<td>Individual farmers</td>
<td>Cooperatives</td>
<td>CAAC</td>
<td>GBM</td>
</tr>
<tr>
<td>Community institutional arrangements</td>
<td></td>
<td>CBOs</td>
<td>Cooperatives</td>
<td>Informal groups</td>
<td>CBOs/Community Forest Associations</td>
</tr>
<tr>
<td>Investment Funding</td>
<td></td>
<td>USAID, UK</td>
<td>World Vision; World Bank and associated bilateral donors</td>
<td>CAAC/(USAID for non-carbon aspects)</td>
<td>World Bank and associated bilateral donors</td>
</tr>
</tbody>
</table>

* TIST has recently begun working with indigenous trees in degraded plots in Forest Reserves, but these are not yet VCS registered

The following brief narrative descriptions of each project highlight documented or study-gleaned information and as such do not correspond completely in content. Each project and proponent comes to forest carbon from a different organizational philosophy and mission and history of community engagement. Where feasible, directly comparable elements of the study projects are addressed in Section 3 and tables throughout the report. These narratives, comprising Sections 2.1 to 2.4, provide broad background information and select points of interest in each project.

### 2.1 TREES FOR GLOBAL BENEFITS (UGANDA)

ECOTRUST is unique among the study project implementers in using Plan Vivo as its carbon standard, though recently GBM has begun a Plan Vivo project in Nakuru County, Kenya. TFGB supports tree planting on farmer-owned private land.

USAID supported the evolution of its environment and natural resources grant management unit into ECOTRUST, an independent NGO focusing on conservation finance in the early 2000s, then provided grant support through its Productive Resource Investments for Managing the Environment—Western Region program and Wildlife, Landscapes, & Development for Conservation project to begin exploratory work on forest carbon. According to Masiga et al. (2012), the United Kingdom Department for International Development (through its forest sector reform program), CARE Uganda, the Edinburgh Centre for Carbon

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^ The three countries have yet to determine national approaches to ownership of forest carbon per se.
Management, the World Agroforestry Center (ICRAF) and others provided indirect technical and financial support to the development of forest carbon concepts of TFGB and links to Plan Vivo. CARE initially intended to continue engagement, but senior management in Uganda decided against pursuing the opportunity further as TFGB/Plan Vivo, almost by definition, cannot target the poorest community members because participant farmers must own land and have sufficient holdings to not negatively affect subsistence food production (Tom Blomley, personal communication). This is a limitation which the other projects overcome to some extent (though probably not entirely) by working in non-farm land or not requiring land ownership per se as a prerequisite (as in TIST).

ECOTRUST works with some of the same Hoima District farmers in a tree planting activity in a nearby Forest Reserve, but this project does not garner carbon credits, though it continues to enhance ECOTRUST’s local role and community relationships with the National Forest Authority. Plan Vivo is designed for working with smallholders on their own land, not government agencies on public lands, so adding Forest Reserve areas (as in Kenya projects) is not feasible even if all partners wished to do so.

In western Uganda, TFGB began operations in Bushenyi District in 2003, incorporating Hoima and Masindi Districts in 2007 and Kasese in 2010. The study team visited sites in Bushenyi and Hoima to capture information from longer running areas. Currently, with support from the United Nations Development Program, TFGB is establishing around Mount Elgon in eastern Uganda. All sites are selected because of the potential to enhance biodiversity conservation in conjunction with nearby National Parks and Central Forest Reserves.

Because Plan Vivo allows purchase of ex-ante credits (anticipated carbon sequestration), buyers were engaged from the outset. In 2003, credits representing 11,200 t of CO₂ were sold to one buyer for $42,764. By 2012, ECOTRUST sold 149,186 t for $745,800 to 12 buyers (approximately $5/t). A total of 423,000 credits were sold through 2012 for a total of $2.27 million with a further 75,500 t awaiting sale. ECOTRUST has established continuing relationships with several buyers as well as finding new ones, some of which are

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2 Bushenyi was more recently divided into several districts; for convenience and simplicity we use Bushenyi in this report to avoid confusion over timing and name changes.
located in Uganda. Most see their purchases as part of their corporate social responsibility commitments. Individual sales range from 1 – 139,000 t.

TFGB had a validation/verification audit by Rainforest Alliance’s SmartWood Program in 2008 that was finalized with a verification statement in November 2009 and to completion of a PDD in 2009. Plan Vivo allows projects to develop their own technical specifications (loosely equivalent to the methodologies specified for CDM and VCS). TFGB has two registered specifications, one for the indigenous *Maesopsis emnii* and the other for “mixed native woodlots”. A third, for the “naturalized” exotic, *Grevillea robusta*, is being prepared. The flexibility of Plan Vivo allows continual expansion without additional validation such that any figures presented are a snapshot, mostly from the 2012 ECOTRUST Annual Report.

An assessment of socioeconomic benefits of TFGB was conducted in 2008, which examined changes in selected indicators since the project began and comparing participant households with nearby non-participants³ (Carter 2009). The assessment sample comprised 768 households from 168 villages in Bushenyi, Hoima and Masindi. ECOTRUST expects to use this study as a comparative basis for monitoring later in the project (planned for late 2013). Up to 2009 average total carbon income from a one ha woodlot was $904. Other benefits quantified, and improved by project participation included food security, material assets, and organizational, enterprise and resource management capacity. Participants had improved their housing and durable assets ownership since joining the project and compared with non-participants. Carbon credit contracts were also useful as security when seeking loans. Of 11 co-benefits listed for having on-farm trees, those recognized by more than 50% of respondents were fruit (for consumption and sale), shade, windbreak and poles. Firewood from integrated thinning and pruning schedules is a highly anticipated co-benefit as the trees grow. There are indications that project participants were not the poorest in the area, as they had somewhat larger landholdings (11.4 ha versus 7.5 ha) – though the non-participants probably have sufficient to set aside land for trees. Overall, the socioeconomic assessment concluded that TFGB had a positive impact on poverty reduction and that only a small proportion of most vulnerable would find membership barriers insurmountable. ECOTRUST has also encouraged Savings and Credit Cooperative Organizations (SACCOs) and other less formal tree-planting community group micro-finance mechanisms that allow members to save and borrow funds at low cost.

### 2.2 HUMBO ASSISTED NATURAL REGENERATION PROJECT (ETHIOPIA)

HANRP relies on farmer-assisted natural regeneration of woody vegetation on a mostly contiguous degraded area in the Southern Nation, Nationalities and Peoples’ Region of Ethiopia. World Vision Ethiopia⁴ has worked with these communities, first in post-famine relief, then in rural development, to enhance food security since the 1980s. These latter aspects have received substantial USAID funding through its Area Development (implemented by World Vision) and Productive Safety Net Programs, but funding for HANRP is from World Vision Australia and the World Bank BioCarbon program. This and the following two projects use various CDM-simplified methodologies for small-scale activities, which limit annual sequestration to a maximum of 60,000 t (CO₂ equivalent) per year. These simplified methodologies are more compatible with farmer implementation and viable social scales than the equivalent large-scale methods.

The project site is a rocky ridge rising from a plain, where smallholder farms predominate, in the Humbo Woreda (district). Before the project the site was described as largely denuded of vegetation where the main activity was digging up remaining tree stumps for charcoal-making. Some grazing was practiced, though forage amounts were low. Project origins and development are described in Brown *et al.* (2011) and

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³ The assessment was commissioned by ECOTRUST, but conducted independently using established methods.

⁴ Throughout the report World Vision refers to World Vision Ethiopia unless otherwise specified.
Biryahwaho et al. (2012 - see Shames et al. 2012). Two distinct aspects of the project are use of natural regeneration of trees as the main method of carbon sequestration, and the creation of cooperatives, one per local administrative unit5 (kebele) to implement activities. The concept of farmer-managed natural regeneration was pioneered in Niger in the 1980s as an agroforestry technique to increase crop yields and provide fodder and fuel wood from thinning and pruning, and thereby combat poverty, as well as environmental degradation. World Vision recognized that such objectives might be enhanced by adding income generation through carbon credits. As land is state-owned in Ethiopia6, and before the project, the area was de facto common land, a prerequisite for forest regeneration was the Ministry of Agriculture granting exclusive use and management rights to the cooperatives under the auspices of HANRP. Woreda agriculture, natural resource and cooperative officers provide oversight to HANRP, but day-to-day management is by the cooperatives with technical and financial assistance from World Vision. Woreda officials and cooperatives agree that the use and management rights will continue indefinitely as long as the communities effectively manage the area.

Project feasibility was assessed in 2004, the World Bank accepted HANRP for the BioCarbon fund in 2006 and the area was “closed” to non HANRP use at the end of the same year. Following a validation mission in 2009, the project was formally registered with the UNFCCC in 2010 (Brown et al. 2011). A CCBA validation statement was approved in 2011 for gold level accreditation (with both biodiversity and community attributes). Initial field studies recommended 500 ha of tree planting (exotic and indigenous) based on expectations of regeneration, but only 50 ha were necessary – a testament to the power of natural regeneration even in sites where it may seem unlikely.

The first carbon credit payments were issued to the cooperatives in 2009, with two subsequent payments for a total of $148,000 to date. These payments are part of the agreement with World Bank, and are fixed at $4.4 t\(^{-1}\) until the first 165,000 credits (from the 0.9 million, 30 year life of project credits anticipated in the PDD) are “repaid” to the BioCarbon fund after which HANRP can sell on the CDM compliance market.

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5 Seven cooperatives originally corresponded with seven kebeles; two kebeles subsequently split making a total of nine, but the original seven cooperatives remain, with two of them now covering two kebeles each.

4 “The right to ownership of rural land and urban land, as well as of all natural resources is exclusively vested in the state and the peoples of Ethiopia. Land is a common property of the nations, nationalities and peoples of Ethiopia.” (Transitional Government of Ethiopia 1995: Article 40).
Unlike the other study projects that have generated credits to date, the cooperative memberships have agreed to pool the carbon income for joint projects rather than paying small dividends to individuals. These community projects address food security through construction of sizeable grain storage facilities and ancillary equipment. Grain is purchased and milled at low season prices then sold to members at “subsidized” (i.e., below market) prices when more scarce and expensive. Some is also sold to outside buyers in the kebeles as well as larger-scale buyers such as the United Nations World Food Program. One of the cooperatives visited had almost 10 t of maize and the other over 100 t.

To counter loss of access to grazing a fodder cut-and-carry system for herbaceous vegetation is operated by interested members to feed their own livestock and for sale to other community members. In Abela Longena the 50 bundles per week collected were sold for three Birr ($0.16) each to members and 7-10 Birr ($0.40 – 0.55) to external markets (Shames et al. 2012).

The cooperatives provide paid forest guards drawn from the membership, but largely rely on voluntary labor to manage forest resources by boundary demarcation, pruning and thinning, nursery management, enrichment planting, fire protection and trail maintenance. Women’s participation is mainly in nursery activities rather than on-site forest management.

Approximately 5,100 inhabitants of the seven kebeles have joined the cooperatives representing 14 percent (range 9 – 26 percent) of the kebele population of whom 21 percent (range 12 – 39 percent) are women. Membership has grown rapidly in the two cooperatives visited; 66 percent in five years in Abela Longena and 85 percent in Bossa Wanche since 2005, where 200 additional members were expected to join soon. The proportion of women members has also increased through time from 9 percent and 4 percent, respectively, to approximately 20 percent in the same period. The cooperatives exclusively work on HANRP, though other agricultural cooperatives in the area overlap in membership. World Vision supports formation of a cooperative union, with members from the seven forest cooperatives, which is supposed to take over management and coordination of HANRP (including monitoring and compliance) in 2014, but most informants felt that several more years are needed before World Vision can step back from these roles.

A socio-economic survey was conducted during HANRP project development to determine whose livelihoods might be adversely affected by forest restoration, and the concomitant restriction on activities in the project area. Three groups were identified: the landless who exploit the forest land; female-headed households dependent on fuel wood collection for income; and potters who obtain clay from the area. A total of 103 households were estimated as wholly dependent and a further 285 partly dependent on the area for livelihoods, though study team review of the 2007 national census shows some inconsistencies, with, for example, the number of women-headed households seemingly higher in the latter. A HANRP mitigation action plan has attempted to address the needs of more than 500 individuals whose livelihoods were disrupted by providing training in apiculture, brick-making, poultry production and other livestock improvements.

2.3 THE INTERNATIONAL SMALL GROUP AND TREE PLANTING PROGRAM (KENYA)

In its original intent, TIST is a program, privately funded by CAAC (a US for-profit business), that supports tree planting by farmers on their land for carbon credits in four countries – Kenya, Uganda, Tanzania and India. TIST-Kenya differs from the other countries in having a Global Development Alliance arrangement with USAID/Kenya under which USAID funds (two successive agreements provide a total of $8 million for the period 2005 – 2014) are used to pursue biodiversity and community development initiatives in addition to the tree management and carbon credit aspects funded by CAAC. The USAID funded activities are implemented by a US-based non-profit I4EI that is closely allied with CAAC.

TIST initially considered certification under the CDM standard, but then decided to pursue VCS certification using CDM methodologies TIST began substantive operations in Kenya in 2005; its first VCS validation was
in 2011. Since then, CAAC has registered four small-scale and three grouped\(^7\) projects in Kenya. As of June 2013, an estimated 484,000 t of CO\(_2\) equivalent had been sequestered under 3,162 contracts. The projects are also CCBA registered, beginning in 2012. In support of enhanced biodiversity monitoring for CCBA and USAID requirements, TIST has held discussions with Nature Kenya on establishing a bird monitoring program. As a national requirement in Kenya, CAAC commissioned an Environmental Audit Report, which was approved by the National Environment Management Authority (NAREDA Consultants 2010).

A striking feature of TIST is its scale and rapid growth\(^8\) with more than 50,000 farmer participants and six million trees planted at the time of the study field work (see Tables 1 and 3). This rate of growth is supported by a project specific institutional structure that mobilizes farmers into Small Groups (6 – 20 farmers), Clusters (20 – 50 Small Groups) along with Regional Councils and a National Leadership Council with members elected to represent the foundation levels. These groups remain informal in the sense of having no government registration or aggregate legal status. Leadership in these groups rotates to empower a broad swathe of membership, including women, at all levels. TIST is reviewing options for the appropriate level and mode at which to register its groups with SACCOs as a probable option. Small Group members are neighbors and Clusters are structured such that the constituent Small Groups are within walking distance of one another. Operational staff (coordinators, quantifiers, paid trainers) are TIST employees or individual contractors, drawn from the membership and supported as needed by CAAC and I4EI staff (none of whom are resident in Kenya). In effect, therefore, TIST is run day-to-day, and at low cost in-country, by its members, two of whom are fulltime employees and the remainder of paid workers are individual contractors.

TIST frames its economic participant benefits, carbon and other, in the rubric of Payment for Environmental Services (PES), defining several such arrangements:

- Tree-planting pre-payments from eventual carbon revenue distributions. TIST pays farmers a base $0.02 per surviving tree (more than six months old) per year as a stipend or “pre-payment” to be drawn from later sale of carbon credits, as an immediate incentive for tree planting;

- Per-tree financial incentives for planting indigenous trees, and their planting in riverine areas. These are additional to the base stipend and are drawn from the USAID funding at a rate of approximately $0.01 for an indigenous tree and an additional $0.02 for an indigenous tree in a riparian area\(^9\);

- Soil and water conservation on-farm through agroforestry and other conservation farming techniques; and

- Production and use of energy-saving stoves.

Only the first of these is a true PES under most definitions of the concept, with payments directly related to some improved, measurable environmental attribute. There are no direct payments related to conservation farming or improved stoves, though socio-economic benefits seem clear through improved productivity, and fuel wood and time savings. TIST provides numerous trainings to support these activities with, for example, more than 370,000 person-sessions of training in environmental conservation topics conducted in addition to trainings on various health issues such as hygiene, disease prevention, nutrition and clean drinking water.

Income from sale of carbon credits is split such that 30 percent of net revenue is retained by CAAC and 70 percent of net revenue transferred to farmer-participants relative to their estimated carbon sequestration

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\(^{7}\) A VCS grouped project “combines multiple project activities into a single, combined project that adds new instances over time. Using VCS requirements for grouped projects, a project proponent may avoid undergoing a full validation for each new instance added to the project. This can allow projects to scale up over time and reduce transaction costs” (http://v-cs.org/grouped-projects).

\(^{8}\) See http://www.tist.org/i2/kenyagrowth.php.

\(^{9}\) Denominated in Kenya shillings at 1 and 1.5 shillings, respectively.
Table 3: Estimated Value of benefits from TIST membership according to Oppenheimer (2011)

<table>
<thead>
<tr>
<th>Benefit per year (total all respondents)</th>
<th>Value (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree products harvested</td>
<td>29,344</td>
</tr>
<tr>
<td>Animal products harvested</td>
<td>8,823</td>
</tr>
<tr>
<td>Compost harvested</td>
<td>5,479</td>
</tr>
<tr>
<td>Seedlings produced</td>
<td>3,788</td>
</tr>
<tr>
<td>Improved yields from conservation farming</td>
<td>2,859</td>
</tr>
<tr>
<td>Honey harvested</td>
<td>1,138</td>
</tr>
<tr>
<td>Fuel savings from improved stoves</td>
<td>1,106</td>
</tr>
<tr>
<td>Carbon stipend</td>
<td>699</td>
</tr>
<tr>
<td>Incentives (quantifier, trainer payments)</td>
<td>678</td>
</tr>
<tr>
<td><strong>Total (124 participants)</strong></td>
<td><strong>53,915</strong></td>
</tr>
<tr>
<td><strong>Average per member</strong></td>
<td><strong>435</strong></td>
</tr>
</tbody>
</table>

TIST uses a unique data collection, monitoring and management system using hand-held smart computers, connected to the low-cost Kenyan cell phone system, to upload information from field monitoring to the CAAC-maintained servers in the internet “cloud.” The compiled data is available on the TIST website (www.tist.com), including to those participant farmers with suitable cell phones. Data from macro to farm-level are available on the website.

TIST commissioned a socioeconomic assessment as part of its submission for CCBA Gold registration (Oppenheimer 2011). Table 3 summarizes some results from interviews with 124 respondents whose average length of project membership was 4.7 years. Note that these benefit valuations aggregate both household use and income from sale of products (where applicable). From tree-growing activities, carbon stipends yielded $17 per year, harvested products (fruits, nuts, fodder, fuel) were valued at $369 from which a proportion sold yielded $297. These estimates serve to emphasize that financial co-benefit values far exceed carbon stipends, and will likely exceed direct carbon income per participant over the life of the carbon contracts after development, operational and 30 percent of net revenue costs are retained by CAAC. However, costs for promoting many of the non-tree benefits (conservation farming, honey production, improved stoves and some portion of the livestock benefits) were from the USAID funding, not the investment by CAAC in commercial arrangements for carbon credits. The impact evaluation estimated that, as a result of TIST support, 34 percent of participants had used conservation farming, 15 percent produced tree seedlings for sale, 19 percent took up bee-keeping and 7 percent saved on fuel wood consumption from use of improved stoves.
The report also uses several social indicators to show that TIST reaches vulnerable households (19 of the 124 surveyed, whose average benefit was valued at $358 compared with $435 for the group as a whole) and is close to gender equality in membership and in total benefit value realized by men and women.

Although not elaborated in this report, except for specific comparative purposes because the activity is not yet formally approved by the Kenya Forest Service (KFS) or VCS verified, TIST is expanding activities into Forest Reserves. The first sites, in Imenti Forest, Meru County, are already planted with indigenous trees. CAAC and KFS have a signed Memorandum of Understanding and PES revenue-sharing agreement stating how this collaboration will operate in Forest Reserves. Under current KFS policy and practice, communities engage in reserve management through Community Forest Associations (CFA), such that all TIST members involved in tree planting, and eligible for carbon benefits, are also CFA members (but not all CFA members are TIST farmers). CAAC has funded preparation of Participatory Forest Management Plans for the forest blocks involved as part of its carbon-compliance costs, and a resulting Community Forest Management Agreement remains to be approved by KFS. A tripartite agreement (KFS, CFA, CAAC) defines allocation of net carbon revenues (after CAAC expenses) as 20 percent to KFS, 3 percent to the CFA and the remaining 77 percent to be split between CAAC (30 percent) and TIST farmers (70 percent) as in the on-farm arrangement described above. An additional benefit for those planting trees in Forest Reserves is the KFS Tree Establishment and Livelihood Improvement Scheme, which allows the tree-planting community members to grow crops around the trees during the early years of seedling establishment. The memoranda, agreements and management plans have a term of five years, much shorter than the carbon sales agreements and the memorandum with KFS.

CAAC facilitated this approval in November 2013, after the study was completed, thereby enabling the Forest Reserve activities to formally proceed.
2.4 EAST ABERDARE/MOUNT KENYA FOREST REGENERATION PROJECT (KENYA)

GBM has a long history as a tree-planting organization founded in 1977 by Nobel Peace Laureate Wangari Maathai. According to the most recent 2011 Annual Report, four million trees were planted that year (51 million since GBM’s inception) with 70 percent survival (Green Belt Movement 2012). Approximately 4,000 nursery groups are planting trees in more than 6,500 watersheds country-wide. This historical perspective, and a GBM mission “… for better environmental management, community empowerment and livelihood improvement using tree planting as an entry point” emphasizes the Movement’s core activity as tree planting, which pre-positioned it for A/R forest carbon credits long before they existed. GBM has a rigorous “indigenous species only” policy in support of biodiversity conservation in contrast to the other projects which include a few (HANRP) to predominantly exotic (TIST) plantings.

EAMK-FRP as GBM’s first forest carbon venture focuses on community tree planting in degraded areas of Forest Reserves that are under KFS jurisdiction. Ten of these areas were planned for carbon credits, while other areas in the program operate without the carbon credit aspect. GBM began submitting draft PDDs in 2007 for three East Aberdare/Mount Kenya biocarbon projects and went through up to five rounds of comments and revised drafts before CDM approval in 2011 and 2012 and projections of 12,000 t per year over the 30 year crediting period. Tree planting commenced in 2008. Slow growth of trees has led to not meeting carbon sequestration targets and realization of no credits to date. GBM is now considering submitting revised PDDs for VCS registration, though the option for reverting to the CDM credits remains. GBM has more recent VCS and Plan Vivo projects elsewhere in Kenya. The EAMK-FRP projects also applied for CCBA registration, though according to the CCBA website, the application was withdrawn in June 2013. GBM indicates that it still expects to obtain CCBA registration, which seems a credible option based upon this study.

Implementation of the project has disappointed in two ways with respect to potential carbon revenues. First, the expected 1700 ha plus was reduced to 720 ha because KFS did not allocate sufficient land within the Forest Reserves deemed suitable for the carbon project, and due to disappointing tree growth and survival rates. The latter are due to various factors including rare frosts at a critical stage in seedling development and failure to control continued livestock grazing at some sites. These external challenges clearly impact initial financial assumptions, as well as illustrate some potential risks involved in forest carbon projects.

A distinguishing feature of EAMK-FRP is the detailed vegetation baselines established with fixed plots in which all plant types are quantitatively estimated in terms of species, density and other attributes. Measurements are sufficiently rigorous to estimate plant biodiversity indices, successional changes and stand level tree growth models. These baseline and monitoring parameters exceed carbon and CCBA requirements, and could provide valuable data for national REDD+ inventories and for impacts of climate change on vegetation characteristics. GBM does not have a faunal monitoring plan.

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11 USAID supported part of the East Aberdare Forest Rehabilitation Project until earlier in 2013, but the sites chosen proved unsuitable for initiating a forest carbon project.
In all its activities GBM operates through community Tree Nursery Groups, which are legally registered CBOs, some of which have existed for two decades. The nurseries observed are well maintained and detailed records are kept. The groups typically have a membership of around 15 individuals, of whom up to 70 percent are women (size and proportion of women vary between groups). Although GBM-supported planting is entirely indigenous, nurseries are allowed to propagate and sell indigenous and exotic seedlings at local commercial rates (at approximately $0.12 for exotics and $0.24 – 0.35 for indigenous, depending on species). GBM compensates its Nursery Groups approximately $0.06 per surviving tree planted after six months, a rate unchanged since 2005. Nursery groups are compensated for their labor in various activities such as digging holes for planting, spot weeding and seedling protection. The latter two ongoing activities are mostly performed by Green Rangers, who are nominated from the Nursery Groups. Green Rangers work from a few hours per week to fulltime at compensation rates below that of day-labor on farms.

As with TIST’s work with KFS in Forest Reserves there are several Kenyan government compliance requirements including registered CFAs, Participatory Forest Management Plans, Community Forest Management Agreements and Environmental and Social Impact Assessments in addition to CDM (or VCS) and CCB A requirements. Currently, some planted areas have approved management plans and agreements and others await KFS signature. GBM covers these compliance costs through support from several bilateral donors and the World Bank. GBM also has a national Memorandum of Understanding with KFS which provides a framework governing its work in Forest Reserves. For both TIST and GBM (as with any organization working in forests on public lands), meeting these requirements with KFS is time consuming and expensive.

GBM indicated that according to the Memorandum, KFS will receive 30 percent of carbon revenues and 70 percent will flow to the communities for community projects rather than individual cash benefits. As no carbon revenues are yet realized, GBM intends to form a local stakeholder committee to agree on details of community revenue use and distribution before revenues accrue. One issue noted (which the TIST

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GBM uses the term “compensation” recognizing the amounts (denominated as 5 Kenya shillings per tree) does not represent the material and labor inputs require to establish each tree. Similarly labor payments are regarded as “compensation” and not comparable to local labor rates. GBM estimates its internal costs per tree from community engagement to aftercare as $2 per tree.
memorandum defines) is how proceeds might accrue to the CFA (as the KFS partner in the forest management agreement) as a whole, compared with the GBM Nursery Groups, which are only one membership section of the CFA. To date GBM operations in the carbon projects are grant-supported, but the organization is considering the option of “charging” communities for GBM services when carbon revenues begin.

GBM heavily promotes environmental and social co-benefits as primary motivators rather than carbon revenues with its Nursery Groups. However, the latter do have cash income from seedlings they sell – and EAMK-FRP supports bee-keeping as a livelihood activity. The project’s Environmental and Social Impact Assessment estimated the value of in-kind contributions from Nursery Groups as equivalent to $156 per ha of trees planted compared to cash payments of $276 ha$^{-1}$ to Nursery Groups participants (Kamweti and Acworth 2006). Although details were not available, this assessment also conducted a cost-benefit analysis that estimated revenue from honey sales equivalent to two hives per ha was necessary for financial gain by community members and that they could lose $500 – $1800 per ha of net present value from loss of grazing in planted sites.

As well as insisting on indigenous species, GBM policy does not allow thinning and pruning of trees (though collection of fallen wood is permitted), nor does it allow a Tree Establishment and Livelihood Improvement Scheme (see Section 2.3) in its planted areas. At one EAMK-FRP site, GBM Nursery Group members were not allowed by KFS to participate in the equivalent field cropping around seedlings under the exotic Plantation Establishment and Livelihood Improvement Scheme in other parts of the same forest block as these are allocated to other user groups in the CFA.
3.0 STUDY FINDINGS

3.1 FOREST CARBON STANDARDS

Carbon sequestration standards, methods used by each project, and results expected and/or achieved so far are provided in PDDs, validation and verification reports. These documents are invaluable reference materials, though their formulaic nature is not conducive to capturing the challenges and learning process of project implementation, nor the interplay between institutions and actors in achieving results.

Box 1 briefly lists MRV factors addressed in projects aimed at garnering forest carbon credits.

**Box 1: Some MRV Definitions**

Measurement, Reporting and Verification is the collection of data and information at a national (or sub-national) level, and performance of the necessary calculations for estimating emission reductions or enhancement of carbon stocks and associated uncertainties against a reference level.

The Baseline represents forecasted conditions (whether carbon, community, or biodiversity-related) under a business-as-usual or “without project” scenario (i.e., had the project activities not been implemented).

Additionality refers to the carbon accounting procedures whereby projects must demonstrate real, measurable, and long-term results in reducing or preventing carbon emissions that would not have occurred in the absence of carbon activities. Proof of additionality is critical because developing countries do not have legally binding reduction commitments by which to judge changes in national baselines.

Leakage is any increase in emissions of GHGs outside the project boundary as a result of project activities.

Permanence is the longevity of a carbon pool and the stability of its stocks, given the management and disturbance environment in which it occurs. A feature of land-based carbon projects is the possibility of a reversal of carbon benefits from either natural disturbances (e.g., fires, disease, pests, and unusual weather events), or from the lack of reliable guarantees that the original land use activities will not return after the project concludes.

Given the level of uncertainty in assessing site-specific values for these factors, all study project PDDs emphasize that their carbon sequestration estimates are conservative. With prevalent low carbon prices, the need for a high degree of conservatism is unfortunate as it makes financial returns less attractive for project developers and for implementing farmers, who all feel payments are too low.

Another key aspect of MRV in forest carbon projects is how much carbon is accumulated during the project. These estimates usually employ existing allometric equations (statistical models) relating easily estimated tree dimensions to tree mass, and models of likely growth rate (to estimate carbon accumulation over time). Ideally, these equations are determined from similar trees in similar environmental (growth) conditions to those at project sites. Such determinations require elaborate destructive sampling of a sample of trees (or other vegetation components) to derive statistically valid equations that relate tree dimensions to oven dry weight (converted to carbon mass using standard formulas) of living above-ground components of the tree. Another option is to use acceptable standardized (or default) estimates. The UNFCCC provides broad
regional default equations, while USAID has developed an online “carbon calculator” for Agriculture, Forestry and Other Land Use projects\(^\text{13}\) in collaboration with Winrock International. These regional default estimates are valuable, but cannot give accurate predictions for a specific location and mixture of tree species. For example, Table 2 showed the wide ranges of environmental conditions that affect tree growth rates at project sites, notably precipitation and temperature (elevation-related). In addition, the range of tree species in the study projects is large (see Table 11), though only a few species-specific equations are used to predict carbon sequestered. While the UNFCCC and Winrock are careful to stress limitations in local use of their carbon estimates, project proponents and others continue to cite carbon sequestration projections to the nearest tonne or fraction of a tonne, even though such accuracy is not attainable.

Table 5: A simplified comparative overview of MRV parameters in study projects. (Further explanation below and in other sections of the report.)

<table>
<thead>
<tr>
<th>Project</th>
<th>Biomass accumulation estimates</th>
<th>Additionality</th>
<th>Leakage</th>
<th>Permanence</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFG8</td>
<td>Two technical specifications developed (one species specific, one “mixed”), little local data input</td>
<td>Some existing vegetation cleared at some sites</td>
<td>Use of vehicles quantified; Some displaced activities probable, not estimated</td>
<td>Contract period (20-50 years); beyond 20 to 25 years uncertain</td>
</tr>
<tr>
<td>HANRP</td>
<td>Uses literature values, little local data input</td>
<td>Site mostly devoid of vegetation, a few residual trees</td>
<td>Some displaced activities probable, not estimated and regarded as minimal in PDD</td>
<td>Contract period (30 years, possible extension to 60), beyond probable as community tenure requires maintenance</td>
</tr>
<tr>
<td>TIST</td>
<td>Uses literature values and equations, little local data input</td>
<td>Some existing vegetation cleared at some sites</td>
<td>Some displaced activities probable, not estimated and regarded as minimal in PDD</td>
<td>Contract period (20-60 years), beyond 20 uncertain*</td>
</tr>
<tr>
<td>EAMK-FRP</td>
<td>Uses default equations, little local data input</td>
<td>Sites previously grazed, little woody vegetation</td>
<td>Some displaced activities probable, not estimated and regarded as minimal in PDD</td>
<td>Contract period (20-60 years), beyond probable because in gazetted Forest Reserves</td>
</tr>
</tbody>
</table>

*Refers to TIST on-farm; recent TIST work in Forest Reserves permanence beyond contract is probable

Carbon estimates: None of the study projects developed new biomass equations for trees using destructive sampling, or new site and species specific growth models for carbon accumulation, nor is it likely that small-scale farmer implemented projects would do so unless grant funds were available for such technically exacting work. Nevertheless, more locally appropriate equations are often available, but not commonly known to project proponents. For example, in Ethiopia a manual for woody biomass has allometric equations for many species based on destructive sampling done in the 1990s (Parent \textit{et al.} 2000). Efforts are underway to more effectively compile such sources, such as Henry \textit{et al.} (2011), which list 373 biomass equations (81 for the three study countries) for sub-Saharan Africa. This study also graphically illustrates variations related to species, forest type, environment and methods used. Recently the United Nations Food and Agriculture Organization has developed an interactive web-based resource\(^\text{14}\) which currently lists seven equations for Uganda, 64 for Ethiopia and 59 for Kenya.

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\(^{13}\) [http://afolucarbon.org/](http://afolucarbon.org/).

Similarly, the four projects use generalized formulas for assessing below-ground biomass using root mass as a percentage of shoot mass from other sources. In Uganda a ratio of 30 percent was applied and in the other three projects a UNFCCC default of 27 percent was used for dry tropical forest. As with above-ground allometric equations, there is substantial variation related to species, environmental conditions and to A/R growth stage. Using approximately 500 direct estimates of root:shoot ratios, Mokany et al. (2006) in tropical dry forests found a range of 9 – 68 percent (median 56 percent) for younger stands of less than 20t ha⁻¹ and 1 percent - 28 percent for older stands above 20t ha⁻¹. Applying their data set globally led to a 50 percent increase in carbon root stock compared with an earlier published estimate.

Another estimation issue for on-farm forest carbon is that most allometric equations are derived from forest plantations in which all size classes are not represented. Recent work in western Kenya shows that sequestration by trees in agricultural landscapes differs from those using previously published equations. Aboveground biomass was underestimated by 7 – 11 percent and below-ground by 21 – 35 percent (Kuyah et al. 2012 a and b).

While some of the standard methods selected by proponents of the three tree-planting projects allow inclusion of natural tree regeneration among the planted trees, which would likely not have grown under prevalent land use systems, and which could increase carbon sequestration amounts, they were not systematically accounted for during monitoring. Between-tree spacing systems employed and survival prospects of natural regeneration, especially on-farm, indicate that incentives for maintaining such trees are weak.
Additionality: PDDs for each project discuss additionality, which is third-party validated and/or verified as reasonable. This validation does not mean that there are clean-cut ways of assessing additionality with respect to government policy, other project interventions and smallholder land use. For example, in Uganda and Kenya, many other projects promote on-farm tree-planting and many farmers are themselves inclined to plant trees after decades of encouragement, irrespective of carbon benefits. In Ethiopia, there are numerous government and donor initiated re-vegetation initiatives without carbon credit aspects, though not all are as successful as HANRP. The 2010 Constitution of Kenya enshrines a 10 percent target for national forest cover (more than double the generally quoted value currently) and this is officially interpreted as a target for private land-holdings (The Agriculture [Farm Forestry] Rules, 2009). KFS also has a mandate to ensure this level of forest cover and to restore indigenous forest in Forest Reserves, which might imply that TIST and EAMK-FRP is not “additional” over what would (should) happen anyway. Based on these requirements, one could argue that there is no additionality in Kenya until farmers already have 10 percent tree cover on their land, or until some verified assessment of increasing tree cover without a carbon project is available, though such a discouragement for farmer-based small-scale projects seems counter-productive.

Another additionality issue is accounting for removal of existing vegetation to allow planting or growth of new project trees. PDDs argue that such removal is negligible, which is likely true for HANRP. TFGB and TIST on-farm sites are often on fallow areas with some existing vegetation, but the overall trend in these areas (if not necessarily on individual farms) is a decline in woody vegetation. Although no PDD is submitted yet, the study team was told by KFS and community members that the Lower Imenti site had substantial biomass of exotic alien shrub *Lantana*, which was cleared for tree planting and there was significant vegetation biomass on several farms that was to be cleared for tree planting, though these particular plots may be negligible in a PDD encompassing many farms. In contrast, EAMK-FRP sites seem to have been heavily grazed for many years prior to planting, and therefore, largely devoid of woody vegetation.

Leakage: TFGB estimates vehicle usage by ECOTRUST as a leakage factor, but the other three projects assume that leakage from project operations is negligible, which is subsequently independently validated and/or verified. HANRP and EAMK-FRP likely have similar vehicle usage to ECOTRUST for head office supervision, though within Kenya TIST staff use public transport. Similarly, all projects assume that previous project site activities are not significantly displaced elsewhere. These assumptions are agreed by the various registry-approved validation/verification exercises.

Nevertheless, the team did find some potential displaced activities, often related to livestock grazing by non-participants in the carbon projects, despite efforts in most case to provide alternative forage on-farm (or by cut-and-carry in HANRP). For example, in on-farm projects, if the land provided for trees was previously fallow, it was often regarded as available for land-owner and neighbor grazing. Livestock grazing in the Kenyan Forest Reserves is also common, though excluded in theory from newly planted areas. Eastern Africa also has many pastoralists who migrate seasonally for pasture and periodically occupy other areas temporarily during droughts. As such they may have or have had a historical customary right to use of grazing resources that becomes restricted by changes in land use such as A/R.

Although local project participants in Humbo and World Vision staff indicated that there was no displacement of grazing for local inhabitants because of the cut-and-carry system (available to all local people, not just cooperative members) Woreda government officials felt it likely that some longer-distance pastoral movements are displaced. World Vision promotes on-farm forage production, but it is uncertain that livestock forage will remain adequate if the on-site tree canopy closes and grass production declines as a result. Some sites used by TIST and EAMK-FRP, especially on the drier side of Mount Kenya, also affect historical and recent grazing patterns of Maasai, Borana and Samburu herders, especially during droughts.

All projects except EAMK-FRP allow pruning and thinning of live wood built into their carbon sequestration schedules. The wood removed is used for fuel, poles and other construction for household needs to ensure that participants do not fell trees elsewhere (leakage) to compensate for maintaining their planted trees. EAMK-FRP allows collection of dead wood, only.
Permanence: Carbon credit contracts specify the length of engagement and, therefore, give an operational (and legal) definition of permanence. Initial crediting periods of 20 – 30 years are specified for study projects, but the contracts have “option periods” stretching two or three times longer if trees are replanted or the area remains under forest cover. These periods of several decades, while not “forever,” are exceptionally long-term commitments in several respects:

- As development projects: the typical donor project cycle is three to five years, after which project results may continue, change or dwindle depending on many factors;

- As “static” interventions in a dynamic environment: CDM and VCS standards evolve somewhat, but remain tied to stringent MRV and other constraints. During several decades, government policies, demography, economies and ecologies change – as will climate and its effects on tree growth. Plan Vivo is more adaptable than other standards, but even it is not immune from social and environmental changes; and

- At a household level: contracts cover several generations and children not yet born may assume responsibilities of their parents, either willingly, unwillingly, or not at all. This factor is more prominent in the on-farm projects, but in the off-farm projects, too, contracts are involved and “communities” assume a level of responsibility for executing them that will not have free and informed consent from children of the signatories.

These factors are largely unprecedented for contractual market arrangements involving rural communities, many of whom have limited education, and for intergenerational consent and equity, though it seems unlikely that breaching contracts by thousands of individual farmers (or TIST Small Groups) will have realistic recourse through legal prosecution.

3.2 ENVIRONMENTAL AND SOCIAL STANDARDS

Implementation of environmental and social aspects of the projects as part of or in addition to the forest carbon elements are described throughout this report. Formal compliance regimes in operation are briefly explained in this Section.

CDM and VCS do not have rigorous “built-in” standards for environmental and social issues, though various REDD+ initiatives are increasingly looking to include such standards in relevant future forest carbon requirements. FCMC has comprehensively reviewed Social and Environmental Standards for REDD+, much of which is applicable to non-REDD forest carbon projects (USAID 2012 b). Among findings are:

- None of the existing systems of safeguards or standards cover the full range of social issues in REDD+. At this stage, however, the priority should be focused on testing and learning from field experience, such as CCBA and REDD+ Social and Environmental Standards, to inform future revisions;

- Simplicity in safeguards and standards is the key to obtaining results, and social (and environmental) standards employing “principles and criteria” offer the clearest logic for designers, implementers and participants of REDD+ at all levels; and

- Safeguards and standards are integral to providing investor confidence and ensuring the viability of REDD+ in the future. Assurances offered by safeguards and standards reduce risk to private and public sector investors by demonstrating efforts to document and mitigate the risk that social or environmental concerns might undermine the delivery of emission reduction benefits, or lead to the decline of social support for project activities.
Box 2: Extracts from Environmental and Social Requirements under Standards Used by Study Projects (does not include December 2013 revisions of both standards, as these were not operational during study)

CCBA requires a high degree of transparency and evaluation of projects by an approved third-party auditor. Project documents must be publicized to local stakeholders and posted on the internet for public comment. Auditors must consider all comments and conduct a site visit to determine whether a project satisfies all required criteria. These criteria demonstrate that a project will mitigate climate change, conserve biodiversity and improve well-being for local communities and show that:

- Rights of Indigenous Peoples and local communities are recognized and respected with no involuntary resettlement;
- Local stakeholders are effectively involved in design, implementation and evaluation;
- Carbon property rights are clear with no unresolved land tenure disputes;
- Positive and negative social and environmental impacts are monitored and the results are made public; and
- No invasive species and no genetically modified organisms are used for mitigation activities and must demonstrate no negative impacts for any use of non-native species.

(www.climate-standards.org)

Plan Vivo
Principle: Integrated design of project activities to ensure livelihood and ecosystem benefits.

- A description of biodiversity in and close to project intervention areas;
- Expected impacts of interventions on biodiversity;
- Identification of and impact on major ecosystem services (other than climate) in and close to project area (including soil and watershed);
- Description of socioeconomic baseline including wealth and income levels, livelihood activities, local governance and cultural groups; and how conditions might change with no project;
- Expected socioeconomic impacts compared to baseline scenario; and
- Socioeconomic baseline plan within one year of project validation based on locally relevant indicators, and performance targets and how results will be used to evaluate project effectiveness.

(www.planvivo.org)

Among the four study projects, TFGB has integral Plan Vivo requirements and the others subscribe to CCBA as a means of “adding value” (whether financial, non-monetary or philosophical) to carbon credits issues under CDM or VCS. Requirements are summarized in the box above.

All projects except EAMK-FRP have recently been validated by third parties for these respective social and environmental standards and as such are regarded as compliant. To an extent these audits have validated intent as much as execution, especially when it comes to effective monitoring. As described elsewhere in this report TFGB, HANRP and TIST have either initiated or plan to initiate faunal monitoring (primarily birds) but systems are not yet operational. Only EAMK-FRP has a comprehensive vegetation baseline. None of the projects have on-going socio-economic impact monitoring though three have conducted semi-independent assessments, which they plan to use as a basis for future monitoring. TIST also monitors estimated economic value to participants of project interventions based on Oppenheimer (2011 – see Section 2.3). Input or process monitoring (such as training content and participation) are recorded routinely as with other development projects.

3.3 COUNTRY COMPLIANCE

In addition to international standard requirements, each country has legal or regulatory compliance regimes applicable to the study projects. For the CDM projects, clearance by the Designated National Authority was given; the Environmental Protection Authority in Ethiopia for HANRP and the National Environment
Management Authority in Kenya for EAMK-FRP. Environmental/Social Impact Assessment was required in Kenya, but not in Uganda or Ethiopia. For the Forest Reserve activities in Kenya, a Participatory Forest Management Plan is required, typically for each forest station (a geographical unit within Forest Reserves) followed by a Community Forest Management Agreement between KFS and the local CFA. CAAC and GBM have broader memoranda of understanding with KFS governing their forest carbon work that include revenue-sharing and other aspects. HANRP also has a Forest Management Plan for Humbo.

All these requirements were met, or in process, at the time of the study field work, except for finalization of some management agreements between CFAs and KFS. Kenya has an onerous and slow system for its forest management plans and agreements.

### 3.4 FINANCIAL ASPECTS

There are numerous actors involved in financial aspects of the study projects, including donors, project proponents, carbon aggregators, community participants, and carbon brokers and buyers. This section reviews project investment financing, economic costs to proponents and community members, financial risk and benefits accruing. Although few quantitative data exist, co-benefits are also reviewed.

#### 3.4.1 Project costs

As with any development project with multiple actors, a full account of comparable financial and in-kind costs cannot be determined accurately in many cases, and may not be relevant, therefore. For example, donor and host-country officers may make significant contributions of time, but as part of their existing mandates. NGOs have multiple funding streams and intertwined projects that overlap geographically and thematically with the same communities (ECOTRUST, World Vision, GBM), while private businesses have proprietary cost information that may affect confidentiality or competitiveness if shared. The study team was unable to get a complete financial picture of any project for these reasons, and because of limited availability of data beyond broad estimates, with occasional more detailed insights. A study covering a larger group of projects (but including all four discussed in this report) provides some additional and some differing cost estimates, which serves to emphasize the difficulty of obtaining complete and comparable data (Gosset and Neufeldt 2012).

Table 6 summarizes types of cost encountered by all projects at proponent and community levels and identifies additional types of cost specific to each study project while the subsequent narrative delves into some specific illustrative examples without attempting to be comprehensive. In all study projects the project proponent is also the carbon aggregator and market interface.

For TFGB, HANRP and EAMK-FRP, most financing for project development, compliance and implementation costs not directly borne by community members were covered by grants from donors and/or advance payments on future carbon credits. All projects (carbon or otherwise) require significant capital outlay during the early years of development. A/R projects are widely seen as high-risk investments for the private sector, in part because of lack of understanding of their risk structures (UNEP-Risoe 2013). One way to fund these investment costs is to sell off a portion of yet-to-be-generated credits in advance through either an Emissions Reduction Purchase Agreement (ERPA) in which a negotiated up-front payment for prospective credits is arranged (such as the World Bank’s ERPA with HANRP), or through an ex-ante sale of credits (as with TFGB). Though EAMK-FRP had an ERPA with the World Bank, this did not involve pre-payments, and their project development costs were funded by grants from the World Bank and several other donors involved with its forest rehabilitation projects in Central Kenya, including USAID. A few private investors are willing to finance forest carbon projects in eastern Africa, CAAC from the study projects but Wildlife Works, for example, has developed a REDD+ project in Kenya and is investigating doing likewise in Ethiopia.
Table 6: Types of cost experienced by project proponents and communities.

<table>
<thead>
<tr>
<th>Proponent/Aggregator</th>
<th>Community / Household</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALL PROJECTS</strong></td>
<td><strong>PROJECT SPECIFIC</strong></td>
</tr>
<tr>
<td><strong>Proponent/Aggregator</strong></td>
<td><strong>Community / Household</strong></td>
</tr>
<tr>
<td><strong>Carbon compliance</strong>: feasibility, baseline, PDD/technical specifications, validation, registration, monitoring and reporting, verification, credit sales and marketing</td>
<td><strong>Carbon sequestration</strong>: land preparation, planting, tending</td>
</tr>
<tr>
<td><strong>Organizational capacity</strong>: project staff salaries, staff and extension/volunteer training, operations and overhead, establishment of trust / social capital</td>
<td><strong>Operational</strong>: land, boundary marking, protection nursery supplies, transport, hired labor, community conflict over impact of project (reduced firewood and/or grazing land, shade over crops, crop and livestock raiding by increased fauna)</td>
</tr>
<tr>
<td><strong>Community engagement</strong>: initial mobilization, on-going outreach, local government relationship building</td>
<td><strong>Group membership</strong>: time for meeting and training attendance, volunteer commitments</td>
</tr>
<tr>
<td><strong>Opportunity costs</strong>: commitments of staff resources to specific activities / knowledge</td>
<td><strong>Opportunity costs</strong>: long-term land commitment and contract/compliance, (re)allocation of time, voluntary labor</td>
</tr>
<tr>
<td><strong>Co-benefit facilitation</strong>: improved stoves, bee-keeping, other enterprise development support</td>
<td><strong>Carbon sequestration</strong>: training in nursery management, agroforestry, improved cook stoves</td>
</tr>
<tr>
<td><strong>World Vision Ethiopia</strong></td>
<td><strong>Formal community coops</strong></td>
</tr>
<tr>
<td><strong>Carbon compliance</strong>: seed purchase, nursery establishment, cooperative development, CCBA registration and verification, government approval (CDM); annual tree monitoring</td>
<td><strong>Carbon sequestration</strong>: Thinning, pruning, firebreak/trail maintenance; guarding, boundary marking; assistance in annual tree monitoring</td>
</tr>
<tr>
<td><strong>Opportunity costs</strong>: commitment of staff resources to specific activities / knowledge</td>
<td><strong>Group membership</strong>: cooperative membership fees</td>
</tr>
<tr>
<td><strong>Co-benefit facilitation</strong>: training in nursery management, conflict resolution, improved stoves, HIV/health, conservation farming</td>
<td><strong>Opportunity costs</strong>: restrictions on grazing; charcoal production; long wait for carbon payment</td>
</tr>
<tr>
<td><strong>CAAC</strong></td>
<td><strong>Small Groups and Clusters</strong></td>
</tr>
<tr>
<td><strong>Carbon compliance</strong>: VCS and CCBA PDD, registration and verification; impact assessment, forest management plans and management agreements</td>
<td><strong>Carbon sequestration</strong>: seed collection, seed purchase, seedlings purchase, nursery establishment, thinning, pruning, watering, weeding, replacing and replanting non-surviving seedlings/saplings</td>
</tr>
<tr>
<td><strong>Opportunity costs</strong>: commitment of staff resources to specific activities / knowledge</td>
<td><strong>Operational</strong>: Volunteer or low-compensation labor</td>
</tr>
<tr>
<td><strong>Co-benefit facilitation</strong>: training and skills in enterprise, conflict resolution, improved stoves, HIV/health, conservation farming</td>
<td><strong>Group membership</strong>: CFA membership fees and participation in management plan</td>
</tr>
<tr>
<td><strong>GBM</strong></td>
<td><strong>Nursery groups and networks</strong></td>
</tr>
<tr>
<td><strong>Carbon compliance</strong>: forest management plans and agreements, CCBA application, government approval (CDM), nursery group / network administration, replacing and replanting non-surviving seedlings/saplings</td>
<td><strong>Carbon sequestration</strong>: seed collection / purchase, nursery establishment, ‘after-care’ seedling patrol / protection, weeding</td>
</tr>
<tr>
<td><strong>Organizational capacity</strong>: fundraising</td>
<td><strong>Opportunity costs</strong>: Excluded from Plantation Establishment and Livelihood Improvement Scheme</td>
</tr>
<tr>
<td><strong>Opportunity costs</strong>: commitment of staff resources to specific activities / knowledge</td>
<td><strong>Group membership</strong>: CBO registration, CFA annual fees</td>
</tr>
<tr>
<td><strong>Co-benefit facilitation</strong>: enterprise training in bee-keeping</td>
<td><strong>Nursery groups and networks</strong></td>
</tr>
</tbody>
</table>

Pre-payments on CDM and VCS credits are uncommon and when applied often at a discount to spot carbon prices, such as the $4 to $5 per tonne offered by World Bank Biocarbon Fund. Discounted early payments offer a project stability and cash flow, but are a significant price for capital. Plan Vivo allows both ex-ante and ex-post sales that helps it to remain relevant to smallholder-based projects. TFGB prefers ex-ante to finance frontloaded payments to tree-farmers and cover other operational needs, though there may be permanence risks after farmers cease receiving carbon payments later in the project.
The carbon component of TIST is funded entirely by CAAC as a corporate investment, though some TIST carbon-related developments overlap with development of USAID-funded socioeconomic and environmental “add-ons” such as development of its information technology system. CAAC rigorously separates activities related to compliance from the USAID funded aspects. Indeed, CAAC goes further in some instances by funding national compliance requirements (such as the management plan required in Kenya’s Forest Reserves), when arguably this might be a “biodiversity” aspect covered by USAID funding.

CDM prohibits “diversion” of Official Development Assistance to carbon projects such that, for example, World Vision Australia HANRP funds are sourced from private donors and philanthropists. Though not always clearly observed, this restriction presents another hurdle for CDM carbon project developers at the vulnerable early stages compared to VCS and Plan Vivo, which do not impose such restrictions (WWF 2008).

**Compliance:** Costs of setting up a carbon project include registration under a standard, and establishing the specific operational and monitoring capacity to undertake sequestration and its measurement. Compliance with CCBA incurs a similar set of costs, though well designed carbon standard documentation will lessen the cost of additional CCBA requirements. Plan Vivo has lower investment and transaction costs, with less paperwork, limited baseline data collection, and less rigorous carbon measurement requirements. VCS and CDM are more expensive, with hundreds of thousands of dollars going to international experts contracted to help the project meet technical requirements. Compliance costs continue for the life of the project, to the order of $20 - 100,000 for each verification. Indicative and unverified development and compliance cost estimates are:

- **ECOTRUST:** $255,000 over nine years, or 37 percent of overall expenditures during that period;
- **CAAC:** $1.5 million annually for the first five years; and
- **World Vision (and World Bank):** $1.5 million.

Initial carbon compliance costs are often interwoven, both practically and financially, with other development costs that are more typical of other types of land use development projects. As such, estimates often have elements of both type of cost that cannot easily be separated.

Community members also incur direct carbon sequestration costs through planting or regenerating trees and their maintenance is labor-intensive. Study projects apportioned sequestration costs differently. For example, in early years of TFGB, ECOTRUST paid for seedlings, but has since shifted this cost to participants; World Vision paid all costs (including labor) associated with seedling nurseries (though this was a relatively small facet of their project); TIST leaves all costs to the participant; and GBM leaves most costs to Nursery Groups. These differences relate to different institutional philosophies and business models, and each works so far in terms of growing trees.

**Opportunity Costs:** Each proponent committed significant organizational time, resources and labor to developing and implementing its project, some of which may have been used more cost-effectively on other activities. Much is made of opportunity costs to communities or households in land use projects, especially carbon A/R which ties up land for decades. What could be done – past, present, future – by project participants with the time, labor and assets (including land) dedicated to carbon sequestration? Such opportunities are missed by participants in all four projects, but caveats include:

- How are true costs of opportunities lost valued? How is the counter-factual estimated; for example, labor spent on under or uncompensated tree-planting may be used productively or lucratively, but there may not be a market for it. Pay-rates for non-volunteer work on all four projects are often below those for farm day-labor, suggesting that the latter may not be in sufficient demand.

- What factors lead to an “economic decision” regarding participation in forest carbon projects including social or psychological factors as well as financial alternatives?
What are the cultural decision-making structures? There is a widely presumed opportunity cost to long-term commitment of farmland to trees which could be under field crops, or sold. Participants may not currently perceive these as significant costs; one Ugandan farmer commented that there is a lower need for liquidity than we might assume and that planting trees serves to stake one’s claim to the land for the long-term, and another noted the investment value of trees for timber later on for himself or his children.

Qualitatively, opportunity cost to land alternatives is relatively low in HANRP, where land restoration has an easily perceived benefit, and there is limited direct population pressure on the communal land for other uses. In Uganda, there is also low population pressure at some sites as many individual landowners had relatively large holdings with uncultivated land, though maintaining trees past their harvest age is “wasting land” according to one farmer. In Kenya, reforesters Forest Reserve land has low opportunity costs for alternative uses as the areas planted are designated for indigenous trees. Opportunity costs (in all projects) of committing farm land for tree for 20-60 years will increase with natural and in-migration population growth and subdivision of inherited land.

Opportunity costs (and leakage issues) related to livestock grazing are less clear for occasional (but customary) use of land in reserves (Ethiopia and Kenya and on farm especially where many farmers are recently established as in Hoima, Uganda, and Laikipia and drier parts of Meru, Kenya). Although this is not an issue peculiar to forest carbon projects, some reforested areas are traditionally used for grazing or access to water by mobile pastoralists or livestock grazing by neighboring farmers. The study team heard of such issues in all three countries even though their magnitude and likelihood is not regarded as serious in leakage assessments in PDDs, validations and verifications.

Table 7 illustrates some opportunity costs that the study team estimated, based on information gathered, though these are approximate and unverified.

Table 7: Illustrative examples of estimated opportunity costs for project participants (based on unverified figures from participant interviews and exchange rates September 12, 2013)

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost type</th>
<th>Description</th>
<th>Value</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFGB</td>
<td>Committed land use</td>
<td>1 ha in 1 year of crop-growing, consisting of 1 rice and 1 groundnut season</td>
<td>Net profit (annual) = USH748,000 = $290 per ha per year.</td>
<td>Based on 2 non-TFGB-participants; costs based on paid labor. At current rates 1 ha will yield around $40 per year over 25 year contract</td>
</tr>
<tr>
<td>HANRP</td>
<td>Time and labor for committee meetings, tree management activities</td>
<td>Meetings: 10 committee members x 7 coops x 2 days / week / each = 7280 days / year</td>
<td>9800 person-days / year at 8 Birr/day = 78,400 Birr/year = $4,126/year (project wide).</td>
<td>Assumes these days used for paid day labor, unpaid crop cultivation activities or other activities. Project endeavors to hold meetings on “non-farming” days/times of day</td>
</tr>
<tr>
<td>TIST</td>
<td>Time for walking to and attending Small Group meetings</td>
<td>Weekly meetings; total time 3 hours</td>
<td>Time and labor for meetings, tree management, $56 per person per year</td>
<td>Daily wage for casual labor in project area is $2.87/day. Some Small Group members also attend monthly Cluster meetings taking up to 1 day</td>
</tr>
<tr>
<td>EAMK-FRP</td>
<td>Group membership fees</td>
<td>Fees for registering as CBO, and its membership in CFA</td>
<td>KSH360 = $4.13 per person per year</td>
<td></td>
</tr>
</tbody>
</table>

Organizational capacity: ECOTRUST, World Vision Ethiopia and GBM had existing organizational capacity in donor project development but none in carbon-specific needs prior to the study projects. Building this capacity in-house with its specialized skill set required investment that continues for new staff and as

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15 US$1/Birr19 on 12 September 2013: [http://www.xe.com](http://www.xe.com)
standards evolve. CAAC had prior environmental compliance experience in the USA, though not in carbon, until it began TIST operations in Tanzania, but has developed new skills in carbon-specific methods and in I4EI in community development activities as well as building a cadre of operational staff in Kenya and other project countries.

**Initial community engagement:** Field work to establish trust, introduce a new project, de-mystify the new and abstract concept of climate change and carbon sequestration and markets, and mobilize voluntary action is expensive and time-consuming (and repetitive for expanding projects TFGB and TIST). The study team could not estimate the cost of building the substantial social capital necessary for a community A/R project. Even if specific organizational expenditures are identified (such as labor, overhead costs, transport, community meetings, information-dissemination, donor and government meetings) causal relationships between historic activities do not relate in measurable ways as value to the current project. Such costs apply in similar ways to other community-based development projects.

**Operational:** A volunteer-based, low budget approach is finding success from both for-profit (TIST) and non-profit (GBM) organizational models as well as on both private (on-farm) and public (Forest Reserve) land. Participants seem willing to contribute work and some financial money to project implementation for little or no compensation. This strong degree of grassroots mobilization may relate to a charismatic leader (GBM, at least until Wangari Maathai’s recent death) or an appealing mission statement (TIST), or in places where the environmental benefits are easily perceived (HANRP). By its nature, a volunteer workforce creating the carbon “product” (as TIST makes clear, but the other projects subscribe to in practice) is one with significant operational (and implied opportunity) costs in time and labor that are agreed in large part by participants when they sign up.

Excluding donor grants for project development, ECOTRUST has a positive estimates operational financial balance from TFGB as its internal operational break-even point is 80,000 t of carbon (or about $480,000) at its current carbon price and operational scale compared to 146,000 t sold in 2012.

All study projects organize individual households into actor-groups. This aggregation is important in PES schemes to structure communications between individuals and the implementing organization, learning and training, community cohesion around the concept of PES activities, and creating a boundary differentiating group members and others in the community. Group membership has costs in addition to tree-planting activities; HANRP and EAMK-FRP participants, with groups organized for planting on government land, incur Cooperative or CFA membership fees, though EAMK-FRP’s fees are for CBO and CFA membership, not project membership. TIST does not charge membership fees, nor are there specific fees for TFGB members (though when implemented as CBOs specific to the project or with broader activities, small fees will accrue). All projects require meeting attendance and cash/in-kind contribution to other voluntary and social activities of the group such as nursery care, or savings-and-credit funds.

3.4.2 **Project risks**

Apportioning risk along carbon value chains impacts project success and sustainability. Too much risk with any one stakeholder – whose reward on the project depends on the others both up and down-stream – poses both logistical and ethical challenges to a carbon project. Table 8 is an outline, illustrative list of risk types. Examples are elaborated below to demonstrate the complex issues in determining and assigning risks.
A pervasive risk is failure to deliver credits – the risk that financial projections and/or socioeconomic goals are not met because communities fail to sequester the carbon or drop out of the program for other reasons. As non-profits, ECOTRUST, World Vision and GBM do not have CAAC’s need to meet shareholder expectations. Nonetheless, the investment costs are high for a project that may or may not “pay off” and may affect future grant opportunities. EAMK-FRP illustrates such a potential failure to meet its ERPA delivery agreement with the World Bank after frost and seedling die-off resulting in slow growth of trees left them...
without trees to verify though GBM has come to amicable agreement with World Bank to provide credits later (or switch to VCS if they wish).

Finding carbon buyers (and good prices) for carbon sequestered (or advanced payments on sequestration) is not a given. ECOTRUST and CAAC work hard to find and retain good buyers and cannot guarantee timely sale of all future credits. HANRP and EAMK-FRP will face similar challenges when they move beyond their World Bank credits. As the number and size of forest carbon projects increase, competition for buyers will likely increase with potential impacts on prices and tree planting incentives.

There are also diverse macro-level risks both in-country (population pressure, regulatory change, political unrest) and in the global carbon market in which prices have fallen and remain low. An issue peculiar to TIST is recruitment of 50,000 farmers through informal groups that are not legal entities (except through their Small Group contracts). While this arrangement is one reason enabling TIST’s rapid expansion, there is a perceptual risk that government officials, politicians or even “rival projects” may object to these unregistered entities (in the sense of CBOs or Cooperatives) spreading among their constituents. CAAC is aware of this issue and seeking the best solution with, as one option, formation of SACCOs at an appropriate level in the TIST structures.

The risk of carbon credit non-delivery is high for community participants as well as for aggregators, but the implications are different. Under and non-delivery of credits by on-farm trees leaves farmers in potential breach of their contract. In both TFGB and TIST the replacement of non-surviving seedlings and trees is the cost and labor responsibility of the individual participant or Small Group, though there seems little or no formal penalty to them regarding contract enforcement. Some risks perceived by participants are misconceptions, but are arguably just as important during project development. For example, in all three countries, carbon payments by foreigners create suspicion of possible land seizure where the trees are grown for “white men.”

![Poor growth of Podocarpus at EAMK-FRP site in Forest Reserve because of frost and livestock grazing on Mount Kenya](image)

Community participants also run a risk of payments less than or later than they expect (or not at all if the proponent fails or withdraws, or carbon markets themselves fail). The team heard many complaints about low and late payments from farmers, though these were normally explained by technical or compliance issues, and by the low market price of carbon. Similarly, many farmers claim to have little information on their individual
(or group) payments. These complaints often result from participants not fully understanding contracts and commitments despite consistent efforts by proponents to repeatedly explain obligations before and after contract signature. These issues reflect the esoteric nature of carbon sequestration and markets and on-going challenges of individually specific payments to thousands of farmers, which bear little resemblance to normal commercial activities community members engage in every day. TIST is now using the Kenyan M-Pesa cell phone money transfer system to increase efficiency of payments.

Risk mitigation: The greatest commercial risk is non-delivery of credits, resulting from either under-performance (a shortfall against projections or pre-sales) and/or non-permanence. To address these risks, proponents are required by carbon standards to put aside a portion of unsold credits as a “buffer” (Plan Vivo, VCS) or by issuing temporary credits (CDM). Non-delivery due to under-performance is managed through MRV processes – projects are issued credits based on actual or statistically projected carbon stocks at the time of verification. TFGB, which has pre-sold credits, keeps 10 percent of credits generated in a buffer account, and additionally diverts 10 percent of carbon revenues into a Community Carbon Fund, one purpose of which is to provide some risk insurance to the farmers (although the study team did not hear directly of either the buffer or the community fund being used, despite some tree losses by farmers).

Risks of carbon market failure (collapse of the CDM regulatory regime or voluntary markets) are real, as witnessed by decline in carbon prices and the current travails of the European Union Emissions Trading Scheme. Even if temporary, such problems affect the entire A/R carbon value chain down to household level. Some donors have piloted innovative financial and political risk guarantees for carbon projects including, for example, USAID (for an improved stove project in Zambia), and the World Bank’s Multilateral Investment Guarantee Agency for a bamboo project in Nicaragua. Through its Development Credit Authority (DCA), USAID is also seeking ways of more systematically providing loan guarantees for REDD+ (USAID 2013). Such guarantees help reassure both buyers and potential project proponents and investors. Mechanisms in the carbon market system that mitigate tree growing risks to project participants are welcome and may help bolster the ethical standing of the system.

3.4.3 Project benefits

The term “benefits” encompasses a range of goods and services accruing to various actors along the carbon credit value chain and other activities, which comprise both financial (carbon revenues or other monetary benefits) and non-monetized co-benefits (material, social and environmental goods and services enabled by the project as a whole). How these benefits are allocated – who gets what – is a political issue in addition to a technical one. Such benefit allocation impacts the success of carbon sequestration (the incentive package for people to grow trees) as well as community relationships and social (gender, power) dynamics.

Table 9 lists benefits to project proponents and communities, first those accruing to all projects and then those specific to each project.

Financial benefits include carbon credit sale revenues and other project-related income including employment, and sales of timber and non-timber forest products. Beneficiaries include project proponents, community implementation groups, household participants, even government agencies. One unanticipated benefit to community groups is that TFGB and HANRP charge some “environmental and development tourists” a fee to mobilize communities for demonstration and discussions.
Table 9: Types of observed/reported benefits accruing to proponents and community members. Benefits across all projects are followed by those specific to each (or several) projects

<table>
<thead>
<tr>
<th>Proponent/Aggregator</th>
<th>Community/Household (benefits reported to team)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALL PROJECTS</strong></td>
<td></td>
</tr>
<tr>
<td>Entry point for other projects</td>
<td><strong>Socioeconomic</strong>: Tree as pension/inheritance, paid labor, carbon income, bee-keeping, collateral of tree asset or carbon income, “certainty” of some predictable income, social capital, community cooperation, camaraderie, learning from other participants, pride, access to other projects <strong>Environmental</strong>: Shade, windbreak, good air and water, more predictable rainfall, firewood (fallen wood or pruning), soil fertility improvement, reduced erosion, flood control, ecotourism</td>
</tr>
<tr>
<td>Reputational benefits</td>
<td></td>
</tr>
<tr>
<td>Carbon revenue</td>
<td></td>
</tr>
<tr>
<td>Staff employment</td>
<td></td>
</tr>
<tr>
<td>Lessons for scale-up/expansion</td>
<td></td>
</tr>
<tr>
<td><strong>TFGB</strong></td>
<td></td>
</tr>
<tr>
<td>Carbon income for operating costs. Donor funds for development and operations</td>
<td><strong>Socioeconomic</strong>: land verification, savings and credit groups, fruit, fodder, firewood (pruned trees), timber (end of project), nursery sales (within and outside project participants), women’s empowerment, fees for project visitors, productive use of marginal soils, tourism potential and fees, interaction with visitors, nutrition and income from fruits and nut, medicinal plants <strong>Environmental</strong>: return of flora and fauna</td>
</tr>
<tr>
<td><strong>HANRP</strong></td>
<td></td>
</tr>
<tr>
<td>Donor funds for development and operations</td>
<td><strong>Socioeconomic</strong>: Cut and carry fodder, firewood (pruned trees), timber (scheduled harvesting), training (agroforestry, stoves, nursery techniques), tourism potential and fees, food security through grain storage and processing, medicinal plants <strong>Environmental</strong>: return of flora and fauna</td>
</tr>
<tr>
<td><strong>TIST</strong></td>
<td></td>
</tr>
<tr>
<td>Carbon income for development and operating costs. Donor funds for non-carbon activities</td>
<td><strong>Socioeconomic</strong>: Tree stipends, carbon profit-sharing (future), merry-go-round schemes, nutrition and income from fruits and nuts, fodder for livestock, building materials, firewood (pruned trees), timber, nursery sales (within and outside project participants), women’s empowerment, leadership capacity building, productive use of marginal soils, training (conservation farming, stoves, health), tourism potential <strong>Environmental</strong>: restrictions on livestock allowing seedling development</td>
</tr>
<tr>
<td><strong>EAMK-FRP</strong></td>
<td></td>
</tr>
<tr>
<td>Donor funds for development and operations</td>
<td><strong>Socioeconomic</strong>: Tree payments, nursery sales (within and outside project), paid labor, women’s empowerment, training for nurseries and tree husbandry; future carbon revenues for community projects. <strong>Environmental</strong>: restrictions on livestock allowing seedling development</td>
</tr>
</tbody>
</table>

Complete information on project income relative to expenditures was not forthcoming. Some funding figures shared were not specific in attribution, and expected carbon revenues are based on projections of number of credits and price. In many instances, differences in project reporting make it difficult to compare information across projects. To generalize on cost versus income:

- Revenue per tonne range typically from $4-6, though TIST has recently realized up to $7.50. ECOTRUST averaged $3.80 per tonne in 2003, but has maintained average prices of $5.10 - 6.10 in each the last five years. When accumulated over thousands of tonnes this spread is large and may make or break projects in terms of net returns.

- TFGB, HANRP and EAMK-FRP received significant grant funding to cover start-up and compliance costs, though accurate figures on amounts are difficult to assess (see also Gosset and Neufeldt 2012). Both World Vision and the World Bank in Ethiopia estimate that HANRP had development costs of the order of $1.5 million. The Wildlife Conservation Society is developing a
REDD+ project covering 130,000 ha in Uganda’s Albertine Rift and estimate development costs at $2-3 million.

- With new estimates of carbon sequestration due for verification early in 2014, TIST expects to soon be financially sustainable in Kenya (and in its Uganda project) in the sense of carbon revenues exceeding all operational costs (including per tree pre-payments), though distribution of net profits to farmers still awaits recouping of CAAC investment costs. The ability to become sustainable using the TIST model depends on the rapid scale-up potential and low-cost approach that has enabled TIST to involve between ten and twenty-five times the number of farmers engaged in the other study projects. With USAID funding for some community and environmental elements due to end in 2014, TIST will need to attract alternative funding for these aspects, drop them, or refine its financial model to encompass some or all of them.

- Based upon current costs and revenues, and carbon projections and prices it is unclear whether all projects will break even. EAMK-FRP is the most precarious in this respect for unforeseen (unforeseeable?) technical reasons such as reducing the anticipated area planted and slow growth of trees. This observation does not reflect on project design and implementation so far, but does illustrate the earlier discussion of risk.

Of the study projects, only CAAC, as a for-profit entity, needs to recover project development costs for the carbon credit component. TFGB, utilizing ex-ante payments and grant funding, is able to continue passing on 60-72 percent of revenues to participants (after taking a 28-40 percent margin for its administrative and operating costs). Though HANRP does not owe its grant financiers money from carbon revenues, World Vision Ethiopia is obligated to “repay” pre-payments to the World Bank; a first tranche of 73,000 credits was recently delivered, and the remaining 92,000 are yet to come. GBM does not recover project development costs, and is unclear whether and how it would recoup operational and administrative costs going forward. Fundraising to keep projects operational remains an important activity for GBM.

**Carbon income to communities:** TFGB sells credits ex-ante and so makes early payments. HANRP distributed first carbon revenues to the coops in 2009, and has done so annually twice since, pro-rating payments based on cooperatives plot size within the project site, for a total of $148,000 over three years. Each cooperative decided to pool revenues rather than dispense to individual members, although there is discussion of paying dividends if revenues increase. CAAC has earned carbon revenues in Kenya since 2011 and made pre-payments to farmers since 2006. Profit-sharing will commence when all development and running costs are recovered, after which 70 percent of net revenues will be distributed to farmers.

EAMK-FRP has not received any revenue to date as no credits have yet been issued; neither have they determined what, if any, of their current seedling and tree-based payments will be reimbursed by gross revenues. GBM has yet to determine the means for future revenue disbursement – annually or by another schedule. This uncertainty is potentially problematic though it has meant that participants do not have high expectations of imminent cash returns for their work.

The two Kenyan projects have formal revenue-sharing agreements with KFS for tree-planting activities in Forest Reserves that draw carbon revenues. These partnerships encompass KFS and CFAs as well as the carbon project tree planting groups (Sections 2.3, 2.4). EAMK-FRP has likewise agreed on a 77 percent/23 percent split (the former to CFAs, the latter to KFS). These overarching national agreements help to alleviate concerns regarding difference between forest management agreements (five years) and the carbon contracts covering several decades. In contrast, one of the TFGB groups in Uganda has signed a 35-year agreement with the National Forest Authority for collaborative management of part of a Central Forest Reserve. Even though this is not part of a forest carbon arrangement, the time period is more appropriate than that allowed by KFS.
Whereas current carbon payments arrangements seem insufficient as individual incentives, there is a strong underlying incentive in three of the study projects for anticipated payments throughout the carbon agreement. However, TFGB payments cease after 10 years (of the initial 20 or 25 year agreement). ECOTRUST hopes that farmers will recognize the multiple benefits of trees on their land and keep them for the remaining contract period, including replanting after the first crediting period. While this outcome remains uncertain, many farmers stated that they will honor their contractual obligations at least during that first period.

**Non-carbon income:** All projects offer participants an opportunity for other income streams (paid by either the project or others) on top of carbon payment. In addition to employing project staff, HANRP, TIST and EAMK-FRP offer paid employment to some participants in protecting trees (HANRP, EAMK-FRP), growing seedlings (HANRP), quantifying trees (TIST) and undertaking other community extension work. Whereas TIST does not offer daily allowances for attendance at training events, HANRP pays a small stipend to attendees at skill-training workshops such as for improved cook-stoves or nursery techniques. Cooperative members as well as others in the community access discounted food staples and a market for their grain, made possible by subsidies from pooled cooperative carbon revenues.

TFGB, TIST and EAMK-FRP offer the structure and impetus for establishing individually and group-managed tree nurseries, from which participants can sell seedlings to other participants or to the general public. One EAMK-FRP Nursery Group said they sell 40,000 indigenous seedlings per year to both GBM and other buyers. At the GBM (for indigenous) or public (for exotics) price of $0.06/seedling, sales provide at least $2400 in gross income for one group interviewed, bearing in mind that market prices for indigenous seedlings ranges between $0.12-$0.35. Mature trees offer the possibility of income as timber (not technically allowed by TFGB before year 20 or 25; allowed up to 5 percent of total on-farm trees after 10 years by TIST; and scheduled for strategic harvesting in years 12, 21 and 35 by HANRP) as well as other tree products. Both TFGB and TIST emphasize fruit and nut trees for household nutrition and sale.

**Co-benefits** encompass a range of economic, social and environmental goods and services accruing to project stakeholders – and the public at large – as a result of project activities. Most are not understood in direct financial terms, but their impact may be just as, or more, important than financial benefits. Relevant to this discussion is: how they accrue, and to whom, within the project value chain; and the role they play in incentivizing project participation and compliance.

Actual and/or perceived co-benefits accrue as direct or indirect results of carbon sequestration activities. Others are added by the proponent, deliberately and at extra cost to reinforce carbon sequestration activities by boosting development benefits, or to create a base of income-generating activities in addition to carbon payments. CDM and VCS methodologies used by HANRP, TIST and EAMK-FRP do not have formal social standards beyond “stakeholders must be engaged,” without specific rules governing or measuring local socioeconomic impact. Addition of CCBA registration is widely seen to create added value to carbon credits, but whether the additional costs of measuring and registering specific CCB-required activities are financially worthwhile remains uncertain. World Vision had not estimated net value of CCBA, but felt it may “earn back” investment through a small premium on post-World Bank credit. ECOTRUST estimates a significant (up to $2) premium for Plan Vivo certificates address environmental and socioeconomic development. TIST expects CCBA registration to be cost effective, with higher carbon credits. In addition TIST pays environmental premiums for indigenous trees and riverside planting, not from carbon credits, but from USAID’s contribution to the project.

Table 9 records many of the perceived co-benefits reported during the study. In all four study projects environmental, economic and social co-benefits are vital incentives and impacts, even though the interventions were built around compliance with carbon standards. Nevertheless, the degree of rigor required for meeting carbon standards was not applied to enumerating or quantifying such co-benefits. As a result, although perceptions of such benefits are strongly advocated by project developers and farmer beneficiaries, direct evidence is often weak. TFGB has assessed many such benefits and TIST has attempted to monetize the value several of these economic co-benefits (see Section 2, and Carter 2009 and Oppenheimer 2011, respectively). While these studies are useful, these economic gains should be extrapolated with caution to the
universe of project farmers (and some non-participants), though TIST does use these estimates to report economic benefits from USAID funding each quarter.

Many co-benefits accrue as a result of carbon sequestration activities. Examples (in all four projects) include soil stabilization, hydrological changes and windbreaks, enhanced community cohesion from group activities, and improved enterprise development with access to a new revenue stream that can be collateralized or otherwise leveraged. Other co-benefits are deliberately facilitated by the proponent, either to ensure certain social/developmental objectives are met (TFGB or HANRP), or to reinforce compliance incentives by providing high-value “add-ons” to project participants. Additional (non-carbon) funding from USAID, enables TIST to operate its non-carbon “PES” schemes (Section 2.3) and training programs as goods and services whose value to the local communities serves to improve lives and reinforce a positive, compliant attitude toward carbon sequestration.

At each project, co-benefits were both meaningful and valuable to participants. There was clear appreciation of improved rainfall patterns and reduced soil erosion, both of which are cited, unprompted, as primary benefits of the projects. In the cases of TFGB, TIST and EAMK-FRP, the relative importance of co-benefits was emphasized from early stages by the proponent, who foresaw the limited value of carbon revenues early and sought to defuse expectations of high financial returns.

Benefits to other stakeholders: Although not itemized above, governments are beneficiaries in various specific ways in addition to the well-being of their participant constituents, as the projects address broader national objectives in tree planting, climate change adaptation and mitigation, biodiversity conservation, agriculture and livelihoods. All projects strive to improve sustainable land use, and in Ethiopia, where revegetation of denuded land is seen as a food security imperative, and in Kenya where there is a constitutionally mandated target for tree cover, the projects are directly responsive to policy goals as well as demonstrating ways to achieve those goals. The projects provide learning sites for formulation of national REDD strategies, even though not designated as REDD projects. In two instances (TFGB and HANRP) clarification and documentation of land rights have been codified for individuals and community groups, respectively.

The broader community and non-project members in the vicinity, garner many of the environmental benefits and, through example, some of the social gains. These include availability of seedlings from project nurseries, cut-and-carry forage and subsidized grain (Humbo), improved hydrology, and in some cases day-labor on project farms (TFGB and TIST). The examples set by project participants in land management, gender empowerment and other behavior changes (energy-saving stoves, health education) are noticed by neighbors and adopted in some cases either a prelude to joining, or simply through seeing co-benefits accruing.

### 3.5 NATURAL RESOURCE MANAGEMENT ACTIVITIES

The study SOW (Appendix A) does not focus on natural resource management as such, except in the sense of carbon sequestration and biodiversity conservation. This section is more descriptive, and less detailed and analytical than others. Biodiversity aspects are described in Section 3.6.

The four study projects carry out a range of activities to encourage tree growth. Two focus primarily on-farm with individual small land holdings and two promote medium-scale reforestation on public land through use and benefit-sharing agreements. All promote tree nurseries, planting and after-care, and, except for EAMK-FRP, allow some pruning and thinning both to improve carbon credit and timber characteristics of trees and to provide wood products (including fuel) to participating farmers. Where necessary, these removals are programmed into the carbon sequestration projections in approved PDDs. EAMK-FRP does not allow for removal of any live wood, but, depending on the management agreements between KFS and a CFA, allows collection of dead wood by participants for fuel if a permit is purchased. The no pruning/no thinning approach of EAMK-FRP is likely to have positive biodiversity effects (more habitat structure with lower
branches, natural growth patterns) but delays carbon credits because leaving several stems intact means that none reach the carbon standard-required size of 10 cm diameter at breast height until later.

All study projects promote tree-planting on farm and agroforestry systems for improved land management, diversification of crop income and improved bee-keeping (based on indigenous trees), though the on-farm elements in HANRP and EAMK-FRP are not related to carbon credits in reserved areas. Indeed, the Environmental and Social Impact Assessment for EAMK-FRP projects that the benefits of the project from honey production and sale are crucial to a positive financial balance for participants (Kamweti and Acworth 2006). Table 10 summarizes the relative emphasis on various activities in each project based upon the team’s observations. Emphasis is on tree-growing sites. HANRP and EAMK-FRP do not have on-farm “carbon-planting” though World Vision and GBM do have parallel programs supporting these types of activity among their farmer participants.

The table is not definitive, merely indicative and comparative, as adoption varies greatly between individuals even when neighbors. One farmer enthusiastically embraced all TIST-supported interventions and had a productive field crop and tree farm, while his neighbor and brother had adopted few practices and clearly had less income and other benefits from his farm.

Table 10: Natural resource management activities observed in study projects with relative level of adoption by farmers (more Xs=higher adoption observed)

<table>
<thead>
<tr>
<th>Country</th>
<th>UGANDA</th>
<th>ETHIOPIA</th>
<th>KENYA</th>
<th>KENYA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>TFGB</td>
<td>HANRP</td>
<td>TIST</td>
<td>EAMK-FRP</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursery development</td>
<td>XX</td>
<td>XX</td>
<td>XX</td>
<td>XXX</td>
</tr>
<tr>
<td>Intercropping (tree/field crop)</td>
<td>XXX</td>
<td>Not applicable</td>
<td>XX</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Shelter-belts/boundary marking</td>
<td>XXX</td>
<td>XXX (boundary for community forest)</td>
<td>XXX</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Woodlots</td>
<td>XXX</td>
<td>X (50 ha planted area)</td>
<td>XX</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Field crop soil conservation</td>
<td>XX</td>
<td>Not applicable</td>
<td>XXX</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Fodder production (trees and herbaceous)</td>
<td>XXX</td>
<td>XXX (cut and carry)</td>
<td>XXX</td>
<td>X</td>
</tr>
<tr>
<td>Honey production</td>
<td>XX</td>
<td>XX</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>Fruit/nut trees</td>
<td>XXX</td>
<td>Not applicable</td>
<td>XXX</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Riparian planting targeted</td>
<td>Not specifically (all areas in forest planted)</td>
<td>XX</td>
<td>(all areas in forest planted)</td>
<td></td>
</tr>
<tr>
<td>Energy-saving stoves</td>
<td>X</td>
<td>Not applicable</td>
<td>XXX</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Source: documents, key-informant interviews, focus groups

Among challenges and benefits reported to or observed by the team are:

- Sourcing good quality tree seed and seedlings (or wildlings as collected at some sites) in sufficient quantity. Commercial supplies were in short supply in some areas (Hoima and Laikipia, especially) and project nurseries varied in quality and practices. GBM’s decades of Nursery Group work with indigenous trees in particular, and with technical support from Kenya Forestry Research Institute and ICRAF, was evident in higher quality nursery management than the other projects;

- Similarly, where practiced, pruning and thinning were variable in execution compared to guidelines provided, though the optimum level differs with objectives for carbon, timber, firewood, or habitat diversity;

- Tree and site selection has sometimes been awry. For example, *Macaopis* has not performed well in some TFGB sites, despite being in its broad ecological zone. Also in TFGB, *Podocarpus* grows well under some slope, soil and shade conditions and not in others on the same small farm. HANRP
planted *Hagenia* with poor results below its normal elevation, and some TIST trees are performing better than others on-farm and at the Lower Imenti site;

- Farmer-managed natural regeneration avoids many of the qualitative and quantitative problems of nurseries and tree planting provided natural propagation is sufficient. As described elsewhere in the report this technique has other advantages for ecosystem and biodiversity attributes as well as low management burden where a suitable governance and management regime exists;

- Natural resource management is time consuming even with natural regeneration. For example, in 2009, the HANRP Bossa Wanche Cooperative’s 600 members thinned 79 ha of coppice, pruned 55 ha, cleared 3.4 km of firelines and trails, propagated 224,000 seedlings, prepared 135,000 planting pits, planted 124,000 seedlings, weeded 15.5 ha and planted 26 km of sisal along the forest boundary. The cooperative also provided daily patrolling of the area to prevent disallowed activities (mainly grazing or unauthorized wood or forage removal) and assisted World Vision in monitoring field plots (a two month exercise). Most of this work is on steep, rocky terrain several kilometers from most homesteads;

- All projects encourage farmers to use land-use planning either on-farm (Plan Vivo requires it), or through participation in forest management planning in reserve areas;

- Project farmers protect their carbon and co-benefit investments by protecting their trees from fire and grazing (whether on private, communal or public lands) enabling effective regeneration of tree cover. Despite farms of only a few hectares, some TFGB farmers complained of trees being felled by other individuals in the neighborhood. While the Cooperatives in Humbo seem respected as “law enforcement” agents, EAMK-FRP Green Guards and Nursery Groups complained about lack of support from KFS in protecting their Forest Reserve plantings from livestock – one of the reasons for poor growth rates in these sites. In contrast, deployment of the KFS Tree Establishment and Livelihood Scheme with TIST, where crops planted in the early years around the tree seedlings, seems effective in protecting these early growth stages;

- Project farmers were happy with environmental improvements they attribute to their planted trees. Those mentioned, almost without exception, include: improved rainfall patterns, revived springs and dry season river flows, reduced soil erosion, flood control, cleaner streams, shade, windbreaks and improved bee forage; and

- Trainings in natural resource management by (or arranged by) project proponents are widely appreciated for their technical aspects and for opportunities to meet peers and exchange ideas and experiences.

One assumption, especially for on-farm planting of indigenous trees, is that over the life of a carbon contract farmers will come to appreciate the natural resource (and livelihood) benefits from maintaining trees to a sufficient extent to want to continue planting, with or without carbon revenues. The team met many farmers who claim they would continue planting, irrespective of direct financial benefits because they love their trees, and met others uncertain about the post-project future tree husbandry. There were few who had thought clearly or carefully about how, or if, their children would assume responsibility for trees they would inherit and hopefully propagate further.
3.6 CONTRIBUTION TO BIODIVERSITY CONSERVATION

All four study projects explicitly seek to promote biodiversity co-benefits alongside those from carbon credits. Biodiversity conservation is integral to Plan Vivo, and while CDM and VCS do not require such benefits the relevant projects have, or have applied for, CCBA validation. This study focuses on “wild biodiversity” – indigenous non-domesticated biota and ecosystems – rather than diversity of agricultural crops and livestock, though increase in the latter may impact the former.

Documentation and data on biodiversity of project sites is not systematic in any of the projects compared to how details of carbon sequestration projections and techniques are provided. This partly results from weaker compliance requirements (or implementation thereof) and partly because of lack of reliable criteria for estimating or predicting biodiversity improvements in given circumstances. Also, given the practical complexity and expense of carbon MRV over decades, adding effective biodiversity monitoring further reduces any already small financial benefits from carbon credits at current prices (unless these costs are covered by donor grant funds). Single number taxonomic biodiversity estimates using indices are common in ecological research, but involve intensive data collection and are likely even more abstract to rural smallholders than forest carbon estimates. Nevertheless, significant potential biodiversity benefits of A/R are expected from use of indigenous trees.

3.6.1 USAID’s Biodiversity Code

Although this stakeholder report does not detail how USAID’s biodiversity funding requirements might apply to the study projects (given that only TIST receives such funding currently), the USAID criteria do provide insights into effective conservation practices. The next sub-section looks at other potential biodiversity conservation benefits. The four strictures of the USAID code16 are as follows. Each criterion is italicized, followed by a brief statement on how the study projects fit.

- *The program must have an explicit biodiversity objective, it isn’t enough to have biodiversity conservation result as a positive externality from another program.* Study projects have biodiversity objectives in their PDDs. These objectives are generalized rather than predicting site-specific, measurable biodiversity conservation gains.

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• **Activities must be identified based on an analysis of threats to biodiversity.** PDDs identify such threats, but typically at a generic regional level rather than a stakeholder analysis of site specific biodiversity and threats. Forest management plans for Forest Reserves in Kenya (where EAMK-FRM operates and where TIST is beginning to operate) include a more specific threat assessment.

• **The program must monitor associated indicators for biodiversity conservation.** Only EAMK-FRP has measurements of non-tree biodiversity (with its comprehensive vegetation baseline) and none have systematic direct conservation indicators, though the other three projects have tree number and species monitoring in place and faunal monitoring ambitions or plans. HANRP, TIST and EAMK-FRP methods will automatically detect naturally regenerating indigenous trees in addition to those planted.

• **Site-based programs must have the intent to positively impact biodiversity in biologically significant areas.** This criterion normally implies that site-based activities must enhance conservation in existing high value sites rather than aiding rehabilitation or restoration of degraded sites. In this sense, A/R programs cannot meet this criterion unless they demonstrably improve conservation in relatively undisturbed sites, which are typically conservation PAs. TGBF and TIST farms are close to PAs and could argue that they have effective buffer zone impacts, while both and HANRP could add that they are likely to enhance connectivity between PAs. EAMK-FRP is entirely located within PAs, albeit in sections that were highly degraded, such that any contribution is more restoration and/or buffer-related than on-site protection of an existing high value site. Direct demonstration of buffer zone or connectivity attributes are not clearly demonstrated by these projects and the best information available is a combination of potential new habitat patches of indigenous trees, inference from comparable scientific studies and systematic or colloquial observations of species recolonizing A/R areas.

Strict interpretation of site-specific aspects of USAID’s biodiversity code does not encompass ecological restoration using A/R on degraded sites. In that sense, the code is more applicable to “REDD-only” sites (avoided deforestation/degradation) than the “REDD-plus” inclusion of A/R.

### 3.6.2 Broader biodiversity concepts

Biodiversity conservation may be viewed from other perspectives than those of USAID’s biodiversity code including:

- Fit with national/international conservation criteria, commitments, strategies and programs (notably the Convention on Biological Diversity [CBD]);
- Restoring degraded areas’ ecological and biodiversity attributes;
- Reducing human pressure on nearby conservation areas;
- Improving connectivity between biodiverse sites for migration/genetic exchange/climate change impacts; and
- Increasing wildlife biodiversity on-farm.

These attributes may coincide at the same time and in the same place and are often assumed rather than demonstrated due to lack of rigorous monitoring data. Also, improvements for one taxon may not favor other taxa. For example, removal of exotic shrub *Lantana camara* in Lower Imenti, Kenya, favors indigenous vegetation and grazing animals, but reduces nectar food availability for some indigenous butterflies and fruit food for some indigenous birds.

Table 11 provides a quantitative comparison across the four study projects of several simple attributes pertinent to biodiversity. For example, according to general ecological/biodiversity principles, indigenous trees (at higher density) are better than exotic trees, larger patches of trees better than small, and proximity to...
high value areas preferable to more isolated patches. Clearly, some study projects are better in some of these attributes and others do better in other categories.

Table 11: Comparison of indigenous and exotic tree density at project sites and proximity of PAs (Bold numbers are highest ranked project in each row)

<table>
<thead>
<tr>
<th>Country/Project</th>
<th>UGANDA TFGB</th>
<th>ETHIOPIA HANRP*</th>
<th>KENYA TIST</th>
<th>KENYA EAMK-FRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees planted/regenerated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total hectares</td>
<td>2773</td>
<td>2728</td>
<td>14,265</td>
<td>720</td>
</tr>
<tr>
<td>Mean tree plot size (ha)</td>
<td>1.3</td>
<td>2728</td>
<td>0.4</td>
<td>80</td>
</tr>
<tr>
<td>Approximate tree density (number ha⁻¹)</td>
<td>200</td>
<td>1480</td>
<td>350</td>
<td>1000</td>
</tr>
<tr>
<td>Exotic</td>
<td>&lt; 40</td>
<td>18**</td>
<td>315</td>
<td>0</td>
</tr>
<tr>
<td>Indigenous</td>
<td>160+</td>
<td>1480</td>
<td>35</td>
<td>1000</td>
</tr>
<tr>
<td>Indigenous trees planted</td>
<td>450,000+</td>
<td>1,000,000</td>
<td>663,000</td>
<td>861,000</td>
</tr>
<tr>
<td>Indigenous species planted</td>
<td>33+</td>
<td>50+</td>
<td>32</td>
<td>20+</td>
</tr>
<tr>
<td>Distance to PA (km)</td>
<td>0 - 15</td>
<td>50</td>
<td>0 - 20</td>
<td>within</td>
</tr>
</tbody>
</table>

Source: information provided by project documents and implementers and observations during the study
*HANRP indigenous trees regenerated, not planted
**exotics planted on 50 ha only at 1000 trees ha⁻¹

Overall, HANRP does best for most of these criteria, except distance to the nearest PA. Nevertheless, the project area seems to have recolonized with a wide range of indigenous flora and fauna. Although HANRP is the only natural regeneration project of the four from a forest carbon perspective, the other three enable and allow natural regeneration around the planted trees (as noted by all the farmers who were asked), often of indigenous species, though these are unlikely to count towards carbon revenue as mentioned in Section 3.1. Monitoring systems of HANRP (trees, presence and size) and TIST (trees, presence only), and EAMK-FRP (all higher plants, various parameters) record these trees.
Species diversity attributes of an ecosystem are often termed as $\alpha$-diversity, while structural complexity of habitats is $\beta$-diversity. HANRP's natural regeneration approach with livestock exclusion clearly scores higher for both $\alpha$ and $\beta$-diversity with a rich layering of plant types and plant litter in irregular patterns compared to forest planting even when several indigenous species are used in the latter. Indeed, habitat diversity may present a more easily estimated proxy for overall biodiversity than attempts to estimate taxonomic diversity, though none of the projects have attempted to estimate habitat diversity.

**On farm biodiversity and habitat diversity:** Agroforestry promoting indigenous trees inevitably increases biodiversity on-farm as well as creating more diverse habitats for wild flora and fauna than do annual field crops. Among the TFGB farms visited, the average number of tree species planted was 17 (range 9 – 23). Extensive reviews of on-farm tree planting (and other on-farm ecological enhancements) show that biodiversity attributes are often significantly improved (Buck *et al.* 2004, Schroth *et al.* 2004). Among techniques enhancing biodiversity (that are also evident in TFGB and TIST) are planting woodlots and hedgerows, and shade-cultivation of woody field crop perennials (coffee and tea) close to “wild” habitat – but these are also the features most studied, so bias towards these attributes cannot be excluded. Indigenous on-farm tree species are better than exotics from a wild biodiversity perspective, though the latter often provide some biodiversity benefits through increasing spatial heterogeneity in otherwise treeless situations.

Agroforests and forests with indigenous trees in Uganda have more diverse bird and butterfly fauna than field-cropping systems, but a different make-up of species-abundance to indigenous forests (Bolwig *et al.* 2006 and Munyuli 2012, respectively). The bird study suggests that even low intensity agriculture with indigenous trees has a marked diversity drop compared to intact forest, but that exotic forest plantations lead to even larger loss of bird diversity. Such studies indicate that monitoring of bird fauna, as planned by several of the study projects, is a sensitive indicator of some aspects of biodiversity change.

Questions about patch size, tree density (including indigenous versus exotic) and connectivity/proximity to intact forest as presented in Table 2 and concomitant biodiversity value have no simple answers and depend on numerous factors including planted tree species, taxa targeted for conservation (size, behavior), site history and land management.

**Restoring degraded areas and reducing pressure on PAs:** All study projects potentially contribute directly to environmental restoration as well as taking some pressures off PAs. HANRP and EAMK-FRP are forest restoration projects on degraded forest sites, whereas TFGB and TIST are adding indigenous trees (albeit at low density, though large total number for TIST) to farmland largely planted with exotic agricultural crops or an initially lower density of trees. Natural regeneration of indigenous trees among those planted is commonly observed and in most cases these trees were allowed to remain as seedlings. Whether these trees will be allowed to survive as they compete with planted trees or other farm produce, or are exposed to grazing is uncertain. Evidence from elsewhere in the region suggests that such regeneration is more diverse under indigenous than under exotic plantings.

Although HANRP is not close to formal PAs, it has become an informal PA itself from which charcoal-making and grazing have been replaced by removal of dead/pruned/thinned wood for fuel and cut-and-carry for livestock fodder. Similarly thinning and pruning provide on-farm fuel wood and some timber in TFGB and TIST as a substitute to collection from nearby forests. Through CFA membership, TIST (Lower Imenti) and EAMK-FRP participants gain controlled access to forest resources according to management plan criteria.

**Ecological Connectivity:** Creation of “wildlife corridors” or “stepping stones,” while conceptually simple, is perhaps the most complex of the biodiversity attributes listed above. Connectivity varies for each species and the type of barriers to movement to different organisms that different landscape features present. Furthermore, definitions and measurement or modeling of connectivity are diverse and inconsistent with a multitude of parameters (for example Kindlmann and Burel, 2008). Community-based forest carbon projects, even when combined with biodiversity conservation objectives, cannot realistically be expected to estimate ecological connectivity because of lack of scientific consensus on what to measure. The best information
available is likely to remain as a combination of creation of potential habitat patches of indigenous trees, inference from comparable scientific studies and systematic or colloquial observations of species recolonizing A/R areas.

Participant farmers in all projects provide such colloquial evidence through new or more frequent sightings of larger animals (mammals, birds, reptiles, insect) and/or increased human-wildlife conflict previously absent or at lower intensity. Perhaps most remarkable is the reported colonization of Humbo by a range of large mammals (said to be absent previously), which is separated by 50 km from Senkele Wildlife Sanctuary to the northeast and 80 km from Nech Sar National Park to the south with much of the intervening areas occupied by high-density rural human populations. In a broader context, these results are less surprising. A meta-analysis of regenerating tropical forests showed that after 5 years, approximately 70 percent of flying animal species, 60 percent of non-flying animals, 45 percent of herbs and lianas and 25 percent of trees had established compared to similar old-growth forests, though this study does not factor in distance from the source of recolonization (Chazdon et al. 2009).

Although some project farmers see value in increased wildlife (mainly aesthetic and potential for tourism and bee-keeping), enhanced populations of wild animals are seen as bringing disadvantages such as crop and livestock raiding, weed invasion of crops and restrictions on movement of people because of the potential for attack by predators. The last was most recognized in HANRP because of the large contiguous area of regenerated forest blocking short distance safe access between some communities. More frequent elephant sightings in and around Forest Reserves in TIST and EAMK-FRP also increase the likelihood of crop damage and human risk and movement restrictions. The Ethiopian farmers were, nevertheless, the least concerned about crop and livestock raiding because of their perception that wild animals would remain within the forest as habitat and wild food regeneration continues to improve. In contrast, farmers in Uganda and Kenya recognize the more likely outcome is that increased wild habitat will lead to increased crop and livestock raiding. This divergence and optimism in Humbo likely results from local farmers not having experienced significant human-wildlife conflict recently because of distant PAs, whereas the farmers in Uganda and Kenya live close to PAs and expect increased conflict as wildlife habitat increases. These negative impacts and perceptions were strongest in TFGB farmers who saw little advantage arising from enhanced biodiversity.

Research on ecological corridors in Uganda’s Albertine Rift Valley by the Wildlife Conservation Society and others at sites close to TFGB in western Uganda show that forest corridors are effective for some species (such as tree canopy birds, primates and elephants), but less so for others (such as understory birds), that forest carbon projects may assist in keeping/restoring tree cover in critical areas between PAs and that some areas outside PAs are potentially important as conservation corridors for movement of species as an adaptation to climate change (Plumptre et al. 2011, Ayebare et al. 2013). Riverine forests in particular may form effective conservation areas and corridors linking PAs provided they are not too fragmented – though removal or degradation pressures are often high (McLennan and Plumptre 2012). TIST has targeted riverine stretches on private farm land for additional PES payments, though to date the number of “riverine farmers” stipend payments is small. The management plan for Lower Imenti Forest, prepared with support from TIST, contains credible claims for the forest as an elephant corridor between northern Kenya and the Mount Kenya forests, and similar arguments are likely applicable to EAMK-FRP sites, as well where elephant sightings are more common since forest rehabilitation began.

As the current study shows, carbon credit income is too low at present to be the main incentive for engagement in community-based tree planting (especially indigenous trees), though the organizing focus and long-term contractual nature of forest carbon projects seem to produce a range of co-benefits that communities find attractive at least in the early years. As many farmers in the study projects with on-farm planting intend to log their trees when their contracts allow in coming decades, the inclination to replant for carbon credits at that time will prove critical for both biodiversity conservation and carbon sequestration benefits.
Generalizations from numerous studies and more diverse taxa confirm that larger patches with more indigenous trees closer to large areas of similar indigenous vegetation lead to higher biodiversity. These criteria indicate that HANRP is likely to have the largest positive impact on ecosystem biodiversity and TIST the smallest. The large overall scale, rapid expansion potential and more recent emphases on riverine areas and Forest Reserves will likely increase potential biodiversity impacts of TIST over time.

3.7 INTERSECTION WITH GOVERNMENT POLICY

Neither the study SOW nor the time allocated allowed a comprehensive review of all government policies in the three countries that might intersect with field-based forest carbon projects. Clearly many institutions, laws and other governance instruments across many sectors may have positive or negative impacts including, but not limited to, international treaties and conventions ratified (and their designated national authorities), climate, land, agriculture, livestock, forestry, water resources, environmental regulation, wildlife, tourism, community institutional structures (CBOs, cooperatives, SACCOs) and devolution.

3.7.1 REDD+

A tree-growing project is conceptually and practically different to an avoided deforestation project, which was the original core of the REDD mechanism. It does, however, fall within the scope of the “plus” in REDD+, which adds other activities that qualify for REDD+ carbon crediting, in particular “enhancement of forest carbon stocks (e.g., through planting and forest restoration).”

Although none of the study projects are formally recognized as REDD+, as forest carbon pioneers they provide insights into how A/R aspects of REDD+ may function in the future. All three countries have submitted REDD+ Readiness-Preparation Proposals to the World Bank for funding, have government REDD+ focal points and are in the process of developing REDD+ strategies. Government REDD+ Coordinators all acknowledged the importance of the study projects as forest carbon pioneers, and as such felt there was much to learn from them. In Ethiopia, the recently announced second Sustainable Land Use Project (which like HANRP incorporates World Bank Biocarbon Funding) builds on the experience at Humbo by including a REDD+ component. The World Bank was deeply engaged with HANRP and made it clear to the study team that this experience was critical to attempts to scale-up for the new project.

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World Vision and GBM are integral partners in REDD+ discussions in Ethiopia and Kenya, respectively. For example, the biocarbon team at GBM could not attend the study workshop in Nairobi because of a conflicting national REDD+ workshop outside the capital. ECOTRUST and TIST are less integrated in the policy deliberations, but both have outreach components that address many forest carbon issues, and ECOTRUST has supported government in conducting REDD+ information campaigns in its areas of operation.

The projects studied fit within their national REDD+ strategies in two ways, albeit to differing degrees: they offer specific data and general implementation lessons for design of a national REDD+ program (see Box 3), and they may form a first-stage mechanism that could be referenced or absorbed into future national REDD+ implementation.

These projects could form a “nested” project base upon which a national-level REDD+ program could build carbon sequestration activities. The REDD+ crediting of project-planted trees as a replacement for, or continuation of, current Plan Vivo, VCS and CDM A/R crediting activities could combine (as is the goal of REDD+) both avoided deforestation and carbon stock enhancement activities. How easily this can be done—with respect to transitioning baselines, additionality arguments, benefit-sharing arrangements, buyer contracts and other parameters—remains to be seen.

### 3.7.2 Biodiversity conservation

All three countries have ratified the CBD and have developed the requisite National Biodiversity Strategies and Action Plans (Uganda 2002, Ethiopia 2005, Kenya 2000), and submitted the required progress reports to the Convention18, most recently in 2009.

The respective country-level USAID Environmental Threats and Opportunities Analyses and/or Biodiversity and Tropical Forestry Assessments also provide an overview of institutional and policy issues related to management of natural resources in general, including biodiversity and forestry (Uganda 2011, Ethiopia 2008, Kenya 201119).

None of these Convention or USAID documents discusses agroforestry as a major contributor to biodiversity conservation. The Kenya and Uganda USAID assessments recognize carbon credits as a potentially significant contributor, where forest carbon is linked to forest conservation as an important incentive worthy of programmatic focus. Although the national biodiversity strategies and action plans are widely recognized as important guiding documents they have not been formally adopted as government policy. These strategies and action plans largely pre-date development of forest carbon initiatives as potential mechanisms supporting conservation. The 2009 progress reports are mixed in recognition of forest carbon in general and the study projects in particular. Uganda’s and Kenya’s reports have no mention of on-going forest carbon projects or REDD+, with only brief mention in each of the carbon sequestration value of forests. The Ethiopia report recognizes forest carbon credits as a conservation incentive, citing the Humbo project and its biodiversity and community co-benefits, but has no mention of REDD+ or CCBA. Ethiopia’s report also draws more attention to agroforestry and other on-farm conservation activities than the other countries. The Uganda biodiversity strategy notes conflicting advice on tree-planting on-farm with some agencies promoting exotics and others indigenous trees, an issue apparent in Kenya as well.

In the TIST Forest Reserve site, extensive growth of the shrub *Lantana camara* was removed prior to planting with indigenous trees. Dense *Lantana* inhibits growth of indigenous trees through competition for light and

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production of growth inhibiting allelopathic chemicals. This species is recognized in Kenya as an invasive alien requiring management, for example, in the Kenya National Environment Action Plan (NEMA 2009), the Environmental Management and Co-ordination Act (1999) and the draft Wildlife Conservation and Management Bill (2013). TIST activities in Lower Imenti are therefore assisting in these control efforts as the shrub cannot re-establish well under a tree canopy.

All four study projects and national REDD+ processes were underway by 2009 (when the most recent submissions to the CBD were made), which suggests that the potential benefits and likely challenges of incorporating biodiversity conservation into financing for carbon sequestration is slow to permeate government thinking in a coordinated fashion. Nevertheless, these and other forest carbon projects in each country clearly contribute in principle and practice to implementation of the national biodiversity strategies and plans through a range of activities common to all countries such as land use planning (including management plans for conservation areas and improved indigenous forest cover), non-timber forest products, benefit-sharing mechanisms and community participation and capacity-building.

Kenya is decentralizing many functions under its new constitution (promulgated in 2010), including management of forest and water resources. As the new county governments were not elected until March 2013, it’s difficult to predict how devolution will affect community efforts in conservation and carbon sequestration. An encouraging sign is that Meru County Assembly (a county with both TIST and EAMK-FMP activities) passed a motion to protect its water catchment areas through conserving forests and wetlands (Kenya **Daily Nation** newspaper, 4 September 2013[^20]). In Laikipia County, the elected governor is a former administrative director of TIST and remains supportive of the project.

### 3.7.3 Other policy implications

Forest carbon projects highlight and provide lessons for a range of policy issues, and illustrate some dangers that may arise that make forest carbon projects less attractive if policy formulation and implementation are not harmonious.

Within the forestry sector Kenya is less trusting of communities’ forest management abilities than the other two countries. While legal provisions and rhetoric support decentralization and participatory forest management, the system is burdensome and retains exclusive powers of KFS in Forest Reserves that could be delegated in genuine co-management arrangements or for other aspects of forest management. Examples include the slow, expensive and top-down technocratic processes involved in community aspects of management plans and management agreements, and the reluctance to allow CFA’s to share forest management revenues. The five-year term of these plans and agreements is not appropriate for forest carbon arrangement. In contrast, as described earlier, Uganda’s National Forest Authority has a 35-year agreement with community groups for reforestation (without carbon benefits), and the Ministry of Agriculture in Ethiopia has ceded land and forest management rights and responsibilities to HANRP, potentially in perpetuity.

In both Uganda and Kenya, the government has commendably taken a hands-off approach to tree planting for carbon benefits on private land. However, policy in the land sector in both countries may lead to taxation of rural smallholder land for the first time. If implemented, farmers may need immediate financial returns from land, which could discourage forest carbon activities. One option is to provide taxation easements for tree planting as a national benefit.

Kenya’s 2010 constitution formalizes the target of 10 percent of national forest cover (more than twice the current amount), and the Ministry of Agriculture Farm Forestry Rules apply that to individual rural land

[^20]: [http://www.nation.co.ke/counties/Meru+County+Assembly+passes+motion+to+protect+water+towers/](http://www.nation.co.ke/counties/Meru+County+Assembly+passes+motion+to+protect+water+towers/)
holdings. As noted earlier this raises questions about additionality with respect to forest carbon until this proportion is reached. KFS policy also encourages *Eucalyptus* planting in many (but not all) circumstances, which is a barrier to promotion of slower-growing indigenous species. GBM is a leader, but not alone, in campaigning against exotic trees, especially *Eucalyptus*.

Extension of forest cover is leading to the prospect or realization of more frequent negative human – wildlife interactions such as crop-raiding and predation on livestock (or people), which can be economically devastating for smallholders. Uganda does not currently compensate for wildlife damage, while Kenya has a wildlife compensation program and fund for human injury or death, and its wildlife bill (currently under discussion) includes compensation for crop and human damage and devolution of decisions to county-based committees.
4.0 CONCLUSIONS

The four study projects have pioneered verified A/R for carbon sequestration and concomitant credits in their respective countries. Many challenges faced design and implementation of the projects, but each proponent has found solutions, and along the way discovered and addressed new challenges. This experiential learning provides a unique wealth of information for carbon sequestration, natural resource management, biodiversity conservation and community engagement. Details as well as broader lessons from these projects should also inform REDD+ deliberations and strategy in each country.

Other studies, notably those of CCAFS, have recently presented comparative findings and conclusions on many of the same projects from different perspectives. Shames et al. (2012) focused on institutional issues and innovations and note many of the issues discussed here, such as low carbon payments, importance of co-benefits and the need to reduce dependence on international project management organizations.

Some of the discussion in Chapter 3 incorporates conclusions, which are not elaborated below. This section summarizes emerging challenges and lessons common to all projects, or particular issues that may relate to a single, or subset of, projects that have broader resonance.

4.1 CHALLENGES

4.1.1 Technical requirements

Several technical and practical aspects of project development, documentation, and MRV issues-arising were discussed in Section 3.1 and elsewhere. The following broad challenges are among those significant when thinking of small-scale farmer-implemented forest carbon projects.

- The formulaic nature of carbon standard PDDs and validation and verification documents is essential for compliance and marketing aspects but these documents are not intended to help proponents or researchers understand and compare “experiential learning” aspects of project implementation. Given the early stage of forest carbon finance (relative to length of commitments), evaluations and comparative studies will remain important to gain such understanding for improving future projects.

- The use of generic regional default equations for estimating carbon per tree (and therefore per unit area) is problematic for several reasons. First, the mathematical formulations provide levels of precision (statistical variance) irrespective of accuracy (of the mean value, which is likely inaccurate to an unknown extent). Lack of species data under similar growing conditions to project sites means that project developers are required to use conservative estimates, which in turn means poorer returns for project implementers – a significant factor for investment risk decisions (for proponent and farmer) when carbon prices are low. Clearly it is not feasible for small-scale projects to pay for or conduct the exacting work needed for site-appropriate equations, but there is scope for using existing more site-appropriate equations and for those supporting national forest carbon inventories to obtain better data. In this way market bias will not favor buyers because of conservative carbon estimates and will give farmers fairer returns for their carbon investments.

- Strict application of additionality and leakage concepts is often not feasible in small-scale projects operating in complex social and historical land-use contexts. While PDDs and audit reports address these issues in some detail, a complete reckoning would take studies beyond realistic time and cost
constraints. Ultimately auditors rely on their judgment of the situation and assume such factors are minimal. This report draws attention to local and mobile pastoralists whose traditional patterns of pasture use are increasingly constrained and displaced when excluded from certain areas. Similar displacement is likely for users of a range of forest products. A common-sense approach seems to prevail and should continue.

- Except for EAMK-FRP, the study projects were realizing faster tree growth (carbon sequestration) than anticipated in the PDDs. Recalibration of growth equations periodically, based on observed tree dimensions, will benefit carbon revenues – and in some cases can provide useful data for national forest carbon baselines.

- Even Plan Vivo and the simplified small-scale CDM methods require technical expertise, consistency and quality control for monitoring, and that proponents use technically trained staff to make routine tree measurements. ECOTRUST experimented with farmers measuring their own trees, but inspection visits quickly found exaggerations and inconsistencies. HANRP expects to hand over these responsibilities to the Cooperative Union in 2014, but doubts remain about adequate capacity without World Vision staff, in the near term at least and World Vision expects to continue some level of support. EAMK-FRP uses ecological research-quality estimation and analysis and recognizes that communities will not assume monitoring responsibility. TIST also uses project contractors (quantifiers) for monitoring, but these are drawn at low cost from the TIST farmer population. To achieve this result, TIST combines relatively simple tree measurements and observations with more sophisticated electronic data upload and analysis managed by CAAC at a cloud-based server.

- Implementers of forest carbon projects are not necessarily experienced forest inventory specialists, and therefore develop methods based upon literature and their experience. The study team’s MRV specialist suggested small well-received technical improvements to project proponents, most of which will improve carbon credits if adopted. Most government foresters are trained in forest inventory techniques and could usefully apply these skills to improve community engagement in quantitative monitoring.

- Although HANRP and TIST are verified by CCBA at Gold level, both projects have limited implementation of the required biodiversity and community impact monitoring in place in the view of the study team. These projects have plans to supplement existing systems for more effective monitoring of these aspects, but at this stage impact monitoring is best regarded as “a work in progress” in the view of the study team. The most common tree planted by TIST farmers is *Eucalyptus*, though the CCBA standard states that the project “must demonstrate no negative impacts …use of non-native species.” Many in Kenya argue that this genus has significant negative hydrological and soil impacts and that it inhibits undergrowth and most indigenous fauna, though its use is promoted by KFS under suitable conditions.

**Lead time** is another factor related to technical and compliance issues. All four projects recognize the enormous effort required in pioneering a community-based forest carbon project, though all have used this first experience to more easily expand or establish new project areas, and with the exception of TIST Kenya, experiment with different carbon standards. The standards themselves are evolving, and increasing compliance demands and costs as a result as the ongoing projects adjust. Although TFGB was able to begin relatively quickly in 2003 because of the Plan Vivo process, it was not validated until 2008. HANRP feasibility

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21 At the end of 2013 (after completion of the study) CCBA and Plan Vivo introduced revised, more rigorous, standards (especially for CCBA Gold level) which set higher bars for several aspects of biodiversity and socioeconomic monitoring. While these are welcome in improving clarity, they will increase some transaction costs though CCBA now allows for expansion to new areas without additional validations (already possible in Plan Vivo).
was assessed in 2004, cooperatives initiated and the area closed in 2006, the PDD developed January 2007-
August 2008 and the project finally registered with the UNFCCC in February 2010. TIST began operations in
Kenya in 2005 and the first verification was in 2011. EAMK-FRP submitted its first PDD in 2007, began tree
planting in 2008 and had its first PDD approved in 2011. Donors (and other investors) wishing to support
A/R projects need to recognize these lengthy processes and not, for example, expect an implementing
partner/project proponent to have a fully-functioning, community-based, financially self-supporting project
within the typical three to five year project cycle.

In reviewing how the projects developed, it is important to note that these were pioneer forest carbon
projects in each country and in essence are pilots working out how to apply largely untested sets of
requirements and standards (that were themselves evolving\(^\text{22}\)) in challenging institutional and geographic
circumstances. The simplest, and potentially most profitable, way to develop A/R projects is a single species
(typically exotic), fast-growing commercial plantation in uniform environmental conditions with a team of
professional forest technicians. Even then the standards are exacting: The four study projects use farmers
organized in new community institutions with little or no technical forestry expertise, encourage multi-species
planting, with a preference for indigenous trees, in numerous small plots (except HANRP) in varied, often
remote terrain.

**4.1.2 Financial issues**

Cost structures of an A/R carbon offset project resemble those of other income-generating projects or
businesses, but where forest carbon credits are the product, some distinct issues arise:

- Investment costs, including compliance, are high (often upward of $1 million for CDM and VCS)
  and typically require international expertise from relatively few approved carbon (or CCBA) auditing
  firms. In many cases these initial transaction costs (compliance plus other initial investments) are
  interwoven and not easily separated based upon information provided. Compliance costs continue
  throughout the project. The standards themselves are evolving, often adding new requirements that
  in turn add to compliance costs. As proponents become more experienced, costs should decline, and
  development of in-country audit expertise may reduce compliance costs;

- Some standards incur higher costs than others – and in theory accrue higher carbon prices, in the
  order CDM, VCS and Plan Vivo among the study projects. However, for the study projects,
  accessing World Bank BioCarbon funds has led to early credits being discounted significantly ($4 to
  $5 per t) compared to CAAC’s VCS (up to $7.50) and ECOTRUST’s Plan Vivo (up to $6.30). Plan
  Vivo’s initial transaction costs are lower and CDM’s Programs of Activities and VCS Grouped
  Projects provide ways of reducing these costs;

- Despite current difficulties in carbon markets, TFGB and TIST are confident they will find sufficient
  buyers at their current expansion rates. However, any new proponent needs to invest time and
  money in finding suitable buyers and establishing productive mutual relationships. As new (and often
  large) projects are developed they may tend to flood the limited current market for A/R credits
  thereby reducing carbon prices further;

- Project proponents have recognized these cost-benefit factors in their choice of standards. For new
  projects, World Vision Ethiopia has switched to VCS; CAAC initially considered CDM, but rightly
  concluded that VCS was a more profitable option (for its shareholders and farmers); and GBM’s

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\(^{22}\) CDM and VCS regularly update existing methodologies requiring changes for ongoing and new projects by defined dates; new CCBA and Plan Vivo standard in December 2013 are noted earlier.
subsequent forest carbon projects use VCS and Plan Vivo (and may switch EAMK-FRP to VCS, too, despite the additional registration costs);

- Regarding operating costs, both TIST (for-profit) and TFGB (non-profit) have successfully mobilized thousands of farmers to plant trees on a fairly low operational budget. Some roles are paid, but overall the models lean heavily on a large cadre of volunteer labor (and related potential opportunity costs to the volunteers), and the promise of future gain from carbon revenue, timber and other co-benefits; and

- Aggregate benefits are the incentive package that motivates carbon sequestration activities in both the immediate and long-term. At current carbon prices, carbon revenues seem insufficient to provide adequate incentive for tree-planting. Co-benefits alone seem to provide sufficient rewards to compensate – and exceed – tree-planting costs for many, but carbon revenue is important as an organizing principle and a behavioral incentive to each tree-grower.

While a general understanding of relationships between trees, carbon dioxide and climate change is widespread, an issue with all projects is the level of understanding of carbon estimates related to tree measurements, aggregation and data management, and carbon contracts, markets and buyers. Such misconceptions raise a question of “informed consent” when signing agreements and contracts concerning project participation and carbon sales. TFGB and TIST contracts are in English, which is not widely spoken in most areas at the level of comprehension needed to parse contract language. All projects make significant educational efforts, using local languages, when introducing projects and this work continues after contracts are signed. TIST has a regular newspaper for members and others, published in local languages, which reinforces these efforts, and TFGB and TIST have, in effect, waiting periods of several months between introduction of the projects and signature of agreements, which gives time for reflection. Nevertheless, the team found no participants who were clear on the details of their contractual commitments, though most understood the long crediting periods. One Kenyan woman likened her relationship with TIST to a marriage – you cannot know everything in advance, but the commitment is there for the long-term. A useful comparison might be to take a random selection of well-educated home owners and ask them for instant recall of the details of a mortgage agreement or credit card terms. Nevertheless, concerted effort to minimize persisting risks to rural smallholders is merited to mitigate this knowledge gap.

With respect to optimum timing of carbon payment, a recent study on the PES mechanism in TFGB concluded:

“there is a danger… front-loaded payments provide a lure to participate when the contract may not be advantageous if the future is discounted…. A clear argument emerges for designing payment systems in synchrony with the ecosystem service provision. [that is, performance-based] …With front-loaded incentives … participants in PES schemes do not necessarily consider the suitability of their involvement … According to the logic of PES efficiency this means that the incentive is not well targeted, as participants may undertake the activity with less or no payment” (Fisher 2012).

Though the lag time in delivering carbon revenues to participants in the other three projects is not deliberate and creates other issues, it may serve to boost participant morale and compliance at times when later pressures on land and trees become evident.

Fisher (2012) also questions PES as mechanism for achieving conservation in general, citing the possibility of a “perverse incentive” whereby introduction of payments reduces the likelihood that the activity will continue without payments, and/or be undertaken by those not receiving payment. The study team observed that, in case of the former, it is unclear what incentives are needed, or feasible, to maintain tree carbon stocks once the crediting period is over (or, in the case of TFGB, after 10 years when carbon payments are completed). There seems a significant risk of reversal, considering the relative value of timber to carbon payments – but as discussed throughout this report, there are myriad social, economic and environmental co-incentives that boost likelihood of continued maintenance. There was no evidence of widespread reluctance to undertake
tree-growing activities by either non-participants or by participants who for one reason or another were not getting credited for certain trees.

**4.1.3 Afforestation/Reforestation, carbon credits and biodiversity conservation**

REDD in its original sense embraced keeping existing forest intact, relative to a baseline deforestation rate. Assuming these forests are largely indigenous, REDD is therefore likely to enhance biodiversity conservation. The REDD+ formulation, developed later, allows for restoring forests on other land types (typically degraded forest converted to other land uses with few trees) among other additional compliance opportunities. Inclusion of A/R in the global deliberations of carbon credits for REDD+ was a sound move as many countries, including Uganda, Ethiopia and Kenya, have severely depleted forests, but desire to increase tree cover with suitable incentives. Nevertheless, promoting A/R primarily to maximize carbon credits does not maximize (or necessarily have significant positive impact on) biodiversity because certain alien tree species, widely promoted in these three countries, accumulate carbon (and provide timber) more quickly than indigenous trees. This divergence between financial incentive and conservation value is especially pronounced with on-farm tree planting where the farmer has to weigh relatively low carbon payments against other land uses that are more likely to succeed where land has not been cultivated for a long period (and possibly in the long-term).

This dilemma is “solved” in Forest Reserves in Kenya (new TIST activity and EAMK-FRP) as the community forest carbon planting is in areas reserved for indigenous trees. Other sites in the same reserves may be set aside for exotic timber production under corporate management (licenses and concessions), but do not accrue carbon credits. Should KFS begin commercial-scale carbon credit projects itself, or through concessions from its exotic plantations in these reserves, it may act as a disincentive for community-indigenous tree carbon agreements, and would do little to promote biodiversity conservation.

**Planting versus regeneration:** Farmer-managed natural forest regeneration was pioneered in western Sahel and has now had great success in HANRP. The relative simplicity, in principle, of protection as the primary management tool is one attraction, and from the biodiversity perspective, the resulting ecosystem restoration is more complete. Success depends on having stumps or rootstock or a seedbank (or nearby dispersal source) for regeneration. It is, therefore, more likely to succeed where land has not been cultivated for a long period, or where there is an adjacent indigenous forest. Significant regeneration was evident in many of the farm plots in Kenya and Uganda, suggesting that it is a possible mechanism in diverse locations. While natural regeneration is a powerful technique for reforestation under suitable conditions, it may not always be applicable to carbon-credits on small farm plots, because of a degree of uncertainty and irregularity of regrowth. Nevertheless, the technique could likely be used more widely in larger plots for A/R projects (whether for carbon or not) at much lower cost than replanting. That it is not more widely employed may result from how foresters are educated and trained rather than reflecting cost-effective and ecologically sound methods. Concomitant habitat diversity favors other flora and fauna, and restoration of the complex of ecosystem structures and processes.

The challenge of slower-growing indigenous species remains for on-farm trees. Both TFGB and TIST actively encourage indigenous species. TIST adds a small “premium payment” for each indigenous tree – though this payment comes from USAID funds rather than carbon credits. However, TIST ultimately leaves tree selection to the farmer – and most of the time exotics result. Though the proportion of indigenous species is increasing steadily, it remains low compared to the other projects.

**4.1.4 Community engagement**

Based upon observations of TFGB, HANRP and EAMK-FRP, the study team, as have others (e.g., Brown et al. 2010), might conclude that many years of pre-carbon project engagement between the project implementer and participant communities is a pre-requisite for building the mutual trust and social capital required. Given the esoteric and unfamiliar nature of forest carbon concepts and markets to rural farmers (as all four projects
acknowledge) substantial education and capacity-building is essential. ECOTRUST and others had worked with communities in Bushenyi through various projects prior to the carbon project, and World Vision has decades of prior relationship with Humbo communities, while GBM is a household name in Kenya and has also worked with Nursery Groups in the central Kenya highlands for many years. The conclusion that trust and social capital are pre-requisites remains intact, but TIST experience demonstrates that these hurdles may be overcome more quickly. Fisher (2012) generalizes, based on her study of TFGB, there may be some negative social influence of a longstanding presence in the project community, as it may create an incentive for local households to join without fully evaluating merit and risk (based on goodwill toward the organization), which may prove a liability over a multi-decade contract.

TIST staff do not dispute these constraints, noting that they did have initial challenges in making forest carbon convincing, but clearly, with their approach, a lengthy prior engagement in other types of work is not essential. Once a critical mass of farmers is engaged, the potential for expansion increases, by bringing new potential participants to see those already productively working with a project.

Managing expectations: Low carbon prices, coupled with high investment costs and operational demands, have led to widespread disappointment with carbon income, and farmers recognize the higher immediate cash value of the wood products. Differing payments potentially to neighbors (because of different buyers), late payments, or no payments for compliance reasons are not well understood. Yet most farmers expect to keep their trees, at least through the first contracting period.

Farmers in all study projects perceive co-benefits, which are widely regarded as valuable. Environmental goods and services such as soil erosion control, windbreaks, or stabilized rainfall and river flows are linked with tree-growing in farmers’ minds and serve as direct reinforcements to continued compliance – although this may backfire if too much is attributed to newly grown trees. A salient example is that virtually every person interviewed (even at managerial levels) cited improved rainfall and river flows as direct reward of more trees on the land, when there is scientifically little evidence of any causal relationship, and these trends may reverse if in the next few years there is low or erratic rainfall. This is an example of the strength of perceived benefits as positive incentives – whether or not they are measurable and verifiable (see Box 4). A perusal of USAID/FEWSNET information covering the study project areas suggests that rainfall has been good over the last few years across large areas with only a short period experiencing impacts of the 2011 drought that was severe in more eastern parts of the Horn of Africa.

Succession planning: An issue facing on-farm A/R that differs from other development activities is that carbon credit contracts span decades – beyond the life expectancy of many signatories. Similar concerns may apply to the off-farm projects (HANRP and EAMK-FRP) though are likely less acute, as individuals are free to join and leave the Cooperatives and Nursery Groups and do not have individual (TFGB) or Small Group (TIST) obligations to carbon aggregators and buyers.

Farmers the team met were aware of succession issues, but most were not actively engaging their likely successors in tree-growing decisions. Several mentioned that they saw their trees as a good inheritance as

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Box 4: Environmental impacts and expectations

Finally there is a risk … raise expectations that planting trees will solve all the communities’ environmental problems – enhancing rainfall, increasing yields … and increasing low-season flow in streams. The scientific evidence does not support such claims in most circumstances, and there is a risk that communities are mobilized under false pretenses, or are disappointed in the future.

Kamweti and Acworth (2006)

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23 http://www.fews.net/Pages/default.aspx
timber value could be realized when the crediting period ends, and many hoped their children would continue “carbon farming.” However, few could explain how they will manage land division (typically between sons) in the future vis-à-vis the trees they had planted for carbon credits. One elderly woman said that she had not told her family that she was receiving stipends for the TIST trees she planted. Another possible area of concern is where women plant the trees, but their husbands (if not TIST members) own the land or control land-use decisions. This possibility applies also to inheritance of land bearing TIST trees if spouses do not agree on inheritance.

In all projects, these inheritance issues interface with delicate socio-cultural norms and are important for permanence. While such decisions are up to individuals concerned, project proponents will need to assist their community members in understanding the implications for contracts and providing advice on viable solutions.

**Equity and exclusion:** Intergenerational equity was discussed above. The study projects have all made efforts to promote gender equity and integration. TFGB, TIST and EAMK-FRP have high participation rates by women compared to most natural resources projects in the region in the experience of the study team. Although there is variation within each of these projects, close to or more than 50 percent of participants are women. Furthermore, women are often in leadership and household decision-making positions and were as vocal as men in our focus group discussions.

Where both are resident on-farm, TFGB insists that husband and wife sign the carbon contracts – a practice that could be used in a range of development projects to increase female participation and benefits. The team found instances where the wife or the husband was the main TFGB advocate, and where one or the other might grumble about growing trees without apparent bias to one gender. While TIST Small Group membership is open to anyone who makes the necessary commitments, and there is no requirement for spouses to participate, women are active and equal participants throughout the institutional structures and are in leadership positions, as well as technical roles as quantifiers.

HANRP has lower female membership (and even fewer in Cooperative leadership) than the other projects, despite investment by World Vision in engaging women leading to more women joining (Section 2.2). The study team also found it more difficult to engage with women for individual and focal group meetings. These differences likely reflect historical and politico-cultural factors in Ethiopia compared to Uganda and Kenya.

Besides gender and intergenerational equity, development agendas, including CCBA and other social and environmental standard systems, stress the need for inclusivity of poor or otherwise disadvantaged (or potentially disadvantaged) groups. From a carbon credit perspective, ignoring such factors may lead to leakage and permanence issues through displaced activities or conflicts leading to tree mortality or removal as discussed in Section 3.1. All four projects make efforts to enhance inclusivity, and are formally open to all community residents in their operational areas. However, several factors related to compliance or project operations may lead to a degree of exclusion for some groups or individuals, especially the poorest. For example:

- Plan Vivo requires that smallholders have sufficient land to maintain, at minimum, subsistence cropping for food as well as for planting trees, thereby excluding those with small land holdings, or no land. In contrast, TIST on-farm planting does not require land ownership, but only recognizable rights to the trees as an environmental service, thereby potentially encompassing poorer, landless members; and

- The public/communal land activities incur small membership fees of some sort (for HANRP cooperative membership; CFA membership for Kenya’s Forest Reserves). Where CBOs or other formal bodies are an organizing local institution, fees are also incurred (TFGB, EAMK-FRP network level, SACCOs (TFGB and as planned by TIST);
Institutional arrangements: The four projects employ different approaches among collaborating institutions that include donors, proponents, host-country governments and communities many of which are described in different parts of the report. Issues of transparency and effective communications along the carbon value chain are apparent in all projects despite proponents striving to inform all parties. Many of these issues are discussed at length in other parts of the report and stem from the esoteric nature of carbon as a product, highly technical compliance regimes and lack of geographic and cultural proximity between producers and buyers. CCAFS studies on these projects focus on institutional issues and many of their conclusions inform and coincide with those of the study team, including the need for (Shames et al.2012, Gosset and Neufeldt, 2012):

- Accountability and transparency in benefit-sharing mechanisms;
- Keeping transaction and operational costs low to maximize revenues reaching participants;
- Prior work with the farming communities as an entry point; and
- Development of robust and sustainable farmer group institutions.

The study projects have national and international NGO and private business proponents and, typically, international organizations undertaking validations and verifications. There is a clear need, from the international development perspective, to build capacity in each country to develop “indigenous” institutions to carry out all these functions (as with ECOTRUST) and to find local buyers for carbon credits (as TFGB and TIST are beginning to do).

TIST is the only study project that maintains its (CAAC/I4EI) headquarters outside its countries of operation and is the only for-profit business among them. CAAC clearly has a revenue responsibility to its shareholders, who are outside Kenya. Also, as a private company, it has legitimate confidentiality aspects to its business. In these respects TIST does not fit the typical profile of a development project (or development contractors, such as Tetra Tech, which do not directly invest their own money in project implementation and remain accountable to donors for all their project activities). However, TIST has made large, long-term corporate investments (and taken resulting risks) in engaging 50,000 Kenyan farmers in a carbon enterprise, which remains without profit after almost a decade. CAAC is not alone, as Wildlife Works is a similar organization with an operational project in Kenya and plans to expand to Ethiopia. This private enterprise model, alongside the donor/philanthropic one, is clearly a valid and useful approach to pioneering forest carbon activities that can bring livelihood benefits to local communities.

4.2 LESSONS LEARNED

Each of the four projects has distinguishing successes worthy of consideration for future projects. However, since each has a different business model these aspects cannot be simply transferred between projects, nor automatically included in design of new projects without determining how they fit with other project objectives, resources, geography and institutional arrangements.

Three highlights from each project are listed below.

TFGB:

- ECOTRUST as the proponent, carbon credit aggregator and market interface is a wholly Ugandan institution and therefore locally accountable to project participants and laws;
- Plan Vivo is well-suited to working with local organizations and smallholders because of its acceptance of project-specific standards and ex-ante payments. It is also attractive to niche corporate social responsibility buyers because of built-in environmental and social benefits; and
• Requires (when applicable) that both spouses sign the carbon agreements enhances household transparency and equity.

HANRP:
• Potential for natural regeneration of indigenous vegetation in eastern Africa, which has significant cost and biodiversity benefits compared with tree planting;
• Well-organized farmers can play a leading role in forest rehabilitation and management on state land without intrusive supervision and regulation (something that some governments are skeptical of); and
• Agreement to priority use of carbon revenues for community well-being rather than individual payments (and spreading some direct benefits to non-members, too).

TIST:
• Effective mobilization and motivation of large numbers of farmers (10-25 times that of the other projects) in a short time, indicating that a long prior engagement with communities is not essential;
• Largely “paper-free” project management through uploading monitoring information directly from the field, and operating this system with locally trained farmer-participant staff; and
• A donor-private sector investment model where the former finances “non-carbon” social and biodiversity benefits and a private company finances the forest carbon (and other compliance) aspects.

EAMK-FRP:
• As with TFGB, GBM is an indigenous organization that is building capacity for forest carbon management in Kenya and is currently experimenting with other carbon standards;
• High-quality vegetation/carbon baseline that yields scientific research-quality ecological and forest stand data and the most appropriate design and management regime for biodiversity conservation among the tree-planting projects; and
• Commitment to A/R in Forest Reserves, and consequent engagement with government and the need to address co-management, responsibilities, cost and benefit-sharing issues (likely of significance in REDD). TIST has more recently begun to address these same issues, but its primary constituent for A/R remains individuals in Small Groups.

4.2.1 Scaling-up and sustainability:
TFGB and TIST scale up as part of their design and normal processes. This expansion is not the result of deciding to begin a new bigger project, but of adding farmers steadily to the existing project. TIST’s growth of participant farmers is exceptional compared to the other projects and regarded by CAAC as an essential factor in reaching a profitable and sustainable scale of operations. GBM and World Vision have also expanded to new areas, though with different carbon standards, which remain small-scale.

Plan Vivo does not require new or changed PDDs, though additional technical specifications may be added. VCS and CDM small-scale projects have an upper limit of 16,000 t of carbon sequestration per year, so new PDDs are needed above this limit unless the more recent option of Grouped Projects (VCS) or Programs of Activities (CDM) is employed. TIST began with four small-scale VCS registrations, but has more recently registered three grouped projects to reduce the cost and compliance burdens.
HANRP was for a fixed area, which cannot easily be expanded as it is surrounded by farms and settlements. However, World Bank and other donors see the potential for applying the experience to larger areas, with carbon income as an additional benefit. A new World Bank project (Sustainable Land Management Project II) plans on rehabilitating hundreds of thousands of hectares, some of which will include forest carbon financing based on the HANRP model using the CDM Program of Activities approach for ease of expansion.

**Does larger-scale reduce costs per unit area?**

As with most enterprises, economies of scale are likely. However, for CDM and VCS this may mean moving from “small-scale, simplified” methodologies to more rigorous MRV requirements and higher transaction costs for larger-scale projects, which in turn may be less suitable for farmer-implemented projects. CDM now Programs of Activities and VCS Grouped Projects, in which several smaller activities may be grouped under one umbrella, reduce some development and compliance costs. Looking at a project cycle and large versus small-scale for community-implemented projects:

- Development/investment costs for a large project are likely similar irrespective of size, unless the larger project is conceptually more complex biophysically or socioeconomically. Baselines covering large, relatively uniform areas will cost less per unit area because of operational and statistical factors. If areas are not uniform, baseline costs may remain proportional to total area. Compliance costs will follow a similar pattern;

- Some operational costs are likely proportional to project size, while others may show some economies of scale. At the management level (staff and systems), proponent costs may increase more slowly than project size. However, at the field level, most costs are likely proportional to size. The number of individual farmers engaged in the group structures of the study projects is limited by logistical (attending meetings) and social factors that may have an optimum “grain size” in most settings. These community interactions are a significant proportion of operational costs. Where monitoring is on individual farms, this cost largely will remain proportional to project size; and

- Benefits related to scale are complex. Costs of administering payments will show some economies of scale, especially if cell phone-based electronic systems are used as with TIST and M-Pesa. Many environmental co-benefits, such as soil and hydrological impacts will increase with scale, especially where the larger areas are close together rather than scattered. Socioeconomic co-benefits are likely proportional to project size provided they are not diluted by reduced benefits per participant. HANRP, through its Cooperatives structure, has mobilized large groups that have agreed to use carbon revenues in community projects, but this model is unlikely to work on individually owned farms.

**How do we assess sustainability?**

Most development projects have a life of three to five years, though may extend through several phases. Sustainability is assessed through monitoring and evaluation processes during the life of the project, but often not long-term post project. USAID, in its project design processes, addresses sustainability in several ways shown in Box 5. The study projects address all the factors listed but have some additional aspects peculiar to farmer implemented forest carbon projects.

First, their time horizons are longer – 20 or more years, with possible additional crediting up to 60 years for some. For perspective, the maximum period exceeds the life of Uganda and Kenya as independent countries and Ethiopia has seen two revolutions in political and governance structures in the same period. The present carbon standards (and CCBA) and the institutions behind them were for the most part created approximately one decade ago and the UNFCCC is only 20 years old. Second, carbon credits are through contractual arrangements with inherent standardized MRV requirements that ensure sustainability in the forest carbon sense of permanence. However, this meaning of permanence is a contractual artifact and does not imply sustainable forest management in perpetuity.
Box 5: USAID Guidance on Sustainability

In abbreviated form USAID’s 2011 *Project Design Guidance* seeks to address the following sustainability issues. Does the project:

- have demonstrable local demand and ownership?
- build skills and capacity of local stakeholders?
- nurture effective institutions?
- have sustainable financing models?
- ensure environmentally sustainability?


By the end of the contractual periods the institutions and mechanisms of carbon finance will have changed inevitably, and conceivably may no longer exist. As discussed above, many project proponent officials and farmers will have changed livelihoods or be dead and proponent organizations may be defunct or have different priorities. Global climate change will have begun to have noticeable effects on land use and livelihoods, though details of impacts specific to project sites remain uncertain.

Looking at more predictable time periods, perhaps a decade, the study projects seem sustainable, and carbon finance provides a long-term framework supporting long-term results, at least for the first contracting periods. Provided there are no major socioeconomic upheavals during this 20-30 year period, and payments continue, the study team has the impression that most farmers will honor the obligations they made. Even with TFGB, where front-loading means payments cease after 10 years, it seems that participants will maintain the trees for the first period. Implicit in all projects, and clearly articulated by ECOTRUST, is the hope that as people evaluate the co-benefits of a landscape with many and diverse trees, they will opt to maintain (or replant) the trees they manage with or without carbon payments.

One factor cited in many studies of forest carbon projects that weakens sustainability is the uncertain viability of carbon markets and the low prices paid. Should carbon markets revive, and suitable local, national and global regulatory architecture for climate change PES become firmly established, the price constraint could change significantly making forest carbon projects more attractive financially. A recent study found that many American firms use an internal carbon price in assessing future investment risks on the assumption that such charges may arise in the future (study cited in the Economist, 14 December 2013). Most set prices in the range $10 – 60 per t, with large oil companies “charging” $34 or more. The same article quotes a “social cost” of carbon as $37 per t – which in theory should approximate to an efficient PES rate.
5.0 REFERENCES

Registration Web Links for Study Projects

Uganda: Trees for Global Benefits

Ethiopia: Humbo Assisted Natural Regeneration Project
CDM: http://cdm.UNFCCC.c.int/Projects/DB/JACO1245724331.7/view

TIST Program in Kenya
VCS:
https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projectsanda=2andi=594andlat=0%2E07217andlon=37%2E659891anddbp=1
https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projectsanda=2andi=595andlat=0%2E141275andlon=37%2E69334anddbp=1
https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projectsanda=2andi=596andlat=0%2E01237andlon=37%2E648583anddbp=1
https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projectsanda=2andi=597andlat=0%2E14305andlon=36%2E819041anddbp=1

CCBA:
http://www.climate-standards.org/2012/07/14/tist-program-in-kenya-ccb-003/

Kenya: Green Belt Movement: Aberdare Range/Mt. Kenya Small Scale Reforestation Initiative
CDM: http://cdm.UNFCCC.c.int/Projects/DB/JACO1260322827.04/view;
http://cdm.UNFCCC.c.int/Projects/DB/JACO1260322919.16/view;
http://cdm.UNFCCC.c.int/Projects/DB/JACO1324448535.95/view

Other References


http://cgspace.cgiar.org/bitstream/handle/10568/21218/AfricanAgCarbon-CaseStudy-Ecotrust.pdf;sequence=6

http://research.ees.utoledo.edu/lees/papers_pdf/Mokany_2006_GCB.pdf


http://cgspace.cgiar.org/bitstream/handle/10568/21222/CCAFS8WEB.pdf?sequence=1. TFGB, HANRP and TIST Case Studies are online at: http://ccafs.cgiar.org/publications/institutional-innovations-african-smallholder-carbon-projects#.UheU55JJ6s0.

UNEP Risoe (2013). Economics of forests and forest carbon projects – Translating lessons learned into national REDD+ implementation. United Nations Environment Program,
http://www.unepriiso.org/~/media/Sites/Unepriiso/Publications%20(Pdfs)/2013_06_20Forest%20Carbon%20Project%20Summary_WEB.ashx

USAID (2012b). REDD+ Social Safeguards and Standards Review. FCMC Program. 

USAID (2013). US Experience on Results-based Finance. FCMC Program 
http://www.fcmcglobal.org/documents/Results_Based_Finance.pdf

APPENDIX A: STUDY STATEMENT OF WORK

Note: this is the approved version of the SOW. Changes to scheduling and levels of effort were agreed operationally with USAID, as needed.

Eastern Africa “Re-greening Study 2013” – USAID FCMC Project; A USAID-supported study comparing projects that combine forest carbon and biodiversity benefits, as a contribution towards determining future programming priorities

1. Introduction
USAID, with other partners, supports a range of natural resources management activities in eastern Africa that, either by design, or by their evolution, combine aspects of biodiversity conservation and A/R for forest carbon benefits in the senses of USAID’s biodiversity code and its strategy for mitigating global climate change, respectively. To date there has been no rigorous comparative review of such projects to guide scaling-up and development of new programming initiatives in the region that combine forest carbon and biodiversity objectives. This study will provide such a review of a range of projects from different geographic, carbon standard and governance perspectives.

1.1 Objectives/Key Questions
The goal is to learn from these projects for improved future USAID forest carbon/biodiversity programming.

Specifically, the study will determine whether these projects:

1. Contribute to and provide sound bases/methodologies for reducing GHG emissions in the sense of USAID Sustainable Landscapes framework for scaling-up/applying elsewhere;
2. Contribute to national thinking on REDD+/Global Climate Change (GCC) policy and practice development;
3. Contribute to biodiversity conservation in the sense of USAID biodiversity code or broader biodiversity benefits and provide sound methodologies for scaling-up/applying elsewhere;
4. Provide effective experience and synergies between USAID forest carbon and biodiversity conservation objectives and requirements; and
5. Contribute other co-benefits (such as GCC adaptation, socioeconomic, gender, livelihoods).

Most important, comparison of the projects will allow broader findings and conclusions that contribute to lessons learned and emerging best practices for community-based forest carbon and biodiversity conservation programming.

USAID Climate Change Strategic Objectives (SO)

1. SO1: Accelerate transition to low emissions development.
2. SO2: Increase resilience of people, places and livelihoods.
3. SO3: Strengthen development outcomes by integrating climate change in Agency programming, learning, policy dialogues and operations.
1.2 Context

USAID Global/Africa
The study is jointly funded by USAID’s climate change (Africa Bureau) and biodiversity (Bureau for Economic Growth, Education, and Environment) teams through the Forest Carbon, Markets and Communities Project (FCMC). The Cross-cutting component of FCMC includes “assessments of USAID sustainable landscapes (or REDD+) projects cataloging and mapping USAID sustainable landscape investments… review of existing projects, and assessing GHG and other impacts of these projects.”

USAID country Missions and their implementing partners will benefit from new analysis of their existing projects, and in particular from the broader perspectives obtained from comparison of projects in different circumstances and countries. This knowledge will contribute to potential improvements to ongoing projects as well as support technical aspects of future programming.

USAID’s Climate Change and Development Strategy (2012) has three Strategic Objectives (box, page 61). This study contributes to SO3 as a learning exercise with programming outputs through examining projects addressing SO1 (climate change mitigation) by reducing emissions from forests and associated land uses by increasing landscape carbon stocks. Adaptation to climate change (SO2) is not studied directly, but is seen as one of several a potential co-benefits included in the analysis. Within SO1, the study contributes directly to “Intermediate Result (IR) 1.2 Invest in land use practices that stop, slow, and reverse emissions from deforestation and degradation (REDD+) of forests and other landscapes.”

For decades USAID has supported biodiversity conservation in tropical forests and other environments. Under the Foreign Assistance Act, USAID’s formal biodiversity activities are defined by the “biodiversity code” (box, left). This definition is somewhat restrictive, especially with respect to interpretation of the fourth criterion requiring that site activities are restricted to intact biologically significant areas. This requirement implies that work in improvement of biologically degraded ecosystems (for example, forest restoration, or increasing indigenous species on farm land) does not qualify for USAID biodiversity funding. As such there is a divergence between “allowable” biodiversity activities and those promoting REDD+ related field projects. Nevertheless, many biodiversity projects have worked with farming communities adjacent to biologically significant areas on the assumption that improved management of these “buffer zones,” or their contribution to connectivity of biologically significant sites enhances biodiversity conservation. Indeed, USAID projects including forest carbon benefits typically began and continue with biodiversity funding, which was later supplemented by climate change funding. Income from forest carbon sequestration is seen as one incentive to forest conservation along with other economic, social and environmental co-benefits.

1.3 Project Selection
The following criteria were used in selecting projects for study:

- Located in eastern Africa;

THE BIODIVERSITY CODE

USAID’s Biodiversity Code guides USAID in determining which activities are considered biodiversity conservation, and therefore count towards the biodiversity earmark. The code stipulates four criteria, all of which must be met to be considered a biodiversity activity:

1. The program must have an explicit biodiversity objective. It isn’t enough to have biodiversity conservation result as a positive externality from another program.

2. Activities must be identified based on an analysis of threats to biodiversity.

3. The program must monitor associated indicators for biodiversity conservation.

4. Site-based programs must have the intent to positively impact biodiversity in biologically significant areas.
• Sufficient duration to have approved forest carbon income, and across projects using different forest carbon standards;
• Variations apparent between characteristics of projects; and
• USAID country mission support24.

Using these criteria, the following projects were identified as candidates. Additional information on these projects is given in Attachment A.

1. TIST is implemented by CAAC/ I4EI combo; CAAC registered in Kenya.
2. East Aberdare Forest Rehabilitation Project (EAFRP) is implemented by Green Belt Movement (GBM), a Kenyan non-profit with many partners;
3. Trees for Global Benefits project (TFGB) is implemented by Environmental Conservation Trust of Uganda (ECOTRUST), a Ugandan non-profit with many partners; and
4. Humbo Assisted Natural Regeneration Project (HANRP) in Ethiopia, implemented by World Vision.

HANRP has no USAID funding, but is using natural forest regeneration, whereas the others are predominantly using planting of seedling trees on farm and/or forest land, and therefore enriches the comparative aspects of the study.

2. Study Questions

The study will focus on a range of focal questions pertinent to USAID biodiversity and climate change programming as listed below. In addition the programmatic evolution of each project (for example, USAID objectives and funding streams) will be described to provide context on how and why circumstances have developed.

Specifically, do these projects:

1) Provide sound bases/methodologies for reducing GHG emissions in the sense of USAID Sustainable Landscapes framework for scaling-up/applying elsewhere:
- What area is now effectively under/planned for forest carbon PES/REDD+ arrangements?
- Specifically, what SES standards are used, are they sound, and how were they implemented?
- What forest carbon MRV processes are in place and what issues have arisen during implementation?
- What were/are the costs of project establishment/running for implementing organization and community members (including transaction and opportunity costs)?
- What are the financial benefits accruing (and to whom) from the forest carbon arrangements – past/current/anticipated long-term?
- What are cost-benefit sharing mechanisms and how were they determined?

2) Contribute to national thinking on REDD+/GCC policy and practice development:
- Fit within national REDD+ strategy/policy/legal /practice?
- Do they have formal or informal mechanisms of communication/consultation/participation with the national REDD+ entity?
- Has project experience influenced/been incorporated into national strategy/policy/legal /practice aspects of forest carbon development?

24 An initial criterion, “Funding support at least in part from USAID biodiversity and/or climate change mitigation sources,” was found too restrictive to match other criteria. Of study projects only TIST currently has USAID funds.
- What mechanisms exist for stakeholder inputs to national REDD+ development?

3) Contribute to biodiversity conservation in the sense of USAID biodiversity code:
   - Do they comply with the four requirements of the biodiversity code?

4) Contribute to broader biodiversity conservation concepts provide sound methodologies for scaling-up/applying elsewhere:
   - What biodiversity concepts are included in the project concept/design?
   - What biodiversity benefits are being realized (within or outside concept/design) and with what evidence?

5) Provide effective experience and synergies between USAID forest-carbon and biodiversity conservation objectives and requirements:
   - What are potential areas of synergy?
   - Which are realized?

6) What other co-benefits do they provide (GCC adaptation, socioeconomic/social capital, gender, livelihoods, etc.):
   - What is the applicable universe of potential co-benefits?
   - What co-benefits are documented, and how determined?
   - What other co-benefits are evident, and what is their contribution?

Attachment A elaborates these questions with respect to methods described below.

**Methods/Information Sources**

An advantage of saleable forest carbon projects is that the carbon accounting methods require a significant effort in collecting somewhat rigorous baseline and monitoring information to a degree often not apparent in development projects. Further these documents are readily accessed on the internet. USAID’s own programmatic documents are typically similarly available, though at country and to a greater extent at project level, these documents may require field visits to obtain current information. Some study projects have donors in addition to USAID and related relevant documentation may also require field visits and support from USAID country Missions.

A range of appropriate methods will provide focused information for analysis of each project and for comparison across projects so that consistent analysis of lessons and emerging best practices become apparent. The comparative aspect of the study is crucial and serves to emphasize that this is not a set of project evaluations, but an attempt to critically understand positive and negative experience in implementing A/R projects linked to biodiversity conservation with different forest carbon standards, different community-based approaches, different benefits and in different countries.

1. Document review (project documents and other key sources such as country-specific strategies, policies, plans, laws, and other relevant framework and project documents).
2. Key informant interviews (KII) with stakeholder representatives.
3. Structured focus group discussions (FGDs).
4. Household Surveys (HHS) or structured community dialogue (using focused participatory assessment techniques). Because of cost issues the current proposal is to use the community dialogue approach – in essence an extended FGD.
5. Informal group/individual discussions as opportunities arise.
6. Field observations by study team to capture relevant undocumented aspects, and to assess quality and effectiveness of field methods employed.
7. Presentations/validation workshop for each country at the end of in-country study (USAID and/or stakeholder workshops).

8. Presentation/validation workshop for USAID/Washington prior to submission of final report.

Use of satellite imagery to assess land-use change – specifically tree cover – is possible, but expensive, as a time series of cloud-free high resolution images are necessary for the smallholder plots involved in most projects. Landsat imagery is free, but has inadequate resolution and technical malfunctions over the period required that preclude precision. Purchase of high-resolution imagery and cost of image analysis is therefore regarded as inappropriate for this study. Recent Google Earth images may be used in field discussions with informants to discuss specific land use features.

Particular attention will focus on how cross-cutting issues of gender and vulnerable group equity and conflict mitigation are addressed in governance, natural resource management and benefit-sharing in all relevant questions. Where applicable, separate KII and FGD will ensure that perspectives of different interest groups are included in the study.

Key stakeholders who the study will engage include: USAID officers; project implementing institution(s) staff; community organizations/members at project sites; relevant government officers (including REDD entity and field officers at project sites); project forest carbon verifiers/validators; and, where relevant other donor officials and other knowledgeable organizations and individuals. Some stakeholder staff may be available for KII in the US (for example, senior TIST officials, TGB verifiers, the Rainforest Alliance).

3. Team Composition

Skill requirements: Leadership, coordination, facilitation, study/survey design (HHS and or FGD/Participatory Rural Appraisal [PRA]); biodiversity conservation, forest carbon MRV, SES (including institutional capacity and governance, gender, vulnerable groups), property rights, agroforestry/forestry, forest carbon finance, economic and financial analysis (projects and livelihoods). While this wide range of skills is necessary, a core team of three to four individuals is envisaged covering most needs with additional shorter inputs as required.

4. Work Plan Schedule and Level of Effort

Given the limited availability of USAID project documentation and need for each Mission to buy-in and become involved in the study design and execution, a two phased field presence is envisaged. A shorter first visit to each country (four to five days) by the study Team Leader and another key team member (designated as Deputy Team Leader) will engage Mission personnel in providing documentation and in design and planning of the study team’s local interactions with stakeholders. The team will also hold preliminary meetings with the main project implementing institution and where necessary identify local consultants to participate in the study. Prior to this visit, USAID/Washington will contact the respective Missions for their agreement to participate in the study. Time needed for completion of this step may affect the overall schedule described below.

Following this first round of visits, the study team will report back to USAID/Washington with a written brief and then elaborate the study plan and instruments for each project, finalize team selection and develop a final detailed study plan. The full team will mobilize for the second field phase of data collection based on Attachment A and any amendments made as a result of the preliminary round of field visits within two weeks of reporting back.

The following estimates of Level of Effort (LOE) (work days, including international travel) are per project studied. Where two projects occur in one country, only one Phase 1 visit is required. These estimates do not include HHS, which, if used, require subcontracts to competent local organizations at a cost per project of
$50 - 100,000 (depending on valid sample size). If used, HHS would ideally follow the team field visits so that the HHS instrument is tightly focused with some of the questions project specific to tease out information not forthcoming from those field visits.

For three projects the total projected LOE is, therefore, approximately 211 work days, for four projects 277 work days.

The work is expected to begin in January 2013 with preparation and Phase 1 visits into mid-February. Phase 2 visits will begin in early March and, depending upon the number of sites/countries, will continue into April. A draft final report will be submitted by the end of April, and a final version within 1 weeks of receipt of all comments and revisions requested.

Scheduling for Kenya, is problematic as the USAID Mission is not allowing temporary duty visits from 4 February 2013 for an undefined period to encompass national elections scheduled for 4 March. If Kenya remains inaccessible for a significant period after the elections, this schedule may need extension.
<table>
<thead>
<tr>
<th>Project</th>
<th>Standard</th>
<th>C-Methods</th>
<th>Donors</th>
<th>USAID $</th>
<th>Implanter/Verifier</th>
<th>Start Date</th>
<th>HH</th>
<th>Ha</th>
<th>Other partners</th>
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<tbody>
<tr>
<td>Kenya</td>
<td></td>
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<tr>
<td>TIST</td>
<td>VCS+CCB Gold</td>
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<td>c. $ 7 million</td>
<td>CAAC/I4EI</td>
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<td>45961</td>
<td>11540</td>
<td>Small land owners, (KFS)</td>
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<td>GBM</td>
<td>CDM</td>
<td>CDM AR-AMS 0001, ver 05; IPCC default values + some local</td>
<td>USAID, others?</td>
<td>$526,138</td>
<td>GBM</td>
<td>2008</td>
<td>?</td>
<td>597</td>
<td>KFS, CFAs, local gov and CSOs, WCS</td>
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<td>Uganda</td>
<td></td>
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<tr>
<td>TGB</td>
<td>Plan Vivo</td>
<td>Plan Vivo standards; local estimates</td>
<td>USAID, DfID</td>
<td>?</td>
<td>ECOTRUST</td>
<td>2002</td>
<td>1492</td>
<td>1904</td>
<td>CARE, ICRAF, NFA, ECCM, local gov. and CSOs, WCS</td>
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<tr>
<td>EANRP</td>
<td>CDM+CCB A Gold</td>
<td>CDM AR-AM003 ver 04; IPCC default values</td>
<td>World Vision Australia; WB</td>
<td>0 (WVA $659,000; WB?)</td>
<td>World Vision Ethiopia/Australia</td>
<td>2004</td>
<td>2728</td>
<td>WB Biocarbon Fund/Canada (C-buyer)</td>
<td></td>
</tr>
</tbody>
</table>

1First Kenya office
2USAID support began
3Total target is 1763 ha with total budget of $3.7 million
4Start of project; nurseries 06, planting 07
<table>
<thead>
<tr>
<th>Study Questions</th>
<th>Data/Information Sources</th>
<th>Study Activities</th>
</tr>
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<tbody>
<tr>
<td><strong>Provide sound bases/methodologies for reducing GHG emissions in the sense of USAID Sustainable Landscape framework for scaling-up/applying elsewhere.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) What area is now effectively under/ planned for forest carbon PES/REDD+ arrangements</td>
<td>- Project documents&lt;br&gt;- KII (project implementing organization, community members)&lt;br&gt;- Carbon standard documents&lt;br&gt;- Field observations</td>
<td>Determine of current A/R area, schedule of establishment and future extension, and methods of determination. Land, resource and carbon tenure issues.</td>
</tr>
<tr>
<td>b) Specifically, what SES standards were used, are they sound, and how are they implemented</td>
<td>- Project documents&lt;br&gt;- KII (project implementing organization, community members)&lt;br&gt;- Carbon standard documents&lt;br&gt;- Field observations&lt;br&gt;- FGD/HHS</td>
<td>Assess formal SES standards and or other formal or informal standards used and how they were employed in design and implementation. Issues covered include: governance, institutional capacity, equity, tenure, gender, conflict mitigation, community understanding, participation, roles and responsibilities.</td>
</tr>
<tr>
<td>c) What forest carbon MRV processes are in place and what issues have arisen during implementation</td>
<td>- Project documents&lt;br&gt;- KII (project implementing organization, community members)&lt;br&gt;- Carbon standard documents&lt;br&gt;- Field observations</td>
<td>Review of institutional aspects, methods, assumptions and differences between projects, and issues encountered in estimation of carbon sequestration. Assessment of forestry/agroforestry methods used and their effectiveness in promoting carbon and other benefits. Community understanding, participation, roles and responsibilities.</td>
</tr>
<tr>
<td>d) What were/are the costs of project establishment/ running for implementing organization and community members (including transaction and opportunity costs)</td>
<td>- Project documents, other implementing organization documents&lt;br&gt;- KII (project implementing organization, community members)&lt;br&gt;- FGD/HHS&lt;br&gt;- Field observations</td>
<td>To the extent possible, review project records on categories and amounts spent in establishing and implementing projects to date and estimates of future costs throughout the carbon contract period. From project records and/or FGD/HHS estimate costs to community level participants in engaging with the project. Identify and estimate, where feasible, “hidden costs” such as unaccounted technical advice, “overhead” costs, opportunity and other costs borne by community participants.</td>
</tr>
<tr>
<td>e) What are the financial benefits accruing (and to whom) from the forest carbon arrangements – past/current/anticipated long-term</td>
<td>- Project documents&lt;br&gt;- KII (project implementing organization, community members)&lt;br&gt;- FGD/HHS</td>
<td>Review of income generation from forest carbon, financial and other procedures for revenue-sharing. Community understanding, roles and responsibilities.</td>
</tr>
<tr>
<td>f) What are cost-benefit sharing mechanisms and how were they determined</td>
<td>- Project documents&lt;br&gt;- KII (project implementing organization, community members, government officials)&lt;br&gt;- FGD/informal community meetings</td>
<td>Review of any national policies/systems applicable for benefit-sharing and their influence on projects. Analysis of operational benefit-sharing (financial and other) mechanisms/practices from financial, other material, non-material and “good governance” perspectives. Community understanding, roles and responsibilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Questions</th>
<th>Data/Information Sources</th>
<th>Study Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contribute to national thinking on REDD+/GCC policy and practice development.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Fit within national REDD+ strategy/policy/legal /practice</td>
<td>- Project documents&lt;br&gt;- National REDD strategy documents&lt;br&gt;- KII (USAID, project staff, national REDD focal entity staff)&lt;br&gt;- Secondary documents</td>
<td>Determine current status of national REDD+ Readiness and other aspects of forest carbon/GCC frameworks and their relevance in framing or implementing subject projects.</td>
</tr>
<tr>
<td>b) Do they have formal or informal mechanisms of communication/consultation/participation with the national REDD+ entity</td>
<td>- Project documents&lt;br&gt;- National REDD strategy documents&lt;br&gt;- KII (USAID, project staff, national REDD focal entity staff, informed local organizations and individuals)</td>
<td>Assessment of project linkages to national REDD+ developments.</td>
</tr>
<tr>
<td>Study Questions</td>
<td>Data/Information Sources</td>
<td>Study Activities</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>c) What mechanisms exist for stakeholder inputs to national REDD+ development</td>
<td>• National REDD strategy documents</td>
<td>Assessment of stakeholder mechanisms and their effectiveness.</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff, national REDD focal entity staff, informed local organizations and individuals)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Secondary documents</td>
<td></td>
</tr>
<tr>
<td>d) Has project experience influenced/been incorporated into national strategy/policy/legal/practice aspects of forest carbon development</td>
<td>• National REDD strategy documents</td>
<td>Assessment of whether/extent of project experiences reflected in national REDD+ framework development.</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff, national REDD focal entity staff, informed local organizations and individuals)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Secondary documents</td>
<td></td>
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</tbody>
</table>

Contribute to biodiversity conservation in the sense of USAID biodiversity code

<table>
<thead>
<tr>
<th>Study Questions</th>
<th>Data/Information Sources</th>
<th>Study Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) do they comply with the four requirements of the biodiversity code</td>
<td>• Project documents</td>
<td>Determine whether/to what extent the four requirements are met (biodiversity objective, threat analysis/reduction, monitoring biodiversity attributes, sites of biodiversity significance).</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff and partners)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Field observations</td>
<td></td>
</tr>
<tr>
<td>b) What biodiversity concepts are included in the project concept/design and with what evidence</td>
<td>• Project documents</td>
<td>Determine whether biodiversity conservation concepts/principles outside the biodiversity code are addressed. Examples: does project fit/contribute towards national CBD commitments, policies, strategies, action plans, practices and/or to conservation biology concepts and principles.</td>
</tr>
<tr>
<td></td>
<td>• National biodiversity documents (strategy, action plans, policy, law)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• CBD documents, secondary documents where relevant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff and partners, informed local organizations and individuals)</td>
<td></td>
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<td></td>
<td>• Field observations</td>
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</table>
| Provide effective experience and synergies between forest-carbon and biodiversity conservation objectives and requirements

<table>
<thead>
<tr>
<th>Study Questions</th>
<th>Data/Information Sources</th>
<th>Study Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) What are potential areas of synergy</td>
<td>• Project documents</td>
<td>Develop a list of potential synergies. Determine which and to what extent these synergies were included in project design and implementation. Assess additional synergies have arisen during implementation.</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff and partners, informed national/local organizations and individuals)</td>
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<tr>
<td></td>
<td>• FGD</td>
<td>Assess to what extent synergies are included in evolving national policy and strategy for forest carbon and biodiversity.</td>
</tr>
<tr>
<td></td>
<td>• Field observations</td>
<td></td>
</tr>
<tr>
<td>b) Which are realized</td>
<td>• Project documents</td>
<td>Assess how projects have documented such synergies, identify any additional synergies evident and analyze the practical relevance and effectiveness of such synergies.</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff and partners)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• FGD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Field observations</td>
<td></td>
</tr>
<tr>
<td>What other co-benefits do they provide</td>
<td>• Project documents</td>
<td>Develop comprehensive list and criteria for potential co-benefits from these types of project including GCC adaptation, other environmental, socioeconomic/social capital, gender, livelihoods, tenure rights, conflict mitigation, etc.</td>
</tr>
<tr>
<td></td>
<td>• KII ((USAID, project staff and partners, informed national/local organizations and individuals)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Field observations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Secondary documents – wide range of</td>
<td></td>
</tr>
<tr>
<td>Study Questions</td>
<td>Data/Information Sources</td>
<td>Study Activities</td>
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<tr>
<td>--------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>b) What co-benefits are documented, and how determined</td>
<td>• Project documents</td>
<td>Assess mechanisms for identifying, estimating and recording co-benefits within project protocols and practice. Rank the subject project co-benefits with respect to perceived impact.</td>
</tr>
<tr>
<td></td>
<td>• KII (USAID, project staff and partners)</td>
<td></td>
</tr>
<tr>
<td>c) What other co-benefits are evident, and what is their contribution</td>
<td>• KII (USAID, project staff and partners, informed national/local organizations and individuals)</td>
<td>Assess and rank as incentives (along with co-benefits from 6b), forest carbon, biodiversity) and any additional co-benefits evident, but not formally documented.</td>
</tr>
<tr>
<td></td>
<td>• FGD/HHS</td>
<td></td>
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<td></td>
<td>• Field observations</td>
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</table>
APPENDIX B: OUTLINE OF STAKEHOLDER QUESTIONS

The following set of questions is the structural guide used by the study teams when conducting KIIs and FGDs. Questions asked of any specific individual or group varied depending on their relevant knowledge or relationship to the study projects. These questions were modified or added to as deemed useful and necessary during discussions with respondents and phrased in ways that elicited useful information. Exact terminology was modified to fit specific study circumstances (for example, co-operatives in Ethiopia, CBOs or other community structures elsewhere). Terminology in the table is as used in Kenya as the final field work country.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Study questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>History/background/context</td>
<td>• General</td>
</tr>
<tr>
<td></td>
<td>• What was happening before this project came? (Other projects? Describe)</td>
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<tr>
<td></td>
<td>• Were there any tree-planting/conservation activities here before the project came – either on-farm (TIST) or in a forest reserve (TIST/GBM)?</td>
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<td></td>
<td>• What crops do people plant – has this changed through time?</td>
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<td></td>
<td>• Have you observed any changes in climate (long term/short term)?</td>
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<td></td>
<td>• Has the population here changed since the project began?</td>
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<td></td>
<td>• Before this project, was there involvement of communities in local forest management?</td>
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<tr>
<td></td>
<td>• What major indigenous species of trees and wildlife were there?</td>
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<td></td>
<td>• What is the ethnic makeup in the area?</td>
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<td>• Have members dropped out (relevant for both) and what is the process/implication of this?</td>
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<tr>
<td></td>
<td>Group context (CFA; User Groups; TIST Small Group/Cluster; GBM Nursery Group)</td>
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<tr>
<td></td>
<td>• When was it formed/was it specifically for the carbon project?</td>
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<td></td>
<td>• What in summary/principle comprises the constitution/by laws/rules, etc.?</td>
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<td></td>
<td>• Who/how are decisions made when needed? Who signed the carbon agreements?</td>
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<td></td>
<td>• Who comprises the membership and how were eligible members agreed?</td>
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<tr>
<td></td>
<td>• What proportion of nearby population is included in membership and is this changing through time?</td>
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<tr>
<td></td>
<td>Tenure</td>
</tr>
<tr>
<td></td>
<td>• Previous land ownership/use pattern (within community; rights within HH)</td>
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<tr>
<td></td>
<td>• Security of KFS arrangement for CFA forest use rights</td>
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<tr>
<td></td>
<td>• What is the use right level given to the CFAs? To what extent do CFAs/user groups have the right to extract products?</td>
</tr>
<tr>
<td></td>
<td>• How (if at all) are C rights attached to land/tree use or ownership? Is this same/different to other Non-timber Forest Products (NTFPs)?</td>
</tr>
<tr>
<td></td>
<td>• What is the range/average land-holding size of participants' farms?</td>
</tr>
<tr>
<td>Topic</td>
<td>Study questions</td>
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</tbody>
</table>
| **Forest Carbon Concepts** | - Do participants understand what they are paid for?  
- Do participants understand CDM/VCS/CCB explicitly or as concepts requiring specific procedures? |
| **Project costs** | **Opportunity costs**  
- To set up and operate the project, (a) what tasks have been involved – please list? (b) who has been involved? (Specific people, M/F, community leaders, etc) (c) for how much time each, (d) what would be an average wage/cost for this effort?  
- What project-related activities have been undertaken by unpaid volunteers, and what have been paid labor?  
- Has this time taken away from other things you needed or wanted to do?  
- How have land use decisions been made?  
- TIST: Have there been any guidelines regarding minimum/maximum tree cover on private land?  
- Seasonality of labor/costs? |
| **Transaction costs** | **Risks**  
- To set up and operate the project, what costs (cash, in-kind, work, transport, other inputs) have been incurred?  
- Has this cost caused you to sacrifice other expenses?  
- What operational costs are incurred?  
- What risks have you taken in order to participate in this project?  
- (Are risks and costs allocated fairly within the value chain – if not, what would be better?) |
| **Project operations** | **Tree planting practices**  
- Can you explain what you’ve done to increase tree cover on the designated land?  
- How were seedlings sourced for planting?  
- What training on tree husbandry have you received, and from whom?  
- Can you tell us any challenges you faced during the process of regenerating / tree planting?  
What was your response?  
- How is protection of the seedlings organized?  
- How have different species performed?  
- Are indigenous or exotic species regenerating among the planted trees? If so, what is done with them?  
- What level of tree-felling/harvesting is allowed?  
*What are community/individual roles and responsibilities in measurement and reporting?  
*What issues, if any, have come up? (e.g., Are there any issues with individuals not being able to read/write or do reporting on their own? Are there any technical capacity issues to do with measurement?)  
- Who conducts the measurements? How are permanent plots maintained and monitored?  
- What checks are made to ensure data is reported / documented accurately?  
- Have GPS coordinates been used to assess project area?  
- What was the project baseline and how was this estimated?  
- What data are kept and maintained by the Group?  
- How are different species recorded in the field? Is this same/different for biodiversity monitoring?  
- How are naturally regenerated trees recorded in the inventory?  
*What has been the survival rate of regenerated/planted trees? How did the project developers aggregate / estimate total tree cover, survival rates, etc?  
<p>| <strong>MRV</strong> |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Study questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value chain</strong></td>
<td>• How well is the value chain understood by HHs, Group leaders, others?</td>
</tr>
<tr>
<td></td>
<td>• How was (TIST)/will (GBM) the allocation of C revenue along the value chain (be) determined? Has this been changed at any point – if so, why?</td>
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<tr>
<td></td>
<td>• How are cut and carry, fuel wood collection and grazing managed? (What were the sources before the project?)</td>
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<td></td>
<td>• What rules apply to trespassers (in reserves and/or TIST groves)</td>
</tr>
<tr>
<td><strong>Structuring of C payments</strong></td>
<td>• When do participants expect C payments to begin? (TIST – are there other PES payments? if so how are they perceived; GBM – are there any payments currently?)</td>
</tr>
<tr>
<td></td>
<td>• What is the process/understanding of other PES payments (1- exotic; 2- indigenous; 3- riverine; 4- CF; 5- stoves)</td>
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<tr>
<td></td>
<td>• What is the nature/understanding of the C contracts (TIST)?</td>
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<tr>
<td></td>
<td>• How is the distribution of C payments decided? Is it fair – if not, what would be better</td>
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<td></td>
<td>• Are the C payments structured in such a way as to compensate / incentivize communities effectively?</td>
</tr>
<tr>
<td></td>
<td>• What happens in terms of inheritance and/or land sale?</td>
</tr>
<tr>
<td><strong>Other financial benefits</strong></td>
<td>• What are some of the other financial benefits that have accrued to the HH/community from this project?</td>
</tr>
<tr>
<td></td>
<td>• How did women benefit from the carbon payments? Is there any income from the sale of grass and/or fuel wood to other non-members? If not where do non-members obtain these materials? Some members of the Groups or households paid for guarding the site or watching for trespassers?</td>
</tr>
<tr>
<td><strong>Biodiversity and other environmental impact</strong></td>
<td><strong>Project design</strong></td>
</tr>
<tr>
<td></td>
<td>• Were any threats to local biodiversity identified at the start of the project that may have been targeted for improvement?</td>
</tr>
<tr>
<td></td>
<td>• Did biodiversity matter to communities in their decision to participate?</td>
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<td></td>
<td>• In what way(s) was biodiversity incorporated into the project design?</td>
</tr>
<tr>
<td></td>
<td>• Proportion of naturalized vs. indigenous planting?</td>
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<td></td>
<td>• Who selected the planted species? Were the planted species suitable for the system?</td>
</tr>
<tr>
<td></td>
<td>• How suitable were the species selected economically, ecologically and socially?</td>
</tr>
<tr>
<td></td>
<td>• Is there any mechanism of assessing biodiversity impacts – either through monitoring and reporting; or recording of anecdotal evidence; or other?</td>
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<tr>
<td></td>
<td>• Were landscape level (watershed) issues considered during planning and implementation?</td>
</tr>
<tr>
<td></td>
<td>• Do people perceive landscape/watershed benefits?</td>
</tr>
<tr>
<td></td>
<td>• What were the monitoring and reporting mechanisms included in the project? (both for fauna and flora) What is the role of communities, TIST, GBM, KFS in the monitoring activities?</td>
</tr>
<tr>
<td><strong>Biodiversity impact</strong></td>
<td>• Is the project in proximity to any PA(s) – which one(s), how far, direction</td>
</tr>
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<td></td>
<td>• Is the project in proximity to any traditional/sacred PA?</td>
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<td></td>
<td>• If so, are people aware of where and how far PAs are?</td>
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<tr>
<td></td>
<td>• Has the community seen any new (or new after absence) sightings of flora/fauna wildlife? (Which ones, when, frequency compared with before – zero/rare/common)</td>
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<td></td>
<td>• What is your feeling about seeing these species of plant/animal again – good (why), neutral, bad (why)?</td>
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<tr>
<td></td>
<td>• What ecological, economic, social values are attached to indigenous species?</td>
</tr>
<tr>
<td></td>
<td>• What ecological, economic, social values are attached to exotic species?</td>
</tr>
<tr>
<td><strong>Synergies between forest carbon and biodiversity</strong></td>
<td>• Is there evidence of an increase/decrease in useful indigenous species – planted or arising as result of planting (e.g. medicinal, food, bees/honey)?</td>
</tr>
<tr>
<td>Topic</td>
<td>Study questions</td>
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<tr>
<td><strong>Has there been any increase/decrease in (eco-) tourism resulting from the project?</strong></td>
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<tr>
<td><strong>Have there been any benefits/negatives regarding changes in biodiversity (e.g. impact on non-participants)?</strong></td>
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<tr>
<td><strong>Would it be possible/reasonable to incorporate biodiversity monitoring into existing forest carbon monitoring structures? What about any potential overlap in activities of carbon project with other extension activities?</strong></td>
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<tr>
<td><strong>Has there been any reduction in deforestation pressure in biologically sensitive areas?</strong></td>
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<tr>
<td><strong>REDD+</strong></td>
<td><strong>Are you aware of this project’s relevance to REDD discussions?</strong></td>
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<td></td>
<td><strong>Has anyone held consultations in this community about climate change or forests?</strong></td>
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<tr>
<td><strong>Community impact</strong></td>
<td><strong>Did you ever hear anything about CCBA environmental/social standards?</strong></td>
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<td></td>
<td><strong>Have any of them been achieved?</strong></td>
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<tr>
<td></td>
<td><strong>Did / does TIST, GBM, USAID (or other donors) have any additional standards of operation that defined how they handled project design, interaction with the community, etc?</strong></td>
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<tr>
<td></td>
<td><strong>Are there other government policies or culturally-held standards of environmental/social management that affect these projects? Are they aligned or in conflict with C and CCBA and project operational stds?</strong></td>
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<td></td>
<td><strong>Have standards of free, prior and informed consent been used (either purposefully or because of general procedure)?</strong></td>
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<tr>
<td></td>
<td><strong>What environmental or social requirements (if any) are needed for Group membership? Are these working well? What about gender/youth or other vulnerable sections of society?</strong></td>
</tr>
<tr>
<td><strong>General understanding</strong></td>
<td><strong>What benefits have you experienced, that you would attribute to this project?</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Can you tell us which:</strong></td>
</tr>
<tr>
<td></td>
<td>o Was the most important to you in deciding to participate?</td>
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<td></td>
<td>o Improves your life the most?</td>
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<td></td>
<td>o Has been the most difficult?</td>
</tr>
<tr>
<td><strong>Environmental co-benefits/challenges</strong></td>
<td><strong>Reduced soil erosion/increased soil fertility and productivity on farm or in forest reserves?</strong></td>
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<tr>
<td></td>
<td><strong>Changed grazing patterns (fodder production, less/more in forest reserves)?</strong></td>
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<td></td>
<td><strong>Any hydrological changes (seasonal stream flows, springs)?</strong></td>
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<tr>
<td></td>
<td><strong>Increased biodiversity?</strong></td>
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<td></td>
<td><strong>Leakage – shifting of deforestation/fuel collection/agriculture/grazing elsewhere?</strong></td>
</tr>
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<td></td>
<td><strong>Any changes in livestock holdings/grazing/manuring patterns?</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Landscape level – soil erosion, rainfall patterns, erosion, soil fertility, water flows?</strong></td>
</tr>
<tr>
<td><strong>Socioeconomic co-benefits / challenges</strong></td>
<td><strong>Climate change adaptation/resilience (conservation farming, additional or diversified income, etc.).</strong></td>
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<tr>
<td></td>
<td><strong>New source of income (non-carbon payments)?</strong></td>
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<td></td>
<td><strong>Exclusivity (or lack thereof) of access to C and other benefits?</strong></td>
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<td></td>
<td><strong>Adequacy of benefits to members (what about non-members)?</strong></td>
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<td></td>
<td><strong>How are decisions made on expenditures (and who administers the money)? (Gender, etc.)?</strong></td>
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<td><strong>Is there dissent or good consensus/what have funds been used for?</strong></td>
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<td></td>
<td><strong>Income-generating opportunities (e.g., fruit, timber, NTFPs, honey, Group banking, earnings reinvestment)</strong></td>
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<tr>
<td></td>
<td><strong>Establishment of clear(er) land tenure rights (implications for land/C revenue as collateral; access to credit; inheritance value for family; etc.)?</strong></td>
</tr>
</tbody>
</table>
| | **Financial security (assured buyer for carbon, timber, earnings reinvestment, access to**
<table>
<thead>
<tr>
<th>Topic</th>
<th>Study questions</th>
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<tbody>
<tr>
<td></td>
<td>• How will the community fund be used and administered? (GBM)</td>
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<tr>
<td></td>
<td>• Gender/intergenerational equity?</td>
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<td></td>
<td>• HH assets or other expenditures (e.g., school fees) now in evidence?</td>
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<td></td>
<td>• HH relationship impact?</td>
</tr>
<tr>
<td></td>
<td>• Difference in impact on wealthier/poor; educated/less; women/men; other?</td>
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<td></td>
<td>• Food security?</td>
</tr>
<tr>
<td></td>
<td>• Political/institutional context and implications – conflicts/contradictions?</td>
</tr>
<tr>
<td></td>
<td>• Power/responsibility allocation?</td>
</tr>
<tr>
<td></td>
<td>• Power dynamic vis-à-vis HH use of funds, land allocation, land use, women’s/traditional/political leadership, etc.?</td>
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<tr>
<td></td>
<td>• Challenges or negative outcomes/unexpected outcomes?</td>
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<tr>
<td></td>
<td>• Is there any negative impact of the project on the social and environmental set up of the project?</td>
</tr>
<tr>
<td>Measurement/documentation</td>
<td>• Is there any process for measuring or documenting co-benefits?</td>
</tr>
</tbody>
</table>
1. The first meetings between USAID, FCMC staff and the approved Team Leader were in mid-December 2012, after which iterations of a draft SOW were developed in consultation with a group of USAID/Washington officers.


3. March 5 – 9, **Phase 1, Kampala Uganda**; meetings with USAID/Uganda, ECOTRUST staff, ECOTRUST Board Members, Wildlife Conservation Society, Uganda Carbon Bureau, Moses Masiga (CCAFS). Identification of/interviews with two Ugandan consultants for Phase 2.

4. March 10 – 18, **Phase 1, Addis Ababa, Ethiopia**; meetings with USAID/Ethiopia, World Vision Ethiopia/World Vision Australia, World Bank, Environmental Protection Authority, Institute of Biodiversity Conservation, USAID Strengthening Land Administration Program. Identification of/interviews with two Ethiopian consultants for Phase 2.

5. April 4, USAID/Washington Agreement on proceeding with Phase 2

6. April 24 – May 10, **Phase 2 Uganda**.
   April 24 – 28; Kampala; field work planning, question development, logistics and travel/Team-Building.
   April 29 – May 1, Bushenyi: Local Government Natural Resource/Forestry officers; Bitereko Women’s Group and local non-participants, Kiyanga Tree-Planting Group and Village Chairman; visits to farms and household interviews.
   May 2 – May 5, Hoima: Local Government Environment and Forestry officers; ECOTRUST representative; Kidoma Conservation and Development Association; nursery group and Village Chairman; visits to farms and household interviews.
   May 6 – 10, Kampala – meetings with ECOTRUST, National Forest Authority/REDD+ Focal Point; Jane Goodall Institute, Nature’s Harness; planning and conduct of stakeholder verification / feedback workshop (8 May); wrap up with local consultants.

7. May 11 – 25, **Phase 2 Ethiopia**.
   May 11 – 14, Addis - field work planning, question development, logistics and travel/team building.
   May 15 – 20, Humbo: meetings with World Vision, Local Government agriculture, forestry and cooperative officers; Bossa Wanche and Abelo Longena Cooperatives, non-members, women, site visits.
   May 21 – 25, Addis – meetings with World Vision, USAID, REDD+ Focal Point, planning and conduct of stakeholder verification / feedback workshop (23 May); wrap up with local consultants.

8. May 26 – 30, **Phase 1, Nairobi, Kenya**; meetings with USAID/Kenya, REDD+ Focal Point (Ministry of Wildlife and Forestry), TIST staff, GBM staff, UNEP. Identification of/interviews with two Kenyan consultants for Phase 2.

9. June 12, US meeting with TIST principles for CAAC and I4EI.
10. **July 8 – 28, Phase 2 Kenya.**
   July 8 – 11, meetings with GBM, KFS, USAID, field work planning, question development, logistics and travel/Team-Building.
   July 12 – 13, Meru area; meetings with TIST field team, KFS, Lower Imenti CFA/TIST members and forest site, nursery, Moroga and Gikumene Cluster Group, farm visits/household interviews, quantifiers.
   July 14 – 17, Nanyuki area - TIST; meetings with TIST and non-TIST farmers, Kamangura cluster group trainer, Kiamariga and Mia Moja Clusters, farm visits/household interviews, quantifier.
   July 17 – 22, Nanyuki area – GBM; meetings with GBM team, KFS, Green Rangers, Muturakwa, Ontulili, Ebenezer and Karikia Nursery Groups, visits to three field sites.
   July 21 – July 28, meetings with Nature Kenya, ICRAF, planning and conduct of stakeholder verification / feedback workshop (25 July); presentation to USAID Economic Growth project forum, wrap up with local consultants, and with international team.

11. **In US:** August 19, phone conversation with CAAC CEO; September 5, meeting with Lini Wollenberg (CCAFS/University of Vermont); September 10; preliminary informal presentation to USAID and FCMC of study findings.

12. **November/December 2013:** draft stakeholder report distributed to USAID/Washington and project proponents for comment; final draft prepared.

13. **January 2014:** Presentation to USAID/Washington (14 January); report distributed to three USAID Missions for feedback; draft USAID programmatic report and study brief prepared.

14. **March 2014:** USAID final review of drafts and finalization of report.