CCBA Project Implementation Report
for
TIST Program in Kenya
CCB-001, Verification 02

for verification under
The Climate, Community and Biodiversity Standard
Second Edition

13 January, 2016

Project Title	TIST Program in Kenya, CCB-001
Project Location	Kenya: Counties of Kirinyaga, Laikipia, Meru, Nyeri, Tharaka Nithi
Project Proponent	Clean Air Action Corporation Charlie Williams P.O. Box 4607 Tulsa OK, USA 74159 Telephone 918-747-8749 CharlieWilliams@CleanAirAction.com Tist.org
Auditor	EPIC Sustainability Services Private Limited (EPIC) Dr. G.Vishnu No. 41, Anugraha, Sundar Nagar, First Cross road, Near BEL Circle, Bengaluru – 560054 Karnataka State, India Telephone: +91-95909-29935 vishnu@epicsustainability.com, director@epicsustaianbility.com epicsustainability.com
Project Life	30 years starting 01-January-2004 and ending 31-December-2033
PIR Period	01-January-11 to 11-August-2015
CCB Status	**Validation:** 09-March-2012 **Verification 01 Period:** 01-January-2004 to 31-December-2010 **Verification 01 Issuance:** 64,501 VCUs on 14-July-2011
CCB Edition	Second Edition
Summary Benefits	**Climate:** 184,839 total gross reductions under VCS Standard. **Community:** New sustainable revenue streams; improved food security from Conservation Farming, fruits, nuts and honey; other tree products such as fodder, poles and fuel; capacity building; sustainable wood lots; health training; improved stoves. **Biodiversity:** New indigenous trees, improved connectivity with the protected forest, net improvement to biodiversity.
Gold Level	Exceptional Community Benefits: Demonstrated to be pro-poor in a poor area and with net positive impacts on community. Survey results show that participants experience a range of economic benefits and positive social impacts, regardless of socioeconomic status, gender or part of more vulnerable groups.
PIR Date	13-January-2016
PIR Version	Version 04 of the Verification 02

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Project Overview

The International Small Group and Tree Planting Program (TIST) empowers Small Groups of subsistence farmers in India, Kenya, Tanzania, and Uganda to combat the devastating effects of deforestation, poverty and drought. Combining sustainable development with carbon sequestration, TIST already supports the reforestation and biodiversity efforts of over 70,000 subsistence farmers. Carbon credit sales generate participant income and provide project funding to address agricultural, HIV/AIDS, nutritional and fuel challenges. As TIST expands to more groups and more areas, it ensures more trees, more biodiversity, more climate change benefit and more income for more people.

Since its inception in 1999, TIST participants organized into over 10,000 TIST Small Groups have planted over 15 million trees, on their own and community lands. GhG sequestration is creating a potential long-term income stream and developing sustainable environments and livelihoods. TIST in Kenya began in 2004 and has grown to over 58,000 TIST participants in over 7,900 Small Groups.

As a grassroots initiative, Small Groups are provided a structural network of training and communications that allows them to build on their own internal strengths and develop best practices. Small Groups benefit from a new income source; the sale of carbon credits that result from the sequestration of carbon from the atmosphere in the biomass of the trees and soil. These credits have been approved under the Voluntary Carbon Standard and, because they are tied to tree growth, will be sustainable. The carbon credits create a new 'virtual' cash crop for the participants who gain all the direct benefits of growing trees and also receive quarterly cash stipends based on the GhG benefits created by their efforts. The maturing trees and conservation farming will provide additional sustainable benefits that far exceed the carbon payments. These include improved crop yield, improved environment, and marketable commodities such as fruits, nuts, and honey. TIST utilizes a high-tech approach to quantify the benefits and report the results in a method transparent to the whole world, which includes palm computers, GPS, and a dynamic "real time" internet based database.

This project description is for a subset of the TIST Kenya program and corresponds to TIST VCS project description KE-VCS-001, 002, 004 and 004. It originally applied to 1,078 of the Small Groups, 8,047 members, 4,264 project areas and 1,565.2 ha.

General Section

G1. Original Conditions in Project Area

G1.1 General Information, location of the project and basic physical parameters. See PD.

G1.2 General information, types and condition of vegetation within the project area. See PD.

G1.3 General information, boundaries of the project area and the project zone. See PD.

G1.4 Climate Information, baseline carbon stocks. See PD.

G1.5 Community information, description of communities in project zone. See PD.

G1.6 Community Information, current land use and customary and legal property rights. Kenya's land system is undergoing a transformation from a communal-based system to a system in which individuals hold title to their land. Approximately 80% of Kenya has been converted to an individual land-based system. As such, most individuals in Kenya hold title to the land under land title statutes. The remainder own their land under customary tenure.

The project zone has been long settled and has not been subject to the land rights disputes that have occurred in some areas of Kenya.

The following details the relationship between the land owners, TIST members and Project Participants.

- Each project area is a tree grove planted by a Small Group. It is either owned by the member, or a family member, or is being used with the permission of the land owner.
- The Project Participants do not own any of the land. TIST is a project name, not a legal entity, and does not own any of the land.
- The landowner covenants together with other farmers to form a Small Group. The Small Groups own the trees that they plant and determine how tree products and carbon revenues are divided among themselves.
- Host Country land law is silent as to the ownership of carbon and carbon pools. However, the Small Groups own the trees that they plant together and grant the rights to all carbon associated with TIST to Clean Air Action Corporation (CAAC) under a "Carbon Credit Sale Agreement."
- Under Paragraph 4 of the "Carbon Credit Sale Agreement," the members affirm their ownership or rights to the land designated as project areas.
- CAAC is registered as a branch in Kenya under the Companies Act and is a legal entity in Kenya.
- Under the associated VCS PD, VERs shall be issued to CAAC.
- The current land use is agricultural.

G.1.7 Biodiversity Information, current biodiversity within the project zone. The following is from the first verification report. In accordance with the 2nd Edition Standards, it describes the "original conditions at the project area and the surrounding project zone before the project commences" and, by definition, it is unchanged from the first verification.

Kenya is widely known for its abundant and diverse wildlife, especially large mammals. Although many of these animals are occasionally present in the project zone, the long history of human habitation and agriculture have pushed them to isolated pockets of protected areas such as the Mt Kenya National Park, Mt Kenya Forest, Meru Forest, Upper Imenti Forest, Nyambini Forest and Ndare Forest. Human animal conflicts are present in the general area. For example, there are many long distance fencing systems present in the Meru area to keep elephants away from areas of human habitat. Both the project areas and

the non-protected parts of the project zone are lands under the control of subsistence farmers, where wildlife has been long removed and replaced by domesticated animals and plants.

The native ecology of the project zone that is located on the slopes of Mt Kenya and on the northeast trending highlands that pass through Meru and include the Nyambeni Hills, are in the East African montane forest.[1] The lower altitude areas in the vicinity of Nanyuki and Naro Moru are part of the Northern Acacia-Commiphora bushlands and thickets.[2] With the exception of some protected forests, little of the project zone that surrounds the project areas is in a natural state. This is due to high level of human activity, primarily for agriculture.

G.1.8 Biodiversity Information, High Conservation Values and attributes. The following is from the first verification report. In accordance with the 2nd Edition Standards, it describes the "original conditions at the project area and the surrounding project zone before the project commences" and, by definition, it is unchanged from the first verification.

Mt Kenya and the surrounding protected forest have High Conservation Values. The core of the mountain is located within Mt Kenya National Park. The lower flanks of the mountain are within the Mt Kenya Forest reserve, which also serves as a buffer between the park and populated farmland where the TIST project areas are located. Extending to the northeast towards the Nyambeni range and Meru National Park are a series of gazetted forests that serve as wildlife corridors. They include the Upper Imenti, Meru and Lower Imenti Forests. To the southwest of Mt Kenya is the Nyeri Forest that helps form a corridor to the Aberdare National Park and Forest.

The HCV of Mt Kenya is recognized. The national park was established in 1949. It was designated as a UNESCO biosphere reserve in 1978 and was made a UNESCO World Heritage Site in 1997. As the second tallest mountain in Africa, it is a vital water catchment for Nairobi and central Kenya. At 17,057 feet and straddling the equator, it provides diverse ecosystems ranging from African savannah to alpine glaciers.

Aberdare National Park was established in 1950. The mountains in which it is located are considered one of the five "water towers" of Kenya.

Rare and Endangered Species: A list of rare and endangered species that are present in the project zone and, at one time, were potentially present in the project areas, was compiled through review of the literature and discussion with local experts. Field observations by TIST staff, discussions with forest department officials and villagers indicate the absence of any endangered or rare species in the project areas.

Table G.1.8. IUCN Red List of Threatened Species

Scientific Name	Common Name	Status
Mammals		
Acinonyx jubatus	Cheetah	VU
Bdeogale jacksoni	Jackson's Mongoose	NT
Caracal aurata	African Golden Cat	NT
Ceratotherium simum	White Rhinoceros	NT
Crocidura allex	East African Highland Shrew	VU
Crocidura fumosa	Smoky White-toothed Shrew	VU
Diceros bicornis	Black Rhinoceros	CR
Eidolon helvum	Straw-coloured Fruit Bat	NT
Equus grevyi	Grevy's Zebra	EN
Eudorcas thomsonii	Thomson's Gazelle	NT
Grammomys gigas	Giant Thicket Rat	EN

[1] World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0108_full.html
[2] World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0711_full.html

Scientific Name	Common Name	Status
Hippopotamus amphibius	Hippopotamus	VU
Hyaena hyaena	Striped Hyaena	NT
Litocranius walleri	Gerenuk	NT
Loxodonta africana	African Elephant	NT
Lycaon pictus	African Wild Dog	EN
Oryx beisa	East African Oryx	NT
Otomops martiensseni	Large-eared Free-tailed Bat	NT
Panthera leo	Lion, African Lion	VU
Panthera pardus	Leopard	NT
Surdisorex norae	Aberdare Mole Shrew	VU
Surdisorex polulus	Mt. Kenya Mole Shrew	VU
Taphozous hildegardeae	Hildegarde's Tomb Bat	VU
Tragelaphus eurycerus	Bongo	NT
Tragelaphus imberbis	Lesser Kudu	NT
Birds		
Acrocephalus griseldis	Basra Reed Warbler	EN
Aquila clanga	Greater Spotted Eagle	VU
Aquila heliaca	Asian Imperial Eagle	VU
Ardeola idae	Madagascar Pond-Heron	EN
Balaeniceps rex	Shoebill	VU
Cinnyricinclus femoralis	Abbott's Starling	VU
Circus macrourus	Pallid Harrier	NT
Cisticola aberdare	Aberdare Cisticola	EN
Euplectes jacksoni	Jackson's Widowbird	NT
Falco naumanni	Lesser Kestrel	VU
Francolinus sterptophorus	Ring-necked Francolin	NT
Gallinago media	Great Snipe	NT
Glareola nordmanni	Black-winged Pratincole	NT
Glareola ocularis	Madagascar Pratincole	VU
Gyps africanus	White-backed Vulture	NT
Gyps rueppellii	Rüppell's Vulture	NT
Macronyx sharpei	Sharpe's Longclaw	EN
Neotis denhami	Denham's Bustard	NT
Phoeniconaias minor	Lesser Flamingo	NT
Prionops poliolophus	Grey-crested Helmetshrike	NT
Rynchops flavirostris	African Skimmer	NT
Torgos tracheliotos	Lappet-faced Vulture	VU
Trigonoceps occipitalis	White-headed Vulture	VU
Turdoides hindei	Hinde's Pied Babbler	VU
Fish		
Alcolapia grahami		VU
Aplocheilichthys sp. nov. 'Baringo'		CR
Barbus sp. nov. 'Pangani'		VU
Labeo percivali	Ewaso Nyiro Labeo	VU
Labeo trigliceps		VU
Nothobranchius bojiensis	Boji Plains Nothobranch	VU
Other		
Bulinus browni	Gastropod	NT
Burnupia crassistriata	Limpet	VU
Euonyma curtissima	Gastropod	EN
Hyperolius cystocandicans	Frog	VU

Scientific Name	Common Name	Status
Lanistes ciliatus	Gastropod	NT
Malacochersus tornieri	African Pancake Tortoise	VU
Mertensophryne lonnbergi	Toad	NT
Phrynobatrachus irangi	Frog	EN
Pila speciosa	Gastropod	VU
Pisidium artifex	Bivalve	VU
Platycypha amboniensis	Montane Dancing-jewel	CR
Pseudagrion bicoerulans	Afroalpine Sprite	VU
Subuliniscus arambourgi	Gastropod	EN
Tropodiaptomus neumanni	Crustacean	VU
Plants		
Angylocalyx braunii		VU
Baphia keniensis		VU
Brucea macrocarpa		EN
Colpodium chionogeiton		VU
Colpodium hedbergii		VU
Commiphora pseudopaolii		NT
Commiphora unilobata		NT
Croton alienus		EN
Newtonia erlangeri		NT
Pandanus kajui		VU
Polyscias kikuyuensis	Parasol Tree	VU
Premna maxima		VU
Prunus Africana	Red Stinkwood	VU
Uvariodendron anisatum		VU
Vepris glandulosa		EN
Vepris samburuensis		VU
Vitex keniensis	Meru Oak	VU

Notes:

EW = Extinct in the Wild
CR = Critically Endangered
EN = Endangered
VU = Vulnerable
NT = Near Threatened

G2. Baseline Projections

G2.1 Most likely scenario. The following is from the first verification report. The 2nd Edition of the Standards states it is a baseline projection, i.e. "a description of expected conditions in the project zone in the absence of project activities." By definition it is unchanged from the first verification.

The most likely scenario without TIST was for the project areas to continue to be grasslands and cropland. The baseline field observation, as detailed in worksheet "Grove Summary", indicates the project areas were grassland and cropland prior to implementation of the project activity. As areas of long term and continuous human occupancy and activity, they have already undergone deforestation, loss of natural habitat and loss of biodiversity. Literature indicates that the project zone continues to undergo deforestation, loss of habitat and loss of biodiversity. It is projected that without the intervention of TIST, that under favorable conditions, at best, the landscape would remain the same. Under less favorable conditions, lands would continue to degrade. This baseline projection is supported by:

- The project areas are all private lands owned by subsistence farmers conducting the project activity, or on some sort of communal land that has been affected by human activity. The land has a history of farming and land use other than natural forest or long-term forestry.
- These lands are located in an area populated by subsistence farmers who use wood for their primary fuel. As supported by the references below in section G2.2, wood use, agriculture and increasing population have been key factors in deforestation.
- These factors lead to the conclusion that there is little reason to believe that the project areas would revert to forest without intervention.
- Without intervention there were no alternative uses of this land that could be reasonably expected.

G2.2 Document how project benefits would not have occurred without project. The following is from the first verification report. The 2nd Edition of the Standards states it is a baseline projection, i.e. "a description of expected conditions in the project zone in the absence of project activities." By definition it is unchanged from the first verification.

Additionality of TIST was proven using the "Assessment of Additionality" contained in Appendix B of Clean Development Mechanism Methodology AR-AMS0001, which demonstrates that the project activity would not have occurred in the absence of the proposed project activity.

There is a clear pattern of rural firewood use and forest degradation in Kenya that supports the case that deforestation, loss of natural habitat and loss of biodiversity on each individual project area would continue, and at best, stay the same without an intervention such as TIST. The lands of and surrounding the project areas had been degrading for decades, due to human intervention. Despite a series of forest policies that began in 1957,[3] forests in the TIST areas are in an extremely precarious position.

According to the Kenya environmental group, Green Belt Movement,[4] "at the turn of the 20th century, Kenya had a forest cover of well over 10%. Today, this has been reduced to a meager 1.7% due to deforestation, commercial agriculture, charcoal burning, forest cultivation and replacement of indigenous forest with exotic plantations."

According to the FAO[5], Kenya has lost over 12,000 ha of forest per year between 1990 and 2005, falling from 3,708,000 hectares to 3,522,000 hectares. Primary forest loss during that period averaged 2,400 hectares/yr, dropping from 742,000 hectares to 704,000 hectares. It was estimated that 26.6 million m^3 (over bark) of wood products was removed in 2005, which was equal to 9.5% of the country's growing stock. Of this, 24,256,000 m^3 (over bark) was removed or fuel wood.

The specific project areas are part of this environment. They are lands owned and used by the rural residents and are subject to constant pressure to provide fuel wood, food and livelihood for these subsistence-level farmers.

G2.3 Calculate carbon stock changes without project. The following is from the first verification report. The 2nd Edition of the Standards states it is a baseline projection, i.e. "a description of expected conditions in the project zone in the absence of project activities." By definition it is unchanged from the first verification.

The methodology used to calculate the changes in carbon stock is based on CDM small scale afforestation reforestation methodology AR-AMS0001 Version 05: *Simplified baseline and monitoring methodologies for*

[3] Abwoli Banana, Paul Ongugo, Joseph Bahati, Esther Mwangi and Krister Andersson, "Resource, Recourse And Decisions: Incentive Structures In Forest Decentralization and Governance In East Africa," page 5. Accessed November 5, 2009. http://pdf.usaid.gov/pdf_docs/PDACO151.pdf
[4] UNDP, "Community Action for Mt. Kenya Forest, the Environment and Sustainable Livelihoods," a UNDP GEF/SGP grant report. http://www.ke.undp.org/GEF-SGP/Compact_Summary_Green_Belt_Movement.pdf.
[5] Global Forest Resources Assessment, 2005 (FAO). http://www.fao.org/forestry/fra/fra2005/en/

small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands. As described in section G2.1, the most likely scenario for the project lands was to continue as agricultural land, subject to ongoing intervention through human habitation. As described in section G2.2, the project zone is undergoing a decrease in forest cover and therefore carbon stocks.

The conservative case for the change in baseline carbon stocks, without the project, was that the biomass and carbon in the cropland and grassland remain constant, and that the baseline trees continued to grow, unmolested and unaffected by actuarial mortality. Making reference to the worksheet "Baseline Strata," the baseline tree count was obtained and the mean diameter was calculated. Dividing the baseline tree count, by the total project area, yields a baseline tree density for the project. The average diameter of the baseline trees were grown at 0.5 cm per year, the biomass was calculated using the proper allometric equation and the tonnes of CO2 per hectare was calculated (see Baseline Tree worksheet). When calculated for the entire project, the conservative change in carbon stocks without the project was estimated to be 39,643 tons (see worksheet "Baseline Growth").

There are no non-CO2 emissions. The project does not use chemical fertilizers and the project does not own any vehicles or power equipment.

G2.4 Effect on communities without project. The following is from the first verification report. The 2nd Edition of the Standards states it is a baseline projection, i.e. "a description of expected conditions in the project zone in the absence of project activities." By definition it is unchanged from the first verification.

Without the project, 50,000 subsistence farmers in the project zone would not be participating in the sustainable development, reforestation and health training of TIST. The communities would not receive the added income that has been paid to the TIST farmers as a carbon stipend and they would not receive the 70% of the project profits, once the carbon sequestered in the trees is enough to sustain the project. This added income would not be available to help pay for primary education uniforms, secondary education, metal roofs and other necessities. The farmers would not have planted the over four million trees already documented by the project. They would not have built nurseries and grown millions of seedlings. They would not have begun to grow their own sustainable on-farm fuel supplies. They would not have started using FAO conservation farming practices, which have been documented to increase crop yields 2 to 10 times. They would not have received training in using more fuel efficient cooking stoves or received training on the effects of indoor cooking smoke. They would not have received training on HIV/AIDS, malaria, hygiene, clean drinking water and nutrition. They would not have had the opportunity for developing leadership skills and become Small Groups leaders regardless of gender, religion, education or general background.

Likely changes in water, soil and other locally important ecosystems, without the project, are ones of continued decline. Illegal harvesting of wood and charcoal in protected areas continues, supported directly or indirectly by the people who live in the project zone, because of their need for cooking fuel. The cutting of these trees leads to loss of soil stability and erosion. It also leads to a loss of water retention. The result is higher sediment load in the critical water supplies of the "five towers", loss of soil due to erosion and decrease in year-round water as run-off increases with each rainfall and less water is absorbed in the soil. Continued deforestation leads to loss of habitat and biodiversity. The project addresses each of these and is helping reverse or mitigate them.

G2.5 Effect on biodiversity without project. The following is from the first verification report. The 2nd Edition of the Standards states it is a baseline projection, i.e. "a description of expected conditions in the project zone in the absence of project activities." By definition it is unchanged from the first verification.

Biodiversity in central Kenya has been declining for decades. Although the Government of Kenya has passed laws and regulations to halt deforestation, they have not succeeded (see G2.2). The increasing population continues to put more pressure on existing biodiversity, the project zone and what little is left in the project areas. Without TIST, there would be four million less trees on sustainable woodlots that reduce

the pressure on protected high biodiversity areas. There would be one million fewer indigenous trees. Although the threatened species in the project zone are long gone from the project areas, the indigenous trees and additional forest cover will have a positive effect on them by improving connectivity and corridors among the protected areas.

G3. Project Design and Goals

G3.1 Summary of climate, community and biodiversity objectives. The following is from the first verification report. The project design and goals are unchanged from the first verification.

The objectives of TIST are to:

- increase biomass and carbon sequestered in project areas,
- provide a sustainable fuel wood supply for the members,
- provide a new source of revenue to the members from the sale of carbon credits,
- provide training in important social and health related subjects, and
- improve the biodiversity of the area by adding canopy and indigenous trees.

G3.2 Description of project activities. The following is from the first verification report. The project design and goals are unchanged from the first verification.

The project activities are:

- Nursery training and development. Farmers are trained on species selections and their benefits, on how to gather and prepare seeds, how to build and maintain nurseries. Special attention is called to the benefits of indigenous trees and trees that provide food and other regularly available products. This is to help reduce the cost of entry to farmers. Where nurseries are highly successful, farmers can sell their excess for additional revenue. This is the first step in tree planting for climate change and revenue enhancement.
- Tree planting. Farmers are trained to plant seedlings using the FAO conservation farming techniques. The trees will sequester carbon as they grow and address climate change. Increased canopy, new woodlots and new indigenous trees helps biodiversity. The carbon revenues and tree stipends paid to the members provide a new source of revenue.
- Selective use of tree products. The farmers own the trees and their products, such as nuts and fruits. They are permitted to use any deadwood. Use of trimming and thinning is permitted, as long is it is sustainable. All of these enhance income and some improve food security.
- Provide training social and health training. TIST conducts training seminars, cluster meetings and at Small Group meetings. They also use a newsletter for training and disseminating best practices. Besides subjects related to tree planting, training includes Conservation Farming, building and use of more fuel efficient stoves, malaria, HIV/AIDS, water quality, benefits of trees, erosion control, water quality, leadership skills, climate change and any other subject of interest to the members.

G3.3 Maps of project location and zone. The following is from the first verification report. The project design and goals are unchanged from the first verification.

Several tools are used to display the thousands of individual project areas.[6]

- Appendix 01. This is a Landsat 4/5 image of the project zone, with dots depicting the location of each discrete project area.
- Appendix 02. This is a Landsat 7 image of the project zone, with dots depicting the location of each discrete project area.

[6] http://www.tist.org/PD-KE-VCS-001-004%20Documents.php

- Appendix 03. This is a KML file for use in Google Earth that has the GPS track of each project area. Although the native format is for Google Earth, it is a GIS file that can be imported into other GIS programs.

G3.4 Project Lifetime. The TIST Program in Kenya, CCB-001 is a 60 year project beginning 01 January 2004 and ending 31 December 2063. It was first validated and verified on 11 April, 2011 by Environmental Services Inc. CCB-001 and covers the same TIST project areas as the VCS project TIST Program in Kenya, VCS-001, 002, 003 and 004. The first verification period was 1 January 2004 to 31 December 2010.

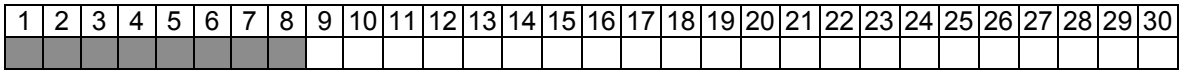
This PIR is for the second verification and covers the period 01 January 2011 to 11 August 2015. All of the carbon accounting is for this period and matches the period of the second verification under the VCS standard, dated 11 August 2015. The second VCS verification was conducted by EPIC Sustainability.

This project was fully implemented prior to the first verification. Activity between 01 January 2011 and the 30 year anniversary will be under the VCS Standard which is a 30 year program. Operations in the last 30 years (2033 to 2063) will be dependent upon the status of the voluntary carbon market.

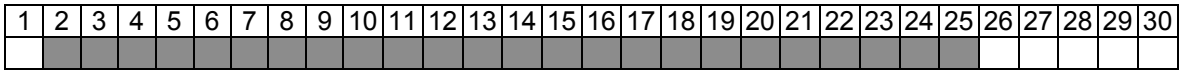
Between 2011-2063, we will conduct periodic verifications such as this one, in accordance with the minimum time frames required by the CCB and VCS standards. KE VCS-001-004 is not a programmatic approach and any project expansion will be focused on adding new groups, members and trees within the original PAs. We will continue with regular monitoring and training, holding regular training and having ongoing and regular consultation with stakeholders.

The following Gantt charts show the timing of annual events for the project. The numbers along the top of each chart are years. Where "project" is indicated in the title, it is for the 30-year project life. Where "project area" is indicated, it is for events that might take place within a project area and the year one may be an event rather than the beginning project date. With all the different project areas, species, farmers and planting schedules, these charts are very general and subject to change.

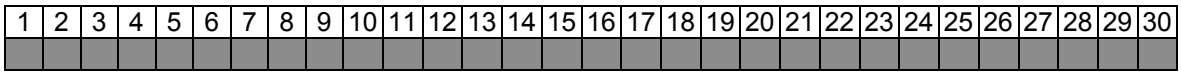
Main planting schedule (project). Main planting has taken place, but additional planting may take place in individual project areas, over the next few years, where the original planting density is low.



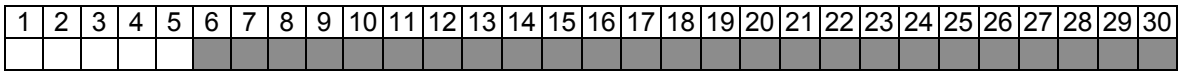
Replacement planting schedule (project). Replanting will take place where project trees die and there is sufficient area where existing crown cover won't inhibit successful growth.



Monitoring (project). Monitoring is ongoing.



Verification (project). Future verifications will take place within 5 years of the previous verification, and sooner as the market warrants.



Thinning (project area). Thinning is allowed, because it improves tree growth. Because of the different species and their different growth rates, the different planting schedules, the different original spacing and different farmers, thinning is ongoing.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Fruit and nut harvest (project area). Fruits, nuts or other products will be harvested whenever they exist.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

Deadwood harvest (project areas). Farmers may harvest deadwood any time it exists.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

G3.5 Natural and human-induced risks. The long term sustainability of TIST is dependent upon a carbon market for afforestation/reforestation credits. As of the date of this verification, the market for CDM-based AR credits is essentially nonexistent. AR credits have been locked out of the largest trading system (i.e. the EUETS) and buyers have no practical use for the currency (i.e. tCERs). The market for VCS credits exists but, by definition, is dependent upon the entities buying credits to voluntarily offset their carbon emissions. An expected US market may or may not materialize and, if it does, may or may not allow AR credits.

TIST is different than most AR projects in that it was created for small scale subsistence farmers. Because of the rules of CDM, many of the farmers in this PD have project areas too small to meet the Host Country definition of a forest. Should VCS, or a possible US program, put the same limitation on size, many of the farmers in TIST will no longer be eligible to participate in the carbon market and will lose the financial incentive to participate in the program. TIST has mitigated this risk by achieving what it has at the lowest costs possible. Rather than using expensive Western experts, it has deployed a sophisticated, yet easy to use, monitoring system and relies on capacity building with the Small Group members and their desire to improve their lives.

Another risk is that farmers will drop out of the program. This is mitigated by the fact that there are thousands of individuals involved already and TIST continues to grow. Having a few farmers quit will not have a significant effect on the project.

Natural risks include drought, pestilence and fire. These, however, are mitigated by the fact there are thousands of individual project areas spread over thousands of square kilometers.

A risk analysis for the PIR period was conducted for VCS KE 001, 002, 003 and 004 and verified by EPIC Sustainability.[7] It indicates the project has a low risk.

G3.6 Maintenance of the high conservation value attributes. Ongoing deforestation in Kenya is a fact. The project areas have been settled for generations and little, if any, of the natural biodiversity exists. The continued need for wood and the expanding population has carried the deforestation into the protected forest, having a negative effect on biodiversity there, too. TIST is reversing this trend by planting millions of new trees, many of them indigenous. While some parties have raised barriers to prevent AR credits from participating in a global carbon market, TIST has recognized that nearly 20% of deforestation is a result of

[7] See "TIST KE PD-VCS-001j App09 Verif 02 Risk Analysis 150813.pdf", "TIST KE PD-VCS-002j App09 Verif 02 Risk Analysis 150813.pdf", "TIST KE PD-VCS-003j App09 Verif 02 Risk Analysis 150813.pdf" and "TIST KE PD-VCS-004j App09 Verif 02 Risk Analysis 150813.pdf" for the risk reports for this period submitted to VCS.

the need for wood for cooking and heating. This type of program is the only way to provide the resources needed by this vast population of subsistence farmers, as well as make a positive impact on biodiversity.

TIST trees are planted on the lands of small hold farmers, so the maintenance of HCV areas is indirect. TIST trees are being planted where deforestation has taken place. The addition of indigenous trees, tree cover and fruit trees enhance biodiversity by providing an expanded range for some of the animals that rely on the HCV area. In addition, the many discrete project areas help improve the wild life corridors between HCV areas needed for healthy animal populations.

G3.7 Measures to maintain benefits beyond the project lifetime. TIST is a comprehensive program that includes training in climate change and biodiversity. The following describes some of the training and their benefits.

- Training in the benefits of specific tree species results in more trees selected that have a value other than as harvested wood or for carbon revenue. Examples include: macadamia trees for their nuts, citrus trees for their fruits and *Croton megalocarpus* as a source for biofuels.
- Training in the maintenance of a sustainable woodlot. Wood and charcoal are some of the greatest expenses for subsistence farmers. Learning the value and convenience of a sustainable woodlot ensures that it is maintained beyond the life of the project.
- Training in the benefits of biodiversity helps the farmers make the choice to keep trees, rather than cut them down. The benefits include more productive soil, return of edible indigenous plants, enhanced area ecotourism, and return of native wildlife that is useful to them personally (e.g. bees).

Each of the above provides reasons for the farmers to keep and manage their trees beyond the project lifetime and without the need for on-going carbon payments.

G3.8 Communities and other stakeholders. Membership in TIST is completely voluntarily. The actions that members take are on their own land. They maintain ownership of the land, the trees planted for sequestration and all the products that the trees yield. TIST exists for the local farmers and only grows if the local farmers support it. The rapid growth of TIST is a reflection of the positive reaction that the farmers and other stakeholders have had about TIST.

When TIST begins in an area, they contact community leaders, village heads/village leaders, local NGOs and local government officials to determine if there is an interest in the program. If there is an interest, TIST holds a public seminar to present the program, answer questions, address concerns and receive comments. This is followed by regular and ongoing meetings where the public is invited to attend. TIST representatives have met with numerous State, District and Village officials seeking comment and showing them the project. Since TIST is organic in its growth, this process continues as it expands to new villages. In addition to the meetings, information about TIST is disseminated by word of mouth; using the “Mazingira Bora,” a multi-lingual newsletter published by TIST Kenya; and direct contact with community leaders and government officials.

The original TIST program was started in Tanzania, in late 1999, to meet local needs in a sustainable way, while at the same time addressing climate change. In February 2004, TIST was invited to begin the project in Kenya. At that time, a trip was made around Mt Kenya where community leaders in Meru and Nyeri were briefed on TIST to gauge the level interest that local farmers might have. They asked to spread the word about the program and if there was grass roots interest, prospective members were invited to begin planting trees. Between February 2004 and February 2005, additional meetings were held with community leaders and government offices such as the Forest Department.

The first TIST seminar of TIST Kenya was held in Nanyuki from February 21, 2005 to February 26, 2005. The seminar began with the process of customizing TIST to the desires and needs of farmers in the Meru and Nanyuki areas. Seventy-three people attended, 40 men and 33 women. A second training seminar

was held April 11, 2005 to April 14, 2005 at the Gitoro Conference Centre in Meru. Seventy-five people attended, 39 men and 36 women.

In February 2005, the first "Mazingira Bora" was published and circulated within the communities to TIST members and those interested in the program. Since that time, TIST has published regular newsletters that document an ongoing dialogue and support with members of the community, both inside and outside the program. These documents are available to the public in a transparent form on the internet at tist.org.[8] TIST also has a collection of written stakeholder comments (see PD).

At the Small Group level, member farmers meet with TIST representatives regularly at Cluster meetings, where they have an opportunity to ask more questions and make more comments. Since one of TIST's main focuses is adopting best practices, these are forums to review what is working about the program and how it can be improved. Changes to the program are announced in the newsletter.

TIST has four CCBs in Kenya and a public meeting was held for each. Although each PD is a different subset of TIST Kenya, the announcements for the meeting and solicitation for comments were basically the same. They were all advertised in a major Nairobi paper and e-mails were sent to major stakeholder groups. (See the PIR for the first verification for an example[9]).

The result of this stakeholder process has led to numerous invitations for TIST to come to new villages and numerous positive comments about TIST. There have been no negative comments received. Based on the comments and responses above, no changes were necessary for the project.

G3.9 Publicizing the CCBA public comment period. TIST announced the intent to verify this project in two major Nairobi papers and in an email to stakeholders.[10] We solicited comments on behalf of CCB. In addition, TIST maintains a publicly accessible webpage that lists and contains all of the documents associated with this and the associated VCS project.[11] It includes the PDDs, PIRs, maps, KML files, risk reports, spreadsheets, monitoring reports, verification reports and appendices. The web link to this page will be made available as part of the public notification.

No negative comments were received during the comment period.

G3.10 Handling unresolved conflicts and grievances. All grievances are first brought to the attention of the Kenya Staff where the issues are compared to standard TIST policy, TIST values[12] and/or the Greenhouse Gas agreement among the Small Group members and CAAC. The policies and values are the subject of training at seminar, cluster meetings, Small Group meetings and are published in the newsletter. Unresolved issues are presented to TIST Management. Where precedence or policy exists, they are used in final decision making. Where new issues arise that are outside the existing precedence, or policy, the issue is brought to the next seminar or Leadership Council meeting, where decisions are made by representatives of the Small Groups, Kenya Staff and TIST Management. If conflicts or grievances cannot be resolved internally, CAAC will submit to arbitration in through the Chartered Institute of Arbitrators, Kenya Branch within 30 days for notice by the aggrieved party indicating they wish to appeal the internal process.

TIST has not received any formal grievances during this verification period.

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[8] http://www.tist.org/moreinfo.php

[9] See "TIST KE PD-CCB-Spt 14a Public Comments PD-001.doc" at http://www.tist.org/PD-KE-VCS-001-004%20Documents.php

[10] See "TIST KE PD-CCB-Spt 14f Public Comments PD-001-004 V02.doc" at http://www.tist.org/PD-KE-VCS-001-004%20Documents.php

[11] http://www.tist.org/PD-KE-VCS-001-004%20Documents.php

[12] TIST Values: We are Honest. We are Accurate. We are Mutually Accountable. We are Transparent. We are Servants to each other.

G3.11 Project Financial Support. TIST began, in late 1999, on the expectation that once the trees were large enough, the project would be self-funding. A series of financial projections were developed that showed that after 6 to 10 years (depending on different financial cases regarding market price, growth rate, tree mortality, etc.) the project would be sustainable based solely on carbon revenues. The key to success was very low costs. TIST has designed the program to minimize cost, developing an award winning monitoring system, building Host Country capacity and relying on voluntary effort. Still, there was a cash shortfall in the early years of the project. This was made up by external sources. CAAC provided funding to make up this shortfall on the carbon side, through its own profits and advanced sales of credits. I4EI provided sustainable development funding that offset much of the project costs, obtaining funding through USAID and private donors.

USAID cash funding ended in June 2013. Since that time TIST has been operating the project solely from carbon revenues. Confidential internal financial projections indicate the rate of TIST tree growth and sequestration is sufficient to provide enough credits over the life of the project to fund the project. We revisited the Financial Plan submitted with the PD and note that we are behind on the volume of credits created and on the market price per ton. On the former, much of this is due to the fact that many project areas could not be validated in time to make a VCS cut-off date and are not in the market yet. However, we have been working with another standard and hope to rectify that soon. Regarding the latter, because TIST has been regarded in the market as an excellent project (voted best offsetting project in 2013), we have been receiving premium prices and nearing the $8 target in the Financial Plan.

The value of the 92,635 VCUs generated under the second VCS verifications to which this CCB verification applies, has about the same value as our entire annual operating budget (all TIST projects in all countries). Concurrent with this verification we are undergoing the second verification of two other Kenya PDs that should generate another 227,000 VCUs. In addition, we have almost 90,000 issued VCUs in inventory and over the next 6 months we expect to create several others under VCS. Our projections continue to show TIST is sustainable and self-sufficient for the life of the project.

G4. Management Capacity and Best Practices

G4.1 Project Proponent. See PD.

G4.2 Document key technical skills for successful implementation. The key technical skills required for the successful implementation of TIST are:

- knowledge of tree planting;
- knowledge and skills related to monitoring tree growth;
- knowledge and skills in carbon standards and writing PDs and monitoring reports
- using the TIST field monitoring system (hand helds and GPSs)
- computer skills to maintain the TIST Data System and extract information;
- how to provide training and the skills to train the Quantifiers and Small Group members;
- management skills and knowledge;
- financial skills and knowledge;
- marketing skills and knowledge; and
- legal and contract skills and knowledge.

TIST has been operating successfully for over 14 years and has expanded to four countries, 70,000 farmers and planted about 15,000,000 documented trees. The in-country staff and contractors are trained and experienced. An administrative structure is in place. The monitoring system developed by CAAC and used by TIST was honored in 2008 as a Computerworld Honors Laureate. In 2011 the TIST program was "First in the World" to be dually verified under the VCS and CCB standards and the first to be verified under the CCB Second Edition. We now have 14 validated and verified VCS-CCB projects, five of them group projects and 13 certified CCB Gold for exceptional community benefits. We have four verified CCB projects in Kenya, two in Uganda and one in India. In 2014, TIST was voted Best Offsetting Project in a

global survey conducted by Environmental Finance. This verification is the second one for this CCB project.

G4.3 Developing Local Capacity. TIST does not have an expatriate staff and only has 4 full time employees in the US. The Kenya program is run by Kenyans. TIST began in the area with a series of orientation seminars. TIST members were introduced to the program and participate in the customization of the program to the locale. Virtually all of the local staff was hired from the TIST membership. All quantifiers and trainers are from the local membership. Staff and quantifiers were hired based on ability, not gender, tribe, cultural background, or level of education. However, all effort is made to ensure a balance in gender and tribal affiliation. Training is passed on to new workers through the seminars and working with an experienced TIST member. As needed, the US team holds seminars to provide new information.

Quantifiers receive ongoing training as needed and attend a training seminar at least once per year. During these seminars, they are trained on the TIST monitoring plan which includes use of the PDAs and GPS, use of the custom data collection software, how to maintain their data, synchronizing their data with the TIST server, the importance of good data, taking tracks of the project area perimeters, taking secondary track of the project area perimeters, counting trees, the importance of proper tree counts, identifying tree species and tree ages, taking proper circumference measurements, keeping accurate expenses, GhG contracts and any new program initiatives.

Small Groups training is ongoing. The Small Groups are all assigned to "clusters," an administrative unit within walking distance of a central point. The cluster meetings are supposed to be held monthly and while that does not always happen; they take place at least once per year at each cluster. While attendance is voluntary, Small Groups are encouraged to send representatives to every meeting. Training includes conservation farming, biodiversity, cook stoves, the GhG contract, climate change, selecting tree species, the benefits of different species, preparing nurseries, tree management, HIV/AIDS, malaria and other subjects of interest to the members.

G4.4 Equal Opportunity Employment. The Kenya program is run by Kenyans. TIST members are utilized as volunteers, independent contractors and employees based on achievement, not gender, education or social status. The 50-plus Cluster Servants (formerly termed Quantifiers) are TIST farmers trained to use the monitoring system and hired based on ability, not gender, religion or tribal affiliation. TIST farmers are trained as trainers. Cluster meetings and Small Group meetings are run by Kenyans. All TIST members have an opportunity to be group leaders, regardless of education or gender. TIST holds regular training seminars and makes a concerted effort to make sure attendance has a gender balance.

During the Verification Period, four new Cluster Servants were added. Three of them were female. They were nominated by the democratically elected leaders of the Clusters that they would support. Since they are from the area of the Cluster (to reduce travel needs) they are generally of the prevailing tribe. As such, most of the farmers on the west side of Mt Kenya are Kikuyu and the farmers on the east side are Meru giving TIST an overall mix of tribal affiliations.

G4.5 Relevant workers right laws. The relevant laws are:

- The Employment Act, 2007
- Regulation of Wages and Conditions of Employment Act
- National Hospital Insurance Fund Act, 1998

Most of the Kenyans working for TIST knew their rights before starting employment. Even so, CAAC uses an employment contract that was vetted by local counsel that reiterates the more important parts of the relevant employment law such as salary, types of leave, rest days and termination. Quantifiers are independent contractors. Their contract has been reviewed by local counsel. Workers are given the contract to read well in advance of signing and given the opportunity to ask any questions about the terms.

CAAC and TIST meet or exceed all applicable laws and/or regulations covering worker rights and all other relevant laws.

G4.6 Occupational Safety. TIST members are conducting activities that they normally do, i.e. farming using manual labor. TIST workers walk or use public transportation. They do not engage in activities that are inherently unsafe. The risks facing TIST workers are minimal and no different than those affecting anyone living in the area. Such risks include:

- riding in a matatu (the local mini bus transportation) where there is risk of crash or robbery;
- venomous or constricting snakes, which, although have been mostly eradicated from the farm lands, still can be encountered;
- elephants, which are present in the Meru area.

TIST has a Standard Operating Procedure to address safety.[13]

G5. Legal Status and Property Rights

G5.1 List of all relevant local, national and international laws. As a tree planting program that takes place voluntarily on existing farm land, there are few laws that are relevant to TIST. They are, however:

- The employment laws listed in G4.5. CAAC uses Kenya counsel to advise on issues relating to employment.
- Companies Act, (Law of Kenya Cap. 486). CAAC is registered as a branch and must remain in good standing to operate in Kenya.
- Environmental Management and Co-ordination Act, 1999.[14] In conformance with the Act, TIST submitted an EIA to the National Environmental Management Authority (NEMA) and because it received not further communication from NEMA, completed all of its obligations under the Act.

As a recipient of a USAID award, I4EI was subject to:

1. Applicability of 22 CFR Part 226 (MAY 2005)
2. Ineligible Countries (MAY 1986)
3. Nondiscrimination (MAY 1986)
4. Nonliability (NOV 1985)
5. Amendment (NOV 1985)
6. Notices (NOV 1985)
7. Subagreements (JUN 1999)
8. OMB Approval Under The Paperwork Reduction Act (DEC 2003)
9. USAID Eligibility Rules for Goods and Services (APR 1998)
10. Debarment, Suspension, and Other Responsibility Matters (JAN 2004)
11. Drug-Free Workplace (JAN 2004)
12. Equal Protection of the Laws for Faith-Based and Community Organizations (FEB 2004)
13. Implementation of E.O. 13224 -- Executive Order on Terrorist Financing (MAR 2002)
14. Marking Under USAID-Funded Assistance Instruments (DEC 2005)
15. Regulations Governing Employees (AUG 1992)

[13] see "TIST KE PD-CCB-Spt 13 Quantifier Safety 110110.doc"

[14] Environmental Co-ordination and Management Act states that all Kenyans have the right to a clean and healthy environment and sets up the administrative and legal structure to provide it. It sets up the National Environmental Management Authority (NEMA) to oversee this effort. It requires a national environmental plan and district plans. It also requires environmental impact assessments conducted by an authorized consultant for any project that is "out of character with its surroundings." Included in this category is "reforestation and afforestation." Relying on Section 59.8 and 59.9 of the Act, if there is no response from NEMA within 6 of submitting the EIA, the proponent may begin its undertaking.

16. Conversion of United States Dollars to Local Currency (NOV 1985)
17. Use of Pouch Facilities (AUG 1992)
18. International Air Travel and Transportation (JUN 1999)
19. Ocean Shipment of Goods (JUN 1999)
20. Local Procurement (APR 1998)
21. Voluntary Population Planning Activities – Mandatory Requirements (MAY 2006)

I4EI is subject to audit by the US government.

Directive regarding Eucalyptus and Riparian Lands. In March 2011, NEMA issued an Order on wetlands whereby "those encroaching into wetlands and adjacent riparian land to vacate." Pertinent to TIST is the instruction to remove "Eucalyptus trees from riparian land." NEMA directed the Water Resource Management Authority to "peg, mark and secure" all riparian lands subject to this order. At this time, no TIST project areas have been designated riparian lands and no TIST farmers have been told to remove any eucalyptus trees.

G5.2 Project Approvals. All project approvals were obtained prior to this PIR period. See PD.

G5.3 Document project will not encroach on other lands. CAAC and TIST do not own or lease any of the project lands. TIST takes place on the existing land of farmers and their families whom participate voluntarily. CAAC enters into contracts with the Small Group members. In the contract, the members attest in that they have the rights to plant on these lands.

G5.4 Involuntary relocation. CAAC and TIST do not own or lease any of the project lands. TIST takes place on the existing land of farmers and their families. Participation is strictly voluntary. CAAC has no authority or desire to relocate any of the members or land owners, and has not.

G5.5 Illegal Activities. Illegal harvesting of trees and charcoal making exist in the protected forests of the project zone. This is an ongoing problem for the Kenya Forest Service and is not related to TIST or caused by TIST. TIST, through its development of on-farm, sustainable, wood lots, will have a positive impact on these activities by providing an alternate, sustainable source of fuel to some of the population.

G5.6 Title to carbon rights. The carbon rights originally vest with the trees and are transferred to the Project Proponent with the “Carbon Credit Sale Agreement.”

Climate Section

CL1. Net Positive Climate Impacts

CL1.1 Change in carbon stock due to project activity. The change in carbon stocks due to project activities are based on AR-AMS0001 Version 06: *Simplified baseline and monitoring methodologies for small-scale A/R CDM project activities implemented on grasslands or croplands with limited displacement of pre-project activities* as adopted by the Voluntary Carbon Standard.

Change with the project. The change with the project is based on the ex-ante estimation required of the methodology. The trees to be planted are stratified by major species and year planted and each strata is grown over time, based on accepted annual volume increments. The following lists the major species and the factors used to estimate the carbon that will result from TIST trees.

Eucalyptus spp.

I_v = 32.5 m^3/ha/yr.[15]

Where: I_v = annual increment in volume based on over the bark log volumes.

BEF = 1.5.[16]

WD = 0.51 t.d.m/m^3.[17]

R = 0.45 when AGB <50 t/ha, 0.35 when AGB range is 50 to 150 t/ha, 0.20 when AGB >150 t/ha.[18]

Grevillea robusta

I_v = 12 m^3/ha/yr.[19]

Where: I_v = annual increment in volume based on over the bark log volumes.

BEF = 1.5.[20]

WD = 0.60 t.d.m/m^3.[21]

R = 0.27.[22]

Cupressus spp.

I_v = 24 m^3/ha/yr.[23]

Where: I_v = annual increment in volume based on over the bark log volumes.

BEF = 1.2.[24]

WD = 0.43 t.d.m/m^3.[25]

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[15] GPG-LULUCF, Table 3A.1.7. Average Annual Above Ground Net Increment in Volume in Plantations By Species, referencing L Ugalde & O Pérez, "Mean annual volume increment of selected industrial forest plantation species," Forest Plantation Thematic Papers, Working Paper 1. Forest Resources Development Service, Forest Resources Division. FAO, Rome (unpublished), Accessed 22 September 2010 at http://www.fao.org/DOCREP/004/AC121E/ac121e03.htm.

[16] GPG-LULUCF, Table 3A.1.10, Default Values Of Biomass Expansion Factors (BEF), Tropical, broadleaf.

[17] GPG-LULUCF, Table 3A.1.9-2**,** Basic Wood Densities (D) of Stemwood (Tonnes Dry Matter/M^3 Fresh Volume) for Tropical Tree Species, Tropical America, Eucalyptus robusta.

[18] GPG-LULUCF, Table 3A.1.8, Temperate broadleaf forest/plantation, Eucalyptus Plantation. AGB means aboveground biomass.

[19] Winrock International, "Fact Sheet, A quick guide to multipurpose trees from around the world," Fact 98-05, September 1998. ("Winrock Fact Sheet 98-05"). Accessed 22 September 2010 at http://www.winrock.org/fnrm/factnet/factpub/FACTSH/grevillea.htm.

[20] GPG-LULUCF, Table 3A.1.10, Default Values Of Biomass Expansion Factors (BEF), Tropical, broadleaf.

[21] Winrock Fact Sheet 98-05.

[22] GPG-LULUCF, Table 3A.1.8, Tropical/Sub-tropical dry forest.

[23] GPG-LULUCF, Table 3A.1.7, Average Annual Above Ground Net Increment in Volume in Plantations By Species.

[24] GPG-LULUCF, Table 3A.1.10, Default Values Of Biomass Expansion Factors (BEF), Tropical, Pines.

[25] GPG-LULUCF, Table 3A.1.9-2, Basic Wood Densities (D) of Stemwood (Tonnes Dry Matter/M^3 Fresh Volume) for Tropical Tree Species, Tropical America, Cupressus lusitanica.

R = 0.46 when AGB <50 t/ha, 0.32 when AGB range is 50 to 150 t/ha, 0.23 when AGB >150 t/ha.[26]

Other Africa, Dry Tropical

N_A = 15 t.d.m/ha/yr.[27]

Where: N_A = annual increment of above ground biomass, t.d.m/ha/yr

BEF = 1.5.[28]

WD = 0.60 t.d.m/m^3.[29]

R = 0.27.[30]

The age class of the strata is based on the age of the trees already planted and listed in worksheet "Strata." The data is tabulated in worksheets "Ex-Ante Carbon Est" and "Ex-Ante Strata Est" and presented in worksheet "Table CL1.1."

Change without the Project. The methodology allows the change in baseline carbon without the project to be ignored, providing it is less than 10% of the change in carbon that results from the project. The existing trees were recorded and measured during the baseline study (worksheet "Baseline Strata"). The non-woody areas were stratified and the area estimated (worksheet "Grove Summary). A conservative case was used to estimate the increase in carbon overtime (worksheet "Baseline Growth"). The ex-ante estimate of the baseline without the project is 2.3% of the ex-ante estimate with the project and the baseline case is ignored in the calculations.

Net change in Carbon Stocks. Due to the methodology, the change in baseline carbon is ignored and the ex-ante net change in carbon stocks is 1,699,076 tonnes of CO_2e.

CL1.2 Change in the emissions of non-CO_2 GHG emissions. The change in emissions of non-CO2 carbon stocks are below 5% and are ignored.

The potential source of methane is burning of biomass. Because the farmers planting the trees are subsistence farmers that rely on wood for cooking food, they do not engage in widespread burning; available wood is used for domestic fuel and just offsets fuel wood gathered from outside the project area. In addition, the burning of biomass is neither necessary for the project, nor promoted. Any methane emission will be de minimis and well below the 5% threshold.

N_2O is a potential source from chemical fertilizers. The policy of TIST is for the farmers to refrain from using chemical fertilizers, and instead, to rely on dung and plant material. Neither of these are the result of project activity and need not be considered.

CL1.3 GHG emissions resulting from project activities. In accordance with the methodology, ex ante leakage is assumed to be zero. TIST does not own any vehicles or fossil fuel equipment. Planting and site preparation is done manually. TIST promotes the use of natural fertilizers and does not supply any chemical fertilizers. N-fixing species will not be left to degrade. Any dead wood is used by the farmers for fuel wood.

CL1.4 Demonstrate a positive net climate impact. The ex-ante estimate is that TIST trees will sequester is 1,699,076 tonnes of CO_2e over the 30 years and will, therefore, have a net positive impact on the

[26] GPG-LULUCF, Table 3A.1.8, Conifer forest/plantation. AGB means aboveground biomass.
[27] GPG-LULUCF, Table 3A.1.6, Annual Average Above Ground Biomass Increment in Plantations By Broad Category, Africa, Other Species, Dry.
[28] GPG-LULUCF, Table 3A.1.10, Default Values Of Biomass Expansion Factors (BEF), Tropical, Pine.
[29] A sample set of tree counts by species planted by TIST farmers around Mt Kenya was obtained from the TIST database. The wood densities where tree counts of a species exceeded 500 trees were obtained and a weighted average was calculated. See Table 4.3.B.
[30] GPG-LULUCF, Table 3A.1.8, Tropical/Sub-tropical dry forest.

climate. The total net change through the end of the PIR Period is 183,556 tonnes and the net change for the PIR period is 92,635 tonnes.

CL1.5 Double Counting. The project areas that make up this CCB PD are being validated and verified under VCS. If they are validated and verified, VCS will issue VERs that will be entered on one registry. The registry rules will prevent these VERs from being sold twice.

Kenya is not subject to an emissions cap.

CL2. Offsite Climate Impacts (Leakage)

CL2.1 Potential Sources of Leakage. While no leakage is expected to result from the project, the potential sources of leakage are reviewed and the reasons why these don't apply to the project are presented.

- ***Activity shifting or displacement:*** The members of TIST are questioned, as part of the baseline survey, to determine if planting trees will cause shifting of activity or displacement. They have stated "no". In addition, the value of the carbon that the trees generate is very small compared to the value of the crops the land can provide. Since, by definition, these crops are the primary source of food for the farmers, the farmers will not displace their primary activity. Because membership is voluntary, there is no reason for any displacement to occur. While TIST farmers are encouraged to plant trees around their homes, they are never asked or encouraged to move from their residence.
- ***Market effects (particularly when timber harvest volumes are reduced by the project):*** The project areas are owned by the farmers and the trees are new sources of wood for them. The need for fuel wood is one of the main reasons Kenya has been undergoing deforestation. Farmers, either directly or indirectly, take wood from gazetted forest. The project allows the farmers to use the deadwood produced by their project trees providing a more convenient and lower cost fuel source and reducing the pressure on the gazetted forests.

CL2.2 Leakage mitigation. Because no leakage sources have been identified, no mitigation is necessary.

CL2.3 Subtracting unmitigated leakage. Because there is no expected leakage, the amount to be subtracted from the net climate impact of the project is zero.

CL2.4 Non-CO_2 leakage in excess of 5%. None have been identified.

CL3. Climate Impacts Monitoring

CL3.1 Initial Monitoring Plan. Because TIST was designed as a climate change project and has been operational in Kenya since 2004, the monitoring plan in this section is operational.

Each project area is owned and managed by a different group of people, which TIST calls Small Groups. The areas are discrete parcels of land spread out over many districts and villages. The Small Groups select the species of trees, the number of trees to plant and the planting schedule. They also own and maintain the trees and the tree products. While TIST works with the groups to develop best practices that can be shared and adopted by everyone in the organization, the fact remains that each project area is different. The difference is such that the monitoring system required is different than typical forest monitoring protocols.

TIST has met the challenge of obtaining accurate information from a multitude of small discrete project areas in remote areas, where roads are poor and infrastructure is minimal, by combining high-tech equipment and low-tech transportation within its administrative structure. The TIST Data System is an integrated monitoring and evaluation system currently deployed in Kenya and three other countries. On the front end is a handheld computer-based platform supported by GPS technology, that is utilized by field

personnel (quantifiers, auditors, trainers and host country staff) to collect most project information. This includes data relating to registration, accounting, training, tree planting, baseline data, conservation farming, stoves, GPS plots, and photographs. The data is transferred to TIST's main database server via the internet and a synchronization process where it is incorporated with historical project data. The server provides information about each tree grove on a publicly available website, www.tist.org. In addition, the other data is available to TIST staff through a password-protected portal.

The handheld computers have been programmed with a series of custom databases that can temporarily store GPS data, photographs, and project data. The interface is designed to be a simple to use, checklist format that ensures collection of all of the necessary data. It is simple enough for those unskilled in computers and high tech equipment to be able to operate, after a short period of training. The interface can also be programmed for data collection not specific to the project. The handhelds are "off the shelf," keeping their costs relatively low.

The synchronization process takes place using a computer internet connection. While office computers are used where available, field personnel commonly use cyber cafes, reducing travel time and improving data flow. Where available, cell phones using GPRS technology are now allowing synchronization from remote tree groves and project areas, providing near real-time data.

The TIST Data Server consists of a public side, accessible by anyone over the internet and a private side only accessible through a password-protected portal. On the public side, a dynamic database is used to constantly update the displayed data. Changes can be seen daily as new synchronizations come in. By mapping the project data with photos and GPS data, the results of each Small Group can be seen on a single page. The GPS data has been programmed with Google Maps to locate project activities anywhere in the world on satellite imagery.

On the private side, confidential accounting data, archive data and data not currently displayed is available. This is the source data for the custom reports and tables necessary for project managers.

The TIST database is off-site and has an off-site backup. The information collected and used for this monitoring program will be archived for at least two years, following the last crediting period.

Monitoring change in baseline carbon. The selected CDM/VCS methodology does not require monitoring of the baseline. As determined with the ex-ante calculation, the change in baseline carbons stocks is fixed at the value derived in section G2.3.

Monitoring selected carbon pools. The selected carbon pools are above ground and below ground biomass. The following monitoring plan is being used and will continue to be used.

Step 1. Because of the difference in species and age of the trees and location, ownership and management of the project areas, each project area shall be monitored. They are documented in "PA Summary " and "Ex-post Strata " worksheets, Appendix 11[31] of the VCS Monitoring Data. The boundary of the project area has been obtained with a GPS (Appendix 03), the area calculated and displayed in the "PA Summary " worksheet.

Step 2. The strata for the ex post estimation of the actual net greenhouse gas removals is by species and year. Stratification is done within each individual project areas. The area of a stratum in a project area ("area of a stratum (ha)") is determined by multiplying the area of project area (see Step 1) by the percentage of trees of that stratum in the respective project area.

Step 3. Where a tree species exceeds 10% of the total tree inventory, it is assigned to a Major Stratum. All other tree species are assigned to an "Other" stratum.

[31] TIST KE PD-VCS-00?l App11 Verif 02 Monitor Data 150811.xlsx where "?" is 001, 002, 003 and 004.

Step 4. Allometric equations are used to convert DBH values to biomass. An allometric equation for each Major Strata was identified. If a species specific equation for a Major Strata is unavailable, it uses the "Other" equation as a default. Based on research conducted for four previous TIST VCS projects in Kenya, the following are examples of the Major Strata and the allometric equations that may be used. The list will be updated as new, or more appropriate ones, become available.

Eucalyptus[32]: $Log\ Y = -2.43 + 2.58\ Log\ C$
Grevillea: no species specific equations, will use "Other" equation
Cupressus: no species specific equations, will use "Other" equation
Other (default)[33]: $Y = (0.2035 \times DBH^{2.3196}) \times 1.2$

Where:
Y= aboveground dry matter, kg (tree)-1
DBH = diameter at breast height, cm
C = circumference at breast height, cm
ln = natural logarithm
exp = e raised to the power of
1.2 = expansion factor to go from bole biomass to tree biomass

Step 5. The DBH of up to 20 trees per stratum, per project area, were measured. Height was not measured or used in the allometric equations. Each DBH value for each tree measured is applied to the appropriate allometric equation and the biomass of each per tree in the stratum is obtained and averaged to determine the "average above ground biomass per tree (kg)" of a stratum.

Step 6. For each stratum in each project area, the average above ground biomass per tree is multiplied times the number of trees to yield the "above ground biomass in stratum (kg)." The results are divided by 1,000 to obtain "above ground biomass in stratum (t)."

Step 7. The methodology requires the use of tons of biomass per hectare in a subsequent step. It is determined by dividing the "above ground biomass in stratum (t)" from Step 6 by the "area of the stratum" from Step 2.

$$\text{above ground biomass (t/ha)} = \frac{\text{above ground biomass in stratum (t)}}{\text{area of the stratum (ha)}}$$

Step 8. The above ground biomass of each stratum will be multiplied by 0.5 to convert biomass to carbon. The result is "above ground carbon" (t/ha).

Step 9. The carbon stocks of the below ground biomass of each stratum (t/ha) are calculated by multiplying the above ground biomass of each stratum (t/ha) by the appropriate roots to shoot ratio and by 0.5, the carbon fraction of the biomass. A root to shoot factor of 0.27 will be used.[34] The result is "below ground carbon" (t/ha).

Step 10. The total carbon stocks (CO2e) are determined by adding the above and below ground carbon (C) of each stratum in each project areas, multiplying each sum by the respective area of that stratum, converting the result to CO2e and summing the products. The following is the general equation required by the methodology.

[32] DH Ashton, "The Development of Even-aged Stands in Eucalyptus regnans F. Muell. in Central Victoria," Australian Journal of Botany, 24 (1976): 397-414, cited by Tim Pearson, Sandra Brown and David Shoch, in "Assessment of Methods and Background for Carbon Sequestration in the TIST Project in Tanzania," Report to Clean Air Action Corporation, (December 2004).
[33] Tim Pearson, Sandra Brown and David Shoch, in "Assessment of Methods and Background for Carbon Sequestration in the TIST Project in Tanzania," Report to Clean Air Action Corporation, (December 2004).
[34] GPG-LULUCF, Table 3.A.1.8

$$P(t) = \sum_{i-I}^{I} (PA(t)\ i + PB(t)\ i) * Ai*(44/12)$$

Where:

$P_{(t)}$ = carbon stocks within the project boundary at time *t* achieved by the project activity (t CO_2e)

$PA_{(t)}I$ = carbon stocks in above-ground biomass at time *t* of stratum *i* achieved by the project activity during the monitoring interval (t C/ha) from Step 8.

PB(t)I = carbon stocks in below-ground biomass at time *t* of stratum *i* achieved by the project activity during the monitoring interval (t C/ha) from Step 9.

Ai = project activity area of stratum *i* (ha) from Step 2.

I = stratum *i* (*I* = total number of strata)

The data to be monitored for monitoring actual net GhG removals by sinks are the number of trees in each project area and representative circumference. Because of the potential difference among project areas, the tree count of each project area is monitored. TIST has a staff of trained Quantifiers that visit each and every project area periodically. When quantifying a project area, they:

- Identify or confirm identification of the project area by its unique name combination of Small Group name and grove name (grove is the vernacular used by the project for a project area).
- Determine the latitude and longitude of the approximate center point of the project area with a GPS. It is automatically logged into the hand-held computer database for temporary storage.
- Map the boundaries of the project area by walking the perimeter using a GPS. The data is stored in the hand-held computer database for temporary storage.
- Count each tree in the project area by age and species strata. This data is entered by the operator directly into the handheld computer database for temporary storage.
- Measure the circumference of up to 20 trees in the age and species strata of a project area. This data is entered by the operator into the handheld computer database for temporary storage.

The data on the handheld computer database is uploaded to the TIST server, through the Internet, for additional processing and permanent storage.

The confidence and precision levels will be assessed in future monitoring.

The following table summarizes the monitoring plan.

Data/ Para-meter	Data unit	Descrip-tion	Source of data	Value of Data[35]	Measure-ment Methods[36]	QA/QC	Comment
Location	Latitude and longitud e	Single point location of the area where project activity has been implemente d	GPS	See "Grove Summary" worksheet for each result.	Go to each project area, take a single location point per area with GPS/PDA, up- load to server.	SOP, audit and multiple visits	The location of each project area is obtained with a GPS once during baseline.

[35] TBD means to be determined during quantification

[36] PDA means personal digital assistant, the hand held computer and custom software used by TIST

Data/ Para-meter	Data unit	Descrip-tion	Source of data	Value of Data[35]	Measure-ment Methods[36]	QA/QC	Comment
Project area	ha	Size of the areas where the project activity has been implemente d.	GPS	See "Grove Summary" worksheet for each result.	Go to each project area, take a track of the perimeter with the GPS/PDA, up load to server. Software computes area inside track	SOP, audit and multiple visits	The area of each project area is obtained with a GPS by walking and mapping the boundary of the project area once during baseline.
DBH	cm	Diameter of tree at breast height (1.30 m)	Measur-ing tape	Multiple values specific to strata taken from selected project areas	Ongoing measurement taken by quantifiers as they visit project areas	SOP, audit and multiple visits, multiple locations	TIST measures DBH of up to 20 representativ e trees of each age/species stratum in different project area at least once every five years.
No of trees	trees	Number of trees in a project area by strata	Physical count	See "Grove Summary" worksheet for current results. This number will change over time for each project area based on replanting and mortality	Physical count by Quantifiers with each visit	SOP, audit and multiple visits	counted at least once every five years.
Ownership	name	Ownership of land of project area	Project registra-tion data	See "Grove Summary" worksheet for each result.	Ask members about changes in ownership. Record on PDA	SOP, audit and multiple visits	List of owners of each PA, their contract status and the status of their carbon rights will be reviewed with each

Data/ Para-meter	Data unit	Descrip-tion	Source of data	Value of Data[35]	Measure-ment Methods[36]	QA/QC	Comment
							monitoring event to confirm ownership.
Total CO2	Mg	Total CO2	Project activity	Changes over time based on tree count, strata and growth	Calculated using allometric equations and conversion factors	See above for tree count and circum-ference. Calculation subject to verification.	Based on data collected from all plots and carbon pools at each verification.

Data will be maintained for at least two years following the end of the last crediting period.

TIST uses the following QA/QC procedures:

- **Quantifier Training:** Quantifiers receive explicit training in regard to TIST's Standard Operating Procedures so that quantifications are performed in a standard and regular fashion. The quantifier field manual/handbook is available online at www.tist.org under "Documents to Download" and is updated to reflect changes in internal procedures. Quantifiers meet monthly to discuss questions or problems that they may have and receive training and software updates when necessary. Quantifiers are not dedicated to a grove for the life of that grove and may be rotated to other groves.
- **Staff Audits:** TIST staff members are trained to quantify groves and have handheld devices that are programmed to conduct audits. A requirement of their job is to periodically audit quantifiers including an independent sampling of tree counts and circumference measurement.
- **Multiple Quantifications:** TIST's internal goal is to quantify each project area as often as possible during the 5 years required by the VCS and CCB standards. Inaccurate data and errors are self-correcting with the subsequent visits. If trees have died or have been removed, a new count will reflect the current population. The growth of the trees, as indicated by increased DBH, is monitored with these subsequent visits. If a species is mislabeled, it will arise as a conflict when different quantifiers attempt to perform tree counts for that grove that do not match the previous one. Comparisons are made over time to determine whether a particular quantification or tree count appears unrealistic.
- **Multiple Tracks:** In order to ensure that the location and perimeter of each discrete project area is accurate, each GPS track of the parcel is measured at least twice or until two tracks that reliably define the project area are obtained. Quantifiers are required to re-trace the tract with each quantification, to verify that they are at the correct project area and that they are counting the correct trees.
- **Double Counting:** To ensure that the same project area was not counted more than once, an overlap script was used that compares the outline of all project areas. If an overlap was detected, the project areas were visually compared. If an overlap is determined, the overlapping project area was removed from the PD.
- **Data Quality:** TIST Quantifiers count every tree in each discrete project area. Counting each tree is 100% sampling and provides greater than 1% precision, at the 95% confidence level. Up to 20 circumference readings, for each stratum, in a project area, were taken and archived to develop a localized database of growth data by strata. This data provides the circumference data for each stratum. This sampling exceeds the 10% precision, at the 95% confidence level, required by the methodology.
- **TIST Data System:** The data system is an integral part of TIST's quality assurance and quality control plan. The handheld devices are programmed in a manner that requires the data to be collected in a

step-by-step manner, increasing the likelihood that all the data are collected. Data field characteristics were defined to force the use of numbers, text or special formats. Drop down menus are used to restrict answers to certain subsets (e.g. a TIST Small Group name comes from a drop down menu). Some data fields were restricted to a range of data (e.g. negative numbers are not allowed). The data is uploaded within a day to the main database, providing timely reporting and secure storage of the data.

- **Desk Audit:** TIST developed and uses analytical tools for reviewing data, as it comes in from the field, to look at track data, tree counts, and completeness of data.
- **Transparency:** By providing the quantification data online and available to anyone with an Internet connection, TIST is open to audit by anyone, at any time. By providing the location, boundaries, tree count by species and circumference, any interested party can field check TIST data. This transparency and the actual visits that have already taken place provide a further motive to make sure the field data is correct.

Monitoring Leakage. Leakage was monitored within five years of the start of the project, by surveying the members responsible for a discrete project area, on whether participation in the program caused leakage, in the form of displaced activity. The answers were universally no. Because no leakage was identified, no further leakage monitoring is necessary.

CL3.2 Commit to developing a full monitoring plan. A full monitoring plan was developed prior to the first verification and is available as Appendix 06.[37] The following table provides the monitoring results as of the end of the PIR Period. Worksheet references are to the monitoring data spreadsheet used for the VCS verification that applies to the PIR Period.[38]

1. Total hectares of the project. 1,554 hectares PAs (1,012 active and 543 pending, "PA Summary" worksheet).
2. Number of discrete project areas (PA): 4,238 total active project areas (2,900 active and 1,338 pending, "PA Summary" worksheet).
    a. See Appendix 03 of VCS PDDs, track files of each PA in KML format (Google Earth).
    b. See "PA Summary" worksheet, "Latitude" and "Longitude" columns.
3. List of PAs including administrative information, tree counts, area and last monitoring date: See "PA Summary" worksheets.
4. Circumference Data: See "Circ" worksheets.
5. Tree data including count and species: Tree count is 753,900 (618,270 active and 135,630 pending PAs only). See "Ex-post Strata" worksheet for species detail.
6. Carbon sequestration data by Strata: See "Ex-post Strata" worksheets.
7. Total Carbon Sequestered. Total: 184,840. PIR Period: 104,212.

[37] Appendix 06 is "TIST KE PD-CCB-001g App06 Monitoring Plan 110214.doc"
[38] TIST KE PD-VCS-00?l App11 Verif 02 Monitor Data 150811.xlsx where "?" is 001, 002, 003 and 004.

Community Section

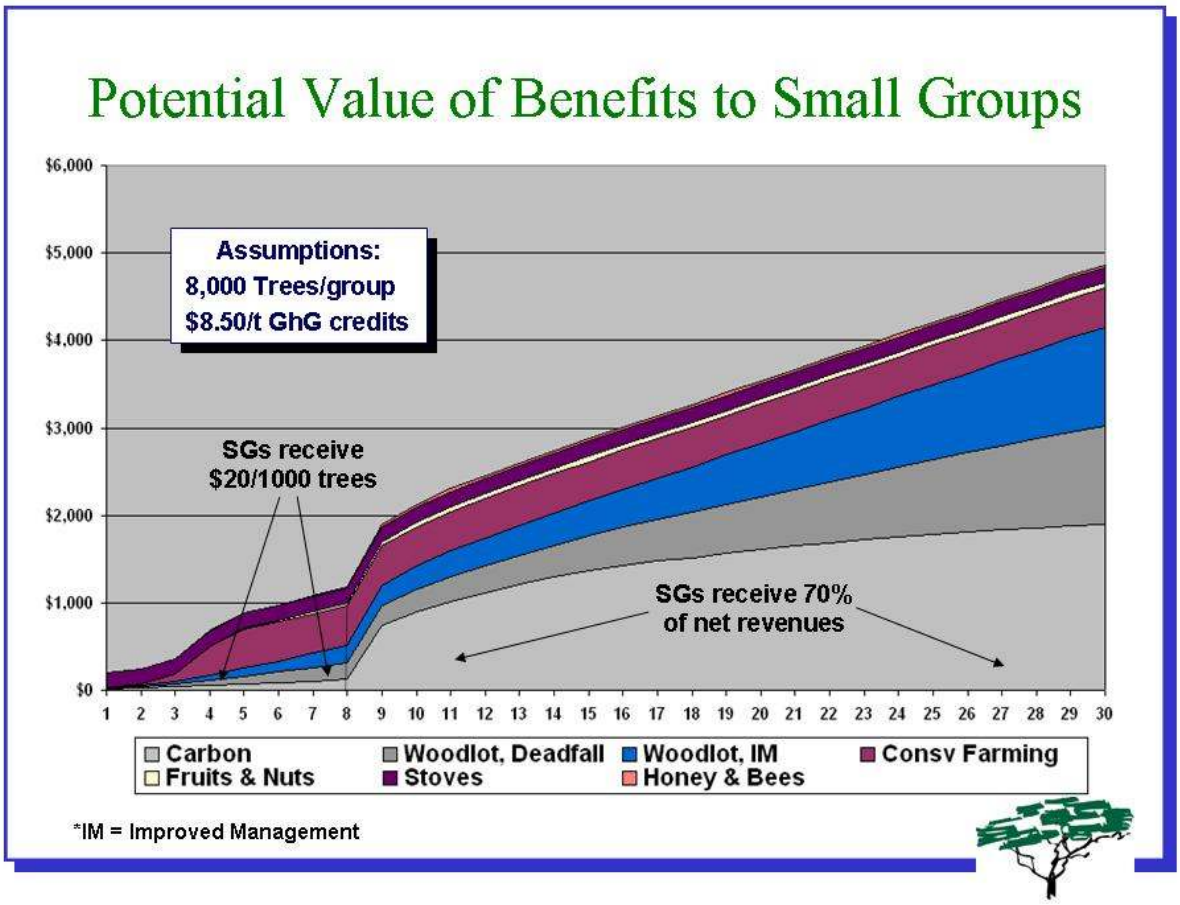
CM1. Net Positive Community Impacts

CM1.1 Impacts on community. The project creates a positive socio-economic impact. Some of the benefits that have been realized by the Small Group members and their families:

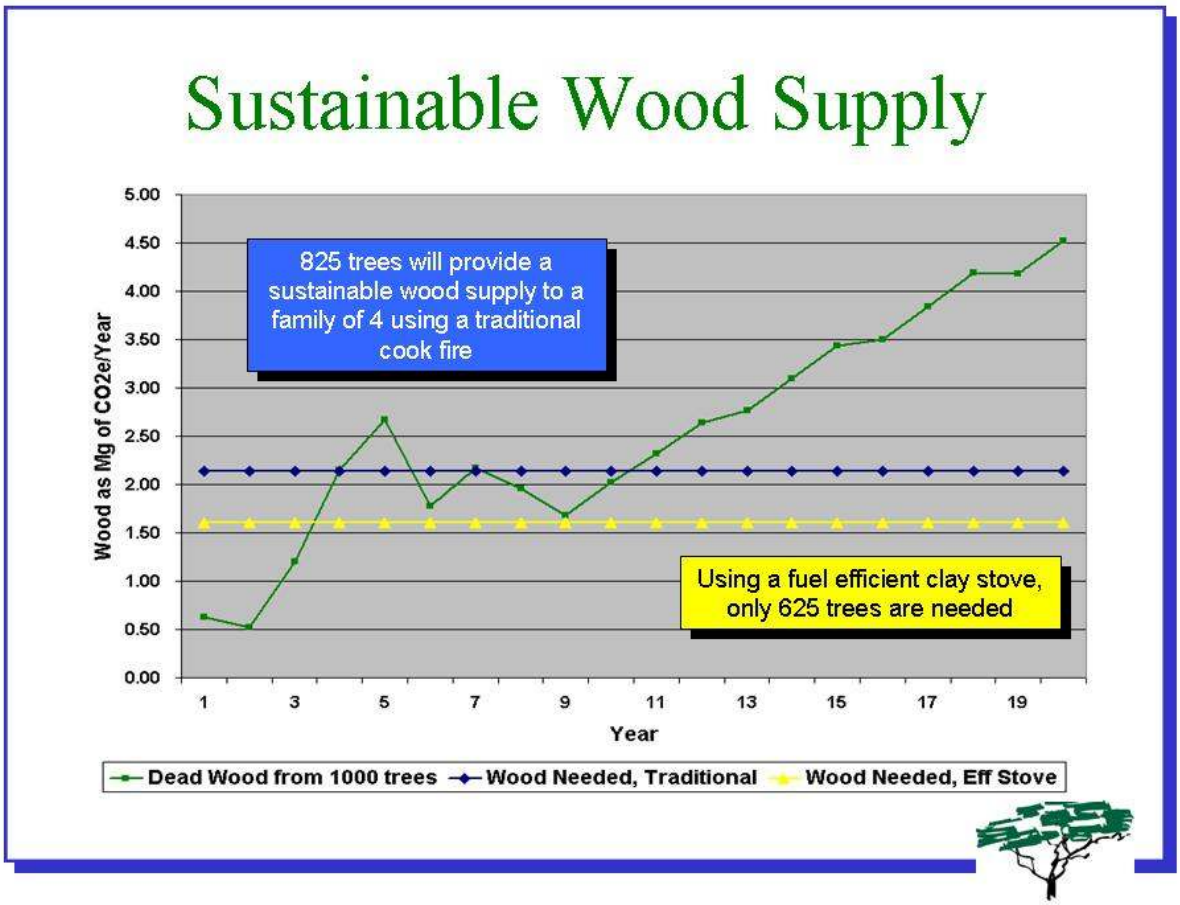
- **New job opportunities:** TIST requires a Host Country staff to operate. There are currently two staff employees and over 50 contract Quantifiers. TIST personnel travel by public transportation and buy food and supplies from local merchants, bolstering the local economy. TIST uses Host Country professionals such as accountants and lawyers. TIST staff is trained to use the handheld computers and GPS and how to collect data. They synchronize their devices in cyber cafés, requiring the use of personal computers.
- **Direct Effects to Small Groups:** TIST benefits over 58,000 thousand of Small Group members by providing a new source of income. Small Group members are paid for each tree they plant and maintain. When the project becomes self-funding from the sale of carbon credits, they will receive 70% of the net carbon revenues. The Gold Level survey indicates that 100% of the members are receiving direct benefits. The average monetary benefit is 146,224 KES per member.
- **Small Group Structure:** Empowerment of Small Groups and creation of "best practices" improves farm production, health, and farmer life. Small Groups use "rotating leadership" which supports gender equality and develops the capacities of each member. The visible success of the TIST groups and the availability of wood, shade, lumber, fruit, and improved crop yields provide the entire community with positive examples. This is supported by the fact that 100% of the members are receiving direct benefits and the expansion to 58,000 members since 2005.
- **Fruits and nuts from tree plantings:** The members select the trees to plant on their land and retain ownership of the trees and their products. To the extent that they plant fruit or nut trees, they will gain the food security and economic benefits the trees provide. The Gold Level survey indicates that 62% of the members are receiving these benefits. The average monetary benefit is 20,470 KES per member.
- **Wood products and limited timber from trees:** Besides owning the trees, the farmers have the rights to all dead wood. They may prune branches and collect fallen branches. The growth models used for extrapolating biomass includes up to 70% mortality over a 30 year period. The farmers can use this biomass for their own consumption without affecting the estimated carbon stocks. In addition, the farmers may thin their trees as part of the on-going management of the project area and sell the harvested stems as timber. The Gold Level survey indicates that 95% of the members are receiving these benefits. The average monetary benefit is 24,174 KES per member.
- **Natural medicines, insecticides and other benefits from trees:** Some of the trees provide other non-wood related benefits such as fodder. The Gold Level survey indicates that average monetary benefit is from fodder is 10,808 KES per member.
- **Capacity building on agricultural improvements, business skills, nursery development, and reforestation:** TIST has a well-developed capacity building program that promotes rotating leadership within the Small Groups that focuses on gender equality and is made available to all members, regardless of education or social standing. TIST provides training in subjects such as conservation farming, nursery development reforestation, climate change, biodiversity, building and using more fuel-efficient stoves and runs the program like a business. The Gold Level survey indicates that 95% of the members are receiving training.
- **Small Groups organize to deal with other social and economic problems such as famine and AIDS.** TIST also supplies training in these subjects. Famine is also addressed with the FAO Conservation Farming program, which can lead to over a doubling of crop yield for practitioners, and through proper tree selection (fruits and nut). The Gold Level survey indicates that average monetary benefit is from Conservation Farming is 7,483 KES per member and the average monetary benefit is from fruits and nut is 20,470 KES per member

- **Improved beauty of the landscape:** This is a welcome attribute in an overused and degraded landscape (subjective, not statistics available).

The economic value to each member is dependent on which program elements they choose to adopt. The following chart illustrates the combined potential of several programs over time.
As noted on the chart, it assumes that the Small Group plants 8,000 trees, which is about 1,000 trees per person. Underlying assumptions are based on conservative adoption rates and values gathered from TIST members.



Another benefit that the program provides is the potential for a sustainable fuel wood supply. The following chart models the deadwood available from planting 825 trees and how it can, if managed properly, lead to a sustainable wood supply for a family of four. The number of trees can be reduced by adopting fuel savings stoves.



TIST's goal is to surpass "sustainability," so that people meet their needs today in ways that improve the next generation's ability to meet its needs in the future

Comparison with "without project" scenario. Quite simply, none of these benefits would exist without the project. There would be no carbon revenues, no incentive to take farmland out of production to garner a long-term benefit, no new trees that can provide food and economic benefits from their products, no training in sustainable development activities and no new employment opportunities.

CM1.2 No High Conservation Values negatively affected. The project does not have a negative effect on the HCV areas. The project takes place on private lands that have been under human habitation and agriculture for generations. The planting of tree for the program does not cause displacement or move activities to the HCV areas. On the contrary, the two greatest threats to the HCV areas are deforestation and loss of biodiversity. The planting of new trees and availability of some of the biomass for use by the participants reduces deforestation pressure. The planting of woodlots on farms, especially where indigenous trees are planted, improves biodiversity and helps connect dispersed HCV areas with canopy.

CM2. Offsite Stakeholder Impacts

CM2.1 Identify potential negative offsite stakeholder impacts. Because the project takes place on private lands and the tree planting is by the landowners, and because the planting of trees is akin to the farming that has taken place on the lands for generations, there are few negative potential impacts to offsite stakeholders.

One that has been identified is the effect of eucalyptus trees on ground water and water courses. As stated, the farmers get to choose the type of trees they plant on their own lands. During training, TIST has been clear about some of the negative effects of eucalyptus trees. However, the Kenya Forest Department (now Kenya Forest Service) had historically encouraged the planting of eucalyptus, for years, to meet local needs for timber and utility poles. Kenya Power and Lighting Company has been very vocal about their need for poles. Because of this, there are many eucalyptus trees in the project.

CM2.2 Mitigation of negative offsite stakeholder impacts. In order to reduce the number of eucalyptus trees, TIST has been requiring all Small Groups to reduce their percentage of eucalyptus to under 33% of their total trees and file forest plans that show how they are going to achieve this reduction. In addition, TIST is now offering a higher per tree incentive to encourage the planting of indigenous trees in riparian areas and throughout the project.

CM2.3 No net negative impact. The multitude of listed benefits to the community members and benefits to the environment are much greater than the potential negative impact from the eucalyptus. Quantified, there are 263 ha of eucalyptus, out of 1,289 ha total project areas. This can be compared to the thousands of square kilometers that make up the project zone.

CM3. Community Impact Monitoring

CM3.1 Initial monitoring plan of community variable. The following were the components of the initial Community Impact Monitoring plan.

1. Number of Small Group members in PD (male and female).
2. Number of Small Groups in PD.
3. Number of community members in TIST Kenya (male and female).
4. Number of Small Groups in TIST Kenya.
5. Number of community members active in TIST Kenya.
6. Number of community members adopting natural resource management practices.
7. Number of community members with greenhouse gas agreements with TIST.
8. Total payments to community.
9. Number of community members adopting Conservation Farming.
10. Number of person-training sessions in climate change (male and female).
11. Number of person-training sessions on HIV/AIDS (male and female).
12. Number of person-training sessions on biodiversity (male and female).
13. Number of live trees planted by TIST Small Groups.
14. Number of fruit or nut trees in TIST Kenya.
15. Number of eucalyptus trees in TIST Kenya.
16. Number of fuel efficient stoves that have been used in TIST Kenya.
17. Number of people employed by TIST or under contract to deliver services.

In addition, many more program components, such as GPS tracts of all the project areas, are being obtained in the climate change monitoring plan.

Monitoring is done as part of the overall monitoring of TIST. Data are collected by TIST quantifiers as they visit each Small Group to count trees by species, count and measure Conservation Farming plots and count fuel efficient stoves. Trainers collect training information at meetings, which include the subjects covered and the numbers of people attending. The metric for training is person-sessions meaning the numbers reported can exceed the number of members. Contracts are collected and recorded by the administrative staff. The number of people employed or under contract with TIST and the amount of GhG payments to Small Groups are obtained from administrative records.

Field data are recorded on custom programmed hand held computers and uploaded to the TIST database. Data will be kept at least three years from the end of the reporting period.

CM3.2 Initial monitoring plan of HCV impacts. Because the project takes place on private lands that have been under human habitation and agriculture for generations, there is no direct monitoring of the Mt Kenya HCV. Instead the impact is addressed by the number of indigenous trees planted by the project and the numbers of hectares that contain indigenous trees.

CM3.3 Develop a full monitoring plan. A full monitoring plan was developed prior to the first verification and is available as Appendix 06.[39] The following are the results of the Community Impact Monitoring. Program-wide data was extracted from the TIST database as of December 31, 2013.

1. Number of Small Group members in PD (male and female): Number of Small Group members in PD (male and female). 8,047 people; 3,125 women; 4,826 men; remainder undifferentiated.
2. Number of Small Groups in PD: 1,078.
3. Number of community members in TIST Kenya (male and female): 58,681 people; 24,338 women; 33,723 men; remainder undifferentiated.
4. Number of Small Groups in TIST Kenya: 8,015.
5. Number of community members active in TIST Kenya: 47,034 people; 20,055 women; 26,979 men.
6. Number of community members adopting natural resource management practices: 47,034 people; 20,055 women; 26,979 men.
7. Number of community members with greenhouse gas agreements with TIST: 43,173 people; 18,177 women; 24,996 men.
8. Total payments to community: US$616,769
9. Number of community members adopting Conservation Farming: 10,744 people.
10. Number of person-training sessions in climate change (male and female): 193,372 people; 96,736 women; 96,636 men.
11. Number of person-training sessions on HIV/AIDS (male and female): 67,528 people; 34,580 women; 32,948 men; remainder undifferentiated.
12. Number of person-training sessions on biodiversity (male and female): 57,363 people; 27,469 women; 29,894 men.
13. Number of live trees planted by TIST Small Groups: 7,469,924 trees.
14. Number of fruit or nut trees in TIST Kenya: 481,246 trees.
15. Number of eucalyptus trees in TIST Kenya: 2,222,338 trees.
16. Number of fuel efficient stoves that have been used in TIST Kenya: 21,949 stoves.
17. Number of people employed by TIST or under contract to deliver services: 64 people.

[39] Appendix 06 is "TIST KE PD-CCB-001 App06 Monitoring Plan 110214.doc"

Biodiversity Section

B1: Net Positive Biodiversity Impacts

B1.1 Changes in biodiversity as a result of the project. As noted, the project areas were grasslands or croplands on private lands owned by subsistence farmers. They have a history of farming and as such, the baseline biodiversity is extremely low. Natural wildlife populations were eliminated or driven off long ago and are currently restricted to transient animals. As such, the approach to improving biodiversity in the project was planting indigenous trees. Isolated woodlots with indigenous trees improve the connectivity of wildlife habitat between natural forests.

Indigenous tree planting data are based on an evaluation of data provided from the monitoring plan, including tree counts by species and by project area. The results of indigenous tree planting as of the second first verification are:

- Over 55,562 new indigenous trees
- Over 178 ha of indigenous trees

The Table B1.1 lists the indigenous species planted to date.

Table B1.1

Scientific Name	Trees
Acacia abyssinica	7
Acacia albida	3
Acacia mellifera	1
Acacia nilotica	3
Acacia seyal	216
Acacia spp.	6,118
Acokanthera schimperi	54
Adansonia digitata	2
Albizia gummifera	235
Annona senegalensis	81
Annona spp.	300
Bersama abyssinica	90
Brachystegia spiciformis	11
Brachystegia spp.	39
Bridelia taitensis	6,022
Burkea africana	164
Canarium schweinfurthii	9
Celtis durandii	22
Combretum molle	564
Cordia Africana	6,213
Croton macrostachyus	1,713
Croton megalocarpus	5,277
Croton Sylvaticus	99
Cussonia holstii	17
Diospyros mespiliformis	48
Dombeya rotundifolia	956
Dombeya spp.	18
Dovyalis abyssinica	1
Ehretia cymosa	481
Erythrina abyssinica	3,182
Euclea divinorum	334

Scientific Name	Trees
Ficus sycomorus	131
Ficus thonningii	1,639
Flacourtia indica	16
Garcinia buchananii	5
Hagenia abyssinica	7
Harungana spp.	948
Kigelia africana	3
Lovoa swynnertonii	21
Maesopsis eminii	209
Markhamia lutea	6,372
Melia volkensii	16
Newtonia buchananii	80
Ocetea kenyensis	3
Ocotea usambarensis	7
Olea europaea	1,455
Pentas longiflora	2
Phoenix reclinata	152
Podocarpus falcatus	726
Polyscias fulva	534
Prunus africana	2,346
Rhus vulgaris	7
Rubus spp.	404
Rumex usambarensis	2
Sapium ellipticum	1,252
Spathodea campanulata	95
Strychnos cocculoides	3
Strychnos henningsii	16
Syzygium cordatum	22
Syzygium guineense	139
Teclea nobilis	11
Terminalia brownii	17
Toddalia asiatica	40
Trichilia emetica	78
Vangueria spp.	725
Vitex keniensis	6,105
Warburgia ugandensis	93
Withania somnifera	4
Zanthoxylum chalybeum	8
Zanthoxylum gilletii	29

An Environmental Impact Audit was carried out by Natural Resources Management & Development Agency (NAREDA Consultants)[40] in Meru and Nanyuki areas of Kenya, to assess the environmental conditions and biodiversity of the area and to assess positive and negative environmental impacts of TIST project activities. The EIA and other assessments indicate that the project areas themselves were not areas rich in biodiversity. However, some areas border Mt Kenya and conserved forest, are rich in biodiversity. By providing fuel wood from sustainable wood lots and improving livelihoods, the project has a positive effect on biodiversity.

[40] See "TIST KE PD-CCB-Spt 04 EIA Report NAREDA 100506.doc" at http://www.tist.org/PD-KE-VCS-006%20Documents.php

Promotion of Conservation Farming further reduces pressure on forest land by increasing food productivity, and consequently, decreasing pressure for land clearing for agriculture. Biodiversity is also enhanced directly through the planting of indigenous trees, both in specific riparian 'biodiversity' groves, and through dispersed inter-planting, homestead planting and woodlots. Increases in tree biodiversity also enhances diversity of associated species, including pollinators, and other beneficial species, while protection of riparian areas improves water quality and provides other important ecosystem services.

Most Likely Scenario: baseline 'without project.' None of the tree planting would occur without the project. In the case of the indigenous trees, the biodiversity benefit is clearly positive.

The members of TIST also plant non-indigenous trees. While they would not have been planted without the project, and some lack the clear biodiversity benefit of the native species, they too have a net biodiversity benefit. Going back to the on-going deforestation affecting the entire country and the obvious continued need for fuel wood and timber by the expanding population, a fuel wood alternative is necessary. The non-native trees such as eucalyptus, cypress and grevillea fill this niche, and by doing so, reduce deforestation and indirectly contribute to biodiversity. The "without project" scenario would mean more pressure on the natural forests and more loss of biodiversity. Therefore, even looking at the project from the vantage of the non-native species, the project has a net biodiversity benefit when compared to the "without project" case.

B.1.2 No HCVs be negatively affected by the project. The Mt Kenya HCV has not been negatively affected by the project. The project areas border, or are in the vicinity of, Mt Kenya and other forests that have significant conservation value and high diversity. The project provides vital resources that reduce pressure on these important areas, and through the planting of indigenous trees, expands the range of biodiversity in these forests.

The project areas are on individual farms, with an extensive history of farming and land use, other than natural forest or long-term forestry. As such, any negative effect caused by human activity at the project sites has already happened. Project activity has had a positive affect on HCVs.

Mt Kenya and surrounding highlands are one of Kenya's five main water towers. The planting of trees has prevented water from running off, and helped the water seep into the ground and back into the water table. In addition, 16 hectares were determined to be in riparian areas at the time of the second verification.

B1.3 All species to be used by the project. Because TIST does not provide seeds or seedlings, TIST farmers collect seeds from locally existing trees that have a history of being grown in the country and regionally. Farmers are trained on how to harvest seeds from local trees for their nurseries and tree planting, and on benefits of varied species. Because the farmers own the trees that they plant, the species are selected by the Small Groups based on their needs and the benefits which they desire to obtain. As a result, numerous species and varieties have been selected. Table B1.3 lists the species present in the project areas and indicates whether they are indigenous to Kenya. Additional species may be added over the life of the project as additional planting takes place.

Table B1.3

Scientific Name	Indigenous
Acacia abyssinica	yes
Acacia albida	yes
Acacia mearnsii	no
Acacia mellifera	yes
Acacia nilotica	yes
Acacia seyal	yes
Acacia spp.	yes

Scientific Name	Indigenous
Acokanthera schimperi	yes
Adansonia digitata	yes
Albizia gummifera	yes
Anacardium occidentale	no
Annona senegalensis	yes
Annona spp.	yes
Artocarpus heterophyllus	no
Azadirachta indica	no
Azanza garckeana	no
Bersama abyssinica	yes
Bixa orellana	no
Blighia unijugata	no
Bombax ceiba	no
Brachychiton acerifolium	no
Brachystegia spiciformis	yes
Brachystegia spp.	yes
Bridelia taitensis	yes
Burkea africana	yes
Callistemon spp.	no
Canarium schweinfurthii	yes
Canavalia sp.	no
Casimiroa edulis	no
Casuarina equisetifolia	no
Cedrela Odorata	no
Celtis durandii	yes
Citrus aurantifolia	no
Citrus limonum	no
Citrus sinensis	no
Combretum molle	yes
Cordia Africana	yes
Cordia monoica	no
Croton macrostachyus	yes
Croton megalocarpus	yes
Croton Sylvaticus	yes
Cupressus spp.	no
Cussonia holstii	yes
Cyphomandra betacea	no
Dendrocalamus giganteus	no
Diospyros mespiliformis	yes
Dombeya rotundifolia	yes
Dombeya spp.	yes
Dovyalis abyssinica	yes
Ehretia cymosa	yes

Scientific Name	Indigenous
Elaeis guineensis	no
Endiandra glauca	no
Erythrina abyssinica	yes
Eucalyptus grandis	no
Euclea divinorum	yes
Euphorbia friesiorum	no
Ficus sycomorus	yes
Ficus thonningii	yes
Flacourtia indica	yes
Fraxinus berlandieriana	no
Fraxinus pennsylvanica	no
Garcinia buchananii	yes
Grevillea robusta	no
Hagenia abyssinica	yes
Harungana spp.	yes
Jacaranda mimosifolia	no
Khaya nyasica	no
Kigelia africana	yes
Leucaena leucocephala	no
Lovoa swynnertonii	yes
Macadamia spp.	no
Maesopsis eminii	yes
Mangifera indica	no
Markhamia lutea	yes
Melia volkensii	yes
Morus alba	no
N/A	no
Newtonia buchananii	yes
Ocetea kenyensis	yes
Ocotea usambarensis	yes
Olea europaea	yes
Pentas longiflora	yes
Persea americana	no
Phoenix dactylifera	no
Phoenix reclinata	yes
Pinus Patula	no
Pinus spp.	no
Pithecelobium dulce	no
Podocarpus falcatus	yes
Polyscias fulva	yes
Pouteria sapota	no
Prunus africana	yes
Prunus persica	no

Scientific Name	Indigenous
Prunus spp.	no
Psidium guajava	no
Pterocarpus angolensis	no
Rapanea melanophloeos	no
Rhus vulgaris	yes
Rubus spp.	yes
Rumex usambarensis	yes
Sapium ellipticum	yes
Schinus molle	no
Senna spectabilis	no
Spathodea campanulata	yes
Strychnos cocculoides	yes
Strychnos henningsii	yes
Strychnos madagascariensis	no
Swietenia mahagoni	no
Syzygium cordatum	yes
Syzygium guineense	yes
Tamarindus indica	no
Teclea nobilis	yes
Tectona grandis	no
Terminalia brownii	yes
Toddalia asiatica	yes
Toona ciliata	no
Trichilia emetica	yes
unknown	na
Vangueria spp.	yes
Vitex keniensis	yes
Warburgia ugandensis	yes
Withania somnifera	yes
Zanthoxylum chalybeum	yes
Zanthoxylum gilletii	yes
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Invasive Species. All listed species have been screened against the global database of invasive species.[41] While two on the above list are included for Kenya, they are high value trees in Kenya, and, according to the Kenya Forest Service, are not invasive.[42]

The first is the guava tree, *Psidium guajava*. It is a mainstay of the Kenyan diet and provides one of the most popular fruit. According to one study in western Kenya, over 25% of the households surveyed

[41] International Union of Concerned Scientists, Global Invasive Species Database, Accessed 11 January, 2011 at http://www.issg.org/database.
[42] Anampiu G.M., Kenya Forest Service, letter to Charles Ibeere, Clean Air Action Corporation, October 28, 2010.

consumed guava in a seven day period and 87.5% gathered guava.[43] Believed to be from Central America, it was brought to Africa in the 1800s, where it has become an important fruit that adds to the economic well being and food security of Kenyans. It is being planted on agricultural lands and not in the natural forest. At the time of this verification there were 2,792 guava trees out of 762,841 project trees, or 0.37%.

The second, *Leucaena leucocephala*, is widely planted for forage production and reforestation. It was introduced generations ago, probably from Central America, and while it may be invasive in the natural forest, it is very popular and useful in agriculture. It benefits the soil, is a better fodder than alfalfa, has year-round blooms to foster honeybees, has seeds that can be used for biofuels and is an excellent firewood.[44] It is being planted on agricultural lands and not in the natural forest. At the time of the first verification there were there were 134 leucaena trees, out of 762,841 project trees, or 0.02%.

B1.4 Adverse effects of non-native species. As stated in B1.3, TIST does not provide seeds or seedlings, so the trees planted by TIST farmers are locally sourced from existing trees with a history of being grown in the country and regionally. They choose both indigenous and non-native species for their varied benefits. Some species, notably eucalyptus, may have negative impacts if not managed with care. Eucalyptus, popular in Kenya since its introduction in 1902, for its fast growth,[45] is known to set deep roots that may deplete water resources without sustainable management.

TIST farmers agree, as part of their contract, that trees that damage the environment will not be counted as TIST trees. Groups are trained on the benefits of alternative indigenous trees and how to grow these trees, and develop group forest plans to decrease eucalyptus on their farms to less than 33% of total trees planted. Farmers are also trained on governmental policies on eucalyptus. Indigenous trees, including water conserving species such as *Bridelia* and *Sysygium* spp, are encouraged in riparian areas, both through training on best species, and through an additional PES, per indigenous tree, planted in groves within 100 meters of a waterway.

For participating groups, there is an additional incentive for indigenous seedlings quantified in their nurseries.

Small Group members are required to follow TIST best practices in riparian areas, for the groves to qualify. They agree not cut down or clear existing indigenous trees, plants or ground cover, not till soil within 30 meters of the waterway, and not plant eucalyptus within 100 meters of a waterway.

Training, monitoring, and incentives are all structured to encourage farmers to plant diverse trees with diverse benefits. Because of all of these active steps taken to safeguard against deleterious environmental effects, negative impacts are not expected.

The use of non-native species is justified in a number of ways. Farmers choose species that provide them with needed products and services. Project activities are on lands already impacted by long term human habitation and agriculture. Many species, like mango and avocado, while not indigenous, have been naturalized over an extended period of time and provide much needed food. Others, like eucalyptus, cypress and grevillea, are chosen for their fast growth. In a country with a high need for forest products, including fuel wood for cooking and timber for construction, sources of sustainable wood products must be

[43] Ekesa BN, Walingo MK, and MO Abukutsa-Onyango, " Accessibility to and consumption of indigenous vegetables and fruits by rural households in Matungu division, Western Kenya. 2009. http://www.thefreelibrary.com/Accesibility+to+and+consumption+of+indigenous+vegetables+and+fruits...-a0214999629, accessed October 10. 2010.

[44] World Agroforestry Centre, AgroForestryTree Database, "Leucaena leucocephala." Accessed at http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SpID=1069, on October 26, 2010.

[45] The Big Debate Over Eucalyptus, *Daily Nation*, Daniel Wesangula, http://www.greenbeltmovement.org/a.php?id=446

developed to substitute natural forest being lost through deforestation. The Kenya Forest Service continues to promote eucalyptus to conserve biodiversity since cultivated eucalyptus wood can replace indigenous species otherwise harvested for fuel-wood degrading natural forests.[46] No fast growing indigenous alternatives have been identified.

As noted in B1.3, two species listed on the IUCS Global Invasive Species Database are used by TIST farmers. This is justified because:

- They are not considered invasive in Kenya by the Kenya Forest Service;
- Each comprise less than 0.4% of the total tree stocks;
- They are common trees on Kenya farms and have been planted by farmers for generations;
- Neither of these species is planted by TIST in protected forests;
- They are planted on farms where their ability to spread uncontrolled is mitigated;
- They provide important products for the farmers (food and fodder).

B1.5 No GMOs will be used for GhG removals. No GMOs were used by the project to generate GHG emissions reductions or removals.

B2 Offsite Biodiversity Impacts

B.2.1 Negative offsite biodiversity impacts. No negative offsite biodiversity impacts were identified. As pointed out in section CL2.1, evidence that there has not been any displacement of members has been provided in the form of a survey of the land owners and project participants during baseline monitoring. They owned the land before the project and own the land during the project.

In addition, the program is designed to allow sustainable harvest within the project boundary by the members, which will reduce the need for fuel wood from external sources. The trees are owned by the Small Group members and as the trees die, either naturally or through selective harvest, they can be used as fuel wood by the members. The project activity has a beneficial effect on area deforestation; instead of causing it, it ameliorates it.

B2.2 Mitigation of negative offsite biodiversity impacts. Not applicable, since no negative offsite biodiversity impacts were identified.

B2.3 Justify the net positive biodiversity impact. No negative offsite biodiversity impacts were identified. Therefore net effect of the project on biodiversity is positive.

B3 Biodiversity Impact Monitoring

B3.1 Initial plan for biodiversity monitoring. TIST has been operation in Kenya since 2004 and has deployed an award-winning monitoring system that collects data for, among other things, biodiversity. The monitoring plan described, herein, is the full monitoring plan required under B3.3, below.

The plan uses TIST's strength in gathering, verifying, and analyzing field data to measure critical biodiversity metrics in the farms and groves where TIST farmers work and live. Trees are the main focus of biodiversity impact monitoring since they provide important habitat diversity and structural features for biodiversity. Tree biodiversity is expected to increase as a result of awareness raising, training and incentives. We monitor and report on the TIST website the species planted, number of trees of each species planted in each area, and, as the trees grow, the age and circumference of these trees. Quantification is a constant process and as a project area is monitored, new data populate the website. At a landscape level, we monitor the number of hectares of riparian land improved with indigenous tree planting by TIST farmers and their location. TIST Small Groups with land in riparian areas who plant

[46] Kenya Forest Service. A guide to on-farm eucalyptus growing in Kenya. 2009. http://www.wrm.org.uy/countries/Kenya/Eucalyptus_guidelines.pdf

indigenous trees to help preserve the area and reduce erosion caused by runoff and flooding receive an additional incentive per live tree. Riparian areas were chosen for their critical importance in providing ecosystem services such as enhanced water quality, reduced sedimentation, and enhanced wildlife habitat.

Trends in landscape connectivity and forest fragmentation have been addressed, using the track data collected by the quantifiers. The location, extent and area of each project area has been obtained. At the time of the first verification there were there were 1,565.2 hectares of new forest comprised of 4,264 individual parcels spread out over 7,000 square kilometers. The location and perimeter of each project area are presented in Appendix 1 and 2. Although the rules of VCS allow additional project areas to be added to a grouped project PD, the rules of CCB do not. Though TIST will continue to add project areas, the areas in this PDD will be fixed for the life of the project and the above numbers are not expected to change.

B3.2 Plan to assess effectiveness of measuring effect on HCV. Because there is no direct interaction with the HCV, the monitoring is indirect and based on monitoring direct project achievements per B3.1 and B3.3.

B3.3 Commit to developing a full monitoring plan. A full monitoring plan was developed prior to the first verification and is available as Appendix 06. The following are the results of the Biodiversity Monitoring. Worksheet references are to the monitoring data spreadsheet used for the VCS verification that applies to the PIR Period.[47] Program-wide data was extracted from the TIST database as of December 31, 2013.

1. Total hectares of the project. 1,289.5 hectares PAs (active/pending, "PA Summary" worksheet).
2. Number of discrete project areas (PA): 4,237 total active project areas (active/pending, "PA Summary" worksheet).
    a. See Appendix 03, track files of each PA in KML format (Google Earth).
    b. See "PA Summary" worksheet, "Latitude" and "Longitude" columns.
3. Tree data including count and species: Tree count is 753,900 (active and pending PAs only). See "Ex-post Strata" worksheet for species detail.
4. Number of indigenous trees by species. 56,002 total indigenous trees. ("Ex-Post Strata" and "Misc Calc" worksheets).
5. Hectares of indigenous trees. 178.7 hectares ("Ex-Post Strata" and "Misc Calc" worksheets).
6. The tree inventory of each project area. ("Ex-Post Strata" worksheet).
7. Hectares of riparian areas (TIST KE). 16 hectares (from database query)

[47] TIST KE PD-VCS-???I App11 Verif 02 Monitor Data 150811.xlsx where "?" is 001, 002, 003 and 004.

Gold Level Section

GL2. Exceptional Community Benefits

GL2.1 Low human development. Kenya meets the requirements of being a medium human development country with at least 50% of the population of the area below the poverty line. According to the UNEP, Kenya ranks 147 out of 182 countries in human development and as such is considered a medium human development country.[48] The UNDEP report also states that 52% of the population is under the poverty line.[49]

GL2.2 Poorest quartile will benefit. This section demonstrates that at least 50% of households within the lowest category of well-being (e.g. poorest quartile) of the community are likely to benefit substantially from the project. Because the TIST project zone covers tens of thousands of square kilometers, we define the community as the over 58,000 farmer members and their families. In addition, however, we discuss the way TIST benefits the poor throughout the project zone.

The project has been designed to benefit the poorest of the poor and in this case the subsistence farmers of rural Kenya. To join TIST, a farmer only needs to join a Small Group and while most of the rural poor already have land to plant trees, they don't even need that. If they work with their friends, family or neighbors, they can plant trees on those lands and benefit.

There is no minimum project area size that would restrict the smallest small-holder farmer from joining. While the CDM afforestation methodologies requires a minimum area of 0.1 hectares (Kenya forest definition), TIST is applying for VCS credits to be able to go below that threshold. TIST has designed a monitoring plan that allows participation of farmers with the smallest of plots.

TIST has tried to eliminate the barriers to entry to the program. Members do not have to buy seedlings. They are taught to gather local seeds, prepare nurseries and raise their own seedlings. They can sell any surplus. The benefits that can be realized by using Conservation Farming not only don't cost money; they can produce higher yields in less land and result in added revenues or decreased food expenses. Participation in the more fuel-efficient stove project is also without cost. While TIST is introducing a manufactured stove, it also trains in making a home built rocket-Lorena stove that can be made for no cash costs, from locally available material. TIST training in nutrition, HIV/AIDS prevention and care, malaria prevention and other health issues is free. Training in improved natural resource management, species selection, nurseries and tree planting, climate change, riparian buffers and other environmental issues is free.

It was demonstrated during validation and the first verification that many of the TIST members are in the lowest quartile.[50] The Gold Level survey (Section GL2.5) further demonstrates that 1) 72% make less than KES 5,000 (US$582) per year (i.e. are poor) and 2) 98% of them have received monetary benefits from the program. The remaining 2% reported receiving health training (a benefit). In addition, no one in the members of the lowest quartile have reported a negative impact from TIST. This demonstrates that 50% of the lower quartile in the entire community will benefit substantially from the project .

Besides the direct benefits of being a TIST member, the results TIST creates benefits essentially all of the lowest quartile in the project zone.

First is the effect of climate change on this population. At risk are food security, changes in temperature and precipitation, changes in soil moisture and soil fertility, changes in the length of growing season and an

[48] United Nations Development Program, Human Development Report 2009, page 178. See Kenya, HDI 147. See TIST KE CCB Spt 06 UN Human Dev Rpt 2009.pdf
[49] Ibid. See Population below income poverty line, National Poverty Line.
[50] TIST KE PD-CCB-001f App05 Implementation Rpt 110428.pdf

increased probability of extreme climatic conditions.[51] These will affect every farmer in rural Kenya, including the lowest quartile. TIST has quantified climate change benefits, which will mitigate these negative impacts.

Regarding food security, TIST has community benefits that affect the lowest quartile. According to the FAO, "many of Kenya's 32 million people live on US$1 per day and suffer poverty and malnourishment. About one-third of the population is chronically undernourished. Limited or no access to independent food production resources and the effects of the HIV/AIDS pandemic and other chronic diseases such as TB and malaria put additional pressure on people's ability to lead healthy, productive lives."[52] TIST farmers are planting new fruit and nut trees, engaging in honey production and, through Conservation Farming, getting higher yields from their farms. Some of this food is consumed by the farmers and their families and some are selling surplus food into the community. This is the independent food production resource identified by the FAO as being needed by the poor and undernourished, i.e. the lower quartile. TIST programs help members directly and provide a larger pool of food that indirectly benefits non-members. It should also be noted that because these are local crops, they do not have the negative impact that imports have on subsistence agricultural prices.

The degradation of the local environment affects the lower quartile and TIST tree planting helps address it. As pointed out by the FAO:

> [The] natural resource base of Africa is being degraded and destroyed at a rate that will soon make food and agricultural production un-sustainable. Poverty, coupled with increasing population pressure, is the biggest single cause of this degradation. *The rural poor, the overwhelming majority of Africa's citizens, destroy their own environment, not out of ignorance, but simply to survive*. Peasant farmers preoccupied with survival over-crop marginal [sic] and because there is no alternative employment and no better technologies they can afford. Pastoralists overstock to improve their chances of surviving the next drought. Rural dwellers strip trees and shrubs for fuelwood because they need fuel. *In the context of the short-term basic needs of an individual, each decision is rational; in the long run, the effects are disastrous.*[53]

According to the UNEP, trees help "conserve soil and water."[54] They improve soil stabilization and reduce erosion. Erosion affects the quality of water and the lowest quartile are the first to be affected by poor water quality. As observed by the United Nations, "poor communities have tended to suffer the greatest health burden from inadequate water supplies and, as a result of poor health, have been unable to escape from the cycle of poverty and disease."[55] The lowest quartile are the people most likely to be negatively affected by drought. Trees also retain soil moisture and help mitigate the affects of drought. TIST tree planting ameliorates these negative results of deforestation and degradation and benefits the lowest quartile.

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[51] Claire McGuigan, Rebecca Reynolds, Daniel Wiedmer; London School of Economics Consultancy Project for The Overseas Development Institute, "Poverty and Climate Change, Assessing Impacts in Developing Countries and the Initiatives of the International Community," 2002. http://www.odi.org.uk/resources/download/2578.pdf accessed October 28, 2010

[52] Food and Agriculture Organization of the United Nations, Special Programme for Food Security, "Success Stories - Kenya (Njaa Marufuku Kenya). See TIST KE CCB Spt 07 FAO Food Security.pdf

[53] Food and Agriculture Organization of the United Nations, "Land and environmental degradation and desertification in Africa," 1995. Accessed 11 January, 2011 at http://www.fao.org/docrep/x5318e/x5318e02.htm. Or see TIST KE CCB Spt 08 FAO Enviro Degradation

[54] United Nations Environmental Programme, "The Billion Tree Campaign." Facts and Figures. Accessed 11 January, 2011 at http://www.unep.org/billiontreecampaign/FactsFigures/QandA/index.asp. Or see " TIST KE CCB Spt 09 UNEP Tree Benefits.pdf"

[55] UN-Water, Coping with Water Scarcity, 2007 World Water Day, 2007, page 6, Accessed 11 January, 2011 at http://www.fao.org/nr/water/docs/escarcity.pdf.

The lower quartile relies on wood for their primary fuel. According to the UNEP, "It provides 90 per cent of rural households' energy requirements and 85 per cent in urban areas."[56] This would include most of the lower quartile. Further, the UNEP states "biomass is seen as the poor people's source of energy."[57] Looking at it from a supply and demand basis, new sustainable biomass from TIST trees leads to more supply and lower fuels costs, therefore benefiting the lower quartile.

TIST health training also has an indirect benefit on poor non-members. According to Kawewa:

> The major factor contributing to the high incidence of HIV/AIDS in Kenya is the rising level of poverty among Kenyans, where over 50 percent of the population lives below the poverty line (economic survey 2000), with an average annual basic income of less $300 that's less than $1 per day. The impoverished families spend less on such basic needs as food, shelter routine preventive health care, general medical care and education. There is a direct link between levels of poverty of the family and enrollments, participation and completion of learning in educational institutions.[58]

Peer training is a way to disseminate information throughout a community. For example, the list of myths associated with AIDS is long and they are circulated worldwide. The poor have little access to HIV/AIDS education and base their decisions on these myths. TIST training helps counter these myths, giving the friends and neighbors of non-members the information that can lead to better decision making.

TIST was designed to benefit the poorest of the poor. While all in the lowest quartile are invited to join and would reap more benefits as members, all of the program activities have community benefits that benefit the non-members in the lowest quartile.

GL2.3 Barriers to benefits addressed. The barriers that might prevent benefits going to poorer households have been identified and addressed in the project design. As discussed in GL2.2., they have been removed to the greatest extent possible.

GL2.4 Negative impacts on the poor identified. TIST was developed through visioning sessions with poor small-hold subsistence farmers in Tanzania in 1998 and 1999. The farmers expressed deep concern about recurrent famine, poor crops, lack of shade and firewood, declining rainfall, declining soil fertility, poor access to water for personal and agricultural use, poor diet, regular health problems including AIDS and malaria, lack of economic opportunity, poor cattle forage on eroded lands, and the decline of wildlife due to over hunting and lack of forests. The Small Group seminar, however, did not stop with identifying the local problems; participants established the goals of starting hundreds of Small Groups to plant trees, reduce poverty, improve health, and prevent famine. TIST Kenya adopted this approach and was designed to do as much of this as possible at the subsistence farmer level. Because this was the approach to the project, no poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project have been identified.

GL2.5 Monitoring Community Impacts. As noted, TIST is a community based program comprised of over 60,000 Kenyans (although not all subject to this PD). They are all part of the existing monitoring plan to determine the effectiveness of TIST in achieving its goals. By monitoring TIST as a project, the positive and negative impacts to the community can be determined.

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[56] United Nations Environmental Programme, "Kenya: Integrated Assessment of the Energy Policy," 2006, page 13. Accessed 11 January, 2011 at http://www.unep.ch/etb/areas/pdf/Kenya%20ReportFINAL.pdf. Or see TIST KE CCB Spt 11 UNEP KE Energy.pdf.

[57] Ibid.

[58] Kawewa, Janet, "SITUATIONAL ANALYSIS ON HIV/AIDS IN KENYA," UNESCO Institute for Education Programs, Learning and Empowerment: Key Issues in Strategies for HIV/AIDS Prevention, International Workshop/Seminar March 1-5, 2004, Chiangmai, Thailand, page 1. Accessed 11 January, 2011 at http://www.unesco.org/education/uie/pdf/Kawewa.pdf

TIST developed a monitoring tool to identify some of the positive and negative impacts experienced by TIST members. Done in the form of a survey conducted with 124 random TIST members between June and August 2011, the interview tool consisted of 39 questions. The instructions for the survey are available in the survey overview document, CCB Support Document 17.[59] The survey form is available in CCB Support Document 18.[60] The four main topic areas of the survey were:

1. demographic/basic information (including literacy, income);
2. TIST membership and participation information (including barriers to participation);
3. benefits from TIST activities (economic, environmental, and social, quantitative and perceptual) and negative impacts; and
4. conservation farming and food security.

The indicators were measured in order to differentiate between poorer and more vulnerable households using the Sustainable Livelihoods Approach and to identify and assess whether positive and negative impacts of the program are affecting households equally.

In March 2015, a similar survey was conducted for TIST by Yale School of Forestry & Environmental Studies and New England College. The number of members surveyed was 61. The survey results is available as Support Document 27.[61]

Gold Level Exceptional Community Benefits Monitoring Report

The results of the survey and the analysis of the results are in the report from the independent contractor, Support Documents 19 and 27. The following highlights how TIST provides exceptional community benefits. The results of the survey indicate that TIST has highly positive net benefit to the participants and community.

Project Explicitly Pro-Poor: The original survey indicates that 35.5% of the respondents make less than KES 12,000 (US$123) per year and a cumulative total of 85% make less than 60,000 Ksh (US$616) per year.[62] The Yale/NEC survey indicates 16% of the respondents make less than KES 1,000 (US$116) and 72% make less than KES 5,000 (US$582) per year.[63] Since income level for abject poverty varies between US$1.00 per day and US$2.00 per day, it is clear that most of the members of TIST are poor. Further analysis in the original report identified 15% of TIST members as particularly vulnerable meaning they met the following criteria:

- their animal ownership is in the lowest quartile (6 animals or less);
- their land ownership is in the lowest quartile (2 acres or less);
- there is only one adult living in the household, or single marital status.

The Yale/NEC survey only identified a single respondent (2%) that met the income criteria and the three vulnerability criteria. This person was in the KES 1,000-5000 income bracket. For the purpose of this analysis, this person is classified as Vulnerable 1. The Survey also identified 5 respondents (8%) in the "less than KES 1000" income bracket that fell below that animal ownership and land ownership vulnerability criteria, but were married. These respondents are classified as Vulnerable 2.

Benefits to the Poor. The surveys included questions to determine the benefits that the program provided to the members. In addition to the many trainings provided (see Community Impact Monitoring Report and the survey report), there are many cash and in-kind benefits. Since most of the members are poor, these indicators demonstrate how TIST benefits the poor.

[59] TIST KE PD-CCB-Spt 17 GL2 Survey Overview.doc
[60] TIST KE PD-CCB-Spt 18 GL2 Community Benefits Survey.doc
[61] TIST KE PD-CCB-Spt 28 YaleNEC Benefits Survey.xls
[62] Currency conversion, 97.25 KES = US$1.00, 02 November 2011.
[63] Currency conversion, 103.5 KES = US$1.00, 26 November 2015.

Benefit	Original Survey	Yale/NEC Survey
Received a carbon stipend	34%. Average KES 296	69%. Average KES 1,069
Sold their own home-grown firewood or fruits/nuts	19% Average KES 4,814	70%. Average KES 25,992
Used/consumed their own home-grown fire wood or fruits/nuts	52%. Average KES 6,528	43%. Average KES 18,652
Harvested and used their own home-grown fodder	25%. Average KES 11,796	66%. Average KES 67,482
Trained in Conservation Farming (CF) practices.	69%.	97%.
Used CF practices and increase value of crop yield	49%. Average KES 12,150	82%. Average KES 7,483
Produced compost manure	29%. Average KES 6,913	54%. Average KES 6,366
Began keeping bees	19%. Average KES 1,040	26%. Average KES 1,134
Raised seedlings for sale or their own use	14%. Average KES 3,197	33%. Average KES 7,241

Benefits to the Most Vulnerable. The original survey identified 15% of the respondents as vulnerable. Using the same criterion, the Yale/NEC survey only identified one respondent as most vulnerable (Vulnerable 1). However, we defined another subset of 8% by dropping the marital status criteria, and only including the "less than KES 1000" income bracket (Vulnerable 2). They report the following benefits:

Benefit	Original Survey	YN-Vulnerable 1	YN-Vulnerable 2
Cash incentives including carbon	Avg: KES 5,168	Avg: KES 4,000	Avg: KES 750
Sale and use of tree products	Avg: KES 4,417	Avg: KES 4,550	Avg: KES 5,220
Compost or fodder	Avg: KES 306	Avg: KES 4,000	Avg: KES 480
Livestock and animal products	n/a	Avg: KES 56,160	Avg: KES 10,036
Improved yield from CF	Avg: KES 1,350	Avg: KES 2,500	Avg: KES 3,312
Honey used or sold	Avg: KES 476	Avg: KES 0	Avg: KES 2,000
Manure	n/a	Avg: KES 1,350	Avg: KES 600
Seedlings sold or used	Avg: KES 6,850	Avg: KES 0	Avg: KES 510

Results show that these vulnerable households experienced a range of benefits from sales and savings. Notably, incremental livestock and their products and harvesting tree products such as fruit, nuts, fodder and firewood was important for this sub-group, with the new survey showing it is higher values than the cash payments. The lack of honey and seedling benefits for the single Vulnerable 1 respondent is interpreted as more a choice rather than a barrier.

There also did not appear to be significant barriers to meeting attendance for these households. The average meeting attendance was 8.7 Cluster meetings per year and 1.4 Small Group meetings per month in the Original Survey. The meeting attendance of the Yale/NEC survey was 11.2 Cluster meetings for the last year and 2.3 Small Group meetings per month. The meeting attendance of the single Vulnerable 1 respondent was 12 Cluster meetings for the last year and 3 Small Group meetings per month. The meeting attendance of the single Vulnerable 2 respondents was 9.8 Cluster meetings for the last year and 1.8 Small Group meetings per month. There was no significant difference in number of health trainings for the vulnerable households in the Original Survey versus survey pool, with an average of 5.3 health training sessions since their time at TIST. In the Yale/NEC survey the pool average was 22 training sessions per respondent, 21 sessions for the Vulnerable 1 respondent and 11 sessions for the Vulnerable 2 respondents. The lower number for the Vulnerable 2 was in part due to the survey responses being text answers ("yes", received training) rather than the number of sessions attended.

Benefits to Women. The study also showed that women benefit from participation in TIST. A Chi-square test of the Original Survey showed no significant difference (at $p < .05$) between male (48%) and female (52%) participants who have held leadership positions since their time at TIST. The Yale/NEC Survey showed that women receive 92% of the average benefits as men and attended more cluster meetings and received more training than men. This is an important finding, given traditional gender roles within the culture of the project area.

Yale/NEC Survey Training Results	Women	Men
SG meetings/month attended	Average 2.1 meetings	Average 2.4 meetings
Cluster meetings/year attended	Average 11.4 meetings	Average 11.1 meetings
Health training sessions attended	Average 23.6 sessions	Average 21.9 sessions

Negative Impacts. Because TIST is voluntary, few negative impacts were identified. While there were several scalar response questions in the survey, only a few could result in a "negative" response. The others only provided an indication of the level of perceived benefits.

- When asked if they lose money participating in TIST:

Response	All Surveys (n=124)	Vulnerable (n=19)	Women (n=61)
Very True	19%	21%	15%
Somewhat true	28%	26%	13%
Not at all true	58%	47%	59%

- When asked if they use too much land planting TIST trees and not enough for food and livestock:

Response	All Surveys (n=124)	Vulnerable (n=19)	Women (n=61)
Very True	5%	11%	3%
Somewhat true	15%	5%	16%
Not at all true	80%	84%	79%

- When asked if their families has less food to eat because of TIST:

Response	All Surveys (n=124)	Vulnerable (n=19)	Women (n=61)
Very True	10%	11%	10%
Somewhat true	10%	21%	16%
Not at all true	80%	68%	66%

- When asked if their friends and families were not happy that they were a members of TIST:

Response	All Surveys (n=124)	Vulnerable (n=19)	Women (n=61)
Very True	12%	11%	14%
Somewhat true	18%	11%	24%
Not at all true	70%	78%	62%

- When asked if they were too busy with TIST to do the important things they need to do:

Response	All Surveys (n=124)	Vulnerable (n=19)	Women (n=61)
Very True	10%	21%	11.5%
Somewhat true	16%	21%	11.5%

Not at all true	74%	53%	69%

In the Yale/NEC survey the major negative issues centered on carbon payment. 25% of the respondents said they wanted more money for the carbon payments. At this time in the program, the farmers only receive a small tree stipend as an advance payment on the carbon. Once the project makes a profit they will receive 70% of the profits. Unfortunately, the profitability of the project is tied to the voluntary carbon market and the prices received are low and there is no source for increases payments. 25% of the respondents also wanted more timely payments. This points to a need to keep improving the cluster payment system. Though we have changed the payment system several times, including being an early adopter of the Mpesa mobile phone payment system, paying 70,000 farmers on a timely basis remains a challenge.

In summary, though there are many ways we can continue to improve TIST, there do not seem to be any "negative" effects that actually harm the farmers.

Positive Net Benefit of TIST. All the benefits from the Original Survey were monetized and the average for n=124 was KES 36,958. When it was determined for the vulnerable households (n=19), the total was KES 30,395. The total for women (n=61) was KES 36,749. In the Yale/NEC survey, the average for n=61 was 146,224. The benefits for the Vulnerable 1 person (n=1) was KES 72,560, for Vulnerable 2 it was KES 21,508 and for women it was KES 138,654.

The lower benefits for the Vulnerable 2 respondents appears to be the result of:

1) poor survey answers. Example: there were several cases where the respondent indicated they had benefits but no quantity was given and the survey calculated as a zero.
2) the respondent opted out or was unable to participate of some of the program elements. An example is livestock and animal products. The average for the total survey was 67,482 but the average for Vulnerable 2 was 10,436 reflecting the fact that 3 out of the five respondents reported no activity in this program. It is quite possible that the reason is that at their income bracket, they are unable to buy additional livestock.

While the Negative Impact section indicated that there is a perception among a few that there are some negative impacts, they were a minority. To determine if TIST violates the "do not harm" tenet of the Gold Level, we refer to the overall monetary benefits to all 3 classes (entire survey population, vulnerable households and women) and note significant increases in participant income. Furthermore, all groups reported more perceived benefits than negative impacts from their participation. Combining this with some of the benefits noted in the climate, community and biodiversity sections of the monitoring report, it is clear that TIST has established "that no member of a poorer or more vulnerable social group will experience a net negative impact on their well-being or rights."

Summary. The two differentiated surveys have demonstrated that TIST has an overall positive effect on all members, including women and the most poor and vulnerable.