

PROJECT DESCRIPTION FOR TIST PROGRAM IN UGANDA VCS-CCB 011



Document prepared by Clean Air Action Corporation

Contact Information: info@tist.org

Project Title	TIST Program in Uganda, VCS-CCB 011
Version	7
Date of Issue	01-April-2023
Project Location	Ugandan Districts: Amuru, Bushenyi, Gulu, Kabale, Kanungu, Kayunga, Kiryandongo, Kyenjojo, Omoro, Rukungiri, and Soroti
Project Proponent(s)	Clean Air Action Corporation (CAAC) 250 Old Harbor Road Vinalhaven, Maine, USA 04863 Telephone 207-798-1243 CharlieWilliams@CleanAirAction.com tist.org
Prepared By	Charlie Williams
Validation Body	AENOR INTERNACIONAL S.A.U. Génova 6. 28004 Madrid- Spain. Telephone +34 914326000 jfuentes@aenor.com www.aenor.com
Project Lifetime	16 December 2003-16 December 2063, 60 years (same for VCS and CCB)
GHG Accounting Period	16 December 2003-16 December 2063, 60 years
History of CCB Status	1st Verification, concurrent with Validation

Gold Level Criteria	<u>Community</u>: This project has substantial economic and non-economic benefits for poor farmers, including carbon income, improved crop yields, new crops, education, health trainings, and leadership development <u>Biodiversity</u>: The project will plant thousands of indigenous trees while supporting critical ecosystems <u>Climate Adaptation</u> TIST trains farmers to use climate resilient planting techniques. The program supports farmers in organizing to meet challenges of climate change, and to develop strategies for issues such as high winds, draught, and erosion.
Expected Verification Schedule	Concurrent with validation

Table of Contents

1	Summary of Project Benefits.....	4
1.1	Unique Project Benefits.....	4
1.2	Standardized Benefit Metrics	5
2	General.....	9
2.1	Project Goals, Design and Long-Term Viability	9
2.2	Without-project Land Use Scenario and Additionality.....	40
2.3	Stakeholder Engagement	42
2.4	Management Capacity	51
2.5	Legal Status and Property Rights	55
3	Climate.....	62
3.1	Application of Methodology	62
3.2	Quantification of GHG Emission Reductions and Removals	72
3.3	Monitoring	84
3.4	Optional Criterion: Climate Change Adaptation Benefits	93
4	Community	94
4.1	Without-Project Community Scenario	94
4.2	Net Positive Community Impacts	103
4.3	Other Stakeholder Impacts	109
4.4	Community Impact Monitoring	110
4.5	Optional Criterion: Exceptional Community Benefits	112
5	Biodiversity.....	119
5.1	Without-Project Biodiversity Scenario	119
5.2	Net Positive Biodiversity Impacts	121
5.3	Offsite Biodiversity Impacts	130
5.4	Biodiversity Impact Monitoring	130
5.5	Optional Criterion: Exceptional Biodiversity Benefits	132
	Additional Information	134

1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) The farmers members are partners in TIST and receive 70% of the profits from the sale of carbon credits increasing their annual income.	4.5.6
2) Community Organization: TIST farmers organize themselves as neighbours, and at the community, regional, and national levels. This allows them to develop locally appropriate best practices, share support, and provide mutual accountability	4.5.8

1.2 Standardized Benefit Metrics

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
GHG emission reductions or removals	Net estimated emission removals in the project area, measured against the without-project scenario	5,139,342 t CO ₂ e Ex-Ante Project Removals are estimated to be	3.2.4
	Net estimated emission reductions in the project area, measured against the without-project scenario	Not applicable	n/a
Forest ¹ cover	For REDD ² projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	Not applicable	n/a
	For ARR ³ projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	2,821 Hectares of forest cover increased, Active PAs	4.4.1
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices are expected to occur as a result of project activities, measured against the without-project scenario	Not applicable	n/a
	Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	2,821 Hectares of forest cover increased, Active PAs	4.4.1

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

² Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

³ Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

⁴ Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Training	Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	8,346 Community Members (reflects all the members in a Small Group associated with a project area in the PD)	4.4.1
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	2,935 Women	4.4.1
Employment	Total number of people expected to be employed in project activities, ⁵ expressed as number of full-time employees ⁶	75 Employees	4.4.1
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	48 Female Employees	4.4.1
Livelihoods	Total number of people expected to have improved livelihoods ⁷ or income generated as a result of project activities	8,346 Community Members	4.4.1
	Number of women expected to have improved livelihoods or income generated as a result of project activities	2,935 Women	4.4.1
Health	Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	75 Employees	4.4.1
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	48 Female Employees	4.4.1

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from the UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
Education	Total number of people for whom access to, or quality of, education is expected to improve as a result of project activities, measured against the without-project scenario	Not applicable	n/a
	Number of women and girls for whom access to, or quality of, education is expected to improve as a result of project activities, measured against the without-project scenario	Not applicable	n/a
Water	Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	n/a
	Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Not applicable	n/a
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	8,346 Community Members	4.4.1
	Number of women whose well-being is expected to improve as a result of project activities	2,935 Women	4.4.1
Biodiversity conservation	Expected change in the number of hectares managed significantly better by the project for biodiversity conservation, ⁹ measured against the without-project scenario	23 Ha of riparian land	5.5.1

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Livelihoods, Health, Education and Water), and may also include other benefits such as strengthened legal rights to resources, increased food security, conservation of access to areas of cultural significance, etc.

⁹ Managed for biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation, e.g. enhancing the status of endangered species

Category	Metric	Estimated by the End of Project Lifetime	Section Reference
	Expected number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities, ¹¹ measured against the without-project scenario	No critically endangered or endangered species impacts are assessed. The project is improving the population trends of three vulnerable species in line with CCB Gold requirements	5.5.2

¹⁰ Per IUCN's Red List of Threatened Species

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

2 GENERAL

2.1 Project Goals, Design and Long-Term Viability

2.1.1 Summary Description of the Project (G1.2)

The International Small Group and Tree Planting Program (TIST) is a combined reforestation and sustainable development project in Uganda, carried out by subsistence farmers. The farmers plant trees on their land and retain ownership of the trees and their products. They receive training from TIST and a share of the carbon revenues from CAAC. TIST empowers Small Groups of 6-to-12 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 100,000 subsistence farmers. The maturing trees and Conservation Farming will provide additional sustainable benefits that far exceed the carbon payments.

TIST provides an administrative backbone that supplies training in building nurseries, tree planting, Conservation Farming, building fuel-efficient stoves and malaria and HIV/AIDS prevention. Part of the backbone is a two-way communications network that includes newsletters, weekly meetings at the Small Group level, monthly meetings where groups of Small Groups receive training, periodic seminars at the national level and an award-winning monitoring system based on cell phones and GPS. Planting trees on privately owned farms in conjunction with agricultural activities is minimally disruptive, resulting in virtually no leakage or baseline emissions.

Prior to project implementation, the project areas were being used as grassland or cropland. The baseline scenario is a continuation of these farming practices but without the introduction of tree species or the associated community, climate, and biodiversity benefits. Participants are largely subsistence farmers.

The program's climate objectives include but are not limited to an increase in hectares and count of indigenous trees, total trees planted, and hectares of planting on hillsides and riparian areas.

The program's community objectives include but are not limited to the incorporation of Small Group participants within PD; an increase in number of Small Groups within PD, number of TIST participants within PD, participation in TIST Uganda, number of person-training sessions on natural resource management practices, health, HIV, tree planting, biodiversity, vocational skills, and ICT. As well as an increase in number of community members with greenhouse gas agreements with TIST payments to community for ecosystem services, number of live trees planted by TIST Small Groups, number of fruit or nut trees in TIST Uganda, number of people employed by TIST or under contract to deliver services, economic benefits for farmers, number of people accessing mobile money services, number of people gaining access to healthcare, hectares of riparian and hillside planting. The program will further seek to monitor eucalyptus trees and ensure equal participation of women in leadership positions.

The project's biodiversity objective include, but are not limited to, increasing the numbers of trees, indigenous trees, and Endangered/Vulnerable/Threatened trees, as well as planting on steep hillsides, riparian areas, and around HCVs.

Project areas can largely be found in southwest and northern Uganda (See Figure 2.1.5 A). They are found in rural areas of districts including Amuru, Bushenyi, Gulu, Kabale, Kanungu, Kayunga, Kiryandongo, Kyenjojo, Omoro, Rukungiri, and Soroti. This project description (PD) is for a subset of the TIST project in Uganda and initially applies to 1,310 Small Groups, 8,346 Participants, 3,876 Project Areas (3,162 initial and more planned), and 2,821 hectares. TIST estimates this project will result in as annual average GHG removal of 85,656 and a total of 5,139,342t tonnes.

2.1.2 Project Scale

Project Scale	
Project	X
Large project	

2.1.3 Project Proponent

Organization name	Clean Air Action Corporation
Contact person	Charlie Williams
Title	Director
Address	250 Old Harbor Road, Vinalhaven, Maine, USA 04863
Telephone	720-394-2112
Email	CharlieWilliams@CleanAirAction.com

2.1.4 Other Entities Involved in the Project

Organization name	Institute for Environmental Innovation (I4EI)
Contact person	Blair Henneke
Title	Executive Director
Address	250 Old Harbor Road, Vinalhaven, Maine, USA 04863
Telephone	918-747-8770
Email	blairhmartin@gmail.com

2.1.5 Physical Parameters (G1.3)

The project is spread across Uganda. The geographic boundaries of the project are the national borders of Uganda. An approximate center point is 1° 35' 17.2" N, 32° 43' 02.2" E.

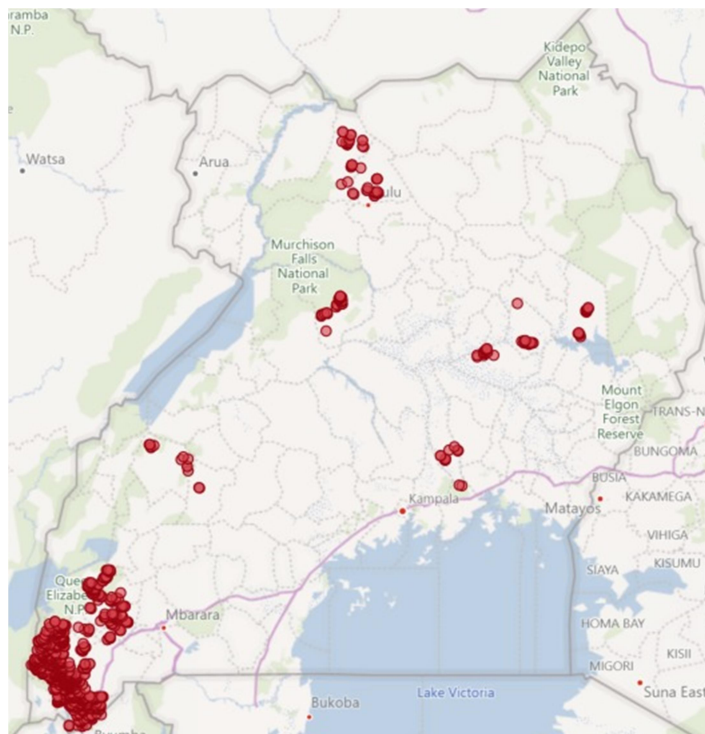


Figure 2.1.5 A This photo shows an approximate distribution of this PD's project areas

Climate: The climate is tropical and shows little temperature variation throughout the year. In the lowlands and Bushenyi plateau, the temperatures range between 25° and 31°C. In the highlands, such as in the Nsika and Kabale Mountains, the temperature ranges from 13° to 26°C. Rainfall is considered moderate, with most of the general area receiving around 1,400 mm per year.¹² The Mbarara plains are dryer, with only 1,000 mm per year of precipitation. The heaviest rains occur in April-May and September-November, with dry seasons between December and February and between June and August.

Soils: Soils are a function of the underlying rocks, topography, and climate. Much of southwest Uganda is comprised of acric ferralsols, lixic ferralsols, and dystic regosols.¹³ The soils covering the Mbarara plains and smaller planes are Ferralsols. They are the result of highly weathered surfaces in the tropics, usually associated with forest cover. In this case, the forest cover has been removed by years of human occupancy.

Overlying the Karagwe-Ankolean terrain of the Kabale Mountains are Haplic Ferralsols. North of the Kabale Mountains and covering the Ankole Hills are Lithic Leptosols, indicative of rocky outcrops. The soil around Rukungiri and Rwashamairi is a Rhodic Nitosol, a red clay soil that is considered some of the better agricultural soil in the region. The volcanic rocks of the Queen Elizabeth National Park are Andosols. Rich organic Histosols can be found in the swampy areas associated with some of the river courses, such as the Koga tributary of the Ruizi River and the Munyere Swamp. Fluvisol cover the floor of the North Maramagambo Forest Reserve.

¹² Exhibit 13 "TIST Dist Enviro Profile National Environment Management Authority (NEMA), District Environment Profiles: Bushenyi"

¹³ Sillem, Onesmus. *Overview of the Status of Soil Resource in Uganda, and the Needs and Priorities for Its Sustainable Management*. National Agricultural Research Organization, www.fao.org/fileadmin/user_upload/GSP/docs/South_east_partnership/Uganda.pdf, accessed February 10, 2020

Topography/Hydrology: At the northwest edge of the general area is Lake George, at an elevation of 922 meters. It is connected to Lake Edward (west of the general area) by the south flowing Kazinga Channel. Straddling the channel and continuing along Lake Edward is a 15 to 20-kilometer-wide lowland (1,000 meters) that is dominated by the Queen Elizabeth National Park and North Maramagambo Forest Reserve (termed herein, the QE lowland).

To the south of Lake George, rising to almost 2,200 meters are the mountains bearing the Kasyoha-Kitomi Forest Reserve and settled area adjacent to the east (termed herein, the Nsika Mountains). The west sides of the mountains drain to the channel via the Chamburo and Buhidagi Rivers, creating two large drainage basins in the Kasyoha-Kitomi Forest Reserve.

Rising up east of the QE lowland and situated south of the Nsika Mountains is a plateau (1,600 meters) defined by Bushenyi Town, Rukungiri, Ntungamo, and Kabwohe (herein termed the Bushenyi plateau). Draining the north side of the Bushenyi plateau are the upper reaches of the Chamburo River. The west portion of the plateau drains to the west and courses across the QE lowland via the Nyamweru, Rwenbuno, Koizi, Nchwera, or Rushaya Rivers. The first four flow directly to Lake Edward. The Rushaya flows into the Ntungu River and then to Lake Edward. The plateau also drains to the south and to the west flowing Minera River. The Minera becomes the Ntungu further downstream towards Lake Edward. Swamps along the slower moving streams characterize much of the plateau.

East and southeast of the Nsika Mountains, stretching beyond Mbarara, are plains (elevation about 1,370 meters, herein termed the Mbarara plains). The creeks and streams of the east portion on the Nsika Mountains and the southern Mbarara plains flow south, as tributaries of the Ruizi River. Also flowing to the Ruizi are the Koga, Buzhago, and Munyere swamps (elevation approximately 1,350 meters). The Ruiza flows east through Mbarara, where it disappears into the swamps near Lake Mburo National Park.

The northern Mbarara plains drain to the north via the Oruyuba, Nyobisheke, Rutungu, Kabagore, and Kaginga Rivers. They ultimately feed the west flowing Katonga River, which feeds Lake George.

South of Mbarara are some minor mountains and a dissected plateau that reaches 1,890 meters (herein termed the Ankole hills). They drain to the north and to the west to the Ruizi River. Water shedding to the west and southwest flows to a major drainage, with as many as three names, the Rubingo, Chamwasha, or Kababo River. The river terminates at the Rwanda border, where it meets the east flowing Kagera River. Flowage on the southern portion of the Ankole Hills goes into the Chezho River, which feeds the Kagera River at the international border. The Kagera discharges into Lake Victoria (1,136 meters).

North of Kabale is a mountain range that reaches 2,640 meters, west of the general area of TIST (herein termed the Kabale Mountains). They drain to the north, across a plateau, to Lake Karangye, the Kakondo swamp, and the Ntungu/Minera River. They drain to the east to the Kakitumba River, which feeds the Kagera River. Southwest of Kabale is Lake Bunyoni.

Ecosystems: According to the FAO, the ecosystem of the general area is “other wooded lands”, with a mosaic closed forest and fragmented forests.¹⁴ Uganda features diverse geographical features ranging from snow-capped mountains to rainforests, swamps, arid, and semi-arid plains. Geographical diversity extends across north-south and east-west axes. Uganda features “four distinct ecosystem types: shrub

¹⁴ FAO Forestry Department, Country Profiles: Uganda, Global Forest Resources Assessment, Food and Agriculture Organization of the United Nations, 2000.
<http://www.fao.org/forestry/foris/webview/forestry2/index.jsp?siteId=5081&siteTreeId=18927&langId=1&geold=0>. Accessed December 16, 2019.

lands, savanna and grasslands covering 44% of the total land area, cropland/natural vegetation mosaic covering 35%, wetlands and water bodies covering 16% and, forests covering 20%.”¹⁵

Rare and Endangered Species: Uganda is widely known for its abundant and diverse wildlife, especially large mammals. While many of these animals were present in the project’s areas in the past, the long history of human habitation and agriculture have pushed them to isolated pockets of protected areas, such as the Queen Elizabeth National Park and surrounding forest reserves. The project areas are lands under the control of subsistence farmers where wildlife has been long removed and replaced by domesticated animals and plants.

The national Redlist for Uganda includes 109 critically endangered species, 170 endangered species, and 247 vulnerable species. Many of these species are found primarily in the southwest. Analysis by Makerere University and the WCS found large data deficiencies.¹⁶

A list of rare and endangered species that 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 Small Group Members indicate the absence of any endangered, or rare, species in the project areas.

Table 2.1.5 IUCN Red List of Threatened Species		
Scientific Name	Common Name	Status
Mammals		
<i>Dasymys montanus</i>	Montane Shaggy Rat	EN
<i>Delanymys brooksi</i>	Delany's Mouse, Delany's Swamp Mouse	VU
<i>Hippopotamus amphibius</i>	Common Hippopotamus, Hippopotamus, Large Hippo	VU
<i>Micropotamogale ruwenzorii</i>	Rwenzori Otter Shrew, Ruwenzori Otter Shrew	NT
<i>Ruwenzorisorex suncoides</i>	Ruwenzori Shrew	VU
Amphibians		
<i>Africalus orophilus</i>	tree frog	VU
<i>Hyperolius castaneus</i>	Montane reed frog	VU
<i>Hyperolius discodactylus</i>	Albertine Rift reed frog	VU
<i>Hyperolius frontalis</i>	White-snouted reed frog	VU
<i>Leptopelis karissimbensis</i>	tree frog	EN
<i>Leptopelis kivuensis</i>	Kivu tree frog	NT
<i>Petropedetes dutoiti</i>	Du Toit's Torrent Frog	CR
<i>Phrynobatrachus versicolor</i>	Western Rift Puddle Frog	VU
Insects		
<i>Agriocnemis palaeforma</i>	damselfly	NT
<i>Chlorocnemis pauli</i>	Orange-tipped Threadtail	NT
<i>Chlorocypha jacksoni</i>	damselfly	VU
<i>Chlorocypha molindica</i>	damselfly	EN
<i>Idomacromia jillianae</i>	dragonfly	VU
<i>Onychogomphus styx</i>	dragonfly	NT

¹⁵ *Country Profile- Uganda*. United Nations Poverty Environment Facility, www.unpei.org/sites/default/files/e_library_documents/UG_ecosystems_rpt.pdf, accessed December 16, 2019

¹⁶ *Nationally Threatened Species for Uganda*. WCS IUCN, www.nationalredlist.org/files/2016/03/National-Redlist-for-Uganda.pdf, accessed February 10, 2020

Table 2.1.5 IUCN Red List of Threatened Species		
Scientific Name	Common Name	Status
<i>Pseudagrion bicoerulans</i>	Afroalpine Sprite	VU
<i>Tetrathemis denticauda</i>	dragonfly	CR
<i>Tetrathemis ruwensoriensis</i>	dragonfly	CR

Notes:

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

2.1.6 Social Parameters (G1.3)

Project participants organize themselves into Small Groups of 6-12 members, who plant trees and engage in TIST activities together. These Small Groups form the building block of TIST, providing mutual support and accountability at a local level. Small Groups are organized into Clusters. These units of approximately 20-70 Small Groups select a central meeting place within walking distance of participants. Education and administration occur at monthly Cluster meetings. Clusters are administered to by Cluster Servants - these are trained workers who serve as educators and Quantifiers.

Project participants are subsistence farmers; these are individuals who grow food to eat. The land use of project areas is largely farming. Project areas are distributed across Uganda. Due to this distribution, it is challenging to generalize on migratory patterns. In Northern Uganda there is a history of cross-border migration with South Sudan (formerly Sudan) and in Southern and Western Uganda with Rwanda and Congo.¹⁷

TIST is open to both men and women. In this PD there are 2,935 women and 5,715 men with the remainder undifferentiated. Participants are largely subsistence farmers and their families. A discussion of income levels can be found in section 3.1.5- information on Small Groups in Busheyini district, where many of the TIST farmers reside, shows that 82% of Small Groups earn between USD 257 and 857 per annum.

The types of land ownership associated with the project areas include Customary Tenure (83.6%), Registered Deed (2.7%), Permission of Landowner/Local Authority (.7%) and Other (13%). A further description of socio-cultural information can be found in Section 2.1.9.

The main ethnic groups found in Uganda are Baganda (16.2%), Iteso (8.1%), Basoga (7.7%), Banyankore (8%), and Other (20.3%).¹⁸ In the south and southwestern regions of the country many TIST farmers are Bagandans; in the north there are a variety of ethnic groups including Kakwa, Acholi, and Landi.

Kampala is the largest city in Uganda and seat of government power. Major settlements near TIST operations include Gulu, Lira, Mbarara, Kabale, and Soroti.

¹⁷ <https://www.unhcr.org/en-us/news/briefing/2017/3/58cba77f4/south-sudans-refugee-crisis-worlds-fastest-growing-uganda-region-critical.html>

¹⁸ Exhibit 48 Ethnic Groups of Uganda at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

2.1.7 Project Zone Map (G1.4-7, G1.13, CM1.2, B1.2)

The individual project areas of this PD are located in Uganda. Project Areas are distributed throughout the southwest, north, and east. The boundaries of the individual project areas are shown on the following map in blue. However due to the thousands present and the scale of the map, a better way to see them is using Google Earth with Appendix 03, the KML file.¹⁹

The TIST program is open to any Small Group of farmers seeking to join. Farmers come from different communities, tribes, and geographical areas. To date, the TIST program in Uganda has spread to more than a dozen districts. This growth is anticipated to continue during successive verifications within the defined project zone. Due to the hundreds of villages and communities associated with this PD, only selected communities can be shown on the maps. Appendix 04²⁰ is an Excel spreadsheet of data, which includes a list of each project area and provides a better reference to the hundreds of villages and communities.

The map presents the two HCVs discussed in the PD, Located in the southwest corner of the map are Queen Elizabeth National Park (marked as 1) and Bwindi Impenetrable National Park (marked as 2).

The template also requires showing areas where offsite climate impacts are predicted, areas where other stakeholders will be impacted and areas where offsite biodiversity impacts are predicted. Since climate issues are global, the entire project zone defines the areas where offsite climate impacts are predicted. Because of the number of project areas in this PD and the 7 other TIST Uganda PDs, the entire project zone defines the area where other stakeholders will be impacted. Because of number of project areas and their distribution throughout Uganda, the entire project zone defines the areas where offsite biodiversity impacts are predicted.

¹⁹ Appendix 03: KML Files of Project Areas: TIST UG PD-VCS-011d App03 PA Plots 230401v3.kml at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

²⁰ Appendix 04 Validation Data: TIST UG PD-VCS-011e App04 Validation Data 230401v4.xlsx at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

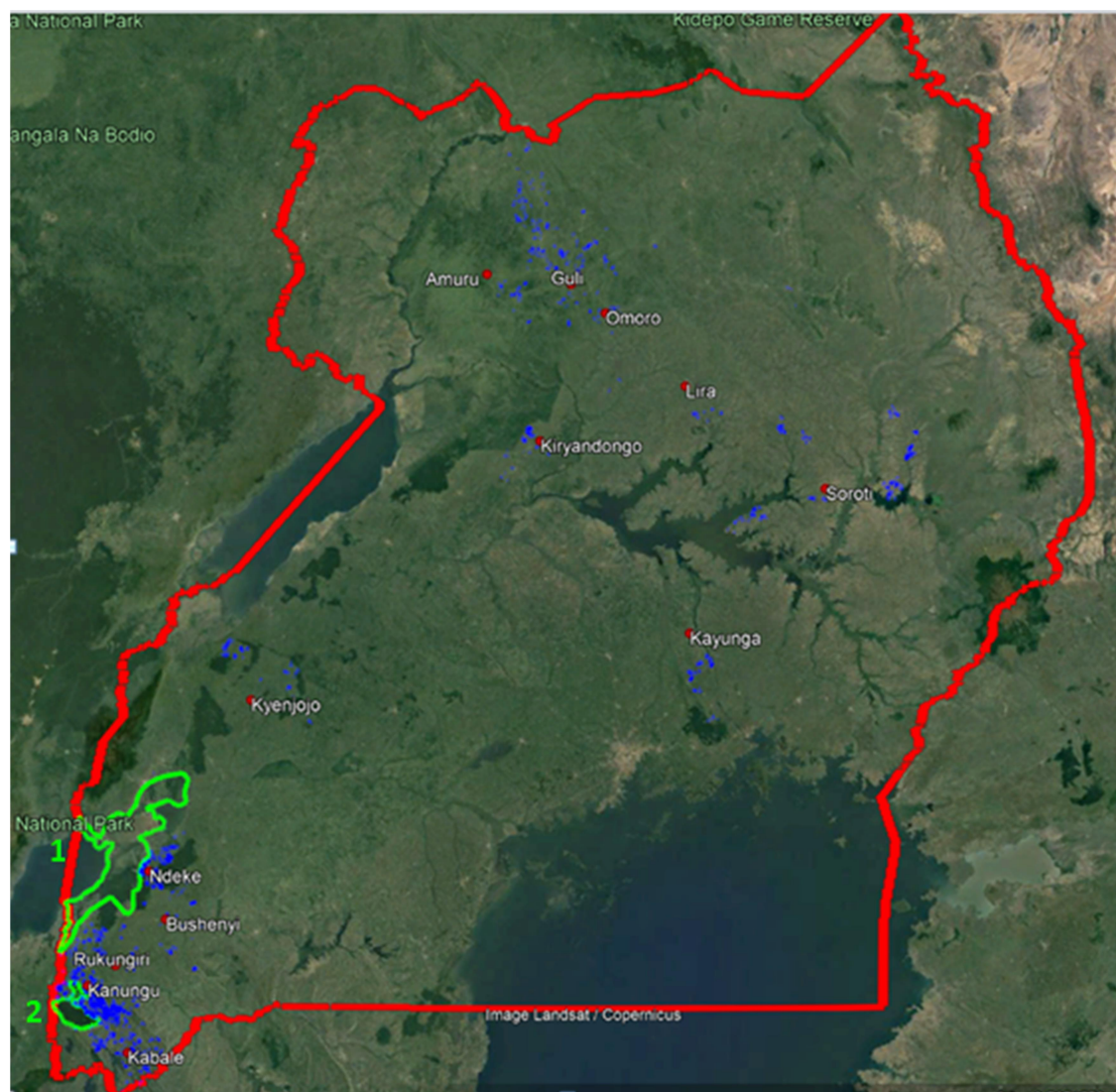


Figure 2.1.7: This map shows the project zone of Uganda as a red outline. The HVCs are in green in the SW corner. The northern most is Queen Elizabeth National Park (marked as 1). Further south, also in green, is Bwindi Impenetrable National Park (marked as 2). The boundaries of each project area are blue. TIST communities are labeled.

TIST has adopted a "grouped project" approach for this PD, because it is expanding throughout Uganda. A KML file has been prepared that defines the extent of the geographic area of the expanded program. The KML file defines the country of Uganda. See Appendix 05.

The district and village of each initial project area are in Appendix 04, "Grove Summary" worksheet. The geographic locations and boundaries of each initial project area have been determined using a GPS and identified with a unique number and geographic coordinate. Appendix 03 is a KML file that can be loaded on Google Earth that identifies each initial project area and plots each boundary. In addition, TIST maintains all of this data in an interactive format on a website that is publicly available to anyone with Internet access. Included on the site are GPS tracks of the project areas on a geographic grid. It can be accessed as follows:

1. Go to tist.org
2. Select "low bandwidth version"

3. At top, select Project Area (example: Uganda). Note Country Profile information showing current tree count, Small Group count and predominate species information for all the TIST activities in the country. This information, as well as the rest of the information on the web site, is updated as much as several times a day as field staff upload their data.
4. On the right, below map, select a Project Area (example: select Kanungu). Note current Area Profile summaries at top showing current tree count, Small Group count and predominate species information for all the TIST activities in the Project Area.
5. Towards bottom, select a Cluster (example: Kinaba). Note current Group Cluster Profile data at top showing current tree count, Small Group count and predominate species information for all the TIST activities in the Cluster.
6. Select link “Click Here to View the Quantified Tree Groves in this Group Center Displayed on a Satellite Map.” A Google Maps satellite image will appear with red dots showing the location of all the project areas assigned to this Cluster. Placing the cursor and clicking on a dot will display an information balloon about that project area.
7. Use the browser back button to return to the Group Cluster Profile page.
8. Note the table at bottom of page listing the Small Groups assigned to this Cluster, their tree and seedling counts and the Last Audit Date.
 - a) The camera icon next to the group name is a link to pictures of the Small Group and their project areas. Digital photographs are taken with TIST’s data acquisition system and are automatically dated and mapped to the Small Group.
 - b) Last Audit Date refers to the last time a TIST Quantifier (a staff member trained to collect project area data using TIST’s data acquisition system) collected data from this Small Group’s project area. It is a link to detailed quantification data.
9. Select one of the dates under Last Audit Date (example: date associated with Rukungwe Tree Planting).
10. On the Tree Audit page is a list of each project area belonging to the selected Small Group. Under Groves Present are the name, latitude and longitude of the project area.
11. Select a Name in the Groves Present Section (example: Alex) that is a hot link and the GPS perimeter of that project area will appear showing the bounding latitude and longitude, identification and area.
12. On the same page, select the link at the top “Click here to view this grove perimeter plotted on a satellite image.” The perimeter of the project area is now displayed on a Google Maps satellite image. If there is a grey screen stating “we are sorry, but we don’t have imagery at this zoom level for this region” use the minus button (“-“) at the top left to zoom out until the satellite image comes into view. Additional clicking on the minus button will display the project area with a regional perspective.
13. On the satellite page, there are two other options. The first link, “Click Here to View Pictures of the TIST Small Group that has Planted Trees in this Grove” goes to the same set of pictures described in 8.a., above. The second link, “Click Here to View All the Quantified Tree Groves in this Group Center Displayed on a Satellite Map,” displays all of the project areas in the Group Center as described in 6, above.
14. Use the browser’s back button to navigate back to the Tree Audit page to see more details about each project area including species, tree count and age.

TIST spreads by word-of-mouth, farmer to farmer. This has meant that the project has expanded organically across regions and villages. Future project areas and communities that are most likely to be incorporated are in the districts of Amuru, Bushenyi, Gulu, Kabale, Kanungu, Kayunga, Kiryandongo, Kyenjojo, Omoro, Rukungiri, and Soroti, as well as the expansion currently underway in Lira district. These districts are in the southwestern and northern areas of Figure 2.1.7A.

2.1.8 Stakeholder Identification (G1.5)

Stakeholder Identification:

TIST was designed to benefit poor farmers by providing carbon revenues and sustainable development tools. As such, the stakeholders were identified as the subsistence farmers in areas where TIST is active or to where it is expanding. The farmers should have an interest in planting trees for long term carbon removals, rights to land where they can plant and be willing to enter into a GHG contract. However, we have members that do not have the resources to plant the trees but are interested in using the sustainable development training to improve their lives. They are also welcome.

When TIST begins in an area, they contact community leaders, village heads/village leaders, local NGOs, churches and local government officials to determine if they think their members or constituents might benefit from the program. These entities are identified through existing contacts such as USAID, World Bank, various churches, Leadership council members, and existing TIST members, and research. TIST representatives have met with numerous National, State, District and Village officials seeking comment and showing them the project.

The organizations are told our focus is on poor farmers and that they are the ones we want to join. If there is an interest, they pass word that TIST will hold introductory seminars. TIST holds seminars to present the program to the initial farmers, answer questions, address concerns and receive comments. This is followed by regular and ongoing meetings where new farmers are invited to attend. 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 "The Tree," a multi-lingual newsletter published by TIST Uganda; and direct contact with community leaders and government officials.

When the farmers decide to join, they come to the nearest cluster meeting and start the registration process (see Section 2.3, Stakeholder Engagement).

TIST works to engage other stakeholders who are not project participants in several ways. Before project implementation, TIST solicits comments and engages stakeholders. When possible, meetings are announced online and in local newspapers/newsletters. TIST also emails various NGO's, government officials, and community leaders to solicit comments and identify relevant non-participant stakeholders. They are invited to attend consultation meetings and provide avenues for providing feedback if they are unable to attend. Due to COVID-19, the program has requested written comments or virtual feedback from stakeholders.

TIST generally expands into new areas because of requests from local community members. In some cases, clients will request program expansion to incorporate new geographies. Leaders and staff are identified through the Cluster meetings and through local seminars. People who are serving as Quantifiers and trainers are assessed for both their passion and ability. Stakeholders are segmented by geography through the formation of Small Groups and Clusters; otherwise, there are no barriers between them.

2.1.9 Stakeholder Descriptions

Stakeholder Description: Participating farmers are the primary stakeholders. A description of their communities is in Section 4.1.1. "Subject to Verra rules, all subsistence farmer communities in Uganda may join. Appendix 04 (Grove Summary) lists the communities that have already joined this PD."

According to program surveys, TIST participants are largely subsistence farmers many of whom are living far below national and international definitions of poverty. There are no barriers to participation in TIST. As such, TIST farmers are a diverse group spanning many different ethnic and geographic backgrounds. The diversity of backgrounds, and the network creation through meetings, seminars, and newsletters, allows for information sharing and capacity building that would be otherwise inaccessible. Labor and management are carried out by both men and women. TIST farmers comprise a broad diversity of ages.

In addition to TIST participants, neighboring farmers and family members can be considered stakeholders as well (see section 4.3.1). These neighboring farmers are similarly comprised of a broad diversity of

ethnic and geographic backgrounds. Both TIST participants and these neighbors are predominantly rural. The lack of barriers to entry means that virtually any farming community in Uganda would have access to TIST and virtually any Ugandan farmer could become a neighbor or family member to a TIST participant.

The Leadership Council oversees the TIST Uganda program. This council is made up of Ugandans, about half of whom are female. It is made up of six to twelve TIST farmers and two full time managers (Ugandan). They supervise the TIST Workers.

TIST workers are men and women who serve as quantifiers, trainers, and the representatives of TIST within local communities. TIST trains local community members, generally TIST participants themselves, to fill these roles. Within TIST, most of these workers are referred to as “Cluster Servants”. Other such workers include expansion workers, tech support, and TIST Staff. The Staff are managers who oversee expansion, technical support, accounting, and day to day operations. Because TIST hires these workers largely from the pool of TIST participants and their neighbors, they share largely the same demographic characteristics.

In addition to farmers and workers, TIST Uganda works with its robust networks to identify interested stakeholders in the region. This identification process is supported by the program’s 29,000+ farmer participants (all members in Uganda) and deep ties to local communities. TIST makes an effort to consult governmental authorities, NGO’s, civil society organizations, and other local leaders.

The TIST program is entirely voluntary and is spread through word-of-mouth. The program does not demand membership but rather relies on farmer’s actively seeking to join. The potential costs, risks, and benefits are best articulated by farmers who are currently participating in TIST. In addition to word-of-mouth, TIST relies on both the newsletter and local leaders to share information. To join TIST, farmers must complete a lengthy application process which includes attending meetings to learn about benefits and costs. In order to be accepted into TIST, farmers must attend training sessions on each element of the program.

TIST farmers give the program the rights to sell the carbon credits they create. In exchange, the farmers get a prepayment based on tree count and ultimately receive 70% of the profits from carbon sales. The farmers maintain ownership of their land, the trees and the tree products. They get 100% of any firewood, fodder, fruits or nuts that come from the trees. They receive training in many life improving topics at no cost. They choose which elements of program are best for them (for example health training, Conservation Farming practices, raised seed bed construction, etc.) for them and keep all the benefits derived from their adoption.

2.1.10 Sectoral Scope and Project Type

This project is seeking registration under the Verified Carbon Standard (VCS 4.4) as an Afforestation, Reforestation and Revegetation (ARR) project and has been developed in compliance with the CDM Afforestation/Reforestation (A/R) methodology “A/R Large-scale Consolidated Methodology, Afforestation and reforestation of lands except wetlands” (AR-ACM0003v.2). The Sectoral Scope is 14 (AFOLU). It is also seeking CCB validation (CCB 3.1) It is a grouped project.

2.1.11 Project Activities and Theory of Change (G1.8)

Per the VCS/CCB template, a detailed description of the GHG emission reduction or removal activities follows. Discussed are the tree planting activities that lead to the physical removals and well as monitoring, management, associated community activities and more. Except for the participation of I4EI to enhance delivery of benefits, there are no other organizations involved. The communities involved are the subsistence farmers of Uganda wanting to voluntarily join TIST. The physical communities are listed in “Grove Summary” of Appendix 04 and discussed in Section 4.1.1. These community members are the people that plant the trees and manage the program. While Uganda has a jurisdictional REDD+ program, TIST is specifically an ARR program.

The technologies associated with tree planting have been developed through discussions with Uganda Forestry Department and use of existing literature. In addition, TIST works with the Small Groups and local experts to develop best practices that are recommended to the members for adoption. The following describes the technologies employed.

General: The project involves direct tree planting of species selected by the individual Small Groups to meet their individual goals and needs. A list of suitable species is prepared based on input from local experts and TIST members and their benefits are discussed at TIST training meetings.

Monitoring: TIST has deployed an innovative and award winning²¹ data collection system that consists of battery-operated smartphones, GPS receivers, data and image uploads through laptops or internet access points to monitor project activities. The data collection is conducted by trained local representatives, called Quantifiers, who are often Small Group members. They travel to each specific project area by walking, bikes, and local buses. TIST does not own any vehicles.

Internet: TIST uses Internet technology to make program results available transparently to a worldwide audience. It is also used to transfer field data collected with the smartphones to the TIST database server located in the USA.

Pest Management: Small Groups are trained to use local natural techniques to manage pests. For example:

- Neem seeds are ground and added to boiling water. The mixture is left overnight and then applied to seedlings when cool.
- Neem leaves, washing soap, salt and red pepper (chili) are mixed together, then added to water and covered with the pan (this is a dangerous mixture!) and then boiled. The cooled mixture is applied to the seedlings.
- Ash is added to the area with seedlings.
- The area is well weeded to avoid encouraging pests.

Ongoing management: Long-term management of the trees rests with the Small Groups. However, due to the ongoing tree payment based on live tree counts and the long-term profit-sharing arrangement with the Small Groups, there are ample incentives for the groups to maintain healthy long-term stands. All species will be maintained for the 60-year life of the project. Small Groups have contracted to replant trees that die in the first 20 years. Management of trees is dependent on species, geography, and farmers individual decisions taken to protect tree viability.

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: Tree planting is accomplished by manual methods using hand tools by the farmers on their land. As such they are the managers of their project area and use their farming experience and the additional training to provide by TIST to manage the planting and oversee the trees. They practice conservation by using local materials such as compost and manure to improve early growth. They use the tree products such as fodder, fruits and nut. TIST best practices call for farmers to dig individual holes that are 45 cm wide, 45 cm deep, spaced 2.5 m to 3.5 m apart for each seedling and fertilized using natural fertilizers. TIST does not own any fossil fuel vehicles or equipment to be used for tree planting.

²¹ ComputerWorld Honors Program Laureate, 2007. For reference, this was before the iPhone.

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 as it is sustainable. All of these enhance income, and some improve food security.

Provide training social and health training: TIST conducts training at 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.

Activity description	Expected climate, community, and/or biodiversity			Relevance to project's objectives
	Outputs (short term)	Outcomes (medium term)	Impacts (long term)	
Recruiting	Increase in program's applications and registrations	Increase in number of farmers participating in TIST Increase in Small Groups participating in TIST	- Sharing of Best Practices among farmers and communities - Increased organization between participants - Access to carbon markets and other benefits - Farmers will sign GHG contracts	Further Community objectives related to organization and economic benefits
Participant Training at Cluster Meetings	Increase in number of person-training sessions on various development topics	Participants are able to request and receive information that is useful to them	Participants receive high quality training on topics such as Climate Change, Health, Biodiversity, natural resource management, TIST practices, and sustainable development goals	Further objectives related to community, economic benefits, and climate resiliency
Planting	Farmers use strategies learned at Cluster Meetings to build raised nursery beds and plant	Farmers grow trees on their farms	- Farmers are able to increase the number of viable trees, indigenous trees, hectares of woodlots, Increase in number in Endangered/Vulnerable/Threatened Species - Farmers are able to protect HCVs and other ecosystems through reduction of pressure on	Further objectives related to biodiversity, economic benefits, and climate

	seedlings		forests and protection of riparian/hillside areas Trees will sequester carbon	
Monitoring of Farms	TIST workers capture information on farms and tree planting activities	Information is used for management and to create carbon offsets	- Farmers receive share of profits from sale of offsets - Farmers are organized to access mobile money transfer to receive payments	Further objectives related to climate and economic benefits
Newsletter Publication	TIST workers and farmers will write newsletters	TIST farmers will receive newsletters at Cluster Meetings	- Participants will be able to receive information on key training topics that is relevant to them and their communities - Participants will be able to ask questions and contact TIST leaders directly	Further Community objectives related to organization
Harvesting of Tree Products	TIST farmers will harvest tree products	TIST farmers will collect fruits, nuts, deadfall, medicinal products, etc	TIST farmers will receive health, economic, and nutritional benefits from the products they collect	Further objectives related to economic benefits and health

2.1.12 Sustainable Development

TIST contributes to the following indicators for sustainable development – Social well-being, Economic well-being, Technological well-being, and Environmental well-being:

Socio-economic well-being

- TIST generates employment of local Quantifiers and staff who travel to TIST tree groves and woodlots to quantify the number, location, circumference, and species of trees planted as a result of this project activity. The project also provides jobs for an office staff, who oversee the production of the TIST newsletter, the scheduling and coordination of Cluster meetings,²² the synchronization of smartphone data from the Quantifiers, and the establishment of the voucher payment system.
- TIST reinforces the removal of social disparities by encouraging participation among all members of society regardless of income, religion, or gender. TIST also removes social disparities by training participants to use the concept of rotating leadership within the Small Group and Cluster formats.
- TIST reinforces good practices for human health. TIST provides training on the use of UNFAO Conservation Farming practices, which, when adopted, have resulted in a doubling of crop output

²² TIST Small Groups organize themselves into administrative units called “Clusters”- these are 20-70 Small Groups within walking distance of a central meeting point

in many cases and helped to secure food, especially during periods of drought. In addition, TIST uses the Cluster meetings as a delivery mechanism to train participants in health matters including HIV/AIDS awareness and prevention, sanitation, nutrition, and other issues.

Technological well-being

- TIST provides the transfer of environmentally safe and sound technologies, including the use of Android smartphones, laptop computers, GPS devices, Internet, and UNFAO Conservation Farming best practices. In addition, the TIST newsletter documents best practices, identified by the participants themselves, for sharing appropriate and adaptive technologies with one another.

Environmental well-being

- The TIST program improves resource sustainability and reduces resource degradation. Because TIST participants plant trees, and because not all trees survive, the deadfall alone will reduce the need for participants to continue to cut down trees outside TIST project boundaries after just a few years. Once enough trees are planted, they have the potential to provide a sustainable fuel wood supply.
- Resource degradation exists when soils erode. TIST trees directly stabilize soils. They also provide shade that enables grasses to grow under the canopy, which further reduces soil degradation. They produce fruit, nuts, and traditional medicines, which lessen the pressure to obtain these from non-TIST tree stocks.
- By empowering Small Groups to select which tree species to plant and training on benefits of indigenous species, the project reinforces biodiversity friendliness. Because of the diversity of Small Groups, the disparate locations of their groves, the decentralized nature of their decision-making, and the variety of species planted, TIST represents the antithesis of a single, large monoculture plantation.
- The impact of TIST is to reduce the levels of pollution in general. TIST provides an improvement in air quality through the sequestration of carbon. Soil stabilization that results from TIST also has the ability to improve water quality over the long-term. TIST does not own a fossil-fuelled vehicle.

Uganda's nationally stated sustainable development priorities are the 17 SDG developed at the UNGA Sustainable Development Summit and the Agenda 2030. The following are some of the sustainable development goals that TIST addresses:



GOAL: There is no poverty – End Poverty in All its Forms – Everywhere

TIST works both directly and indirectly to address the issue of poverty. Farmers receive cash benefits equal to 70% of the profits from carbon sales. They also gain significant financial benefits from their participation in TIST. These benefits include fruit and nut crops, improved crop yields through Conservation Farming, fodder for cattle, wood for craft and fuel, improved land, and training in small business development. Currently farmers receive over \$8 of value per tree planted. Working

with subsistence farmers on degraded land, the TIST program addresses acute instances of poverty; TIST succeeds in creating new revenue streams without interfering with the farmer's primary economic activity.



GOAL: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

TIST addresses the issue of hunger directly. By teaching Conservation Farming, TIST farmers are almost always able to double their crop yields in the first year and can increase yields as much as 400% in subsequent years. TIST farmers also

benefit from growing new crops, such as fruits and nuts, that improve their food security. The ancillary benefits of increased fodder and fertile land also improve the farmers' ability to raise animals. Finally, the planting of trees restores degraded and/or desertified land, improving the long-term agricultural outlook for TIST farmers.



GOAL: Ensure healthy lives and promote well-being for all at all ages

The TIST program addresses many of the health issues facing participants. Training includes a ten-part program on HIV/AIDS education. TIST offers further education on malaria, typhoid, tuberculosis, nutrition, sanitation, clean drinking water, and hygiene topics. This information is distributed at Cluster meetings and through multilingual newsletters.



GOAL: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Education is fundamental to TIST. Through Clusters and newsletters, TIST offers applied and vocational education that is accessible to people regardless of age, gender, or social status. This promotes lifelong learning and democratizes informational distribution. The revenue from participation in TIST is also reported to often pay for school fees and uniforms.



GOAL: Achieve gender equality and empower all women and girls

Gender equality is a foundational aspect of the TIST program. The practice of rotational leadership supports gender equality by providing everyone a chance to lead.

Training for leadership opportunities is open to both genders, and women are actively encouraged to seek these roles. TIST engages equal numbers of men and women as independent contractors and in leadership positions.

The TIST program's benefits are not determined by land ownership, which is usually patriarchal in the operational countries. Instead, the 'ecosystem service' can be accomplished by women, the contract can be held by women, and it can be transferred through inheritance.



GOAL: Ensure availability and sustainable management of water and sanitation for all

TIST plays a direct role in clean water and sanitation issues, through several activities. Riparian planting works to anchor sediment and improve water quality in the areas where we operate. Through this program, TIST has restored hundreds of hectares of vital riparian land. In areas where the average TIST participant is an hour's travel away from the closest water source, the preservation and improvement of existing watersheds is vital. Educational programs about hygiene improve sanitation. TIST also educates farmers on methods for water purification, including through the use of sunlight.



GOAL: Ensure access to affordable, reliable, sustainable and modern energy for all

TIST provides resources and training on the construction of clean burning stoves. These stoves require significantly less wood to produce energy and offer improved ventilation. In some areas, TIST has also provided access to solar power and to manufactured metal stoves. More than 50,000 people have benefited from these technologies through TIST.



GOAL: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

TIST works with people as both employees and independent contractors. Flexible hours allow people to generate a secondary revenue stream from TIST, while also continuing to work on their farm. This income is further directly linked to beneficial results for the farmers they are serving.

Many of the issues addressed by TIST have serious economic implications.

HIV/AIDS and land degradation problems have wide reaching economic impacts. By improving health and environmental concerns, TIST significantly improves the economic potential of its participants. Improved soil is a multi-generational and sustainable benefit. More generally, TIST's operations strengthen the environment and societies they operate within, directly and indirectly promoting regional and national economic growth.



GOAL: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

TIST has significant infrastructure and innovation benefits. The Small Groups, Clusters, Newsletters, and Seminars are all designed to facilitate information sharing and innovation. These incubators allow farmers to share improvements and ideas with one another across geographical, cultural, and social barriers. Information technology and training allow participants to further leverage their intellect and

innovation. In addition, the TIST structure is itself an award-winning logistical achievement. Solving the "last mile" problem that many organizations run into in our operational countries constitutes a major innovation.

The creation of a virtual cash crop is a way to eliminate many of the challenges presented by limited traditional infrastructure. The creation and verification of carbon credits requires only limited transportation networks and low-quality internet connections. Using cell phones for training and data collection, and mobile payment platforms, TIST is able to overcome the existing limits of infrastructure.



GOAL: Reduce income inequality within and among countries

The TIST program directly helps reduce inequality. By eliminating barriers to participation, TIST helps to mitigate patriarchy and ageism in the communities we operate. Improving degraded land, increasing crop yields, and providing secondary, or tertiary, revenue streams increases the income of some of the world's poorest farmers. Verification reports certify that TIST's operations directly impact more than 50% of the poorest quartile of the communities we operate within. Voluntary carbon

credit sales transfer income from richer countries, where impacts of climate change are costly, and the costs of carbon mitigation are also high, to the TIST farmers, whose costs of mitigation are lower and the benefits higher.



GOAL: Make cities and human settlements inclusive, safe, resilient and sustainable

TIST creates networks across large geographic areas and social barriers. Through leadership identification and training, we work to create more inclusive societies. Our values explicitly encourage inclusion, safety, and sustainability. TIST training and Best Practices are designed to maximize the safety of our participants and contractors. With improved crop harvests and improved nutrition, the TIST areas are more sustainable. They are also more resilient because they are less impacted by

drought and floods. Women, youth, and the disabled are fully included.



GOAL: *Ensure sustainable consumption and production patterns*

TIST helps to create efficient production patterns by facilitating land fertility improvements such as Conservation Farming, composting practices, and the restoration of degraded land. Avoiding chemical fertilizers and pesticides, while increasing production, makes farms more sustainable.



GOAL: *Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy*

TIST works to combat climate change through the sequestering of carbon in a direct, quantifiable way. Sequestration is accomplished through the planting and growing of trees. In addition to sequestering carbon, forests reduce the temperature of the air by evaporating water through their leaves and reduce the soil temperature by shading the ground.

Increased availability of fuelwood and higher efficiency stoves reduce the consumption of petroleum-based fuels. Using electronic data systems reduces otherwise needed travel. The use of solar power, where applicable, improves lives without the use of kerosene. Creating natural mulch and pest control replaces petroleum derivative fertilizers, chemicals, and the fuel used for transport.

TIST also works with local communities to create adaptation strategies and ways to combat the local ramifications of climate change. Climate change is often considered on the macro level, with little thought to the day-to-day impacts on vulnerable populations. By working directly with communities, listening to their concerns, and helping to develop strategies, TIST's approach is focused on local results. Our work also increases awareness of climate change issues.



GOAL: *Conserve and sustainably use the oceans, seas and marine resources for sustainable development*

TIST's Riparian Program has a direct impact on marine resources. The protection of wetlands and riparian areas is crucial to the overall health of watersheds, rivers, lakes, and eventually, seas. Healthy riparian areas trap sediment, store floodwater and energy, recharge groundwater, and promote biological diversity.



GOAL: *Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*

The planting of millions of trees increases biodiversity, while also providing the structural conditions for subsequent increases. Tree growth not only restores degraded land but also allows for the return of various forms of life. Practices such as agroforestry, apiculture, and Conservation Farming help these dynamics. In order to understand the impacts of tree planting on terrestrial ecosystems, it is best to think of TIST groves not only as discrete instances of biodiversity, but also as anchors that support the revitalization of entire regions.

TIST's activities directly contribute to sustainably managed forests, both by increasing tree growth and serving as buffers to National Parks, High Conservation Value Areas, and other protected lands. In many cases, TIST groves serve as wildlife corridors between habitats.



GOAL: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

TIST works in various ways to strengthen the communities and institutions we work with. Small Groups, Cluster meetings, and TIST values promote cohesion. Partnering with civil society organizations strengthens them through shared success; TIST provides forums for direct interactions between subsistence farmers and people in power. Having women in leadership roles promotes more inclusive ideas of justice. Entering into understandable and mutually beneficial contracts is often a new experience for TIST participants and increases their comfort in navigating a sometimes-daunting part of civil society. TIST's Verified results prove the institutions that make up TIST are effective, accountable and inclusive.



GOAL: Strengthen the means of implementation and revitalize the global partnership for sustainable development

TIST has had a variety of partners in our sustainable development work. These include local governments, civil society organizations, community forest associations, CBO's, NGO's, churches, temples, and other religious organizations. We also work with international conservation, development and health NGOs, international finance and development bi-lateral and multi-lateral organizations (including USAID), and with individuals who want to help make the world sustainable. We share our information and successful implementation technologies with all organizations with similar goals and aspirations.

2.1.13 Implementation Schedule (G1.9)

The starting date of the proposed small-scale A/R CDM activity and the crediting period begins December 16th, 2003. The project is scheduled to last 60 years but may be extended if the carbon market is vibrant enough to support it.

Key dates

Introductory meetings: 21 July to 01 August 2003 in Morogoro Tanzania,²³ 06 October to 15 October 2005 in Busheyini,²⁴ Uganda, 12 February 2009 in Bushenyi, Uganda. 16 February 2009 Kabale, Uganda.²⁵

Start and end dates for each project activity: The start year of each project activity is in Grove Summary of Appendix 04. The data collected by TIST indicates that the first Small Group was registered into the program on December 16th, 2003 (2003UG15). The end date is December 16th, 2063. TIST maintains a database record of each project area showing when it was first quantified by a TIST staff member and how old the trees were. These records appear at www.tist.org under "Project Areas" and under each region, group center, and Small Group where audits have taken place.

Start and end dates for the GHG accounting period: December 16th, 2003-December 16th, 2063,

Monitoring schedule: Monitoring is daily and on-going. Monitoring reports will be issued every 2 to 5 years.

²³ Tanzania newsletter, August 2003 at <http://www.tist.org/i2/moreinfo.php>

²⁴ TIST UG011 Bwango email 051024.pdf. References Bushenyi Seminar. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

²⁵ TIST UG011 Ara email 090228.pdf. References Kabale and Bushenyi public meetings. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

Verification schedule: Verification 01 is contemporaneous with validation. Subsequent verification will be every 2 to 5 years.

Meeting with national authority: 01 March 2005 via email with Godfrey Semakula. 15 May 2005 with via email with Bwango Apuuli.²⁶

Justification: TIST maintains a database record of each project area showing when it was first quantified by a TIST staff member and how old the trees were. These records appear at www.tist.org under "Project Areas" and under each region, group center, and Small Group where audits have taken place. The data collected by TIST indicates that the first Small Group was registered into the program on December 16th, 2003 (2003UG15).

Gantt Charts: 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 60-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.

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
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

Replacement planting schedule (project). As trees die, farmers are to replant for 20 years. Replanting can start as soon as the second year. Replanting is shown for 25 years because of the staggered start of individual project areas.

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
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

Monitoring (project). Monitoring is ongoing. The internal goal is to quantify each grove annually. Whether that is achieved or not, the Quantifiers are out in the field, all the time, visiting the multitude of project areas.

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
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

Validation and verification (project). Validation is taking place with this document, after project areas have been established and trees are already in the ground and growing. The initial verification is taking place contemporaneously. Future verifications will take place every 2 to 5 years.

²⁶ TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip. UG Stakeholder Notice.zip : TIST UG011 Bwango email 050523.pdf, TIST UG011 Bwango email 051024.pdf at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

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

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

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 can begin in as early as four years, where an early harvest for poles or firewood is made.

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

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

Fruit and nut harvest (project area). Most of the trees won't bear any fruits, nuts or other products for five or six years. After that, harvest will be annual.

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

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

Deadwood harvest (project areas). Farmers may harvest deadwood any time it exists. For those that lose trees in the first year, it will come in year one. However, it is expected that most deadwood harvest will take place in later years as larger trees are lost, or branches die.

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

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

2.1.14 Project Start Date

The project's start date is December 16th, 2003. This is the date that the first Small Group was registered into the program (2003UG15).

Due to the particularity of the TIST program, Verra has granted an exception to Section 3.7.3 of the VCS Standard, v4 for this PD which requires that AFOLU projects validate within five years of the project start date.

2.1.15 Benefits Assessment and Crediting Period (G1.9)

December 16th, 2003 – December 16th, 2063, 60 years

2.1.16 Differences in Assessment/Project Crediting Periods (G1.9)

Accounting periods will be the same between GHG and CCB impacts.

2.1.17 Estimated GHG Emission Reductions or Removals

Year	Estimated GHG Removals (t CO ₂ e)
2003	5
2004	50
2005	178
2006	443
2007	947
2008	3,571
2009	6,531
2010	11,264
2011	15,579
2012	22,852
2013	34,342
2014	46,767
2015	51,139
2016	53,805
2017	58,702
2018	67,692
2019	82,610
2020	95,868
2021	104,576
2022	103,679
2023	108,740
2024	109,097
2025	109,952
2026	110,274
2027	108,901
2028	108,131
2029	109,266
2030	110,201
2031	109,695
2032	107,722
2033	107,014
2034	105,360
2035	106,952
2036	101,173
2037	97,662
2038	95,032

Year	Estimated GHG Removals (t CO ₂ e)
2039	103,438
2040	106,418
2041	106,277
2042	106,938
2043	104,570
2044	103,528
2045	106,099
2046	107,572
2047	107,572
2048	107,572
2049	107,572
2050	107,572
2051	107,572
2052	107,572
2053	107,572
2054	107,572
2055	107,572
2056	107,572
2057	107,572
2058	107,572
2059	107,572
2060	107,572
2061	107,572
2062	107,572
2063	107,572
Total estimated ERs	5,139,342
Total number of crediting years	60
Average annual ERs	85,656

2.1.18 Risks to the Project (G1.10)

The long-term sustainability of TIST is dependent upon a carbon market for afforestation/reforestation credits. 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. As of the date of this PD, the carbon markets appear to be experiencing a modest rebound.

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. We provide training on minimizing risks from fires in newsletter and in training broadcasts on area radio programming.

The VCS Risk Assessment finds a risk rating of well below the minimum threshold.

2.1.19 Benefit Permanence (G1.11)

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 will result 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 will ensure that it is maintained beyond the life of the project.

Training in the benefits of biodiversity will help 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).

Tree planting and education activities will create benefits beyond the duration of the project. Even in the absence of a carbon market, trees provide through fruits, nuts, medicine, timber, etc. Trainings on sustainable development issues, leadership development, and community organization will improve the lives of farmers even in the absence of TIST.

We believe that the design of the program, by providing training and self-demonstration of the long term benefits mentioned above, will be sufficient to maintain and enhance the CCB benefits beyond the project lifetime.

2.1.20 Financial Sustainability (G1.12)

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 six to ten 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 is a cash shortfall in the early years of the project. This is made up by external sources. CAAC has provided funding to make up this shortfall on the carbon side, through its own profits and advanced sales of credits. I4EI has provided sustainable development funding that offsets much of the project cost, obtaining funding through private donors. The fact that TIST is in its 20th year demonstrates its longevity.

Financial statements (confidential) have been made available to the Validator.²⁷ The financial statements show 1) project is entirely self-funding through carbon revenues, 2) CAAC and the TIST project are and have been profitable 3) CAAC carries no debt and 4) the profit has allowed payments of almost \$2.9 million in profit share to the Small Groups. The financial statements document the ability of the PP to provide adequate financial support to new project areas included in the project at this verification event.

2.1.21 Grouped Projects

1. Eligibility Criteria for Grouped Projects (G1.14)

Each instance, present and future, will meet the appropriate CDM or VCS requirements. Each project activity, technology and other measures will be adopted and applied in the same manner as specified in the PD. This includes eligibility, applicability (Section 3.1.2), additionality (Section 3.1.5), baseline scenario and determination (Section 3.1.4), project boundary identification (Section 3.1.3) and monitoring (Section 3.3.3), all as described in this document. New instances will only be considered eligible if they are subject to the same baseline scenario and community and biodiversity without project scenarios. New instances will only be considered eligible if they follow the same basic project activities described in section 2.1.11. As new instances are brought into the program, they will be subject to the same stakeholder engagement processes and have all the same rights with respect for land, territory, resources, and FPIC as the initial participants.

Specific Criteria

- *Each project activity, technology and other measures will be adopted and applied in the same manner as specified in the PD.* Each PA will be an ARR project activity involving tree planting by farmers in the TIST program as further described Section 2.1.11.
- *Meet the applicability conditions set out in the methodology.* The applicability conditions in the methodology are:
 - *The land subject to the project activity does not fall in wetland category.* Each PA has been visited by a TIST Quantifier (or will be for future instances) to see if any of the PA are in a wetland. Appendix 04 is a summary for the results of the observation and surveys for each PA and indicates none are wetlands (Grove Summary, Col AG). In addition, each PA was reviewed using Google Earth and none bore the characteristics of a wetland. All the current PAs meet this criteria. If a future PA does not meet this criteria, it will not be included in the PD. See Section 3.1.2.
 - *Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary: a) Land containing organic soils and b) Land which, in the baseline, is subjected to land-use and management practices and receives inputs listed in appendices 1 and 2 to this methodology.* Each Pa is visited by a TIST Quantifier to determine if the soil disturbance is greater than 10%. As described in Section 3.1.2, if the member plants using the recommended technique and does not plow as part of the planting process, the soil disturbance will be less than 10% and will be eligible to be included in the PD. If a PA has been plowed or observed to use a tree planting method that would cause soil disturbance to exceed 10%, it will be further determined if the land contains organic soil and receives the referenced inputs. Current PAs are eligible. Future PAs that do not qualify under this criteria will not be included in the PD.
 - *A project activity applying this methodology shall also comply with the applicability conditions of the tools contained within the methodology and applied by the project activity.* The tools and their applicability are as follows:

²⁷ CAAC Financial statements for 2020, 2021 and 2022 were sent to the VVB as CONFIDENTIAL

*AR-TOOL 02, v1.0 - “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”. **Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced.** Each PA has been (and future ones will be) reviewed against the existing or newly implemented regulations such as presented in Section 3.1.2.*

*AR-TOOL 02, v1.0 - “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities”. **This tool is not applicable to small - scale afforestation and reforestation project activities.** This is a large scale PD and the tool is applicable. The tool is used to determine the baseline scenarios and demonstrate additionality of all new and existing instances. See Section 3.1.5 for the analysis of existing instances. Future instance will undergo the same review.*

*AR-TOOL 08, v04.0.0- “**Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity**”. **The tool is applicable to all occurrence of fire within the project boundary.** This tool is only applicable after an instance has been put in the PD. It is not applicable to fires that have occurred before the PD has been validated and is not applicable to fires that may have occurred before a PA is brought in as a new instance. The tool will be used if a PA has a fire subsequent to its inclusion in the PD.*

*AR-TOOL 08, v04.0.0 – “**Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity**”. **Non-CO2 GHG emissions resulting from any occurrence of fire within the project boundary shall be accounted for each incidence of fire which affects an area greater than the minimum threshold area reported by the host Party for the purpose of defining forest, provided that the accumulated area affected by such fires in a given year is ≥5% of the project area.** Since any fire would have to take place after the PA has been added to the PD, this tool is not applicable prior to a PA being added to the PD. The tool will be used if a PA has a fire subsequent to its inclusion in the PD.*

*AR-TOOL 12, v03.1 - “**Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities**”. Since the project is not selecting dead wood or litter for accounting of carbon stock changes, tool is not applicable.*

*AR-TOOL 14, v4.2 - “**Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities**”. This tool is used to determine the carbon stocks of all PA that are part of the original PD and added later as instances. The applicability of the tool is described and demonstrated in Sections 3.2.1 and 3.2.2*

*AR-TOOL 15, v2.0 - “**Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity**”. **This tool is not applicable if the displacement of agricultural activities is expected to cause, directly or indirectly, any drainage of wetlands or peat lands.** The PAs have been (or if a new instance, will be) visited to determine if wetlands or peat lands are included and no draining of any wetlands or peat lands is taking place. The tool is used to determine the increase in GHG emissions attributable to displacement of pre-project agricultural activities. Section 3.2.3 describes the application of the tool in the PD and demonstrates that there is no leakage from displaced agriculture. This tool will be used for all new instances, too.*

*AR-TOOL 16, v1.1 - “**Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities**”. The methodology considers soil organic carbon stocks an optional pool. The project is not selecting the pool for accounting of carbon stock changes and this tool is not applicable as an eligibility criteria*

AR-TOOL 17, v01.0.0 - “Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities”. This tool has no internal applicability conditions. The PD uses 3 allometric equations. They and their sources are provided in Section 3.2.2. These equations will be applied to trees in the original PD and to all new instances.

AR-TOOL 19, v2.0 “demonstration of eligibility of lands for A/R CDM project activities”. This tool is the basis for determining eligibility and is addressed in its own subsection, below.

- *Are subject to the same community and biodiversity without-project scenarios as determined for the project.* Each new PA will be reviewed to determine that they have the same community and biodiversity without-project scenarios as determined for the project as described in Sections 4.14 and 5.1.3, respectively. If they do not, they will not be eligible.
- *Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.* Each PA (current and new) will be reviewed to determine that they have the baseline scenario as described in Section 3.1.4. If they do not, they will not be eligible.
- *Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.* Each new PA will be reviewed to determine that they have the same characteristics relating to additionality as described in Section 3.1.5. If they do not, they will not be eligible.
- *Are subject to the same processes for stakeholder engagement described in G3 and respect for rights to lands, territories and resources including free, prior and informed consent described in G5.* Each new PA will subject to the same processes for stakeholder engagement as described in G3 and will be reviewed to determine that their members have been given the same training and undergo the same process to ensure their rights to lands, territories and resources including free, prior and informed consent as outlined in G5. If they do not, they will not be eligible.
- *Have similar monitoring elements.* All new PAs will undergo monitoring described in the PD. They will be visited by the TIST Quantifiers on a regular bases when trees will be stratified by species and age, counted and measured. The new members will attend the cluster meeting and receive training that will be monitored and reported.

Appendix 04 includes project activity instances currently implemented (Active) on the issue date of the project description, as well as planned instances of project activity that have been developed to a sufficient level of detail to enable their assessment at validation. These planned project activity instances will be identified by TIST Number, grove, and Cluster, and will be subject to the same baseline scenario and rationale for demonstration of additionality as initial project activity instances. Future project areas will be similar farm areas of small hold farmers that wish to join TIST. While TIST is open to all farmers, they will need to be in an areas serviceable by the project. The Gulu and Soroti expansions demonstrate that with enough farmers requesting to join, TIST can expand and service them. The project zone was define as Uganda so that we can accept farmers from virtually anywhere in the country.

The communities will be where the farms are located. Geographically these are small villages and markets. Currently there are 868 villages included in Appendix 04. New instance may come from them or from other areas and villages. The demography of the communities are virtually all subsistence farmers. This is true for those farming the project areas in the PD and those that could join in the future. Section 4.1.1. provided a detailed look at the communities.

AR-TOOL 19, v2.0 “Demonstration of eligibility of lands for A/R CDM project activities”.

Under AR-TOOL 19²⁸, project participants shall provide evidence that the land within the planned project boundary is eligible for an A/R CDM project activity by following the steps outlined below.

To qualify as a CDM reforestation project, the project must meet the host country definition of a forest. Uganda defines the minimum area of a “forest” as 1.0 hectare with a minimum tree crown cover of 30%, with trees having the potential to reach a minimum height of five meters at maturity in situ. As a VCS project, however, this aspect of eligibility does not apply. VCS captures them as afforestation, reforestation and revegetation projects and does not consider minimum areas or crown cover.

To demonstrate compliance with the other eligibility criteria, the tool allows the demonstration to be made using “aerial photographs or satellite imagery complemented by ground reference data”. Since the project began in 2003, the 10 year look back period from project start is 1993. The imagery available at that time was Landsat 4/5 from 1988-1992. The resolution is 30m per pixel, coarser than more modern imagery. Also needed for the demonstration is imagery from the time the project activities began. The imagery available at that time was Landsat 7 from 1999-2003. The resolution is 15m per pixel, still coarser than more modern imagery.

The ground reference is also used. It is from the baseline surveys done for each project area. The information is collected on-site, through direct observation and measurement and through direct discussion with the landowner and members of his/her Small Group. The Quantifier walks the property, take baselines information about the general condition of the project area and gathers history about previous forest cover, deforestation and displacement. The information is collected using the custom smartphone forms that TIST developed and deployed and is synchronized to the TIST database. The raw data is reviewed and analyzed for the PD and summarized in Appendix 04, “Grove Summary” worksheet, columns P-AG.

The other eligibility criteria follows with a demonstration of eligibility.

a) Demonstrate that the land at the moment the project starts does not contain forest by providing transparent information that:

(i) Vegetation on the land is below the forest threshold values applicable to the host Party.

This demonstration is not necessary for VCS. This PD is a VCS ARR (afforestation, reforestation and revegetation) project which allows both forest and non-forest activity.

(ii) The young natural stands and plantations on the land, if existing at the start of the project activity, are not expected to reach or exceed the forest threshold values applicable to the host Party;

The Landsat 2000 imagery was reviewed and there is no indication of young natural stands and plantations on the land at the start of the project activity. While larger plantation should be evident if they exist, the resolution is too coarse to see young natural stands. We rely on our program design and ground reference to address this.

TIST does not include the young natural stands and plantations on the land in the project. When the quantifier conducts the baseline, they either do not include existing non TIST trees within the project area boundary or they count them as baseline trees.

²⁸ TIST UG PD-VCS-Ex 52 CDM AR Tool 19-v2 Land Eligibility at <https://www.tist.org/PD-UG-VCS-011%20Documents.php.pdf>

The physical survey of each parcel taken during baseline monitoring indicates the lands were barren, cropland and/or covered with grass, shrub or litter, or had limited existing trees (Grove Summary, columns U-AA). Trees planted by farmers prior to project implementation and included in the boundaries of the project area have been identified by species, counted and a sample of circumferences were taken (Appendix 04, "3.2.1a Baseline Strata" worksheet). As shown in 3.2.1a Baseline Strata, the average stem density of the baseline trees was 8.8 stems per hectare, well below the forest threshold.

Many of the relatively few baseline trees were found as isolated trees often along the border of individual parcels. Given the history of continued deforestation, as indicated by the maps and satellite images (discussed below) and described in Section 3.1.4, and continued use of the land by the project members, it is not expected that this area will revert to natural forest without intervention.

(iii) The land is not a part of forest area that is temporarily unstocked as a result of human intervention (e.g. harvesting) or natural causes, and the land is not expected to revert to forest.

Demonstrating that the project areas were not a part of forest area that is temporarily unstocked at the moment the project starts utilized both the 1990²⁹ and 2000³⁰ Landsat. By showing that the project areas were not stocked 10 years before the moment the project started and was not stocked when the project started, the land could not have been part of forest area that is temporarily unstocked.

The project area boundaries were overlain on the 1990 Landsat to determine if there was evidence of that the areas was temporarily unstocked. Considering the size of the files and number of project areas in the PD, examples are provided in the following slides of Appendix 01.

Slide 1 is the area south of Kanungu and includes a large area of the Bwindi Impenetrable National Park. The park is dark green representing heavily forested land. It is in stark contrast to the light green and tan areas outside the park that are farmland and settlements. The yellow polygons are project areas sited on settled land. There is no evidence that these project areas were temporarily unstocked.

Slide 2 is around Ryeru, near the Queen Elizabeth National Park (west of the blue border line). The dark green on the left and right sides are the North Maramagambo Forest Reserve and Kasyoha Kitomi Forest Reserve. The area where TIST project areas are located (yellow polygons) are a light green and pink indicative of farms and settlements. There is no evidence that TIST project areas were in areas forested in 1990.

Slide 3 is around Kabale. Most of the image is the pink and orange because the surrounding mountains had few if any trees. There were no existing forests in 1990.

Slide 4, Landsat 1990: TIST UG011 project areas (yellow) near Omodor and Otatai (south of Soroti). The project areas are located on farmland and settled areas. There are no forests in this area.

Slide 5, Landsat 1990: TIST UG011 project areas (yellow) near Masongora (NE of Fort Portal). The project areas are located on farmland and settled areas. In contrast is the darker green of Itwara Central Forest Reserve.

Slide 6, Landsat 1990: TIST UG011 project areas (yellow) near Parabong (NW of Gulu). The project areas are located on farmland and settled areas. There are no forests in this area.

²⁹ Appendix 01 LSat1990 Examples: TIST UG PD-VCS-011b App01 LSat1990 Examples 230309.pdf at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

³⁰ Appendix 02 LSat2000 Examples: TIST UG PD-VCS-011c App02 LSat2000 Examples 230309.pdf at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

The 1990 Landsat demonstrates that TIST project areas were not part of a forest area that was temporarily unstocked as a result of human intervention in 1990. Since the project areas were not forested then, they would not be expected to revert to forest.

The project area boundaries were overlain on the 2000 Landsat imagery to determine if there was evidence that the project areas were temporarily unstocked at the time the project began. Because of the large file size and number of project areas in the PD, examples are provided in the following slides of Appendix 02.

Slide 1 is south of Kanungu Uganda and includes part of the Bwindi Impenetrable National Park, and nearby TIST project areas on settled land. The park is dark green indicative of forest cover. The light green and mottled tan outside the park is farmland and settlements. The yellow polygons are TIST projects areas.

Slide 2 is in the Ryeru area of SW Uganda. The darker green areas near the bottom left and right of the slide are North Maramagambo Forest Reserve and Kasyoha Kitomi Forest Reserve, both forests. Queen Elizabeth National Park is west of the blue line (its border). In between are farmlands and settlements. The boundaries of the project areas are yellow. There is no evidence that TIST project areas are temporarily unstocked.

Slide 3 is around Lake Bunyonyi, west of Kabale. This is further west of the 1990 image because cloud cover masks the 2000 image. The Echuya Forest Reserve shows the darker green of a forest. The light green, pink and tan is farmland and settlement.

Slide 4, Landsat 2000: TIST UG011 project areas (yellow) near Omodor and Otatai (south of Soroti). The project areas are located on farmland and settled areas. There are no forests in these images.

Slide 5, Landsat 2000: TIST UG011 project areas (yellow) near Masongora (NE of Fort Portal). The project areas are located on farmland and settled areas. In contrast is the darker green of Itwara Central Forest Reserve.

Slide 6, Landsat 2000: TIST UG011 project areas (yellow) near Parabong (NW of Gulu). The project areas are located on farmland and settled areas. There are no forest in this area.

The 2000 Landsat demonstrates that TIST project areas were not part of a forest area in 2000. The combination of 1990 and 2000 satellite imagery demonstrates a continuing lack of forest 10 years before the project and at the start date of the PD. Again, there is no indication that these project areas were forest areas that were temporarily unstocked.

TIST baseline monitoring provides ground reference. The baseline monitoring indicates these areas have a history of cultivation ("Grove Summary" worksheet, columns V, W and AD and AE) and minimal tree cover (column U). Specific questions were asked of each member regarding whether the project areas had been a forest within the 10 years of the start date of the project. The answers were summarized in Grove Summary, column AC. If the answer is "N" the PA didn't have a forest and passes this eligibility test. If the answer is "0", the data has not been collected and the project area is not included in the monitoring report but could become active if the history supports it. If the answer was "yes" they were exclude from the PD. The question pertains to any forest whether a native ecosystem or an on-farm plantation.

In addition, baseline monitoring was conducted on each individual project area to confirm that there had not been recent deforestation. This generally included looking for stumps or evidence of recent harvest activity and looking at the surrounding lands to see if there were indications that the project areas were cleared prior to the proposed project start date. Nothing was observed to indicate there had been deforestation activity.

Another question is asked about displacement and one of the smartphone application's pick-list answers is "existing forest" (i.e. probing whether the member displaced an existing forest to plant TIST trees). Existing forest is interpreted to be either native ecosystem or an on-farm plantation. A positive answer would exclude a project area from participation.

Given the history of continued deforestation, as indicated by the maps and satellite images and described in Section 3.1.4, and continued use of the land by the project members, it is not expected that this area will revert to natural forest without intervention.

b) Demonstrate that the land also met criteria (of the subsections) above on 31 December 1989.

The VCS rules supersede this date requirement. According to VCS "Agriculture, Forestry and Other Land Use (AFOLU) Requirements" Section 3.1.6, a project area is eligible as long as any "clearing or conversion took place at least 10 years prior to the proposed project start date". Instead of 31 December 1989, the date for this PD is 16 December 1993. It doesn't really matter for this PD because the date of the 1990 Landsat imagery is 1988–1992. This demonstration is made with the 1990 Landsat data discussed in eligibility subsection (iii), above.

The ground reference provided by the baseline monitoring is also discussed above. As with subsection (iii), it has been demonstrated as of 16 December 1993 that there were no young natural stands and plantations on the project areas that were expected to reach or exceed the forest threshold and that the project areas were not a part of forest area that was temporarily unstocked as a result of human intervention.

Additional Criteria

In addition to the CDM Eligibility requirements, there are three other eligibility criteria for inclusion of new instances of each project activity. The first is that it must be in the geographic area defined in Section 2.1.7 (i.e. be in Uganda). All of the project areas in the PD are in Uganda.

The second is that the ex-ante carbon estimates for each project area (i.e. instance) must be below the pertinent capacity limits. This PD utilizes a large-scale methodology and, as such, does not have a capacity limit.

The third regards clearing native ecosystems. Section 3.2.4 of the VCS Standard states :

"Activities that convert native ecosystems to generate GHG credits are not eligible under the VCS Program. Evidence shall be provided in the project description that any ARR, ALM, WRC or ACoGS project areas were not cleared of native ecosystems to create GHG credits. Such proof is not required where such clearing or conversion took place at least 10 years prior to the proposed project start date. The onus is upon the project proponent to demonstrate this, failing which the project shall not be eligible."

This demonstration is made in CDM eligibility subsection (iii), above. Subsection (iii) discusses forests and this eligibility criterion is about clearing or conversion of native ecosystems. TIST project areas are forest-focused and project activities take place on existing farmland. As can be seen on Appendix 01, there are very few native ecosystems remaining in Uganda. Included in Appendix 01 are Bwindi Impenetrable National Park, Queen Elizabeth National Park, North Maramagambo Forest Reserve, Kasyoha Kitomi Forest Reserve, and Echuya Forest Reserve. As demonstrated by Landsat 1990, the project areas of this PD do not encroach on any of them, nor is there any evidence that the project areas are situated on any native ecosystem.

Furthermore, the ground reference demonstrates that the project areas have been populated and used for livelihoods. These are farms. There is no evidence that the project areas were cleared of native ecosystems to create GHG credits.

The project areas meet all the criteria to make them eligible for inclusion in the PD and validation

2. Scalability Limits for the Grouped Projects (G1.15)

The TIST program in Uganda has grown to 29,000 farmers and over 4,300 Small Groups. The country's strong in-country leadership and proven ability to manage growth demonstrate that there are no managerial limits to growth. As the program grows, new people are trained to administer to expansion areas. Subsistence farmers planting trees on privately owned land is a broadly applicable approach over different geographies and cultures. This project does not set any scalability limits.

3. Risk Mitigation Approach for Grouped Projects (G1.15)

Not Applicable

2.2 Without-project Land Use Scenario and Additionality

2.2.1 Land Use Scenarios without the Project (G2.1)

The Project Proponent declares this project was not implemented to create GHG emissions for the purpose of its subsequent reduction, removal or destruction. The "Carbon Credit Sale Agreement" among the Project Proponent and the Small Groups members is long term and does not allow for the harvesting of trees, except for thinning to enhance growth. Trees that die are to be replanted. The project does not create any other products and the long-term funding of the project is totally dependent on the revenue stream provided by a long-term tree growth.

The scenario described in Section 3.1.4 is the same as the conditions existing prior to project implementation. Associated drivers of land use changes and potential outcomes are described in the same Section.

The range of potential land use scenarios and the associated drivers of land use changes most likely to occur within the project zone in the absence of the project are limited.

- Sell the land to another farmer. The neighbors and family are likely subsistence farmers, too, so the land use would remain the same.
- Sell the land to a capitalized buyer whom could convert the land to some sort of industrial or commercial use. There is no indication that this is a realistic scenario.
- Keep the land and change the land use to plantations, orchards or large scale commercial farms. While any of these are possible, they require capital, which as subsistence farmers, they do not have.

While planting TIST trees requires a small amount of capital, it is available through the tree payments. Initial capital is also offset by the TIST nursery development program whereby the farmers learn to develop their own nurseries.

2.2.2 Most-Likely Scenario Justification (G2.1)

The most likely scenario is justified as follows:

Poverty assessment: In order to change from being a subsistence farmer to something else requires capital or credit. Referring to the Southwest Region³¹ of Uganda, IFAD reports income of "about USD

³¹ Defined as the areas in Uganda, which borders Tanzania, Rwanda and Zaire. This is the area where TIST farmers are located.

100 per [capita], which is less than half the national average” and states, “a lack of credit has constrained farmers' ability to acquire inputs or adopt improved practices.”³² Muwanga (2001) reinforces this and, referring to rural Uganda, concludes “lack of credit contribute[s] to community and household poverty.”³³

Remote sensing analysis. A review of the Landsat 1990 and 2000 satellite images provided in Appendix 01 and Appendix 02 illustrates that most of rural Uganda, especially in the project areas, are subsistence farms. This is reinforced in Section 4.1.1 which document the poverty in the project zone and the subsistence farming economy. It is uncontroversial to say that extremely poor people would rather not be poor yet most of the people remain some of the poorest in the world.

The communities are poor and lack the ability to obtain capital or credit. The result is that the scenario for remaining subsistence farmers is the most likely.

2.2.3 Community and Biodiversity Additionality (G2.2)

TIST activities are additional to any legal requirement to plant trees or for subsistence farmers to make carbon reductions. The project activities are not required by law so no demonstration can be made that pertinent laws are not being enforced. There are no requirements on the farmers and their efforts are voluntary.

The project activities would not have been implemented under the without-project scenario due to, among other things, significant financial and technological barriers. As discussed in 2.2.1, 2.2.2, 3.1.5 and 4.1, the members of TIST are poor and cannot obtain credit. 3.1.5 details the investment barrier, and how it takes capital to buy and plant seedlings and take parts the land out of the normal subsistence farming use. Section 2.2.2 and 4.1.1 discuss the extent of subsistence farming, demonstrating the difficulty of changing the without-project scenario.

The technology that TIST uses, is not present anywhere else. There are no Cluster meetings where farmers can get free and regular training on subjects such as biodiversity, natural resource management and climate change adaptation. There are no Cluster meetings where the farmers can go and receive pre-payments for planting trees and profit share for the sale of carbon credits. The government could set up a program but they have not. The fact that these programs and benefits exist nowhere else demonstrates they would not have been implemented under the without-project scenario.

The TIST project is funded by the generation and sale of carbon offsets. Thus, the additionality demonstrated in Section 3.1.5 applies to CCBA co-benefits as well. The financial, institutional, technological and capacity barriers described in Section 3.1.5 similarly serve as barriers to the resulting carbon payments, health and education sessions, improved agricultural training sessions, and biodiversity.

The social fabric of communities prior to project implementation is familial, with limited government interaction in predominantly remote areas. TIST provides a structure to organize and share information, as well as to receive trainings and education. This structure and these trainings would not exist but for the carbon revenues generated by the program. While farmers may occasionally plant trees, anecdotal reports indicate that oftentimes this had not been considered prior to TIST entering a new area.

In parts of Uganda there are local community groups that meet and provide support, such as table banking and mutual support. However, these groups are not accessing carbon markets nor engaging in

³² Uganda: Southwest Region Agricultural Rehabilitation Project, Mid-term evaluation, International Fund for Agricultural Development (IFAD)

http://www.ifad.org/evaluation/public_html/eksyst/doc/prj/region/pf/uganda/s010ugae.htm

³³ Nansozi K. Muwanga, “The Differences In Perceptions Of Poverty,” Structural Adjustment Participatory Review Initiative (Sapri), Uganda National NGO Forum, June 2001.

http://www.saprin.org/uganda/research/uga_poverty.pdf

the types and breadth of training that TIST provides. Local law and regulation is largely silent on the land use scenarios of smallholder farmers; thus it is likely to be unchanged, save for the impacts of climate change, without the project. By looking at the state of the small-hold farmers outside of TIST, it is evident that the lack of any law regarding the scenario of planting trees and maintaining them does not encourage or require such a scenario.

Biodiversity benefits including hillside and riparian planting, indigenous tree planting and HCV protection would not occur but for the project. TIST trains farmers to plant strategically, using trees to protect and improve their environment. This strategy is not locally found in most TIST areas. Similarly, the program provides education on various indigenous trees and the environmental value they provide. Without these trainings and education these biodiversity benefits would not have a reason to exist. Although some local foresters will provide education on tree planting at community groups and upon request, there is not a structure in place to disseminate or incentive tree planting to create the biodiversity impacts of TIST. Most government intervention involves triage after natural disasters, rather than prevention as a grassroots level.

2.2.4 Benefits to be used as Offsets (G2.2)

TIST will not use any of the community and biodiversity benefits it creates as offsets.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

TIST operates as transparently as possible. Stakeholders are given access to the full project documentation in several ways:

- The project documents will be posted with VERRA as part of the 30-day comment period.
- Cluster meetings serve as public meetings and points of contact for both participants and local communities. These monthly meetings allow such stakeholders to learn about the project, request more information, and provide feedback. Individual Clusters will be notified at their monthly Cluster meetings and through dissemination of The Tree newsletter. The TIST program is represented by trained Cluster Servants at these meetings who will be equipped to answer questions.
- If we have an email address for a stakeholder submitting comments, they will be sent an email with a link to project web page and notice of the public meeting. Links to the project web page are included, as well as links to all of CCB and VCS documentation.
- The email notices contain a summary of the project.

All of the documentation that TIST generates to support validation and verification is publicly available online. TIST further allows for public access to its proprietary database, including data on progress updated in real time. TIST provides newsletters (The Tree) through the Cluster structure. These newsletters include the TIST URL, as well as updates and information about the program. These newsletters are distributed monthly in the local languages of participants. They further include contact information for those with questions.

2.3.2 Dissemination of Summary Project Documents (G3.1)

Summary project documentation including the results of the monitoring plan, results, and contact information will be published in the TIST Uganda newsletter.³⁴ Because the validation and first verification are just taking place, such summary project documentation has not been disseminated previously. However, the farmers and Small Groups in the PD have been members in TIST and have received all of the benefits, whether in a PD or not. As such, they have received the Tree newsletter where summary project documentation of other TIST PDs have been published³⁵ and been invited to the Public Meeting TIST has held for other validations and verifications.³⁶

2.3.3 Informational Meetings with Stakeholders (G3.1)

TIST holds regular and ongoing informational meetings with project participants. Dozens of these meetings happen in Uganda each month, resulting in thousands of points of contact between project participants and project representatives. These meetings serve as a forum for both educating participants and learning from them. Project participants are given the opportunity to communicate directly with in-country and US-based management.

These Cluster meetings are publicized to participants upon entry to the program. Each Small Group agrees to send a pair of representatives to each monthly Cluster meeting, ensuring a constant line of communication between the program and the group. These meetings are held at central locations in communities that are intended to be within walking distance of TIST participants. The locality of the meetings encourages awareness from the broader community, who is welcome to attend. Meetings are regularly discussed in TIST newsletters, and by TIST workers in the communities.

2.3.4 Community Costs, Risks, and Benefits (G3.2)

Relevant and adequate information about potential costs, risks and benefits to communities is provided in introductory meetings, training meetings and Cluster meetings. These are open meetings where all can participate and ask questions. New members are given the TIST application information.³⁷ They are shown how to access the TIST website with their mobile phones where more information is available. Additionally, quantifiers, also termed Cluster Servants due to their expanded role, visit the project areas regularly and attend the Cluster meetings where further questions can be asked and clarifications made. They are walked through the GHG contract and given ample opportunity to discuss it with their Small Group and Cluster leaders. The Tree newsletter carries articles that cover a wide range of TIST benefits.

When farmers seek to join TIST, they complete an application and registration process. This process of applying can last up to 7 months. During this time, TIST educates farmers on the activities and structure of TIST, through participation in Cluster meetings and training sessions. This education occurs prior to baselining and formal registration into the program. In these meetings, farmers are given a chance to speak with current farmers, who can communicate their own experiences with the program.

Small Groups receive payment vouchers which clearly state what the results of that Small Group's efforts have been. This is communicated in the number of trees planted and money earned. These payments are recorded into the TIST database. The TIST website publicly records program progress at the Cluster, regional, and national level.

³⁴ The Tree, TIST Uganda Newsletter, November 2020

<http://www.tist.org/i2/docs/NL/2020.11.November.UG%20Newsletter.pdf>

³⁵ <http://www.tist.org/i2/docs/NL/2021.05.May.UG%20Newsletter.pdf>

³⁶ Exhibits 14: Example for UG CCB-001: 20 January, 2012; 04 November, 2014; 12 June, 2019, Exhibit at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

³⁷ Exhibits 36, 37, 38, 39 and 04 TIST Information: TIST Intro FAQ, TIST SG Eligibility Requirements, TIST SG Membership Application, TIST Values, and the GHG Contract, all at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

2.3.5 Information to Stakeholders on Validation and Verification Process (G3.3)

TIST will use the Cluster and Small Group structures to disseminate information about the VCS/CCB validation and verification process, explaining that we are attempting to achieve dual certification. Cluster Servants will inform TIST farmers of verifier visits at Cluster meetings when possible. The intent to validate and verify this PD will be announced in The Tree.

TIST's operational structure facilitates direct and independent communication between stakeholders and the representatives of the validation and verification bodies.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

TIST announced the site visit by email sent to the stakeholders.³⁸ In addition, as part of the coordination, it was announced at some of the cluster meetings. Phone calls were also made to the stakeholders such as NGOs, cluster nursery operators, beneficiaries of the education program and farmers. The result was strong attendance by the farmers and leaders at a large seminar for the VVB held on the first day in Kabale. Attending were 45 farmers, 7 Cluster Leaders and 5 cluster servants. On the second day, a Cluster meeting was held in Rutenga where about 50 attended. The contacts with NGOs resulting in two meetings including the Rukararwe Partnership Workshop for Rural Development (RPWFRD). A meeting was held with two of the beneficiaries of the education program. The VVB visited 15 project areas where the farmers were present and they had a chance to ask the VVB questions about the site visit.

2.3.7 Stakeholder Consultations (G3.4)

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. Uganda sent their first stakeholders to a TIST seminar in Tanzania in July 2003.³⁹ These farmers went back to Uganda and introduced TIST by word of mouth and Small Group meetings. Interested individuals formed Small Groups and began planting trees.

Following the 2003 stakeholder meeting, the program held a series of stakeholder consultations starting in 2005. The first occurred in May of 2005 with the National Focal Point for the UNFCCC.⁴⁰ Subsequently, the program held a weeklong seminar with Ugandan farmers from October 6-October 15th, 2005 in Bushenyi, Uganda.⁴¹

In 2006 as part of an Environmental Impact Screening, auditors interview various stakeholders on behalf of TIST including local government and forest officers.⁴² Beginning in 2007, the program began to implement regional "node" meetings, the precursor to today's Clusters.

Two formal public meetings were held, one at the Katungu Mothers Union in Bushenyi on 12 February 2009⁴³ and one at the Kirigime Guest House in Kabale on 16 February 2009.⁴⁴ Notice was given in two

³⁸ Exhibit 14h Public Comments: [TIST UG PD-VCS-Ex 14h Public Comments CCB-011 V01.doc](#)

³⁹ Tanzania newsletter, August 2003, page 1. <http://www.tist.org/i2/moreinfo.php>

⁴⁰ TIST UG011 Bwango email 050523.pdf. Discuss contacts with National Focal Point for UNFCCC. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴¹ TIST UG011 Bwango email 051024.pdf. References Bushenyi Seminar. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴² Exhibit 01 Environmental Screening: TIST UG PD-VCS-Ex 01 Environmental Screening 060803.pdf at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴³ 2009.02.February.TIST UG Newsletter.pdf: Page 2, picture of Andrew Dinsmore at Katungu Mothers Union, Bushenyi. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

Uganda newspapers, the New Vision and Orumuri. Announcements were made on the radio in Bushenyi on 2, 3 and 6 February 2009. Announcements were made on the radio in Kabale on 3, 4 and 5 February 2009. Letters of invitation were also sent to selected stakeholders and interested parties.

A public stakeholders meeting was held 07 January 2013 at the TIST Office located at Katungu in Bushenyi, Uganda where comments were taken.⁴⁵

Another public meeting was held on 04 November 2014 at the Holy Cross Guest House in Kanungu, Uganda.⁴⁶

The program began to implement the Cluster system in Uganda with funding secured in 2015. This system took several years to develop, with initial meeting records from 2016. From 2016-Present (except for during COVID-related lockdowns) the program has been running and recording Cluster meetings across each region of TIST Uganda.

Since TIST was ultimately designed by the participants and the participants are from the community, it can be stated that:

- Community Groups and Other Stakeholders have influenced project design and implementation
- The CCB Gold section will demonstrate that TIST has been optimized to benefit the community
- TIST respects the local customs, values and institutions
- Consultation with stakeholders such as district foresters have addressed maintaining high conservation values
- TIST has a constant consultation process in effect

The TIST program was designed by and for stakeholders through visioning exercises and thousands of subsequent meetings. The program's intention and design are to provide benefits specifically for poor, marginalized, and vulnerable peoples. Because of the unique nature of the TIST program, virtually all consultation being implemented constitutes "continued consultation and adaptive management".

2.3.8 Continued Consultation and Adaptive Management (G3.4)

TIST has a collection of written stakeholder comments⁴⁷. Stakeholder feedback is constantly being incorporated into the program. However, TIST's approach is not simply to solicit feedback and then adjudicate what suggestions are meritorious. Farmers are able to provide suggestions and advice from their own life directly to members of their Small Groups and their Clusters. Ideas that work for a Small Group or Cluster are then shared via TIST Quantifiers and through the newsletter- this "networking effect" is one of the main benefits associated with the TIST program. For instance, one community began to use

⁴⁴ TIST UG011 Ara email 090228.pdf. References Kabale and Bushenyi public meetings. TIST UG PD-VCS-Ex 57 UG Stakeholder Notice.zip at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴⁵ Exhibit 14b Public Comments CCB-002: TIST UG PD-VCS-Ex 14b Public Comments CCB-002.doc, Page 4, contains newspaper notice for 7 Jan 2013 public meeting. At <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴⁶ Exhibit 14c Public Comments CCB-001 V02: TIST UG PD-VCS-Ex 14c Public Comments CCB-001 V02.doc, pages 5 and 6, contains newspaper notices of 4 Nov 2014 public meeting. At <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁴⁷ TIST UG PD-VCS-Ex 14a Public Comments CCB-001.doc. Pages 11-13
TIST UG PD-VCS-Ex 14b Public Comments CCB-002.doc, Pages 6-8
TIST UG PD-VCS-Ex 14c Public Comments CCB-001 V02.doc: Pages 12-15
TIST UG PD-VCS-Ex 14d Public Comments CCB-002 V02.doc: Page 9
TIST UG PD-VCS-Ex 14e Public Comments CCB-001 V03.doc: Pages 11-13

the structure and byproducts of participation in TIST to begin making soap. Their success was then recorded and shared through the newsletter. Similarly, successes with apiculture and agroforestry practices have been disseminated across the program area. In this way TIST employs a “bottom up” approach.

TIST is a community-based project, which means that the thousands of farmer-members represent a cross-section of population. TIST membership is further comprised of government officials, church leaders, and members of other NGO's who are able to contribute input from diverse sources representing local leaders and cultures.

The network of TIST Quantifiers and representatives, combined with the thousands of Cluster meetings occurring annually, provide numerous contact points for local, national, and international organizations to make contact and provide input. Thus, TIST is able to leverage its networks into a structure providing continuous feedback and consultation.

At the Small Group level, member farmers meet with TIST representatives regularly, 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, facilitating adaptive management. TIST's operational structure ensures that marginalized groups, in particular women and youth, are attending meetings and contributing to the dialogue. In this way the program is able to proactively address the needs of marginalized groups.

Changes to the program are announced in the newsletter. The result of this stakeholder process has led to numerous invitations for TIST to come to new villages and numerous positive comments about TIST, as well as numerous improvements to the program. This structure has resulted in an adaptive and dynamic program, with constant changes occurring as feedback is solicited.

2.3.9 Stakeholder Consultation Channels (G3.5)

All consultations and participatory processes have been undertaken directly with communities and other stakeholders. This is ongoing and demonstrated through the structure of the program.

Cluster meeting are held about once per month at each cluster where Small Group representatives (TIST Members) attend with Cluster leaders and Cluster Servants for training, to receive payment and to discuss any issue brought up by the members. Exhibit 46 (Cluster meetings), documents 867 meetings in Uganda from up to 7 June 2021 which include 2,389 person-sessions on What is TIST, TIST Eligibility, TIST Values, Developing Best Practices and GHG Contracts.⁴⁸ Dates and locations are provided. The meetings have been held at 62 clusters. The Cluster Meeting Checklist gives an idea of the contents of a typical meeting.⁴⁹

Seminars are held periodically where representatives from multiple clusters are invited. The Seminars include reports from the areas, program updates, reaction to events, program issue, training and more.⁵⁰

TIST Uganda has published 131 issues of “The Tree” newsletter through 2021 containing 604 articles.⁵¹ We print about 1,500 issues per month and distribute them at Cluster meeting. The Small Group representative takes them back to their group to share. Exhibit 53 is an index listing all articles.⁵²

⁴⁸ Exhibit 46 Cluster Meetings: TIST UG PD-VCS-Ex 46 Cluster Meetings 210609.xlsx

⁴⁹ Exhibit 54 Cluster Meetings Checklist: TIST UG PD-VCS-Ex 54 Cluster Meetings Checklist.docx

⁵⁰ Exhibit 55: UG Seminar Notes TIST UG PD-VCS-Ex 55 UG Seminar Notes.zip

⁵¹ TIST UG011 Project web page: <http://www.tist.org/i2/moreinfo.php>

⁵² Exhibit 53: UG Newsletter Index TIST UG PD-VCS-Ex 53 UG Newsletter Index.xlsx

TIST has held 5 public meetings announced in newspapers, open to the public and where comments were taken.⁵³

The cluster meetings are undertaken directly with communities and stakeholders and led by the Ugandan staff. The seminars are undertaken directly with the communities. The Newsletter are given for free to the members at Cluster meetings. The justification that adequate levels of information sharing has occurred is based on the number of meeting, number of attendees, the wide range of subjects, the fact they are open meetings (held outside in common areas) and the number of newsletter provided.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

First is should be noted that TIST was designed so that subsistence farmers, especially women, would be eligible for revenues from the sale for GHG credits. The program design, by necessity required conformance with CDM and later VCS/Verra (VCS and Verra did not exist in 2003). So the general design of the program needed to adhere to the then GHG standards. As noted in Section 2.3.7, we began our consultation with farmers in Tanzania to determine how to develop the program on the ground that worked for and benefitted the farmers. Ugandans were invited to participate. We had the benefit of Ara Bannyanga, a Ugandan elder, to help guide the development of TIST Uganda to make sure we conformed with Uganda norms. Ugandan's have been involved and led since the beginning.

CAAC has no ex-pat managers in Uganda. All of the host country leaders are Ugandans from the project areas. As such, they are in-grained in the culture and operate TIST in regard to cultural sensitivity. They lead the seminars. The Cluster leaders are from the Cluster and lead the meetings and handle the administrative function of the Cluster. Ugandans from the program write the newsletter and have members write short articles. The Cluster Servants/Quantifiers and Auditors are Ugandans, often from one of the local Clusters.

Gender sensitivity is built into the program. It was designed for gender equality from the beginning. Against culture norms for male leadership and domination, we required "one man and one woman" to attend seminar and be Small Group representatives at Cluster Meeting. We try to maintain 50% women on the Leadership Council and are currently at 40%. Cluster Leaders are about 50% women and women are 64% of the Cluster Servant. A women is in charge of the expansion and a women is in charge of the accounting. CAAC employees are 75% women. The I4EI executive director and a major CAAC stockholder is a women. Their participation it TIST has meant that gender sensitivity is front and center with everything we do. Women make up over 35% of the members in a culture where typically men are head of the household.⁵⁴ 38% of the signatories of the GHG contracts are women and 40% of the prepayments and profit share go to the women.

This program design led to the development of several currently integral components of TIST program. The TIST Values of honesty, accuracy, transparency, mutual accountability, service to one another, and small budget/big results were formally articulated. These values were vetted by other countries' participants and came to undergird the entire program in all countries. Cluster organization (described in Section 4.5.8) borrowed previous TIST practices, including rotating leadership and the policy of "one man, one woman". This operational unit has become one of TIST's defining features, and a huge part of the program's success.

- Hold regular seminars to keep the community members informed and to see what is working and what is not. When there are suggestions or changes that are locally appropriate, Small Groups

⁵³ Exhibits 14 Public Comments: TIST UG PD-VCS-Ex 14e Public Comments CCB-001 V03.doc
TIST UG PD-VCS-Ex 14d Public Comments CCB-002 V02.doc
TIST UG PD-VCS-Ex 14c Public Comments CCB-001 V02.doc
TIST UG PD-VCS-Ex 14b Public Comments CCB-002.doc
TIST UG PD-VCS-Ex 14a Public Comments CCB-001.doc

⁵⁴ Section 4.1.1

and Clusters are able to serve as incubators for these changes or improvements. When information needs to be passed to management for operational suggestions, it is communicated through the Cluster leader and Cluster Servants to the Leadership Council. These administrative structures use the same communication channels to solicit clarifications and provide transparent feedback. Both middle and senior level management in Uganda is well appraised to receive input from farmers because they themselves are drawn from the network of TIST participants. They are peers.

- Use a structure such as the Small Groups, Clusters and newsletters for training, to disseminate information and to develop other program elements.
- Encourage rotating leadership at all levels. This rotational leadership alternates by gender ensuring equal access to leadership positions and decision making. Gender parity is maintained in the national Leadership Councils.
- Use a Leadership Council made up TIST farmers that have excelled in leadership to operate the program.
- Train and use TIST farmers to do the monitoring and keep them trained through seminars and internal audits.

2.3.11 Anti-Discrimination Assurance (G3.7)

The program requires equality of access and opportunity regardless of age and gender, oftentimes in contradiction to cultural norms. As such, TIST identifies the potential threat of discrimination or harassment in response to this program attribute. In order to mitigate this threat, TIST has publicly available sexual harassment and discrimination policies.⁵⁵ TIST has numerous venues where complaints can be brought forward including the Cluster meetings, seminars (see Section 2.3.9), talking to Cluster Servant, talking to the Uganda staff and talking to the CAAC staff. Since all of these venues are at least one-third women, there is ample opportunity to bring complaints forward in a sympathetic environment. To date, this combination of policy and education has been very effective, and no official complaints have been filed. A member that has been found to discriminate or sexually harass can be removed from TIST. A TIST worker that discriminates or sexually harasses can be dismissed.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

A grievance policy is available on the TIST project website.⁵⁶ The grievance procedure is intended as the tool by which members and workers may formally have a grievance heard by TIST management.

The TIST grievance policy was developed for TIST worldwide and project wide. It was originally developed by CAAC, the TIST Leadership Council and the law firm DLA Piper (as part of their pro-bono work for I4EI. DLA Piper's scope was to represent the farmers). It was modified in 2012 based on "Validation/Verification – Non-Conformity Reports/Clarifications" for TIST Uganda CCB-001, dated 21 February, 2012 and prepared by Environmental Services, Inc., the VVB conducting the review of Uganda's initial CCB PDD, CCB-001. The modification was found acceptable by the VVB in their "Project Validation/Verification Report". It was found acceptable by Verra in their acceptance of "CCBA Project Description for TIST Program in Uganda CCB-001" dated 21 February, 2012 and "CCBA Project Implementation Report for "TIST Program in Uganda CCB-001" dated 29 February, 2012.

⁵⁵ Exhibits 34 Sexual Harassment and 35 Non-Discrimination: TIST UG PD-VCS-Ex 34 Sexual Harassment 170120.doc, TIST UG PD-VCS-Ex 35 Non-Discrimination 170120.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁵⁶ Exhibit 33 Grievance Policy: TIST UG PD-VCS-Ex 33 Grievance Policy 170120.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

As part of the continuing effort to inform and solicit feedback from the stakeholders, various UG PDDs, each containing the grievance policy, have been presented at public meetings where comments were taken. The meeting were announced in newspapers such as New Vision (a daily national paper) in English and Entatsi (a regional weekly publication) in Runyankore/Rukiga. In addition, the grievance policy has been included in the TIST newsletters and discussed at Cluster Meetings. A version is available to TIST farmers on the TIST Mobile website.

All grievances are first brought to the attention of the Leadership Council, where the issues are compared to standard TIST policy, TIST values and/or the Greenhouse Gas agreement among the Small Group members and CAAC. TIST policies and values are the subject of training at seminar, Cluster meetings, Small Group meetings and are published periodically in The Tree newsletter. The Leadership Council shall give the aggrieved party an answer within 30 days of receipt of the formal complaint.

If the issue is not resolved within 30 days, the aggrieved party shall be informed that the case must be presented to TIST Management and shall inform TIST Management of the issue. Where precedence or policy exists, TIST Management shall use such documents in final decision making and respond to the aggrieved person within 30 days of their receipt of the formal complaint. Where new issues arise that are outside the existing precedence, or policy, the issue shall be brought to the next seminar or Leadership Council meeting, where decisions are made by representatives of the Small Groups, Uganda Staff and TIST Management.

If conflicts or grievances cannot be resolved internally, CAAC and the aggrieved party shall agree upon a mediator to whom they shall submit the issue. Any grievances not resolved through mediation shall be subject to arbitration in through the Chartered Institute of Arbitrators, Uganda Branch within 30 days of the close of mediation.

The principle of free, prior and informed consent gives the community the right to give, or withhold, its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. First, TIST membership is voluntary. Second, when they decide to join, they are trained in the participation requirements. This can be a six-month process. Third, they are trained in the greenhouse gas contract before they sign it. They are free to not sign the GHG contract or register with TIST. Fourth, they participate directly in the design of the project. The farmers plant trees voluntarily on their own land and own the trees and their products. There is never a requirement, request or expectation that any involuntary relocation of people, or of the activities, takes place.

To date we have not had a formal grievance. If there is one, it will be published in the Tree and presented to the Clusters.

2.3.13 Accessibility of the Feedback and Grievance Redress Procedure (G3.8)

Feedback and grievance redress procedures are publicly accessible on the website. New TIST workers are oriented on these policies. Links to these policies are published in the monthly newsletter. To date we have not had a formal grievance. If there is one, it will be published in The Tree and presented to the Clusters.

2.3.14 Worker Training (G3.9)

Local capacity is not lost through staff turnover. First, we have many people on staff in Uganda that do common jobs. For example there are 70 Cluster Servant including some more senior quantifiers that know how to quantify, train and help at Cluster meetings. They provide institutional knowledge and help train new quantifiers. Some of the leadership positions are rotating. For example, Cluster Leaders come from the cluster. The Leader serves 6 months, rotates off and is replaced by the co-leader. The Cluster coordinator becomes co-leader and a new member is brought on as coordinator. We also have the TIST data system. The smartphones have an easy to use user interface that walks the user through the steps

for quantification, expenses and other data components. We have written manuals available on the website. And we have capacity in Kenya that can provide extra support should it be needed.

TIST begins in an area with a series of orientation seminars. TIST members are introduced to the program and participate in the customization of the program to the locale. Virtually all the local staff is hired from the TIST membership. All Quantifiers and trainers are from the local membership. Staff and Quantifiers are 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. Cluster Servants/Quantifiers receive ongoing training as needed and attend a training seminar at least once per year. They are given access to the Quantifier Manual. During the seminars, they are trained on the TIST monitoring plan, which includes use of the smartphones 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 tracks 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 initiated.

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 will 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. The three Cluster Leaders are rotated every six months. The Cluster Servants train them and guide them.

2.3.15 Community Employment Opportunities (G3.10)

TIST does not have an expatriate staff. Although the main management staff and computer development are in the US, the Uganda program is run by Ugandans from the Rukungiri, Kabale, and Kanungu areas. The 70 Quantifiers are largely TIST farmers trained to use the monitoring system. The land and trees planted belong to the TIST farmers. The TIST farmers work together to establish the best practices for their area (whereas the Kenyan and Indian farmers establish their own best practices more suitable to their areas). The local managers are the Leadership Council, which is made up of Ugandans. Cluster meetings and Small Group meetings are run by Ugandans. All TIST members have an opportunity to be group leaders, regardless of education or gender. TIST members are utilized as volunteers, independent contractors and employees based on achievement, not gender, education or social status. TIST holds regular training seminars for Quantifiers and conducts regular audits to make sure their skills are honed.

We strive for gender equality. About half of our Cluster Servants/Quantifiers, Auditors, Cluster Leaders and Leadership Council are female. Females hold positions of responsibility like voucher payments and expansion. When Seminars are held, Clusters must send at least one man and one woman. When a Cluster shows up with all males, they are sent home with instructions to send a woman.

Opportunities are open to all, especially marginalized people. We do not have a formal education requirement for any position. Those that have proven they can do the job are the ones doing the job.

2.3.16 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

Most of the Ugandans 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.

The employment laws are listed below. CAAC is not in violation of these laws.

- The Employment Act, 2006
- National Social Security Fund Act, Cap 222

All employees are given an overview of their rights when hired or at training meetings. The "TIST Uganda: Employee Rights"⁵⁷ are provided to them either verbally or in writing.

2.3.17 Occupational Safety Assessment (G3.12)

Quantifiers are often tasked with visiting remote areas and navigating difficult terrain in order to locate and quantify tree growth. This presents a threat that would not exist in the absence of the program. In order to mitigate this threat, the program outlines a list of precautions and requirements for Quantifiers in the Quantifiers' Safety Requirements. This document is publicly accessible and reviewed annually by each quantifier.⁵⁸

This document included information on:

- General safety precautions
- Riding in public transportation
- Encounters with wild and domesticated animals
- Sexual assault
- Robbery
- Dangerous conditions related to rivers and mountains

TIST encourages avoidance of these conditions where possible. For example, the program recommends avoiding public transportation where the driver appears intoxicated or is driving dangerously. Similarly, the program recommends avoiding dangerous conditions such as crossing fast rivers or areas where a fall could be dangerous.

In some cases, the program recommends working with a partner, particularly to mitigate the risk of wild animals and violence/sexual violence. In the cases of robbery, TIST recommends surrendering material and reporting immediately.

2.4 Management Capacity

2.4.1 Project Governance Structures (G4.1)

The project proponent is Clean Air Action Corporation (CAAC). The role of CAAC and other parties involved with TIST are summarized:

⁵⁷ Exhibit 16 Employee Rights: TIST UG PD-VCS-Ex 16 Employee Rights.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁵⁸ Exhibit 15 Quantifier Safety: TIST UG PD-VCS-Ex 15 Quantifier Safety 110110.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

- Clean Air Action Corporation (CAAC) is a for profit US corporation that manages the GHG component of TIST. CAAC is TIST's largest contributor, provides technical assistance and uses its host country subsidiaries to manage operations.
- Institute for Environmental Innovation (I4EI), a US based non-profit organization, manages the TIST sustainable development program components. I4EI provides funding from government agencies, foundations, and private donors.
- Thousands of TIST farmers make up the Small Groups, plant the trees on their lands, manage their own trees and make up the core of TIST.

No new entities have been included in the project since the last CCB validation or verification .

Operating within the TIST Structure are:

- Leadership Council. It is made up of five to twelve TIST farmers and two full time managers (Ugandan). They supervise the TIST Staff.
- TIST Staff. These are five members who oversee expansion, technical support, accounting, and day to day operations
- Tech Support and QAQC. This is held by a TIST member that rose through the program based on his abilities. He is in charge of daily desk reviews and keeping the field monitoring system operational
- Voucher Payments. This is handled by a team of TIST Cluster Servants and staff that have proven their ability to oversee voucher payments.
- Cluster Leaders. There are three Cluster leader positions per Cluster: Cluster Leaders, Co-leaders, and Accountability people. They serve for a period of four months. After four months of service, the Cluster leader rotates out, the Co-leader becomes the Leader, the Accountability person becomes the Co-leader and the Accountability person is filled by Small Group members from the Cluster.
- Expansion Team. This team is responsible for expanding TIST to new areas.
- Cluster Servant. They serve as Quantifier, trainer and liaison for one or more Clusters.

This is the first validation and no new entities have been included in the project since the last CCB validation or verification.

2.4.2 Required Technical Skills (G4.2)

The following technical requirements are needed in order to operate TIST Uganda:

- Stakeholder engagement- success begins and ends with strong stakeholder engagement. All of TIST's accomplishments are created by and for stakeholders.
- Database creation and maintenance- CAAC oversees a metric-intensive and comprehensive database which supports and confirms the work being implemented on the ground.
- Education- many of the benefits that TIST farmers are able to produce are the result of educational initiatives. These benefits are dependent on the quality of training materials and the skill of those administering the training.
- Ecosystem service assessment and management- tree planting in general, agroforestry in particular, and all of the related benefits and activities rely on robust ecosystem assessment.
- Administration- the project is reliant on clear communication between TIST employees and participants, strong reporting, and responsive management.

2.4.3 Management Team Experience (G4.2)

The two founders of CAAC have almost 85 years combined experience in energy, natural resources, monitoring, quality control, transportation, biofuels, pollution control technologies, emission trading, trading program development, third party due diligence, computer technology and management. They began CAAC in 1993 and helped develop emission trading programs in the US and Canada and were responsible for many firsts in innovative emission control (See CAAC website).

TIST was established in direct response to the needs developed and expressed by Small Groups of Tanzanian subsistence farmers in 1999 and 2000. Attending a Small Group training seminar organized by the Anglican Diocese of Mpwapa in July 1999, one of CAAC's founders participated in a visioning exercise with local subsistence farmers. They 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 TB 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. They decided the groups should work together with each other, and with resources in the US and the UK, to share “njia bora” (best practices) and to start achieving the goals.

With CAAC's involvement with nascent GHG trading in Canada, there was an obvious way to bring these improvements to the farmers using carbon credits as a financial tool.

TIST has been operating successfully for over 20 years and has expanded to four countries, 103,000 farmers and planted over 21,000,000 documented trees. The monitoring system they developed won a Computerworld Honors Laureate in 2007. TIST has 16 VCS PDs, many of which have gone through two or three verifications. TIST has seven CCB PDs under the 2nd edition. TIST was the first project to be verified under CCB. Its successes with CCB demonstrate it has the skills required to implement the project successfully, including community engagement, biodiversity assessment and carbon measurement and monitoring skills.

The following summarizes CAAC carbon project development experience:

- TIST Program, Tanzania, a small-hold farmer A/R project. It began in 1999, with the first tree planting in 2000. The project is centred around Mpwapa and Morogoro and includes over 2,000 farmers.
- TIST Program, India, a small-hold farmer A/R project. It began in 2002, in the rural area outside of Chennai, Tamil Nadu. There are about 7,300 farmers and 2.0 million trees. A subset of the Project Areas has been validated and registered as a CDM project (subsequently withdrawn due to a lack of markets for tCERs). There is one validated and verified VCS project, which has been validated and verified under CCB (Triple Gold for exceptional community, biodiversity and climate benefits).
- TIST Program, Uganda, a small-hold farmer A/R project. It began in 2003 and is centred around three towns in southwest Uganda (Bushenyi, Kabale and Kanungu). There are about 17,000 farmers and about 8.2 million trees. The DNA approved the project contingent on submitting a PD based on an approved methodology. They also approved the EIA. There are seven validated and verified VCS projects, all of which have been validated and verified under CCB (Triple Gold for exceptional community, biodiversity and climate benefits).
- TIST Program, Kenya, a series of small-hold farmer A/R projects. The project started in 2004 and is centred around Mt Kenya. There are about 77,000 farmers and 10.8 million trees. The project has been accepted by the forest department and DNA for CDM. An EIA was accepted by the National Environmental Management Authority (NEMA). TIST Kenya has eight validated and verified VCS projects, all of which were also validated and verified under CCB (Triple Gold for exceptional community, biodiversity and climate benefits).

- Sulfur Hexafluoride emission reductions from electric power equipment in substations of Duquesne Light Company. Reductions were made at numerous locations in Pennsylvania from 1996 through 1999. The reductions were approved as credits under the Pilot Emissions Reduction Trading Program (PERT) in Ontario Canada. CAAC managed the project.
- Methane emission reductions through the recovery of landfill gas from the Lancaster Landfill in Lancaster, New York. Reductions were made 1995 through 1998. The reductions were approved as credits under the Pilot Emissions Reduction Trading Program (PERT) in Ontario Canada. CAAC managed the project.
- TIST has also been a pioneer in the development of measuring sustainable development impacts. The program's farmer-facing structure and focus has allowed farmers to generate diverse benefits that have been recorded in independently administered surveys and TIST's award winning database. The results trove of information uniquely positions TIST and CAAC to begin SD Vista validation and verification proceedings.

2.4.4 Project Management Partnerships/Team Development (G4.2)

As explained in Section 2.4.3, management has 16 TIST PDs in three countries, each is VCS and CCB triple gold. Per section 2.1.20, CAAC has been profitable for years. The Project Proponent does not need additional organizations to support the project.

2.4.5 Financial Health of Implementing Organization(s) (G4.3)

CAAC has been in business since 1993 and has operated TIST for over 20 years. CAAC is profitable after all TIST expenses. CAAC does not have any debt. Financial statements and a financial plan (confidential) have been made available to the Validator (See Section 2.1.20). 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.

2.4.6 Avoidance of Corruption and Other Unethical Behavior (G4.3)

The Project Proponent, or any of the other entities involved in project design and implementation, are not involved in, or are not complicit in any form of corruption such as bribery, embezzlement, fraud, favoritism, cronyism, nepotism, extortion, or collusion. CAAC is a small company. It's CEO and Vice President are active in the day to day operations and are very familiar with the financial aspects of CAAC and TIST and are aware of no instances of the aforementioned types of corruption within either organization. "TIST Values" are the guiding principles of the program.⁵⁹ They state: 1) We are honest; 2) We are accurate; 3) We are transparent; 4) We are servants to each other; and 5) We are mutually accountable to each other. These values are discussed in Seminars⁶⁰ and are regularly in the newsletter.⁶¹ They are a training topic at the Cluster meetings.⁶² They are introduced to new members during the application process.⁶³ They are a component of the Grievance Policy.⁶⁴ They are incorporated in the GHG contracts. TIST has fostered a culture of honesty, accuracy and transparency, that provides the assurance necessary for this section.

⁵⁹ Exhibit 39 TIST Values

⁶⁰ Seminar Notes

⁶¹ The Tree: January 2018, April 2018, March 2017, May 2017, March 2015, etc.

⁶² Exhibit 46 Cluster Meetings

⁶³ Exhibit 36 TIST Intro FAQ, Exhibit 161001.docx, Exhibit 37 TIST SG Eligibility Requirements, Exhibit 38 TIST SG Membership Application.

⁶⁴ Exhibit 33 Grievance Policy

2.4.7 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

But for what is shown below, no commercially sensitive information has been excluded from the public version of the project description including information related to the determination of the baseline scenario, demonstration of additionality, and estimation and monitoring of GHG emission reductions and removals (including operational and capital expenditures). Commercially sensitive information that has been excluded from the public, but made available to the Validator, is:

- CAAC's proprietary financial model⁶⁵
- CAAC Financial Statements
- 20 individual Carbon Credit Sale Agreements with Small Groups. However, the templates are available in Exhibits 03 and 04.

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

There are four main types of land tenure:

- Customary tenure: This is the most widespread and oldest tenure known in the area. Under this system, the owner of land has rights to use and may dispose of it at will, including passing it on to his sons and daughters. This type of ownership was legally recognized in the Constitution (1995).⁶⁶
- Leasehold tenure: A leasehold is a contract for use of a parcel of land and has a maximum term of 99 years.
- Freehold tenure: Freehold is the absolute private ownership of interest in land, which can be transferred, without restriction, and is free of obligation to the state.
- Mailo land: This is a system where people were given land by traditional kings. Farmers living on Mailo land are considered tenants and do not have land ownerships rights. They pay a fixed annual rent set by the Ugandan Government.⁶⁷

No land disputes have been identified. The demonstration that all Property Rights are recognized, respected, and supported is based on the fact that TIST does not interfere with the farmer's tenure.

2.5.2 Recognition of Property Rights (G5.1)

All property rights are recognized, respected, and supported. This is demonstrated by the GHG contract with the Small Groups. It states "The Small Group shall own the trees and the fruits, nuts, medicines and all other products from the trees; the stoves; and the crops from the sustainable agriculture. As for ownership of the land, the contract discusses how the members must demonstrate that they own or be entitled to use the land but imparts no rights of ownership or transference to CAAC or TIST. The purpose of the contract is for the members to plant trees on their land and only transfer the rights to the carbon. The project will not encroach uninvited on private property, community property, or Government property. The lands are controlled by the farmers.

2.5.3 Free, Prior and Informed Consent (G5.2)

⁶⁵ Exhibit 09 Financial Model

⁶⁶ Uganda's Constitution of 1995 with Amendments through 2017. Section 237. Land ownership at https://www.constituteproject.org/constitution/Uganda_2017.pdf?lang=en

⁶⁷ <https://justicecentres.go.ug/glossary/mailo-land-tenure/>

The project will not encroach uninvited on private property, community property, or government property. This is documented by the GHG agreement among CAAC and the Small Groups. Consultations regarding the GHG agreement is conducted through training prior to the signing of the contract by each Small Groups. The trainings are described in below in this section. Per the GHG agreement, TIST does not own or control any property nor does the agreement contemplate any acquisition of land from the farmers. It only contracts for the rights to the carbon that is removed by the trees planted by the members. The members demonstrate they have the rights to the land where they plant and attest to the same in the contract. See Section 2.5.2. By signing the GHG contract the members represent that they have the legal right to the land that will become a project area. Nothing in the contract gives CAAC or TIST the right to that land. It also states affirmatively that the Small Groups maintain the rights to the trees, tree products, crop and stoves. The contract only transfers the right to the carbon to CAAC. However, the contract does “allow auditors and quantifiers access to locations of the Small Group activities, including where TIST trees are planted and, when asked, assist them in locating the trees, farms, or other project locations.” Therefore, by contract, TIST does not encroach uninvited on private property, community property, or government property.

The process by which free, prior, and informed consent will be or has been obtained of those whose property rights will be or are affected by the project is described as follows.

First, as noted above and in Section 2.5.2, the only property rights that are affected are the rights to the carbon removals resulting in participation in TIST.

Second, joining TIST is voluntary. In existing areas, farmers learn about TIST from friends and neighbors and if they are interested are told to attend a Cluster meeting here they are given the application packet.⁶⁸ In new areas, TIST representatives travel to these areas and make contact with farmers.⁶⁹ The farmers are told about TIST and if they are interested, asked to invite other farmer to a meeting where they are informed about TIST and given an application packet.

Consultation takes place over several months. Prospective members are given an application packet and many opportunities to discuss what it means to join TIST and what the GHG agreement does and doesn't do. The opportunities to learn about TIST include attending Cluster meetings, discussing the applications packet with their Small Groups and consultation with TIST representatives such as Cluster Servants and Cluster Leaders. As noted in Exhibit 46, there have been 2,389 person session of training on TIST since 2018.⁷⁰ As noted in Exhibit 54, the ideal Cluster meeting includes 2 training sessions, a discussion on who to see regarding application for membership and time for answering questions/ hearing suggestions & concern.⁷¹

The application packet includes a TIST Info FAQ, eligibility requirements, group application, TIST Values and a GHG contract.

The group application states: “We have an application process made up of several steps to ensure that you have the information you need to decide if you want to volunteer to join, and to create strong group that can work well together to plant trees to fight climate change and improve our communities. The process involves getting information from the TIST websites, developing Small Groups and Cluster meetings and talking with a designated TIST member. After you have taken actions to develop areas where you plan to plant trees a Quantifier will visit your farm to see what you have accomplished. In the

⁶⁸ Exhibits 04, 36-39 at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁶⁹ The Tree, January 2018, page 4.

⁷⁰ TIST UG PD-VCS-Ex 46 Cluster Meetings 210609.xlsx at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>. See the cluster_meeting worksheet for the dates and location of the meetings. See cluster_meeting2topic for training topics. See PD Total UG011 for summary.

⁷¹ TIST UG PD-VCS-Ex 54 Cluster Meetings Checklist.docx at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

process, you will be meeting weekly with neighbors with whom you would like to form a TIST Small Group, and keeping a record of these meetings.” They are informed about the website (accessible by mobile phone) and how the TIST members will guide them through the application process and about the trainings required for registration. The application discusses the interview process including attending training meetings, asking questions to learn about the farmer and how group members know each other; asking why the member wants to join TIST and verifying that they understand the terms of the GhG contract that was given in the application packet.

The eligibility requirement list 14 criteria that will govern membership, including signing a GHG contract, planting trees, meeting the requirement of the GHG governing bodies (e.g. Verra), joining or forming a Cluster and Small Group and following the program values (TIST Values). It also gives a description of the payment structure. At this point the farmer has not joined TIST or made any commitments to plant trees.

The FAQ is a four page document that further describes TIST. It begins with the TIST Values of honesty, accuracy and transparency and discusses the culture of TIST. Some key points are;

- Who is TIST? We are! It describes the member community and how we take actions to improve the environment and address climate change.
- How Does TIST work? It discusses Small Groups, making GHG credits, how we grow leaders with rotating leadership and share best practices.
- What exactly are ‘greenhouse gas credits’? This provides more detail about what is entailed in making credits.
- What is the Greenhouse Gas Contract? “Small Groups enter into a contract with CAAC and promise to plant a minimum of 5,000 trees over five years.” In return, they receive an annual incentive payment to maintain and replant trees. The payment is based on the number of live trees in the ground. When the TIST Program is able to cover its costs from the sales of carbon credits, the Small Groups will receive a 70% share of the net profits.
- What are the benefits of being in TIST? These include improved crop yield from Conservation Farming; fruits, nuts, firewood, honey, medicine and other tree products; building local capacity in technology use, training and agroforestry knowledge; new friends; leadership and management skills; opportunities for service to others; stipend payment for live trees and profit sharing.
- How much does TIST pay Small Groups? The payment is 0.02USD per live tree per year. While this seems small at first it is much more than the value of sequestered carbon in the early years of a project area. Ultimately, however, they receive 70% of the profits from carbon sales.
- Where does the money for the tree-planting incentives come from? The initial investment comes from CAAC.
- Does TIST provide material handouts to the groups? “TIST does not provide any materials such as planting pots, tools, seeds or seedlings. Instead, we provide information and training so that all of us can perform the activities ourselves.”
- Can anyone join TIST? “TIST is expanding rapidly. Because we do the work ourselves and we keep our budget low, our results are high and we accomplish a lot. If people in an area are willing to live by the TIST Values, work hard and help each other, we invite them to apply to be a TIST Small Group.” “Before being registered in TIST, the farmers will need to go through an application and training process to make sure that they are serious and qualified. After Registration, they become part of the TIST Program and can start helping each other improve their environment, their farming, and their lives. Then when people ask “Who is TIST?” they can say “WE ARE!”

TIST Values elaborated on the key points of Who Are We?

- We are honest.
- We are accurate.
- We are transparent.
- We are servants to each other.
- We are mutually accountable to each other.

GHG Contract. This is provided with the above material and is part of the training. It is only after the farmer is given the application packet and the training that a farmer is permitted to sign the contract.

This process ensures free, prior, and informed consent has been obtained of those whose property rights are affected by the project. It is a long consultation and, because we have new farmers joining all the time, it is ongoing. Some members in the PD joined in over 15 years ago, and some have joined in the last few years. The documents and training presented above demonstrate we provide the training and information necessary to make an informed decision. The GHG contract is the agreement, only signed after a farmer has made the voluntary choice to join.

Appropriate restitution or compensation is allocated to any parties whose lands have been or will be affected by the project. As noted, no lands will be affected by the project. The TIST contract requires a Small Group to plant trees on their land to sequester carbon. The project makes no claim on the land. The trees, their products and the environmental benefits are kept by the farmer.

The consultation takes place as part of the training described in this section. The compensation is disclosed before the signing of the contract. The GHG contract is the binding agreement.

The project does provide compensation for the trees and the carbon. Initially the farmers are paid \$0.02 per tree per year per live tree. When this was established it exceeded the value of carbon in international carbon market that a tree would sequester over a multi-year period. Once the project became profitable from the sale of carbon credits, the members began to receive 70% of the "Project Net Revenue." (The Project Net Revenue is defined as the cumulative revenues from the sale of Carbon Credits from TIST Uganda less the cumulative costs of TIST Uganda, including the pro-rata international development costs and tree payments to the Small Groups). As noted in the first verification report (contemporaneous with this PD), Ugandans have received over \$3.9 million through March 2021.⁷²

In addition, the structure of TIST provides free training in sustainable development ideas and activities that have a multiplying benefit to the farmers.

TIST has allocated appropriate compensation to the parties whose lands have been or will be affected by the project.

2.5.4 Property Rights Protection (G5.3)

The project activities do not lead to involuntary removal or relocation of property rights holders from their lands or territories, and does not force rights holders to relocate activities important to their culture or livelihood. TIST is voluntary and does not take any lands or encroach on any lands. TIST does not ask that a farmer displace themselves, family or home or force them to relocate activities important to their culture or livelihood. By the GHG contract, the members maintain ownership of the land and trees. TIST was designed to benefit the farmers and to leave it up to them to decide whether to participate and if they do, where to plant their trees. Any displacement they choose to do of their pre-TIST activities is done with free, prior, and informed consent, as noted in Section 2.5.3.

As noted in Exhibit 40, the farmers are asked a series of questions regarding displacement as part of the baseline survey.⁷³ The section begins as follows:

The following questions are to determine if a farmer had to displace any regular activities as a result of planting TIST tree groves. Sometimes, when activities are displaced, this causes the

⁷² Based on computer generated report from the TIST Server where payment data resides. Supported by the CAAC audited financial statements.

⁷³ TIST UG PD-VCS-Ex 40 Quantifier Manual 190613.docx at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>. See page 14, Displacement.

farmer to clear trees on their own or other people's land. Since cutting down trees causes deforestation, TIST does not want members to cut trees in one place so they can plant them in another. This takes away the positive environmental effects of tree planting, and can even have negative effects when older, larger trees are cut down unnecessarily.

NOTE: If while interviewing a farmer about displacement you find that they have been cutting trees as a result of displacement of activities from TIST tree groves, educate them on the dangers and ask them to stop.

The questions include whether there has been displacement of a household, existing forest, cultivation or grazing. The responses are captured on the smartphone database and synchronized with the TIST Server. As part of the process for determining eligibility for the PD, the answers are analyzed and summarized in column AG, Grove Summary, Appendix 04. If there is an "N" in the column, the answers have indicated no displacement and the project area is eligible for the PD. If the answer is blank, the baseline is incomplete and although the project area is in the PD, it will not be included in the monitoring report until it is completed and no ineligible displacements are indicated. If the answer is "Y" the project areas will not be included in the monitoring report until it can be demonstrated that an error was made during the questioning or input. Only the project areas that are designated with an "N" in column AG are active in the PD.

While displacement can include farmland under Verra rules, it is a decision made by the farmers and they are compensated with the payments required in the GHG contract.

2.5.5 Illegal Activity Identification (G5.4)

The Project Zone is the land owned or controlled by the farmers and no illegal activity (e.g. illegal logging) has been identified. The farmers own the trees and can choose to cut them down. However, if the trees are TIST trees, they will be in violation of the GHG contract wherein they have promised to maintain them. If a farmer decides to void the contract and fell their trees, they will be exited from the program and their trees deducted from the Small Group's total. Similarly, if a Small Group decides to cease maintaining their trees they will be removed from the database. Because the TIST program is dedicated to helping farmers, TIST is uninterested in litigating breaches of contract; however, there is a strong social barrier to breaching this contract. TIST farmers understand that by cutting down their trees, they will harm both their Small Group and their community. This is a powerful social force, particularly in strongly communitarian societies. Over TIST's 20-year history, the program has experienced a *de minimus* number of contract issues. The program is further insulated from this dynamic by constant programmatic growth. With a constantly expanding number of farmers and trees, an individual grove or Small Group's removal will never offset net increases.

Since this is the source of TIST's GHG revenues and the removal has to be offset by other trees, TIST continues to train the members in the GHG contract and the benefits of keeping the trees.

2.5.6 Ongoing Disputes (G5.5)

No ongoing or unresolved conflicts or disputes over rights to lands, territories and resources have been identified. No disputes that were resolved during the last twenty years where such records exist, or at least during the last ten years have been identified. There are cases where a member has died and there arises a family dispute over the land. If the member's family cannot resolve the dispute or if the successors do not want to be in TIST, they are released from the contract.

But for the aforementioned family disputes, no other conflicts or disputes have been identified, and a demonstration that no activity is undertaken by the project that could prejudice the outcome of an unresolved dispute relevant to the project cannot be made and is not applicable. In the cases of family disputes, TIST does not take a position with the members or their successors. TIST will re-sign the

contract if that is the desire or they will release the members for the contract, therefore not prejudicing the issue.

2.5.7 National and Local Laws (G5.6)

As a tree planting program that takes place voluntarily on existing farmland, there are few laws that are relevant to TIST. A review of the potentially applicable laws and regulations was made by CAAC's US staff, the Uganda staff, and local Ugandan counsel. They include:

- The Constitution of the Republic of Uganda of 1995. It empowers Parliament to enact laws to protect, preserve and manage the environment. It does not contain any language that would have a specific impact on the project.
- The National Environmental Act of 1996. It establishes the National Environment Management Authority (NEMA). NEMA established the Environmental Impact Assessment Regulation, S.I. No. 13/1998.⁷⁴ In accordance with the Act and Regulation,, TIST submitted an Environmental Screening (i.e."Brief") to NEMA.⁷⁵ Because of the multiple benefits of the project for forests and people, NEMA waived the requirement for an environmental impact assessment for the TIST tree planting activities in Uganda.⁷⁶
- The National Forestry and Tree Planting Act, 8/2003. The Act provides for the conservation, sustainable management and development of forests for the benefit of the people of Uganda. While it promotes tree planting, it specifically states that the national and/or local government have "no ownership over trees or forest produce situated on private land."
- The employment laws are listed below. CAAC uses Uganda counsel to advise on issues relating to employment. CAAC is not in violation of these laws.
 - The Employment Act, 2006
 - National Social Security Fund Act, Cap 222
 - Companies Act, Cap. 110). CAAC is registered as a branch and is in good standing to operate in Uganda.

2.5.8 Approvals (G5.7)

As noted in Section 2.5.7, NEMA established the Environmental Impact Assessment Regulation, S.I. No. 13/1998 which required TIST to submit an Environmental Screening to NEMA.⁷⁷ Because of the multiple benefits of the project for forests and people, NEMA waived the requirement for an environmental impact assessment for the TIST tree planting activities in Uganda. NEMA accepted the Environmental Screening with their letter of 5 May 2007.⁷⁸

2.5.9 Project Ownership (G5.8)

CAAC's project ownership is derived from "an agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservational or management process that generates GHG emission reductions or removals which vests project ownership in the project proponent."

Each project area is a tree grove planted by a Small Group. It is named using a unique combination of the TIST number for that Small Group and the grove name.

⁷⁴ https://nema.go.ug/sites/all/themes/nema/docs/eia_regulations.pdf . See Part III: Environmental Impact Studies, Section 9. Approval of the project brief.

⁷⁵ Exhibit 01 "Environmental Screening at <https://www.tist.org/PD-UG-VCS-011%20Documents.php> "

⁷⁶ Exhibit 02 "NEMA EA Approval" at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁷⁷ Exhibit 01 Environmental Screening

⁷⁸ Exhibit 02 NEMA EA Approval

- The landowner is a small hold farmer who is one of the TIST Small Group members. Uganda is going through a transition from customary tenure to land registry. The ownership of TIST project areas is both through customary tenure and registered land deeds.
- TIST is a project name, not a legal entity, and does not own, control or have any rights to 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 activities to Clean Air Action Corporation (CAAC) under a “Carbon Credit Sale Agreement.”⁷⁹
- Under Paragraph 4 of the “Carbon Credit Sale Agreement,” the members affirm their ownership or rights to the land designated as project areas.
- Under this PD, VERs shall be issued to CAAC.
- The current land use is agricultural.

The status of the contractual relationship between the landowner and CAAC will be monitored. This will include changes in ownership of the land and changes in Small Group membership.

2.5.10 Management of Double Counting Risk (G5.9)

The project does not seek to generate, nor has received, any form of environmental or social credit, other than the carbon offsets discussed in this document.

2.5.11 Emissions Trading Programs and Other Binding Limits

The Project Proponent declares that net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program, or to meet binding limits on GHG emissions.

2.5.12 Other Forms of Environmental Credit

The Project Proponent declares this project does not create another form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program, or that any such credit has been, or will be, cancelled from the relevant program.

2.5.13 Participation under Other GHG Programs

The Project Proponent declares the project has not been registered, nor is seeking registration, under any other GHG programs.

2.5.14 Projects Rejected by Other GHG Programs

The Project Proponent declares this project has not be rejected by any other GHG program, has not been submitted to any other GHG project for crediting and is not claiming credits associated with the trees planted and maintained by this project, under any other program.

⁷⁹ Exhibits 03 and 04 GHG Contract

2.5.15 Double Counting (G5.9)

Uganda does not have a compliance market; thus, this is not applicable.

3 CLIMATE

3.1 Application of Methodology

3.1.1 Title and Reference of Methodology

The approved baseline and monitoring methodology applied to the proposed VCS project activity is CDM AR-ACM0003 Version 2: "A/R Large-scale Consolidated Methodology, Afforestation and reforestation of lands except wetlands."⁸⁰

The project applies the following CDM tools:

- "Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" (AR-TOOL 02, v1.0.);
- "Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity" (AR-TOOL 08, v04.0.0)
- "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities" (AR-TOOL 12, v03.1)
- "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (AR-TOOL 14, v4.2);
- "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity" (AR-TOOL 15, v2.0)
- "Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities" (AR-TOOL 16, v1.1)
- "Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities" (AR-TOOL 17, v01.0.0)
- "Demonstration of eligibility of lands for A/R CDM project activities" (AR-TOOL 19, Version 02.0)

3.1.2 Applicability of Methodology

The proposed project activity fulfills all of the applicability conditions stated by AR-ACM0003: This methodology is applicable under the following conditions:

- (a) *The land subject to the project activity does not fall in wetland category;;*

Baseline monitoring assessed the topographies of each individual grove. Topographies reported include "flat land," "gentle hill side," "basin," "top of hill," "steep hill side," "valley," "riverbank," and "flood plain" but not wetlands or any variation of wetlands. Project groves are predominantly used for food production. Baseline monitoring attests to a combination of cropland and grasslands.⁸¹ In addition, Appendices 01 and 02 document that the project areas were not wetlands in 1990 or 2000.⁸²

- (b) *Soil disturbance attributable to the project activity does not cover more than 10 per cent of area in each of the following types of land, when these lands are included within the project boundary:*

⁸⁰ <https://cdm.unfccc.int/methodologies/ARmethodologies/approved>

⁸¹ Appendix 04 Validation Data, "Grove Summary" worksheet. See columns V-AA demonstrating the land used was either agriculture, barren, grass, shrubs or litter.

⁸² Appendix 01 Landsat 1990 and Appendix 02 Landsat 2000.

- (i) Land containing organic soils;
- (ii) Land which, in the baseline, is subjected to land-use and management practices and receives inputs listed in appendices 1 and 2 to this methodology.

The minimum spacing recommended for the trees is two meters x two meters, or 4² meters. The recommended size of the holes is 0.3 meters in diameter, or 0.07 square meters.⁸³ The calculated area disturbed as a result of soil preparation for planting is less than 1%. See "Misc Calc" worksheet, Appendix 04.⁸⁴ Plowing does take place for intercropping, as part of the baseline activity and is not considered by the CDM AR Working Group to be part of the project activity.

The proposed project activity fulfills all of the applicability conditions of the tools listed in Section 3.1.1. as follows:

"Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities" (AR-TOOL 02, v1.0). The tool is applicable under the following conditions:

- Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law even if the law is not enforced.

As noted in Section 2.5.8 and the referenced NEMA approval, forestation of the land within the proposed project boundary does not lead to violation of any applicable law.

- This tool is not applicable to small - scale afforestation and reforestation project activities.

This is a large scale project using AR-ACM0003. This tool is applicable.

"Estimation of non-CO2 greenhouse gas (GHG) emissions resulting from burning of biomass attributable to an A/R CDM project activity" (AR-TOOL 08, v04.0.0)

- The tool is applicable to all occurrence of fire within the project boundary.

The project does not intentionally burn biomass. However, if a project area has an occurrence of fire, the tool will be used to calculate the non-CO2 greenhouse gas (GHG) emissions in accordance with the tool.

- Non-CO2 GHG emissions resulting from any occurrence of fire within the project boundary shall be accounted for each incidence of fire which affects an area greater than the minimum threshold area reported by the host Party for the purpose of defining forest, provided that the accumulated area affected by such fires in a given year is ≥5% of the project area.

Uganda defines a forest as 1.0 hectare. For any project area that exceeds 1.0 hectare and where the accumulated area affected by such fires in a given year is ≥5% of the project area, the tool will be used to calculate the Non-CO2 GHG emissions.

"Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities" (AR-TOOL 12, v03.1)

- This tool has no internal applicability conditions.

As stated in paragraph 4 of the tool, there are no internal applicability conditions.

- This tool makes the following assumptions:

⁸³ Exhibit 49, Tree Planting SOPs

⁸⁴ Row 72-81

- (a) *Linearity of change of biomass in dead wood and litter over a period of time: Change of biomass in dead wood and litter may be assumed to proceed, on average, at an approximately constant rate between two points of time at which the biomass is estimated;*
- (b) *Appropriateness of root-shoot ratios: Root-shoot ratios appropriate for estimation of below-ground biomass from above-ground biomass of living trees are also appropriate for dead trees.*

The methodology considers dead wood and litter an optional pool. The project is not selecting the pool for accounting of carbon stock changes and is not including the below-ground biomass in its carbon accounting.

“Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” (AR-TOOL 14, v4.2).

- This tool has no internal applicability conditions.

As stated in paragraph 3 of the Tool, there are no internal applicability conditions.

“Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity” (AR-TOOL 15, v2.0)

- This tool is not applicable if the displacement of agricultural activities is expected to cause, directly or indirectly, any drainage of wetlands or peat lands.

This tool is not applicable. The project areas are located on individual farms. It has been demonstrated that the farms are not wetlands. It follows that no displacement of agricultural activities is expected to cause, directly or indirectly, any drainage of wetlands or peat lands.

“Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities” (AR-TOOL 16, v1.1)

- This tool is applicable when the areas of land, the baseline scenario, and the project activity meet the following conditions:
 - a) *The areas of land to which this tool is applied:*
 - i) *Do not fall into wetland category;*
 - ii) *Do not contain organic soils as defined in Annex A: glossary of the IPCC GPG LULUCF 2003;*
 - iii) *Are not subject to any of the land management practices and application of inputs as listed in the Tables 1 and 2;*
 - b) *The A/R CDM project activity meets the following conditions:*
 - i) *Litter remains on site and is not removed in the A/R CDM project activity; and*
 - ii) *Soil disturbance attributable to the A/R CDM project activity, if any, is:*
 - In accordance with appropriate soil conservation practices, e.g. follows the land contours;
 - Limited to soil disturbance for site preparation before planting and such disturbance is not repeated in less than twenty years.

The methodology considers soil organic carbon stocks an optional pool. The project is not selecting the pool for accounting of carbon stock changes.

“Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities” (AR-TOOL 17, v01.0.0)

- This tool has no internal applicability conditions.

As stated in paragraph 3 of the tool, there are no internal applicability conditions.

“Demonstration of eligibility of lands for A/R CDM project activities” (AR-TOOL 19, v02.0)

- This tool has no internal applicability conditions.

As stated in paragraph 3 of the tool, there are no internal applicability conditions.

3.1.3 Project Boundary

The project boundary is defined as the collection of 3,162 individual active project areas in the PD. Each boundary is displayed in the KML file, Appendix 03 where they are identified by location ID.⁸⁵ They are also listed by Project Areas ID and Location ID in Grove Summary, Appendix 04. Samples of hundreds of project area boundaries are shown on Appendices 01 and 02. Although the resolution makes them impossible to see, all of the project area boundaries are shown on Figure 2.1.7 A (Section 2.1.7). Please refer to Appendix 03 for the full set of project area boundaries.

All activity will take place in the project areas. There are no installations and no leakage is expected.

The relevant GHG sources, sinks and reservoirs for the project and baseline scenarios are the above and below ground biomass of the trees planted by the project. The methodology considers the dead wood, litter and soil organic carbon as optional pools for carbon accounting. The project has opted to not include them. The reason is simplicity. We have designed TIST to be implementable by the local farmers using minimum instrumentation. We count and measure trees and use allometric equations to calculate the carbon. We have chosen not to try and calculate carbon changes from dead wood, litter and soil organic carbon in either the project or baseline.

Source		Gas	Included?	Justification/Explanation
Baseline	Baseline Tree Growth	CO ₂	Yes	Above and Belowground biomass, see Section 3.2. The methodology considers the dead wood, litter and soil organic carbon as optional pools for carbon accounting and the project has opted to not include them for simplicity.
		CH ₄	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO ₂ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		N ₂ O	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO ₂ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		Other	No	n/a
	Baseline	CO ₂	No	Inclusion only justified for burning. Program has

⁸⁵ Appendix 03 Project Areas Boundaries. TIST UG PD-VCS-011d App03 PA Plots 230401v3.kml at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

Source		Gas	Included?	Justification/Explanation
	Non-Woody Growth			minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		CH ₄	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		N ₂ O	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		Other	No	Not required by the methodology
Project	Tree growth	CO ₂	Yes	Above and Belowground biomass, see Section 3.2. The methodology considers the dead wood, litter and soil organic carbon as optional pools for carbon accounting and the project has opted to not include them for simplicity.
		CH ₄	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		N ₂ O	No	Inclusion only justified for burning. Program has minimal fire risk, as assessed in both the risk report and program history. The tool “Estimation of non-CO2 GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity” is deemed not applicable.
		Other	No	n/a

3.1.4 Baseline Scenario

For the baseline scenario, the “combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” is used.

The baseline field observation as detailed in the "Grove Summary" worksheet indicates the initial project areas are largely grassland and cropland prior to implementation of the project activity. That this is also the most likely use of these project areas, without the project activity, is supported by:

- The project areas are all private lands owned by subsistence farmers conducting the project activity. They have a history of farming and use of the land, 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, 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 will revert to forest without intervention.
- There are no alternative uses of this land that can be reasonably expected.

Literature Regarding Changes in Baseline Carbon Stocks. There is a clear pattern of rural firewood use and forest degradation in Uganda that supports the case that carbon stocks on each individual project area would be expected to decline or, at best, are increasing at a rate of less than 10% compared to the expected removal by sinks. The lands of and surrounding the project areas have been degrading for decades, due to human intervention. Despite a series of forest policies that began in 1929,⁸⁶ forests in the TIST areas are in an extremely precarious position.

The Uganda Forest Policy⁸⁷ cites a decline in forest resources:

(T)he trend in Uganda is one of loss of forest cover and degradation of the remaining forest resource base:

- in tropical high forest, about 280,000 hectares are now degraded, representing at least a third of the country's valuable high forest;
- in woodlands, the degradation and clearance is more marked, as most of the current loss of forest cover is in woodland areas;
- in the government Forest Reserves, which cover over 1.1 million hectares, there is less than 740,000 hectares of forest cover, a loss of 35% of forest cover. Of the 20,000 hectares of timber plantations planted on this government land, as little as 6,000 hectares of well-stocked softwood plantations currently remain standing.

According to the FAO⁸⁸ Uganda has lost 86,000 ha of forest per year between 1990 to 2005, falling from 4,924,000 hectares to 3,627,000 hectares. That is 1,297,000 total ha, equal to over a 25% loss. It was estimated that 46.4 million m³ (over bark) of wood products was removed in 2005, which was equal to 29.8% of the country's growing stock. Of this, 42,0416,000 m³ (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. Any planned project areas that are verified in the future will be subject to these same baseline scenario conditions.

⁸⁶ The Uganda Forest Policy, Ministry of Water, Lands and Environment, Republic of Uganda, 2001. Accessed December 16, 2019 <https://www.nfa.org.ug/images/UgandaForestryPolicy2001.pdf>

⁸⁷ Ibid, p. 2

⁸⁸ Agriculture Organization of the United Nations. "Global Forest Resources Assessment 2005." *Global Forest Resources Assessment*, FAO, www.fao.org/forestry/fra/fra2005/en/. Accessed February 10, 2020

3.1.5 Additionality

For the additionality, the “Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities” (AR-TOOL 02, v1.0) is used. A step-by-step application of the tool follows:

STEP 0. Preliminary screening based on the starting date of the A/R project activity

- Provide evidence that the starting date was after 31 December 1999.

As noted in the title page of this document, the start date is 16 December 2003. This is based on the start date of the earliest Small Group registration in the PD. (See Section 2.1.13).

- Provide evidence that the planned sale of carbon credits was seriously considered in the decision to proceed with the project activity.

This is demonstrated in the TIST Phase II Report dated March 2003 (see page 4 to 8).⁸⁹ It must be highlighted that while TIST received funding in the early years, there was no sustainable income except the prospect of selling GHG credits.

STEP 1. Identification of alternative land use scenarios to the proposed A/R CDM project activity.

Sub-step 1a. Identify credible alternative land use scenarios to the proposed project activity.

The following land use scenarios were considered:

- Continuation of the pre-project land use. The baseline field observation as detailed in the "Grove Summary" worksheet (Appendix 04) indicates the initial project areas are largely grassland and cropland prior to implementation of the project activity.
- Forestation of the land within the project boundary performed without being registered as the A/R project activity.

Sub-step 1b. Consistency of credible alternative land use scenarios with enforced mandatory applicable laws and regulations.

The project areas are farms owned or controlled by the members of TIST. There are no applicable laws or regulations that require them to plant trees or require planting a certain type of crop. They are free to plant trees or allow them to regenerate naturally or to continue farming as they did before the project began. Both scenarios in Sub-step 1a. are consistent with enforced mandatory applicable laws and regulations.

STEP 2. Barrier analysis

Sub-step 2a. Identification of barriers that would prevent the implementation of at least one alternative land use scenarios.

The barriers identified are:

- Investment barriers
- Barriers due to social conditions, lack of organization and

⁸⁹ Exhibit 56 TIST Phase II Report, TIST UG PD-VCS-Ex 56 TIST Phase II Report 030403.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

- Remoteness of land area and undeveloped roads.

Sub-step 2b. Elimination of land use scenarios that are prevented by the identified barriers.

Continuation of the pre-project land use case is unaffected by the barriers. The subsistence farmers have occupied these land for generations and, while they remain impoverished, this is their livelihood. See Section 4.1.1.

The scenario for forestation of the land within the project boundary performed without being registered as the A/R project activity is prevented by the barriers as follows:

Investment barrier, Project Proponent. From the Project Participant's perspective, TIST has numerous investment barriers. TIST does not create or sell any products, other than GHG credits, associated with carbon sequestration. The trees and their products are owned by the Small Groups. Any revenue generated by the tree products belongs to the Small Groups. The TIST GHG "business" has been funded by Clean Air Action Corporation (CAAC), as an investor, based solely on future GHG revenues. There is no business or business case without carbon revenues. There is no payback or ROI, without carbon revenues. But for the expectation of a carbon market and the expectation of the sale of GHG credits from the project activity, CAAC would not have invested in TIST. Without carbon revenues, TIST is not viable or sustainable.

Investment barrier, TIST Small Group Members. From the Small Groups or member's perspectives, there are barriers that have prevented reforestation of these lands. Tree plantations require investment to obtain seedlings and, in the case of TIST farmers, to take land out of current revenue production activities, such as cropland, for long-term gain. Investment requires access to credit. However, due to their low income, the farmers participating in TIST have little opportunity for investment loans or capital. Banks tend to be reluctant to lend to those living at the subsistence level, because they have few assets for collateral and little disposable income available for debt service. According to The International Fund for Agricultural Development (IFAD), "more than one billion people – 90 percent of the world's self-employed poor – lack access to basic financial services, depriving them of the means to improve their incomes, secure their existence, and cope with emergencies."⁹⁰

Referring to the Southwest Region⁹¹ of Uganda, IFAD reports income of "about USD 100 per [capita], which is less than half the national average" and states, "a lack of credit has constrained farmers' ability to acquire inputs or adopt improved practices."⁹² Muwanga (2001) reinforces this and, referring to rural Uganda, concludes "lack of credit contribute[s] to community and household poverty."⁹³

TIST members are the people described above. They are subsistence farmers with little access to the credit required for a plantation. Table 3.1.5.A is from Bushenyi District Planner based on discussion about the Small Group income.

⁹⁰ "Over One Billion People Lack Access to Basic Financial Services ." IFAD, www.ifad.org/en/web/latest/news-detail/asset/39070979, accessed February 10, 2020

⁹¹ Defined as the areas in Uganda, which borders Tanzania, Rwanda and Zaire. This is the area where TIST farmers are located.

⁹² "Southwest Region Agricultural Rehabilitation Project." IFAD, www.ifad.org/en/web/ioe/evaluation/asset/39826950, accessed February 10, 2020

⁹³ "THE DIFFERENCES IN PERCEPTIONS OF POVERTY" UGANDA NATIONAL NGO FORUM, www.saprin.org/uganda/research/uga_poverty.pdf, accessed December 16, 2019

Table 3.1.5.A. Annual Income Brackets				
Income Level (Ush)		Income Level US\$		Pct of Groups
Min	Max	Min	Max	
720,000	2,400,000	\$257	\$857	82%
2,400,000	4,800,000	\$857	\$1,714	11%
4,800,000	9,600,000	\$1,714	\$3,429	5%
9,600,000	12,000,000	\$3,429	\$4,286	2%
12,000,000	and up	\$4,286	and up	0.3%

While the trees can have a long-term financial benefit without the carbon component, day-to-day household expenses prevent these farmers from spending their minuscule income on reforestation projects. For example, seedlings cost Ush 100 to Ush 1,000 per seedling. Since each farmer is expected to plant a minimum of 500 trees, the total up-front cost is Ush 50,000 to Ush 500,000 per farmer, which is a significant portion of their annual income.

The following table provides an example of the initial costs, to the farmers, to start a plantation. Without TIST, the farmer must buy the seedlings and incur labor costs. Without TIST, an investment is required, but there is no credit available to fund it. TIST overcomes the investment barrier two ways. First, it provides training that reduces the capital required to develop a tree plantation. The training teaches TIST members how to obtain seeds and build nurseries at zero cost, thereby, reducing the need for credit. Second, under the terms of the Project Participant's contracts with the TIST Small Groups, the farmers receive an annual advance on their potential carbon revenues, which eliminates the need for credit.⁹⁴ These payments are paid at least annually based on the number of live trees counted each year. The payments are \$0.02, per tree, per year, and are initially of greater value than the value of the carbon. Ultimately, the Small Groups will receive 70% of the net carbon revenues.

Table 3.1.5.B Start-up Cost Comparison: 1 ha Plantation		
	Without TIST	With TIST
Live Trees	500	500
Income	\$ -	\$ 10
Cost of a 500 Tree Plantation		
Seedlings	\$ 98	\$ -
Labor	\$ 46	\$ -
Total Yearly Cost	\$ 145	\$ -
Income/(Loss)	\$ (145)	\$ 10

Barriers due to social conditions, lack of organization. Planting large plantations requires more than a single individual. The local communities lack the organizational structure to put together a volunteer effort to plant trees. This statement is supported by the fact that Uganda has had Forestry Policies since 1929 but is still seeing annual losses in forest cover (see Section 3.1.4). TIST and the Small Group approach provide the organizational structure necessary to overcome this barrier. TIST provides the training and the member's Small Group provides the necessary manpower and support.

Remoteness of land area and undeveloped road. As seen on Appendices 01, 02 and 03⁹⁵, many of the project areas are only accessible by dirt tracks. Developing a plantation would require better access

⁹⁴ Exhibit 03 and 04: GHG Contracts

⁹⁵ Appendix 01, Landsat 1990; Appendix 02, Landsat 2000; Appendix 03, KML file of all the project areas on more current satellite images using Google Earth.

to take felled trees to market or a mill. Figure 3.1.4a provides an example of two project areas and their relationship to a nearby road.



Figure 3.1.4a, KML Tracks on Google Earth. Note road on the left and project areas (blue) with no access roads.

Sub-step 2c. Determination of baseline scenario (if allowed by the barrier analysis)

- Is forestation without being registered as an A/R CDM project activity included in the list of land use scenarios that are not prevented by any barrier? No.
- If no, then does the list contain only one land use scenario? Yes.

STEP 3. Investment analysis: not applicable because only the continuation of the pre-project land use case remained after sub-step 2c.

STEP 4. Common practice analysis

There are cases in the area where farmers have planted fast rotation trees without the carbon incentive. These farmers have no incentive to maintain the trees; indeed, their incentive is to harvest them as soon as possible to get the revenue. In contrast, TIST is using the annual tree payment to encourage and promote long-term, managed tree stands. The TIST GHG Agreement requires the members to “plant a minimum of 1,000 trees and raise them to maturity”, “replant trees that die, for any reason, each year for the next” 20 to 30 years; and to “not cut down trees, except when implementing best practices for agroforestry developed by TIST.” This is only possible because of the potential carbon revenues.

Conclusion. The extension activities implemented by TIST that allow the project participants to overcome these barriers, and the incentive payments TIST provides that support their decision to participate, are entirely dependent on the carbon market. These kinds of activities are not possible, without external financing of some kind. TIST’s operational budget for the project is funded through an investment from CAAC, which is contingent on returns of future GHG revenues. Without carbon revenues, on which its funding solely depends, the TIST project is neither viable, nor sustainable.

3.1.6 Methodology Deviations

The project and project monitoring plan meet all of the requirements of the methodology and does not deviate from the baseline scenario, additionality determination or inclusion of project GHG sources, sinks and reservoirs.

As noted in Section 2.1.21, TIST has many project areas that do not meet the host country definition of a forest. However, since VCS allows for afforestation, reforestation and revegetation, this is not an issue for this project or PD. Therefore, there are no applicable deviations to the methodology.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

The methodology allows the ex-post change in baseline carbon stocks to be deemed zero under certain conditions. Therefore, this section will 1) calculate the baseline carbon stocks and 2) demonstrate that the project meets the requirements that allow the change to be considered zero.

The project area baseline carbon pools are above and below ground biomass. Dead wood, litter and soil organic carbon are considered optional by the methodology and are not used in the PD.

The baseline emission are estimated using the following tools.

- “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities” (AR-TOOL 12, v03.1)
- “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” (AR-TOOL 14, v4.2);
- “Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities” (AR-TOOL 16, v1.1)

AR-TOOL 12: The methodology allows dead wood and litter to be optional pools. The project has opted not to select these pools for accounting of carbon stock changes.

AR-TOOL 14: The baseline carbon stock in trees can be accounted as zero if all of the following conditions are met:

- (a) *The pre-project trees are neither harvested, nor cleared, nor removed throughout the crediting period of the project activity.* The project considers these baseline trees and does not harvest, clear, or remove them.
- (b) *The pre-project trees do not suffer mortality because of competition from trees planted in the project, or damage because of implementation of the project activity, at any time during the crediting period of the project activity.* This statement is true for the baseline trees. Project planting takes place away from baseline trees.
- (c) *The pre-project trees are not inventoried along with the project trees in monitoring of carbon stocks but their continued existence, consistent with the baseline scenario, is monitored throughout the crediting period of the project activity.* TIST only counts and measures project trees. Baseline trees are not included in ex-post carbon calculations. An inventory of pre project trees is collected during the baseline visit and their continued existence can be confirmed over the life of the project.

AR-TOOL 16: The methodology allows soil organic carbon to be an optional pool. The project has opted not to select this pools for accounting of carbon stock changes.

The equation for measuring baseline net GHG removals by Sink (AR-ACM0003 Section 5.4) is:

$$\Delta C_{BSL,t} = \Delta C_{TREE_BSL,t} + \Delta C_{SHRUB_BSL,t} + \Delta C_{DW_BSL,t} + \Delta C_{LI_BSL,t}$$

$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks in year t; t CO₂-e

$\Delta C_{TREE_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities”; t CO₂-e

$\Delta C_{SHRUB_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities”; t CO₂-e

$\Delta C_{DW_BSL,t}$ = Change in carbon stock in baseline dead-wood biomass within the project boundary, in year t, as estimated in the tool “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities”; t CO₂-e

$\Delta C_{LI_BSL,t}$ = Change in carbon stock in baseline litter biomass within the project boundary, in year t, as estimated in the tool “Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities”; t CO₂-e

As the program is solely focused on the growth and monitoring of trees, TIST chooses to account for aboveground and belowground biomass, but chooses not to account for the potential increased sequestration of dead wood, litter, or soil organic carbon. Thus, the baseline for these values shall be assumed to be zero, and the baseline calculation shall be:

$$\Delta C_{BSL,t} = \Delta C_{TREE_BSL,t} + 0 + 0 + 0$$

$$\Delta C_{BSL,t} = \Delta C_{TREE_BSL,t}$$

To calculate the $\Delta C_{TREE_BSL,t}$ the project applied the “Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities” tool (AR-TOOL 14).

The calculation of the baseline carbon stocks is done in Appendix 04, Validation Data, “3.2.1a Baseline Strata” worksheet. The baseline trees in each project area are stratified by species and counted. The average circumference is estimated and put in a “bin” (column K). The bin value is multiplied by the number of trees in the strata to get a weighting value (column M). The weighting values are summed (cell M2553). The trees are summed (column L) and divided into the sum of the weighting values to derive the average circumference and average diameter (cells I2556 and I2557). The stem density is determined by dividing the number of baseline trees (C557) by the hectares in the PD (measurable area). The average diameter and stem density are entered into the “3.2.1b Baseline Trees” worksheet (cells B2 and C2). Using the formula by Brown⁹⁶, the AG and BG Biom (kg) is obtained (column D) and converted to tonnes CO₂/ha (column E). Each year the circumference is grown by 0.5 cm (column B) and the above is replicated for all 60 years to determine the cumulative carbon removals of the baseline trees over 60 years (28.7 tonne per ha).

TIST deems $\Delta C_{TREE_BSL,t}$ to be zero because⁹⁷:

- Baseline trees are stratified separately. They are inventoried separately in the baselining and in the data monitoring system. TIST counts and measures individual trees by hand. The removal of baseline trees prior to monitoring of project removals allows the baseline to be considered zero.

⁹⁶ Exhibit 41 Brown Allometric: TIST UG PD-VCS-Ex 58 Brown Allometric.pdf, Equation 3.2.1. (=EXP(-1.996+2.32*LN(B2))*1.48) at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

⁹⁷ Appendix 04 Validation Data: Worksheets 3.2.1a Baseline Strata, 3.2.1b Baseline Trees and 3.2.1c Baseline

- At the time of baselining farmers attest to the fact that project activities have not led to deforestation. The presence of TIST trees is considered likely to mitigate the pressure for forest products and thus likely to protect these baseline trees.
- TIST mandates that farmers plant trees at least 2 meters in spacing. Individual baseline trees are considered unlikely to experience mortality due to competition due to this spacing model.
- Due to the lack of clearing of baseline trees, lack of competition, and separation of tree inventory, the ex-post baseline change in carbon stock is deemed zero.

3.2.2 Project Emissions

Ex-Ante Estimation

Ex-Ante Estimations of Carbon Stocks

AR-TOOL 14 outlines several choices for estimation of ex-ante carbon stocks and calculation of ex-post carbon stocks. This project has chosen to use to approach outlined in Section 8.2 “Estimation by modelling of tree growth and stand development” for the ex-ante projections. The methodology states:

“This method is used for ex-ante estimation (projection) of carbon stock in tree biomass. Under this method existing data are used in combination with tree growth models to predict the growth of trees and the development of the tree stand over time.”

The project stratifies the trees by major species and age. As the tool does not provide a specific equation for the approach outlined in Section 8.2, the project applies equations from an approved CDM methodology used in 16 previously validated TIST PDs:⁹⁸

$$N_{(t)} = \sum_{i=1}^I (N_{A(t)i} + N_{B(t)i}) * A_i \quad \text{Eq. 3.2.a}$$

Where:

$N_{(t)}$ = total carbon stocks in biomass at time t under the project scenario (t C)
 $N_{A(t)i}$ = carbon stocks in above-ground biomass at time t of stratum i under the project scenario (t C/ha)
 $N_{B(t)i}$ = carbon stocks in below-ground biomass at time t of stratum i under the project scenario (t C/ha)
 A_i = project activity area of stratum i (ha)
 i = stratum i (I = total number of strata)

For above-ground carbon stocks, $N_{A(t)i}$ is calculated per stratum i as follows:⁹⁹

$$N_{A(t)i} = T_{(t)i} * 0.47 \quad \text{Eq. 3.2.b}$$

Where:

$N_{A(t)i}$ = carbon stocks in above-ground biomass at time t under the project scenario (t C/ha)
 $T_{(t)i}$ = above-ground biomass at time t under the project scenario (t d.m./ha)
 0.47 = carbon fraction of dry matter (t C/t d.m.)

Where volume tables are used to calculate the aboveground biomass, the following equation is used:¹⁰⁰

⁹⁸ For application, see Appendix 04, worksheets “3.2.2a Ex-Ante Carbon Est” and “3.2.2b Ex-Ante Strata Est”. NA and NB are derived in “3.2.2a Ex-Ante Carbon Est” (example see columns E, F and G). The area is applied in “3.2.2b Ex-Ante Strata Est”.

⁹⁹ For application, see Appendix 04, worksheet “3.2.2a Ex-Ante Carbon Est”, column F.

$$T_{(t)i} = SV_{(t)i} * BEF * WD$$

Eq. 3.2.c

Where:

$T_{(t)i}$ = above-ground biomass at time t under the project scenario (t d.m./ha)

$SV_{(t)i}$ = stem volume at time t for the project scenario (m³ /ha)

BEF = biomass expansion factor (over bark) from stem to total above-ground biomass (dimensionless)

WD = basic wood density (t d.m./m³)

For below-ground biomass, $N_{B(t)}$ is calculated per stratum i as follows:¹⁰¹

$$N_{B(t)i} = T_{(t)} * R * 0.47$$

Eq. 3.2.d

Where:

$N_{B(t)i}$ = carbon stocks in below-ground biomass at time t under the project scenario (t C/ha)

$T_{(t)}$ = above-ground biomass at time t under the project scenario (t d.m./ha)

R = root to shoot ratio (t d.m./t d.m.)

0.47 = carbon fraction of dry matter (t C/t d.m.)

For the purpose of calculating ex ante actual net GHG removals, the area of project activity has been stratified by major species and age class.¹⁰² The primary species are stratified separately, and the minor species are aggregated into one species class.

The factors used for estimating the actual net GHG removals, for the four tree classes, are shown below.

Pinus patula

$$I_v = 24 \text{ m}^3/\text{ha}/\text{yr}.$$
¹⁰³

Where:

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

$BEF = 1.2$.

¹⁰⁴

$WD = 0.45 \text{ t.d.m./m}^3$.

¹⁰⁵

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

¹⁰⁶

¹⁰⁰ For application, see Appendix 04, worksheet "3.2.2a Ex-Ante Carbon Est". There are different columns for different species groups. Examples:

$T(t)i$ = example column D

$SV(t)i$ = example column B

BEF = example column C

WD = example column D

¹⁰¹ For application, see Appendix 04, worksheet "3.2.2a Ex-Ante Carbon Est". The factors are in different columns for different species groups. Examples:

$T(t)$ = example column F

R = example column F

¹⁰² Appendix 04, Strata and Misc Calc worksheets

¹⁰³ 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>.

¹⁰⁴ GPG-LULUCF, Table 3A.1.10, Default Values Of Biomass Expansion Factors (BEF), Tropical, pines.

¹⁰⁵ GPG-LULUCF, Table 3A.1.9-2, Basic Wood Densities (D) of Stemwood (Tonnes Dry Matter/M3 Fresh Volume) for Tropical Tree Species, Tropical America, Pinus patula.

Eucalyptus spp.

$$I_v = 32.5 \text{ m}^3/\text{ha}/\text{yr}.^{107}$$

Where:

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

Biomass Expansion Factor (BEF) = 1.5.¹⁰⁸

Wood Density (WD) = 0.51 t.d.m/m³.¹⁰⁹

Root to Shoot Ratio (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.¹¹⁰

Cupressus spp.

$$I_v = 24 \text{ m}^3/\text{ha}/\text{yr}.^{111}$$

Where:

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

BEF = 1.2.¹¹²

WD = 0.43 t.d.m/m³.¹¹³

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.¹¹⁴

Other Africa, Dry Tropical

$$N_A = 15 \text{ t.d.m}/\text{ha}/\text{yr}.^{115}$$

Where:

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

BEF = 1.5.¹¹⁶

WD = 0.60 t.d.m/m³.¹¹⁷

¹⁰⁶ GPG-LULUCF, Table 3A.1.8, Conifer forest/plantation.

¹⁰⁷ 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>.

¹⁰⁸ GPG-LULUCF, Table 3A.1.10, Default Values of Biomass Expansion Factors (BEF), Tropical, broadleaf.

¹⁰⁹ GPG-LULUCF, Table 3A.1.9-2, Basic Wood Densities (D) of Stemwood (Tonnes Dry Matter/M³ Fresh Volume) for Tropical Tree Species, Tropical America, Eucalyptus robusta.

¹¹⁰ GPG-LULUCF, Table 3A.1.8, Temperate broadleaf forest/plantation, Eucalyptus Plantation. AGB means aboveground biomass.

¹¹¹ GPG-LULUCF, Table 3A.1.7, Average Annual Above Ground Net Increment in Volume in Plantations by Species.

¹¹² GPG-LULUCF, Table 3A.1.10, Default Values of Biomass Expansion Factors (BEF), Tropical, broadleaf.

¹¹³ GPG-LULUCF, Table 3A.1.9-2, Basic Wood Densities (D) of Stemwood (Tonnes Dry Matter/M³ Fresh Volume) for Tropical Tree Species, Tropical America, Cupressus lusitanica.

¹¹⁴ GPG-LULUCF, Table 3A.1.8, Conifer forest/plantation. AGB means aboveground biomass.

¹¹⁵ GPG-LULUCF, Table 3A.1.6, Annual Average Above Ground Biomass Increment in Plantations by Broad Category, Africa, Other Species, Dry.

¹¹⁶ GPG-LULUCF, Table 3A.1.10, Default Values of Biomass Expansion Factors (BEF), Tropical, Pine.

¹¹⁷ A sample set of tree counts by species planted by TIST farmers in East Africa was obtained from the TIST database.

R = 0.27.¹¹⁸

The above are used to calculate the Ex-Ante carbon in Table 3.2.4, below. In Appendix 04 Validation Date, “3.2.2a Ex-Ante Carbon Est” worksheet there are 4 sections, 3 for the major species and “Other Africa”. Looking at Eucalyptus Grandis as an example, cell B3 uses the annual volume increment from above, 32.5 m3/ha/year. Column B reflects adding 32.5 m3/ha/year for 60 years. Column C multiplies the BEF (1.5) times column B. Column D is the above ground biomass calculated by multiplying the wood density (cell D3) times column C. Using standard below ground biomass factors and standard conversions, the tonnes of carbon per hectare are determined (column H).

The “3.2.2.b Ex-Ante Strata Est” worksheet is the next step in the process. To figure the total ex-ante carbon, the areas of major strata by year planted are extracted from the “Strata” worksheet (using the “Misc Calc” worksheet to facilitate the calculation) and used in Row 3. They are multiplied by the appropriate value of carbon determined in “3.2.2a Ex-Ante Carbon Est”. Because the planting takes place over 18 years, the table has a descending stair case appearance. Example: column I is Strata 2010. There are 37.9 ha of 2010 Eucalyptus strata (cell I3) meaning they were planted in 2010. Since it is the first year of planting the carbon for a one year old eucalyptus is used (3.2.2a Ex-Ante Carbon Est, H4). In 2011 the 2010 trees are 2 years old and the carbon from 3.2.2a Ex-Ante Carbon Est, H5 is used. The rest of the sheet follows the example. The carbon is summed in columns CK, CL, CM and CN to provide the values for Table 3.2.4.

The project’s strata have been measured from the Strata worksheet and are shown in the “Misc Calcs” worksheet of Appendix 04.

Table 3.2.2a Ex-Ante Strata			
Scientific Name	Age Class	Hectare	Area %
Eucalyptus grandis	2002	0.0	0.0%
Eucalyptus grandis	2003	0.0	0.0%
Eucalyptus grandis	2004	0.0	0.0%
Eucalyptus grandis	2005	0.0	0.0%
Eucalyptus grandis	2006	0.0	0.0%
Eucalyptus grandis	2007	0.2	0.0%
Eucalyptus grandis	2008	13.8	0.5%
Eucalyptus grandis	2009	5.2	0.2%
Eucalyptus grandis	2010	21.9	0.8%
Eucalyptus grandis	2011	19.7	0.7%
Eucalyptus grandis	2012	8.1	0.3%
Eucalyptus grandis	2013	33.8	1.2%
Eucalyptus grandis	2014	34.7	1.2%
Eucalyptus grandis	2015	4.0	0.1%
Eucalyptus grandis	2016	25.9	0.9%
Eucalyptus grandis	2017	0.5	0.0%
Eucalyptus grandis	2018	26.0	0.9%
Eucalyptus grandis	2019	0.0	0.0%
Eucalyptus grandis	2020	0.0	0.0%
Eucalyptus grandis	2021	0.0	0.0%
Eucalyptus grandis	2022	0.0	0.0%
Pinus patula	2002	0.0	0.0%
Pinus patula	2003	0.1	0.0%
Pinus patula	2004	1.3	0.0%
Pinus patula	2005	3.9	0.1%

¹¹⁸ GPG-LULUCF, Table 3A.1.8, Tropical/Sub-tropical dry forest.

Table 3.2.2a Ex-Ante Strata

Scientific Name	Age Class	Hectare	Area %
Pinus patula	2006	0.1	0.0%
Pinus patula	2007	10.0	0.4%
Pinus patula	2008	48.6	1.7%
Pinus patula	2009	61.3	2.2%
Pinus patula	2010	91.8	3.3%
Pinus patula	2011	56.5	2.0%
Pinus patula	2012	169.2	6.0%
Pinus patula	2013	232.3	8.2%
Pinus patula	2014	275.3	9.8%
Pinus patula	2015	97.1	3.4%
Pinus patula	2016	33.9	1.2%
Pinus patula	2017	35.3	1.3%
Pinus patula	2018	20.8	0.7%
Pinus patula	2019	67.0	2.4%
Pinus patula	2020	85.1	3.0%
Pinus patula	2021	30.5	1.1%
Pinus patula	2022	5.6	0.2%
Cupressus spp	2002	0.0	0.0%
Cupressus spp	2003	0.0	0.0%
Cupressus spp	2004	0.0	0.0%
Cupressus spp	2005	0.0	0.0%
Cupressus spp	2006	0.0	0.0%
Cupressus spp	2007	0.0	0.0%
Cupressus spp	2008	0.0	0.0%
Cupressus spp	2009	0.0	0.0%
Cupressus spp	2010	0.1	0.0%
Cupressus spp	2011	2.8	0.1%
Cupressus spp	2012	0.8	0.0%
Cupressus spp	2013	1.5	0.1%
Cupressus spp	2014	0.4	0.0%
Cupressus spp	2015	0.4	0.0%
Cupressus spp	2016	0.0	0.0%
Cupressus spp	2017	0.2	0.0%
Cupressus spp	2018	0.7	0.0%
Cupressus spp	2019	0.9	0.0%
Cupressus spp	2020	1.4	0.0%
Cupressus spp	2021	0.1	0.0%
Cupressus spp	2022	0.1	0.0%
Other Africa, Dry Tropical	2002	0.0	0.0%
Other Africa, Dry Tropical	2003	0.0	0.0%
Other Africa, Dry Tropical	2004	0.1	0.0%
Other Africa, Dry Tropical	2005	0.0	0.0%
Other Africa, Dry Tropical	2006	8.7	0.3%
Other Africa, Dry Tropical	2007	0.2	0.0%
Other Africa, Dry Tropical	2008	6.0	0.2%
Other Africa, Dry Tropical	2009	17.8	0.6%
Other Africa, Dry Tropical	2010	7.7	0.3%
Other Africa, Dry Tropical	2011	32.4	1.1%
Other Africa, Dry Tropical	2012	30.5	1.1%
Other Africa, Dry Tropical	2013	45.7	1.6%

Table 3.2.2a Ex-Ante Strata			
Scientific Name	Age Class	Hectare	Area %
Other Africa, Dry Tropical	2014	30.0	1.1%
Other Africa, Dry Tropical	2015	26.5	0.9%
Other Africa, Dry Tropical	2016	50.3	1.8%
Other Africa, Dry Tropical	2017	104.0	3.7%
Other Africa, Dry Tropical	2018	191.2	6.8%
Other Africa, Dry Tropical	2019	317.7	11.3%
Other Africa, Dry Tropical	2020	288.0	10.2%
Other Africa, Dry Tropical	2021	118.9	4.2%
Other Africa, Dry Tropical	2022	16.7	0.6%
Total ha		2,821	100.0%

These areas are applied against the expected sequestration values for each of the strata over the project's 60-year crediting period. This process is demonstrated in "Ex-Ante Strata Est" worksheet of Appendix 04. Total tonnage estimates for each strata and year can be found in this worksheet.

Ex-Post Calculation

To calculate the Ex-Post change in carbon stock, the project applies the method found in 6.2 of AR-TOOL 14 "Direct estimation of change by re-measurement of sample plots". Per the methodological tool, "the same sample plots are measured on two successive occasions and the plot-level change in biomass is obtained by subtracting the plot biomass on the first occasion from the plot biomass on the second occasion." Trees in this PD are stratified and monitored separately from baseline trees. Because they are new trees, biomass is considered to be zero at project start.

The project stratifies trees by age and species; sequestration is measured across 100% of plots. A step-by-step explanation of this process is described below.

Ex post estimation of the actual net greenhouse gas removals by sinks

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 "Grove Summary" and "Strata" worksheets, Appendix 04. The boundary of the project area has been obtained with a GPS (Appendix 03), the area calculated and displayed in the "Grove Summary" worksheet.

Step 2. The strata for the ex-post estimation of the actual net greenhouse gas removals will be by species and year similar to the ex-ante estimate as described above. 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 will be assigned to a Major Strata. All other tree species will be assigned to an "Other" strata.

Step 4. Allometric equations will be used to convert DBH values to biomass. An allometric equation for each Major Strata will be identified. If a species-specific equation for a Major Strata is unavailable, it will use the "Other" equation as a default. Based on research conducted for previous TIST VCS projects in Uganda, 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.

Pinus¹¹⁹: $Y = 0.887 + [(10486 \times (DBH)^{2.84}) / ((DBH)^{2.84} + 376,907)]$
 Eucalyptus¹²⁰: $\log Y = -2.43 + 2.58 \log C$
 Grevillea: no species specific equations, will use "Other" equation
 Cupressus: no species specific equations, will use "Other" equation
 Other (default)¹²¹: $Y = (0.2035 \times DBH^{2.3196}) \times 1.2$

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, will be measured. Height will not be measured or used in the allometric equations. Each DBH value for each tree measured will be applied to the appropriate allometric equation and the biomass of each per tree in the stratum will be 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 will be multiplied times the number of trees to yield the "above ground biomass in stratum (kg)." the results will be 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 0.47 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

¹¹⁹ IPCC 2006 AFOLU, Annex 4A.2, Table 4.A.1. Temperate/Tropical Pines. Note: While the most current version of the IPCC Good Practice Guidance for LULUCF is "2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories", the preface states: "The 2019 Refinement does not revise the 2006 IPCC Guidelines, but update, supplement and/or elaborate the 2006 IPCC Guidelines where gaps or out-of-date science have been identified. It will not replace the 2006 IPCC Guidelines. It should be used in conjunction with the 2006 IPCC Guidelines." Annex A.2 Table 4.A.1 from IPCC 2006 is used because it contains allometric equations that have not been updated.

¹²⁰ 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).

¹²¹ 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).

0.47, the carbon fraction of the biomass. A root to shoot factor of 0.27 will be used.¹²² 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.

$$\Delta C_{\text{TREE}} = (44/12) \times CF_{\text{TREE}} \times \Delta B_{\text{TREE}} \quad \text{Equation 3.2.a}$$

$$\Delta B_{\text{TREE}} = A \times \Delta b_{\text{TREE}} \quad \text{Equation 3.2.b}$$

3.2.3 Leakage

Leakage Management:

Per AR-ACM0003 Section 5.6., leakage emissions are estimated using

$$LK_t = LK_{\text{AGRIC},T}$$

Where:

LK_t = GHG emissions due to leakage, in year t; t CO₂-e

$LK_{\text{AGRIC},T}$ = Leakage due to the displacement of agricultural activities in year t, as calculated in the tool "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity"; t CO₂-e

Displacement of agricultural activities in Section 4.7 of AR-TOOL 15 refers to displacement from both crop cultivation activities ("human induced activities, occurring on land, that are aimed at vegetation control for producing food, forage, fiber, oilseed crops, etc., including harvesting of the produce" and grazing activities "human induced activities, occurring on land, that are aimed at livestock production".

Per AR-TOOL 15, Section 6.9:

Displacement of an agricultural activity by itself does not result in leakage emission. Leakage emission occurs when the displacement leads to an increase in GHG emissions relative to the GHG emissions attributable to the activity as it exists within the project boundary.

and

Increase in GHG emission occurring outside the project boundary attributable to the secondary effects of the A/R CDM project activity (e.g. changes in demand, supply or price of goods) is considered insignificant for the purpose of this tool and hence accounted as zero.

TIST farmers are smallholder farmers that rely on their land for subsistence agriculture. Since they need most of their land to grow foods and because the value of their crops far exceeds the GHG revenues that are available, displacement of agricultural activities is extremely limited. The average farm is planting a limited number of trees in conjunction with their pre-project agricultural activities. Farmers generally choose to plant in boundaries, sporadically throughout their farm, or on unused land.

¹²² Exhibit 50, Table 3.A.1.8

As part of the data collection for the baseline activity, Small Groups are asked, "Will any activities be displaced?" In each case, members surveyed confirmed that no deforestation occurred as part of this activity displacement. As the displacement largely refers to small-scale agriculture and the grazing of individual animals, it is deemed unlikely that such displacement would have resulted in an increase in GHG emissions. Leakage is estimated to be zero.

3.2.4 Net GHG Emission Reductions and Removals

As per Section 5.7 of the methodology, the procedure for quantifying net GHG removals is to:

1. determine the actual net GHG removals by sinks per Section 3.2.2;
2. subtract the net baseline GHG removals by sinks per Section 3.2.1;
3. subtract the GHG emissions due to leakage which per Section 3.2.3 are zero.

$$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$$

Table 3.2.4: Ex-Ante Carbon

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2003	0	5	0	5
2004	0	50	0	50
2005	0	178	0	178
2006	0	443	0	443
2007	0	947	0	947
2008	0	3,571	0	3,571
2009	0	6,531	0	6,531
2010	0	11,264	0	11,264
2011	0	15,579	0	15,579
2012	0	22,852	0	22,852
2013	0	34,342	0	34,342
2014	0	46,767	0	46,767
2015	0	51,139	0	51,139
2016	0	53,805	0	53,805
2017	0	58,702	0	58,702
2018	0	67,692	0	67,692
2019	0	82,610	0	82,610
2020	0	95,868	0	95,868
2021	0	104,576	0	104,576
2022	0	103,679	0	103,679
2023	0	108,740	0	108,740

2024	0	109,097	0	109,097
2025	0	109,952	0	109,952
2026	0	110,274	0	110,274
2027	0	108,901	0	108,901
2028	0	108,131	0	108,131
2029	0	109,266	0	109,266
2030	0	110,201	0	110,201
2031	0	109,695	0	109,695
2032	0	107,722	0	107,722
2033	0	107,014	0	107,014
2034	0	105,360	0	105,360
2035	0	106,952	0	106,952
2036	0	101,173	0	101,173
2037	0	97,662	0	97,662
2038	0	95,032	0	95,032
2039	0	103,438	0	103,438
2040	0	106,418	0	106,418
2041	0	106,277	0	106,277
2042	0	106,938	0	106,938
2043	0	104,570	0	104,570
2044	0	103,528	0	103,528
2045	0	106,099	0	106,099
2046	0	107,572	0	107,572
2047	0	107,572	0	107,572
2048	0	107,572	0	107,572
2049	0	107,572	0	107,572
2050	0	107,572	0	107,572
2051	0	107,572	0	107,572
2052	0	107,572	0	107,572
2053	0	107,572	0	107,572
2054	0	107,572	0	107,572
2055	0	107,572	0	107,572
2056	0	107,572	0	107,572
2057	0	107,572	0	107,572
2058	0	107,572	0	107,572

2059	0	107,572	0	107,572
2060	0	107,572	0	107,572
2061	0	107,572	0	107,572
2062	0	107,572	0	107,572
2063	0	107,572	0	107,572
Total	0	5,139,342	0	5,139,342

3.3 Monitoring

3.3.1 Data and Parameters Available at Validation

Data / Parameter	Location of project area
Data unit	Latitude and longitude
Description	Single point location of a discrete project area.
Source of data	GPS
Value applied	See "Grove Summary" worksheet, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	Direct measurement of latitude and longitude of a point within a project area using a GPS. Used to provide a simple location of a discrete project area.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	TIST Small Group Number
Data unit	Concatenation (ex. "2004UG413")
Description	This is a value comprised of the year a Small Group entered TIST, the country of the Small Group, and the sequential number in which they joined in a given year
Source of data	TIST Database
Value applied	See "Grove Summary" worksheet, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	This is a commonly understood identifier used within the database and by field workers to identify groups.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	TIST Grove Name
Data unit	Name

Description	This is a name selected by the Small Group to identify groves within that Small Group
Source of data	TIST Participants
Value applied	See "Grove Summary" worksheet, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	Farmers choose names that are meaningful to them. These names are recorded and used in our database to identify groves.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Cluster
Data unit	Cluster Name
Description	Clusters are used within TIST to identify subsections of the larger TIST program.
Source of data	TIST Participants
Value applied	See "Grove Summary" worksheet, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	Clusters are useful for grouping project areas together. This is of value both to monitor community trainings and the track potential project areas for inclusion.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Boundary of project area
Data unit	Latitude and longitude
Description	Multiple points of latitude and longitude that describe the boundary of a discrete project area.
Source of data	GPS
Value applied	See KML file, Appendix 03, for all results.
Justification of choice of data or description of measurement methods and procedures applied	Direct measurement of latitude and longitude of a point within a project area using a GPS. Used to provide a simple location of a discrete project area.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Area of project area
Data unit	Hectares
Description	Size of the area where the project activity has been implemented

Source of data	GPS
Value applied	See "Grove Summary" worksheet, Appendix 01, for each result.
Justification of choice of data or description of measurement methods and procedures applied	A calculated quantity based on the latitude and longitude values collected with the GPS to determine each project area boundary.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Ownership of project area
Data unit	Name
Description	Ownership of land of project area
Source of data	Exhibit 05 "Carbon Credit Sale Agreement"
Value applied	Not applicable
Justification of choice of data or description of measurement methods and procedures applied	Each Small Group member is a signatory to a "Carbon Credit Sale Agreement."
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Baseline trees
Data unit	Count of baseline trees
Description	The number of trees existing in a project area, before the planting of project trees, is counted.
Source of data	Trees are physically counted in the field.
Value applied	See "Baseline Trees" Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	Baseline trees are inventoried and monitored at project start.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Baseline tree circumference
Data unit	Centimeters
Description	The circumference of trees existing in a project area, before the planting of project trees, is counted.
Source of data	Trees are physically measured in the field.
Value applied	See "Baseline Strata" worksheet, Appendix 04, for each result.

Justification of choice of data or description of measurement methods and procedures applied	The circumference of each tree in each strata are measured and used to determine a <i>de minimis</i> level of baseline sequestration. See Section 3.4.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Baseline strata
Data unit	Hectares
Description	The area of cropland or grassland at baseline.
Source of data	Estimate based on visual field observations.
Value applied	See "Baseline Strata" worksheet, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	The percent of cropland and grassland are estimated for each individual project area. The percent is multiplied by the area of the project area. The product is used as part of the procedure to determine the change in baseline carbon stocks. See Section 3.2
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Project trees
Data unit	Count of tree
Description	The number of trees per age and species strata in each project area.
Source of data	Trees are physically counted in the field.
Value applied	See "Grove Summary" and "Strata" worksheets, Appendix 04, for each result.
Justification of choice of data or description of measurement methods and procedures applied	The tree count by strata is used to extrapolate the ex-ante GHG removals. See Section 3.2.
Purpose of data	Determination of Baseline Scenario
Comments	None

Data / Parameter	Root to Shoot Ratio
Data unit	Fraction, Decimal
Description	Above Ground Carbon to Below Ground Carbon
Source of data	Exhibit 16: UNEP Good Practice Guidance for Land Use, Land Use Change and Forestry
Value applied	.27

Justification of choice of data or description of measurement methods and procedures applied	Data is specific to tropical forests and is used in ex-ante and ex-post calculations of sequestration
Purpose of data	Determination of Ex Post Calculations
Comments	None

Data / Parameter	Carbon Fraction
Data unit	Fraction, Decimal
Description	Relation of biomass to CO2
Source of data	AR-Tool 15 Default value
Value applied	.47
Justification of choice of data or description of measurement methods and procedures applied	Default value of methodology
Purpose of data	Determination of Baseline Scenario and Ex Post Calculations
Comments	None

3.3.2 Data and Parameters Monitored

Data / Parameter	Number of Trees
Data unit	Trees
Description	Number of trees in a project area by strata
Source of data	Physical counts
Description of measurement methods and procedures to be applied	Physical count of the trees in each stratum by Quantifiers with each visit
Frequency of monitoring/recording	Ongoing measurement taken by Quantifiers as they visit project areas. Each project area could be visited as much as once per year.
Value applied	Tree count by strata
Monitoring equipment	Android phone with proprietary monitoring application
QA/QC procedures to be applied	Part of overall QA/QC procedures discussed in Section 3.3.3.
Purpose of data	Calculation of Project Emissions
Calculation method	Not applicable
Comments	None

Data / Parameter	DBH
Data unit	Centimeters

Description	Diameter of tree at breast height (1.30 m)
Source of data	Physical measurements
Description of measurement methods and procedures to be applied	TIST measures DBH of up to 20 representative trees of each age/species stratum in different project area.
Frequency of monitoring/recording	Ongoing measurement taken by Quantifiers as they visit project areas.
Value applied	Representative circumference of trees in a strata.
Monitoring equipment	Measuring tape and smartphone.
QA/QC procedures to be applied	Part of overall QA/QC procedures discussed in Section 3.3.3.
Purpose of data	Calculation of Project Emissions
Calculation method	Not Applicable
Comments	None

Data / Parameter	Total CO ₂
Data unit	Metric Tonnes
Description	Total CO ₂ e sequestered by the trees
Source of data	Calculation
Description of measurement methods and procedures to be applied	Allometric equations are assigned to each stratum. DBH values are applied to the allometric. Average biomass of a tree in each stratum is calculated and multiplied by number of trees in each stratum. Biomass is converted to CO ₂ e and the CO ₂ e of the stratum are totaled.
Frequency of monitoring/recording	Calculation takes place with each monitoring report
Value applied	Above and below ground biomass
Monitoring equipment	Computer, Android phone, and database
QA/QC procedures to be applied	Part of overall QA/QC procedures discussed in Section 3.3.3.
Purpose of data	Calculation of Project Emissions
Calculation method	Not Applicable
Comments	None

3.3.3 Monitoring Plan

Monitoring roles and responsibilities.

The Small Groups manage themselves based on a covenant among the members of each Small Group. They manage and oversee their own trees. They contract with Clean Air Action Corporation (CAAC) to sell their carbon, receive payments, and receive training. The GHG component of TIST is managed by CAAC, who developed the database, web site and procedures for monitoring the GHG. CAAC is responsible for this project description and for selling any GHGs that become available.

The operational processes for monitoring the actual GHG removal by the sinks are for TIST Quantifiers to visit each grove, at minimum once every five years, to count trees and collect circumference, GPS and other data. Quantifiers transmit the monitoring data via the Internet to the TIST website, where it is managed by CAAC. CAAC oversees the data and conducts QA/QC reviews. Feedback is provided to the TIST Quantifiers and office staff. CAAC is responsible for tabulating carbon stocks.

The Uganda Staff has oversight of the Quantifiers. They also conduct internal audits of Quantifier performance.

The TIST Data System stores all of the current and archived data. CAAC managers use customized reports to analyze the data and look for trends, missing data or obvious errors. TIST managers visit selected project areas and observe quantifications and audits.

Allometric equations will come from literature research. Leakage monitoring will come from surveys of the TIST members in charge of an individual project area.

TIST Data System

Each project area is owned and managed by a different group of people that TIST calls a Small Group. 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 maintain the trees. 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 Uganda and three other countries. On the front end, is a smartphone-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, 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 smartphones 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 smartphones are "off the shelf," keeping their costs relatively low.

The synchronization process takes place using an Internet connection. Since the smartphones access the Internet using the local cellular network, data can be synchronized from remote project areas and provide near real-time data to the TIST database and web page.

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.

Data to be monitored.

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 smartphone database for temporary storage.
- Map the boundaries of the project area by walking the perimeter using a GPS. The data is stored in the smartphone 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. Data will not be collected at all locations. It is entered by the operator into the handheld computer database for temporary storage.
- The data on the smartphone database is uploaded to the TIST server through the Internet for additional processing and permanent storage.

Managing data quality.

TIST will use 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 periodically 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 smartphones 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 multiple times. 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 will be 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 is not counted more than once, an overlap script is used that compares the outline of all project areas. If an overlap is detected, the project areas are visually compared. If an overlap is determined, the overlapping project area is 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 will be taken and archived to develop a localized database of growth data by strata. This data will provide the circumference data for each stratum. This sampling will exceed the 10% precision at the 95% confidence level required by the methodology. The confidence and precision levels will be assessed in future monitoring.
- **TIST Data System:** The data system is an integral part of TIST's quality assurance and quality control plan. The smartphones 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 will be collected. Data field characteristics are 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 are restricted to a range of data (e.g. negative numbers are not allowed). The data is uploaded within a few days to the main database, providing timely reporting and secure storage of the data.
- **Desk Audit:** TIST has developed 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.
- **Data Storage:** The data is stored in an electronic format on the TIST server. Currently, the server hardware is operated by Amazon Web Services, a company that specializes in web and data hosting. However, CAAC could, in the future, change hosts or choose to host the server at its offices.
- **Based on the TIST program's 20-year history,** risk non-compliance with the validated monitoring plan is assessed to be extremely low.

3.3.4 Dissemination of Monitoring Plan and Results (CL4.2)

This information is included in the process described in Section 2.3.1.

The data monitoring process is communicated to farmer prior to the entry into the program. As part of this entry, the agree to allow TIST representatives to come and collect data on their farm. This information is collected and made publicly available on the TIST website. Directions to this website are included on newsletters distributed at Cluster meetings. Prior to validation and verification, TIST announced a summary of results of the monitoring plan in a monthly newsletter. This summary was disseminated in 6 languages: English, Runyankore, Ateso, Luganda, Luo, and Kiswahili.¹²³

¹²³ <http://www.tist.org/i2/docs/NL/2020.11.November.UG%20Newsletter.pdf>

3.4 Optional Criterion: Climate Change Adaptation Benefits

3.4.1 Regional Climate Change Scenarios (GL1.1)

Climate Change is impacting local land use scenarios in numerous ways:

Drought: In 2019, Uganda experienced severe drought, prompting the government to warn of famine; this has been particularly true in the north and east of the country. Climate change contributes to this dynamic.¹²⁴ The impact of drought is felt acutely in certain regions where this project is active. These include Amuru, Gulu, Soroti and Kiryondongo.

Fire: Drought in turn has led to the prevalence of wildfires in Uganda. R.J. Wheeler, director of the Uganda National Park Service, warned of the increasing difficulty in protecting against these fires. As climate change intensifies, the above-mentioned droughts will exacerbate this dynamic.¹²⁵

Irregular Rainfall: In addition to acute drought, irregular rainfall dramatically impacts farmers' ability to grow food.

High Wind: Climate change is contributing to unpredictable and highly variable wind patterns in Uganda.

In the absence of the project, these impacts could have significant impact on the land-use scenario of project participants. High winds can damage buildings and harm agriculture, while contributing to erosion. Similarly, drought, fire, and unpredictable rainfall could potentially render agricultural land less productive. Some farmers have reported having to move their crops up the hillsides to seek cooler temperatures for traditional crops. TIST has received anecdotal reports of flooding and landslides caused by irregular rainfall. Through TIST, farmers are able to identify, share, and implement strategies to mitigate these risks.

3.4.2 Climate Change Impacts (GL1.2)

The threats described in Section 3.4.1 are already having an impact on both community well-being and biodiversity conservation status. Drought and/or irregular rainfall impact TIST participants' ability to grow food. In the worst cases, this can lead to widespread famine. More mild cases lead to food shortages and diminished economic prospects. Changes in weather negatively impact HCVs and many of the flora and fauna listed in Section 2.1.5.

Fires are less pervasive but have a more dramatic impact on affected communities and ecosystems. As climate change accelerates, it is likely that fires will become more widespread, causing health, economic, and environmental challenges to TIST farmers.

3.4.3 Measures Needed and Designed for Adaptation (GL1.3)

Project design helps to mitigate the impacts of climate change in several ways:

Drawdown of CO2: Ultimately, climate change must be addressed through the removal of CO2 from the atmosphere. Thus far, TIST farmers have removed more than 7M tonnes of CO2.

¹²⁴ "Prepare for Famine, Government Tells Ugandans - Uganda." *ReliefWeb*, reliefweb.int/report/uganda/prepare-famine-government-tells-ugandans, accessed February 10, 2020

¹²⁵ Wheeler, R.J. *Problems of Controlling Fires in Uganda National Parks*. Uganda National Parks, talltimbers.org/wp-content/uploads/2014/03/Wheater1971_op.pdf, February 10, 2020

Conservation Farming: TIST trains farmers on climate resilient agricultural techniques. Use of FAO Conservation Farming techniques allows farmers to gather minimal rainfall in specially dug and spaced holes. Even in times of drought or limited rainfall, this technique allows crops to grow and improved seedling survivability.

Trees: Trees retain moisture and create microclimates on TIST participants farms. Trees provide shade to cool farms and introduce new organic matter to restore soil health. This makes farms more productive in adverse conditions. Trees prevent erosion and can serve as windbreaks when planted near structures. Trees further help to prevent against catastrophic landslides and flooding.

Community Organization: TIST farmers organize themselves in local and regional groups that share knowledge in monthly meetings. These meetings provide an opportunity for farmers to share experiences and find locally appropriate solutions to local issues. This organization makes TIST farmers better able to navigate the challenges posed by climate change.

The following metrics will be used to assess climate change preparedness:

1. Number of indigenous trees
2. Hectares of indigenous trees
3. Number of live trees planted by TIST Small Groups
4. Hectares of trees planted on steep hillsides
5. Hectares of riparian tree planting

4 COMMUNITY

4.1 Without-Project Community Scenario

4.1.1 Descriptions of Communities at Project Start (CM1.1)

The main stakeholder group consists of farmers who have chosen to participate in TIST. Because TIST is voluntary and occurs on privately held land, the impacts to exterior groups are limited. The overarching characteristic of TIST farmers is their diversity; however, there are certain unifying features. Nearly the entire community is comprised of subsistence farmers. Although the foods they choose to grow may vary, they are tied together by this common livelihood system. Because of geographical proximity and shared climate, TIST farmers often have common practices and strategies related to their productive activities. TIST farmers also largely share a similar economic status. The program is targeted to benefit the very poor. Many TIST farmers are poor by Ugandan standards and virtually all of them are poor by global standards (see income bracket in section 3.1.5).

Uganda's population is primarily rural. There are 49 million people¹²⁶ and 7.3 million households. 75% of the households are in rural areas.¹²⁷ The Bantu-speaking majority live in the central, southern and western parts of the country and non-Bantu speakers occupy the eastern, northern and northwestern portions of the country. Buganda make up the largest ethnic group in Uganda with about 17%.¹²⁸ Their land historical lands are outside the areas of the initial PD project areas but their population could be included with expansion. The median age in Uganda is 16.7 years. Primarily, Ugandans practice one of three religions: Christianity (82%), Islam (14%) and indigenous religions.¹²⁹ Ugandans are considered a

¹²⁶ [https://www.worldometers.info/world-population/uganda-population/#:~:text=Uganda%20ranks%20number%2031%20in,593%20people%20per%20mi2\).&text=The%20median%20age%20in%20Uganda%20is%2016.7%20years.](https://www.worldometers.info/world-population/uganda-population/#:~:text=Uganda%20ranks%20number%2031%20in,593%20people%20per%20mi2).&text=The%20median%20age%20in%20Uganda%20is%2016.7%20years.)

¹²⁷ https://www.ubos.org/wp-content/uploads/publications/07_2020WORLD-POPULATION-DAY-BROCHURE-2020.pdf

¹²⁸ <https://www.africa.upenn.edu/NEH/u-ethn.html>

¹²⁹ <https://www.state.gov/reports/2021-report-on-international-religious-freedom/uganda/>

“happy” people. According to the World Happiness Report 2022 released by the UN Sustainable Development Solutions Network Ugandans are the happiest people in East Africa.¹³⁰

TIST farmers in this project are united by their nationality. As Ugandans, they have shared experiences with governance. This is demonstrated by their relationship with land ownership; the Ugandan government’s push to transition from customary land tenure to registered deeds is experienced across various cultural boundaries within the country and amongst TIST farmers. The majority of TIST farmers, like the majority of Ugandans, are Christian.

The TIST farmers in this project are diverse in many respects. They speak many languages and are members of numerous ethnic groups and tribes. These tribal and ethnic affiliations, as well as ideological leanings, result in TIST farmers supporting a range of political beliefs and parties. Stakeholders are both men and women, with gender equality throughout the program. They are young and old, single and married. While many stakeholders are landowners, others plant trees on land they have access to but do not own.

Most of the project areas are in southwest Uganda where the dominant ethnic groups are Banyankole and Bahima. The chief language is Runyankore. The chief crops in the areas are beans, bananas, millet, maize, peas, groundnuts, millet, coffee, tea, and cotton. They also have livestock, including cows for beef and milk.

Some statistic about the people of the Bushenyi district are:¹³¹

- The population is 234,443, 51% female. 77% of the heads of household are men. 51% of the population is under 17.
- Of the children ages 6-15, 7% of the do not attend school and 20% over 18 are illiterate. 41% of the people 13 to 18 attend secondary school.
- 65% of the people over 18 are married.
- 60% over 18-30 have mobile phones but only 16% use the internet.
- 98% live in a house with a permanent roof.
- 16% are within 5km of a health care facility.
- 16% have piped water.
- 96% of the households are not living in a decent dwelling.
- 12% own a TV, 4% own a computer, 24% own a bicycle and 74% own a radio.

Some statistic about the people of the Kabale district are:¹³²

- The population is 331,335, 52% female. 74% of the heads of household are men. 51% of the population is under 17.
- Of the children ages 6-15, 9% of the do not attend school and 25% over 18 are illiterate. 37% of the people 13 to 18 attend secondary school.
- 64% of the people over 18 are married.
- 54% over 18-30 have mobile phones but only 12% use the internet.
- 98% live in a house with a permanent roof.
- 13% are within 5km of a health care facility.
- 26% have piped water.
- 97% of the households are not living in a decent dwelling.
- 8% own a TV, 2% own a computer, 28% own a bicycle and 74% own a radio.

Some statistic about the people of the Kanungu district are:¹³³

¹³⁰ <https://nilepost.co.ug/2022/03/22/ugandans-ranked-the-happiest-people-in-east-africa/>

¹³¹ <https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/BUSHENYI.pdf>

¹³² <https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/KABALE.pdf>

- The population is 183,232, 51% female. 68% of the heads of household are men. 57% of the population is under 17.
- Of the children ages 6-15, 7% of the do not attend school and 19% over 18 are illiterate. 36% of the people 13 to 18 attend secondary school.
- 56% of the people over 18 are married.
- 61% over 18-30 have mobile phones but only 8% use the internet.
- 96% live in a house with a permanent roof.
- 15% are within 5km of a health care facility.
- 13% have piped water.
- 96% of the households are not living in a decent dwelling.
- 12% own a TV, 1% own a computer, 42% own a bicycle and 75% own a radio.

There are 679 current project areas in the Gulu area. The ethnicity is primarily Acholi and the language is Acholi. Subsistence farming is the primarily economic and agricultural means. The primary crops are millet, sorghum, sesame, beans, cassava, maize, groundnuts, fruits and cotton. The main domestic animals are chickens and goats.¹³⁴

Some statistic about the people of the Gulu district are:¹³⁵

- The population is 275,613, 51% female. 70% of the heads of household are men. 53% of the population is under 16.
- Of the children ages 6-15, 9% of the do not attend school and 25% over 18 are illiterate. 38% of the people 13 to 18 attend secondary school.
- 62% of the people over 18 are married.
- 61% over 18-30 have mobile phones but only 30% use the internet.
- 38% live in a house with a permanent roof.
- 11% are within 5km of a health care facility.
- 21% have piped water.
- 95% of the households are not living in a decent dwelling.
- 17% own a TV, 8% own a computer, 42% own a bicycle and 57% own a radio.

There are 453 current project areas in the Soroti areas. The ethnicity is primarily Iteso and Kumam and the languages are Ateso, Kumam, and Swahili.¹³⁶ Soroti is one of the poorest districts of the country with 53% living on less than UD\$1.00 per day. The economy is subsistence agriculture and the main crops are millet, cassava, peas, potatoes, beans, onions, tomatoes, cabbage, sunflower, cotton and sweet potatoes.

Some statistic about the people of the Soroti district are:¹³⁷

- The population is 296,833, 51% female. 75% of the heads of household are men. 56% of the population is under 16.
- Of the children ages 6-15, 10% of the do not attend school and 28% over 18 are illiterate. 33% of the people 13 to 18 attend secondary school.
- 66% of the people over 18 are married.
- 43% over 18 have mobile phones but only 12% use the internet.

¹³³ <https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/KABALE.pdf>

¹³⁴ https://digitalcollections.sit.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=3734&context=isp_collection

¹³⁵ <https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/GULU.pdf>

¹³⁶ <https://www.iwa-uk.org.uk/soroti-district/>

¹³⁷ <https://www.ubos.org/wp-content/uploads/publications/2014CensusProfiles/SOROTI.pdf>

- 40% live in a house with a permanent roof.
- 22% are within 5km of a health care facility.
- 17% have piped water.
- 96% of the households are not living in a decent dwelling.
- 8% own a TV, 3% own a computer, 45% own a bicycle and 48% own a radio.

As can be seen from the statistics, the communities where TIST is active are predominantly subsistence farmer. They live on small plots of land and grow a staple of crops. Education is a challenge with around 10% of children not attending school, only a third completing secondary school and a quarter illiterate. Most live in poor housing. In some areas they have permanent roofs but in all cases most live in houses that are not considered “decent” by the Uganda Bureau of Statistics. Few have piped water and rely on boreholes. While around half have mobile phones, few have access to the internet.

Uganda is considered poor. The World Bank estimates 42% of all Uganda's to live below a US \$2.15/day poverty line.¹³⁸ Of the rural farmers, 67% live below the US\$2.50/day poverty line and 26% live below the US\$1.25/day poverty line.¹³⁹

It is the communities that are described above the makeup TIST. This is true at a project level, for the PD and for future members that may be included in the PD.

4.1.2 Interactions between Communities and Community Groups (CM1.1)

Prior to the start of the program in Uganda TIST encouraged interactions between communities of farmers in Tanzania and Uganda to discuss the benefits of the program. A seminar in July of 2003 in Tanzania provided a forum for these interactions. After this, farmers returned to Uganda to begin discussions of the program. These discussions largely occur without the presence of project representatives.

Due to project design, the implementation of TIST in Uganda started with conversations between farmers who decided they would create Small Group with which to join. As farmers can only join the program in Small groups, there is always a level of community interaction prior to implementation of project activities. Farmers decided amongst themselves to begin participating in project activities and encouraging community members to join them.

The interaction between communities, community groups, and TIST at the project start is described in Sections 2.1.8 and 2.3.7. The following are summaries of some of the comments TIST has received from stakeholders.

Mbabazi Annet, 0777840023/0751364891	10 homes neighboring form TIST – Other 10 do not. As a trainer, what can I do to have them all join TIST?
Ngikabakunzi F., 0782-239393	Have you reached Kigoro District? If not, when are you going there?
Mbwenu Ukoreki	I planted Eucalyptus trees, they have drained all the water, what should I do?
Ngarama – Kankiriho, 0782363336	Eucalyptus exhibits allelopathy and creates conflict between neighbors. Is it possible for plant breeders to breed a Eucalyptus variety that does not exhibit that phenomenon? I have observed some varieties that are fairly compatible.
Mwesigwa Trichard, DPDO,	What strategies have you put in place to ensure youth movement and

¹³⁸ <https://data.worldbank.org/country/UG>

¹³⁹

<https://www.cgap.org/sites/default/files/publications/Uganda%20CGAP%20Smallholder%20Household%20Survey%20Report.pdf>

West Angola Diocese, 0712202254	continuity of TIST program? Are you in liaison and partnership with other organizations at the grassroots, so as to avoid duplication of services?
Ngarambe – Kankiriho, 0782363336	America signs most Conventions but does not ratify them, yet they are one of the bigger producers of carbon dioxide leading to global warming. What can be done to convince the US to ratify those Conventions?
Namara Gad, 0782449744	Are the western countries changing their way of industrial production to reduce carbon emissions? What should be the immediate remedy to reduce carbon dioxide as far as the world is concerned?
Katringi K. Asaph, 0772473190	We signed the agreement that we should be paid twice a year, why are we now paid once?
Mr. Ndyabawe Carlpeters, Ababaliisa Tree Planting Group No 200595, 077529544 (Trainer)	Clean Air Action Corporation collects money from Greenhouse Gas sales every year. For accountabilities sake, how will farmers know how much money has been collected, how much money has been given to farmers, and what balance remains, so that by year 2022 we are able to know how much money there is to give out to farmers as the 75% top up?
Ndyabawe Carlpeters, 0775294544	Article 6 of the Agreement has been contravened with because many groups are not paid their due despite their trees having been quantified. What is the explanation? CAAC has not complied with her pledges, Sec. 8. (i) CAAC has never helped any group to open account, (ii) Why not pay individuals through individual bank accounts in individual banks? Why doesn't Kabale have a full time functional office since Mr. Beshobelio's office is always locked?
Rev. Sunday Jotham, 0782-584759	As churches, we have grown trees on our land. Do we, also, need to join other farmers to form a group? As churches, are we included in the TIST program?
Biraali Yasin of Kanyinya Small Group, 0702903720	I have an Arboretum that has been left to grow for the last 16 years. It has many young trees brought by migrating birds. What TIST benefits should I receive from the big trees of 16 years and more? What about the young trees now coming up as a result of migrating birds?
Besigye Agguly, 078174536, Kigatatukore	Last payment was 2007, so we request we should be paid on time.
Generous Kachetero, 0772520472	Can we the farmers who are registered with TIST get Certificates of Insurance from TIST organization for security of our children's inheritance?
Green Earth Movement Group, Bugembe Levi N, 0752275443	Request for increase on the price given per tree because – cost of living has gone up, - cost/labor for planting and maintaining trees has gone up, - land appreciates every day.
John Fisher Ivanmremye, 0782822904, Kashenshero – Ruhinda – Bushenyi, Kashambya Tweyambe Group	Groups should be monitored. TIST should teach groups on soil fertilization and conservation. Amount of money paid to farmers should be more than the current payment.
Hamurwa Bahingi Kwebeisaho, Kokole, PO Box 262	Not paid for 3 years. Have registered. Have counted. A group of 6 farmers along Kigoro road – 15 km
Turyatunga Javira Nyamunozza, Agriculturist man as profession from Muko sub county where we don't have any representatives of TIST, 0773461381 or 0703212252	Which type of trees would you need for us to plant? Suppose we were involved in planting trees, would you provide us with fertilizers since some of our soils are hilly and are not fertile to support this activity?
Rwenjeru United Asso Group,	Eucalyptus drains our swampy water. Groups need loans. More

0781521422	training is needed. Where is the market for medicinal plants?
Koyelhyenga Milton, 0772476529	I recently learned of TIST and I'm interested in it. I have already planted over six hundred trees. I come from Kabwabe area and I don't know any group. What is the processing of joining any group?
Nuwagaba K Fredrick, 0774364441, Twehamizidize Tree Planting Group	We should be paid more money to maintain our tree plantations.
Green Earth Movement	Reduce the cost of administration, increase price paid to farmers to make the project sustainable.
Ainamani, Emmanuel, Makerere University, ainemmyx@yahoo.com	Of the youth who have land, we don't have money to invest, so can we be partnered and plant?
Miyuwi Joseph from Vyambura Valley Tree Planting Group	In our area we have a problem transporting at the time of rain and transporting our products from Conservation Farming to the market. What method can be done to help those farmers to transport their products?
Baguma Gerald, an environmentalist by profession, aged 25 year, 0782017753	Can you help us and employ at least one quantifier in Kitumba sub county? Am willing to do that job if given opportunity.
Tumwize Elly, 0752587113	Involving Youth in TIST: Parents should encourage the youth to plant trees by giving them land. I personally gave my daughter land and she has 500 pine trees.
Group No 195, Karukana Tukwatanise Group	Pur group was quantified on 12/09/07; but we have not received our payment.
I'm one of the farmers of TIST, Kyangabo Group, Ashmwe T Christopher, 0782252709	The problem that we're facing, we have fire hazards in the area, so can you get us any means of insurance, so that we can insure the trees in our areas. This is a very serious problem we face.
Hamurwa Sub County, TIST IS GOOD, Miyuni Faustine, Trainer	I thanked God who put mind to TIST to help poor people through the International Small Group and Tree Planting Program, especially in Kabale, which is suitable for trees, grow out, like these species of trees - pinus patula, cupressus lusitanica, eucalyptus kalitunsi. When we received TIST we planted more and more trees with a hope of receiving an incentive for each alive tree. People thanked TIST very much for their environmental conditions to be protected. Concepts from farmers to visitors: 1. We need more Quantifiers because our groups are not counted for their trees, if possible, each sub-county should have one quantifier. People are complaining for their trees to be counted. 2. Some people who are not in TIST want to sell their land and pinus trees. Would you buy it for TIST? Challenges: 1. Payments do not come in time, 2. Our trees are not counted, 3. 35 % is little money for alive tree.

Response to Public Comments:

1) *There were six farmers who voiced concerned about TIST not paying farmers on time, wanting to be paid more per tree, wondering when they would start seeing the 70% carbon offset money the GHG contracts talks of, or wanting to see the overhead reduced so that farmers get paid more money.*

In the meetings, we also explained how the payments were devised, how much we sell offsets for, and how the basic economics of the program work out. We told the farmers that as the price of carbon increases, and as we expand in Uganda and keep expenses down, they would get paid more.

We reminded the farmers that certain criteria must be met in order to trigger a payment. They include having more than 500 trees in a Small Group, having been quantified and having a signed GHG contract.

We told all the farmers who had not been paid recently and thought they met all the criteria, to meet with us after the meeting to see if we could resolve the problem.

2) Five farmers asked questions or made comments about the kinds of trees we are planting, the dangers of Eucalyptus trees, the benefits of Eucalyptus trees, and wanted to know if TIST could provide insurance for trees.

We explained to the farmers that Eucalyptus trees were causing many serious environmental problems in Uganda, and monoculture tree planting was a practice that many farmers in Uganda were beginning to reverse. We encouraged the farmers in Uganda to begin starting nurseries of their own and growing indigenous trees. We told some of the farmers who seemed not to know about Eucalyptus trees, that they could cause erosion of land, and that the presence of Eucalyptus trees on farms limited food crops that could be grown. Lastly, we told the farmers that crop insurance for trees was something that we did not have any experience with, and therefore it was something that we did not think we would be able to provide.

3) Three people wanted to request that we involve the youth more in our efforts or make suggestions about how children of TIST participants could take part in our work.

We told the group that were very interested in getting the youth more active in TIST and in tree planting, but we thought that this was something that would probably have to be done by parents or grandparents.

4) Criticism from three farmers was directed at Western nations and the US for polluting so much and not doing more to solve the problem, for not ratifying the Kyoto Protocol, and for not curbing their industrial emissions.

The people in the audience were told that they were correct about America not ratifying the Kyoto Protocol and America being a large polluter. They also were told that some Western nations were probably not doing enough, and some were doing a lot to improve the environment and reduce their emissions.

We gave them the address of President Obama and encouraged them to write him about their concerns with America being a polluter and not signing any climate pact. We explained that while Ugandans do not have a representative in the US government, many many letters from villages in Uganda to the President would be a powerful and meaningful gesture, and it also might be the best thing to do in order to convince the US to ratify the Kyoto Protocol.

5) Two participants of the community asked that TIST provide more training on a variety of subjects.

Conservation Farming and how to build and manage a nursery were two main areas where we saw large needs for training in Uganda. We told them that these two areas were places where training could help farmers grow more food with Conservation Farming and save money by having their own homegrown seedlings instead of having to buy seedlings. Regarding better training, we are committed to improve the quality.

6) One person wanted to know if TIST could help farmers open bank accounts.

We told the farmers that since we are not a bank, we couldn't directly help them with this. We also told them that we learned that the bank fees were too high and costly for a dedicated account for the tree stipends. We are looking into other options but, until one is found that is advantageous to the farmers, we would continue to make cash disbursements. We encouraged them to tell us if they had any new ideas.

7) One person asked TIST to help groups of farmers transport goods to market in the rain when the roads get bad.

We told the farmers that we do not have a vehicle of our own, so we would not be able to help them move goods to market in our own vehicle.

4.1.3 High Conservation Values (CM1.2)

There are two major HCVs in the vicinity of the Project Zone; Queen Elizabeth National Park and Bwindi Impenetrable Forest National Park.

Queen Elizabeth National Park

Queen Elizabeth National Park is west of the project areas and occupies about 1978 km² on the east side of Lake Edward. Formed in 1952, it has one of the highest bio-diversity ratings of any national park in the world, with over 600 different bird species, and about 95 mammal species. It is the home of the tree climbing lion and about 20 other predators such as lions, leopards, side striped jackals and spotted hyenas. Other big mammals include the kob, bushbuck, topi, waterbuck, buffalo, elephant, warthog and the world's highest concentration of hippos. There are also various primates such as chimpanzees, red-tailed monkeys, blue monkeys, black and white Colobus monkeys, and olive baboons, among others. The park and neighboring forest preserves are listed as a UNESCO Biosphere Reserve.

Queen Elizabeth National Park qualifies as an HCV as an area that is critical for the traditional cultural identity of the community. Within the park are several women's, artistic, and traditional communities.¹⁴⁰ In addition, the park is Uganda's largest and one of its most well visited, providing critical resources to communities outside its boundaries.

High Conservation Value	Critical ecosystem services: sustaining biodiversity
Qualifying Attribute	Queen Elizabeth National Park has over 95 mammal species and over 600 bird species including the northern Queen Elizabeth lions at high risk of extinction.
Focal Area	TIST activities will continue to support this area through planting trees that help reduce the pressure to harvest fuel wood in the and around the park, and thereby reducing pressure on the biodiversity.

High Conservation Value	Fundamental for the livelihoods
Qualifying Attribute	QENP is one of the most important parks in Uganda attracting many tourists which supplies jobs to the community and revenues for the government.
Focal Area	TIST activities will continue to support this area through the formation of buffer zones and biodiversity corridors which mitigate the need to remove forest products from this protected area.

High Conservation Value	Traditional cultural identity
Qualifying Attribute	Music, dance and arts are integral components of Ugandan culture. QENP has many forums where traditional Ugandan music and art can be seen such as the Kikorongo Women Community.

¹⁴⁰ <https://www.ugandawildlife.org/activities-qenp/cultural-encounters>, accessed February 19, 2021

Focal Area	TIST activities will continue to support this area by reducing pressure on the park allowing the cultural opportunities to continue to flourish.
------------	--

Bwindi Impenetrable National Park

Bwindi Impenetrable National Park qualifies as an HCV due to its provision of critical ecosystem services and is fundamental for the livelihoods. These include hydrological services (serving as an important water catchment) and erosion control services.¹⁴¹

Bwindi Impenetrable National Park is located in southwestern Uganda, near the Kanungu project areas. The 331 square kilometer park is a combination of both montane and lowland forest. The Bwindi Impenetrable Forest is one of the richest ecosystems in Africa and has half the world's population of the endangered Mountain Gorillas. It is habitat for some 120 species of mammals, 348 species of birds, 220 species of butterflies, 27 species of reptiles and more than 1,000 flowering plant species. The Bwindi Impenetrable National Park is a UNESCO-designated World Heritage Site. The park serves as a key water catchment.

High Conservation Value	Critical ecosystem services: water
Qualifying Attribute	Bwindi is an important water catchment and is the headwaters for the Ivi, Munyaga, Ihizozo, Ishasha, Ntengyere rivers. It supplies water for local agricultural areas and enhances local precipitation.
Focal Area	TIST activities will continue to support this area through planting trees that help maintain the water quality through reduced erosion and improved soil water retention.

High Conservation Value	Fundamental for the livelihoods
Qualifying Attribute	Due to the rich biodiversity Bwindi attracts many tourists which supplies jobs to the community.
Focal Area	TIST activities will continue to support this area through the formation of buffer zones and biodiversity corridors which mitigate the need to remove forest products from this protected area.

High Conservation Value	Traditional cultural identity
Qualifying Attribute	The Bwindi is the home of the Batwa pygmies, known as the "Keepers of the Forest", a hunter-gatherer tribe that has lived in the park for thousands of years.
Focal Area	TIST activities will continue to support this area through the formation of buffer zones and biodiversity corridors which will improve the park for the Batwa people

¹⁴¹ Lanjouw, A., A. Kayitare, H. Rainer, E. Rutagarama, M. Sivha, S. Asuma, and J. Kalpers. 2001. Beyond boundaries: Transboundary natural resource management for mountain gorillas in the Virunga-Bwindi region. Washington, D.C.: Biodiversity Support Program.

4.1.4 Without-Project Scenario: Community (CM1.3)

The without project scenario is the same as the baseline scenario described in Section 3.1.4 the Stakeholder Description found in 2.1.9 and the Description of the Communities in 4.1.4. At the start of the project, the communities subsistence farmers, living below the international poverty line and eking out a living on their farms. Since this PD is being written 18 years later, the fact remain the same. The communities are still extremely poor; subsistence farmers living below the international poverty line. According to the World Bank:

“Agriculture contributes 25% of national GDP and employs 70% of the population. The sector provides great avenues for economic growth and economic inclusion, particularly from women and youth. Women make up 55% of the economically active population, contribute more than 75% of the total farm labour and over 90% to farm-level primary processing operations. Almost half (45%) of the heads of smallholder farming households are under the age of 40.

But the sector has grown very slowly. Over the last five years, Uganda's population has grown 3.3% per annum while output in agriculture has grown at only 2% per annum. In comparison, other East African countries have had up to 5% annual output growth in agriculture.”¹⁴²

As climate change worsens, farmers in Uganda, like farmers around the world, face new risks and uncertainty.¹⁴³ These dynamics would likely continue without project activities.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

Community Group	TIST participants
Impact(s)	Improved tools to address sustainable development issues that will facilitate a positive change in well-being.
Type of Benefit/Cost/Risk	Predicted direct benefit
Change in Well-being	Farmers will gain access to trainings and resources to develop locally appropriate best practices. This is based on the ongoing Cluster meetings and training session demonstrated in Exhibit 46 where 27,094 person-training session ¹⁴⁴ have been documented. Training includes climate change, health/ HIV/AIDS, biodiversity, adopting natural resource management practices and TIST (membership application, values, etc). The impact is they will be given additional tools that can be beneficial to their livelihood, such as Conservation farming and improved food security by planting fruit, nut, fodder and other beneficial trees. They participate in the evaluation of the impacts: 1) they are the ones that decide what to plant and 2) they are the recipients of the improved food security and the revenues should they sell the tree products. The rationale for looking at

¹⁴² <https://www.worldbank.org/en/country/uganda/publication/closing-the-potential-performance-divide-in-ugandan-agriculture-fact-sheet#:~:text=Over%20the%20last%20five%20years,annual%20output%20growth%20in%20agriculture.,> accessed February 15, 2021

¹⁴³ <https://www.sciencedirect.com/science/article/pii/S2212096316300821>, accessed February 15, 2021

¹⁴⁴ Exhibit 46 Cluster Meetings: TIST UG PD-VCS-Ex 46 Cluster Meetings 210609.xlsx, “PD Total UG011” worksheet, cell J27. At <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

	the number of members is important because it allows the positive benefit of TIST to spread further and provide more benefits to more people and increases the area and number of trees providing positive benefits to the environment and climate. The rationale for looking at the number of Small Groups is important because they provide mutual support and accountability at a local level and receive payments together. As of the date of the PD (end of the first monitoring period), there were 8,346 members (2,935 women) and 1,310 Small Groups in the PD. There were 19,433 members (12,174 women) and 4,433 Small Groups in TIST Uganda. (Based on a computer report of the administrative record that tabulates the members in the Small Groups that have project areas in the PD. All project areas, regardless of status are included).¹⁴⁵
--	---

Community Group	TIST participants
Impact(s)	Economic Benefits for Members
Type of Benefit/Cost/Risk	Predicted direct benefit
Change in Well-being	Joining TIST leads to economic benefits for the members and their Small Groups. First there are the actions they take based on the training they receive. The benefits are from saleable tree products such as fruits and nut, reduced fuel costs from their own sustainable wood supply and higher yields for conservation farming. The second there are direct cash payments made to the farmers based on the number of trees they plant and a 70% profit share of the carbon revenues. The rationale for listing these impacts is that these provide an incentive for joining TIST and take actions for themselves, the environment and the climate. The benefits from the training were determined through surveys of the farmers.¹⁴⁶ The surveys were compiled, extrapolated to 2020 and determined to be a cumulative of \$5,352 per farmer.¹⁴⁷ The cash payments are based on the result of signing the GHG contract with CAAC. After a several month long application process where members are indoctrinated in TIST and the culture of TIST, and where they have the opportunity to learn about the GHG contract and ask questions, they can voluntarily sign the GHG contract. The impact is they will commit to plant trees to sequester carbon and will be paid based on the number of trees they plant and receive a 70% profit share. The contract states the farmers keep all the tree products and does not

¹⁴⁵ Appendix 08 Monitoring Data, "PA Summary" worksheet, "Status V1" column at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

¹⁴⁶ Exhibit 21 GL2 Community Survey Template: TIST UG PD-VCS-Ex 21 GL2 Community Survey Template.doc at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

¹⁴⁷ Exhibit 22 GL2 Community Survey Result: "Cum Benefits" worksheet, Cell k14, TIST UG PD-VCS-Ex 22 GL2 Community Survey Result 161130.xls at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

	infringe on their property rights of property ownership. It only transfers the carbon rights to CAAC. Members participated in the evaluation of impacts by choosing how many trees they plant; reviewing and agreeing to the monitoring results and agreeing to the amounts they are being paid. The metrics shown are for TIST Uganda. This is because Small Groups and members can be in multiple PDs (there are 8 PDs in Uganda including this one) and there is an overlap of benefits. As of the date of the PD (end of the monitoring period), 10,780 members (4,049 women) have signed the GHG contract. The farmers have received \$1,159,724 in tree payments¹⁴⁸ and \$2,791,513 in profit share.¹⁴⁹
--	---

Community Group	TIST and Stakeholder Community
Impact(s)	Number of live trees planted by TIST Small Groups
Type of Benefit/Cost/Risk	Predicted direct benefit
Change in Well-being	Trees provide a suite of economic and social benefits to farmers. They provide shade, on-farm firewood, stepping stones for wildlife and a basis for carbon credits and carbon revenues. Some of the trees, such as fruit and nut trees, provide improved food security and possibly a cash crop. Many of these benefit the other stakeholders. The environmental improvements extend beyond the project area boundaries. Trees planted on hillside and riparian areas serve to improve water quality. Trees providing areas of cover serve as stepping stones for transient wildlife moving across the project zone. Improved food security increase the community food supply. Carbon removal benefits the global community. The rationale for including this metric is that this is a tree planting project and it is important the benefits be recognized both by the members and the stakeholders. The members participate by deciding how many and what kind of trees to plant and provide an example for how a TIST-type program can be beneficial to their lives. The stakeholders can participate by planting their own trees or joining TIST. The global stakeholders can participate by buying TIST credits and reward the farmers for their efforts. As of the date of the PD (end of the monitoring period), the

¹⁴⁸ Based on administrative records on the TIST database, extracted using a custom query. Table payment_group_voucher. The TIST database is password limited.

¹⁴⁹ Based on administrative records on the TIST database, extracted using a custom query. Tables 2019group_profit_share, 2020group_profit_share, 2021group_profit_share. The TIST database is password limited.

	number of live trees planted by Small Groups in the project are 1,672,088 trees in active Project areas ¹⁵⁰ and there were 77,554 fruit and nut trees. ¹⁵¹
--	--

Community Group	TIST Workers
Impact(s)	Number of people employed by TIST or under contract to deliver services
Type of Benefit/Cost/Risk	Predicted direct benefit
Change in Well-being	TIST employs workers as Cluster Servants/Quantifiers and to provide management services such as serving on the Leadership Council, bookkeeping and expansion. These jobs provide TIST farmers employment and a chance to advance. All of the workers receive salary, healthcare and ICT training. They receive ICT training and practice on smartphones and can use the TIST on-line database through the website portal. Many have pads or computers. Some have access to TIST accounting and access to the TIST server. The rationale for this metric is because there is little opportunity, beyond subsistence farming, for employment in the area, and it is important to recognize TIST's contribution beyond the programmatic benefits. The employee's participation is to provide good work and show they apply the TIST values. Excellent workers can advance to Leadership. In fact, that is where the Leadership council came from. As of the date of the PD (end of the monitoring period), TIST employed 75 people (48 women). 70 are Cluster Servants/Quantifiers (46 women) and 5 are leadership Council managers (2 women). All receive healthcare and ITC training.¹⁵²

Participants, Community Members, and affected groups are directly responsible for evaluation of impacts. TIST quantifiers, who are responsible for the quantification of trees and provision of trainings, are drawn from these groups. They continue to live in and amongst the people they serve. Participants directly provide information through GHG contracts, welcoming of quantifiers to their farms, and at Cluster meetings that contributed to the evaluation of community level benefits. During the application and registration process they learn about the rights and responsibilities of participation, which include working with trained TIST representatives to collect this information. At monthly Cluster meetings, TIST participants of project representatives meet to discuss progress and new goals or desired impacts.

¹⁵⁰ Appendix 08 Monitoring Data: TIST UG PD-VCS-011i App08 Verif 01 Monitoring Data 230304v4.xlsx, "PA Summary" worksheet, cell AB4499. At <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

¹⁵¹ Appendix 08 Monitoring Data: TIST UG PD-VCS-011i App08 Verif 01 Monitoring Data 230304v4.xlsx, "Ex-post Strata" worksheet, cell AQ11729. At <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

¹⁵² Based on administrative records.

4.2.2 Negative Community Impact Mitigation (CM2.2)

There are minimal threats to stakeholders presented by the project, largely due to its voluntary nature on private lands. This is demonstrated by the continued program uptake and lack of negative comments received. In the causal chains, two major threats to stakeholders were identified.

One threat is that women or men experience harassment or discrimination. TIST often operates in communities that have strongly enforced cultural normativity. The program requires equality of access and opportunity regardless of age and gender, oftentimes in contradiction to cultural norms. As such, TIST identifies the potential threat of discrimination or harassment in response to this program attribute. In order to mitigate this threat, TIST conducts regular seminars where they review sexual harassment and discrimination. The program further has defined sexual harassment and discrimination policies which are publicly available and reviewed at meetings. Members who are found to have violated these policies are removed from TIST as either participants or employees. To date, this combination of policy and education has been very effective, and no official complaints have been filed.

TIST also identifies a threat to the safety of TIST employees. Quantifiers are often tasked with visiting remote areas and navigating difficult terrain in order to locate and quantify tree growth. This presents a threat that would not exist in the absence of the program. In order to mitigate this threat, the program outlines a list of precautions and requirements for Quantifiers in the Quantifiers' Safety Requirements. This document is publicly accessible and reviewed annually by each Quantifier.

HCV Impact. As discussed in section 4.2.4, the planting of trees will have a direct benefit on the health of HCVs, which will in turn provide environmental services to community members. The monitoring of riparian and hillside planting in the project areas nearby to HCVs will have a particular impact on the health of HCVs whose hillsides abut project areas or whose waterways traverse project areas. The reduction of pressure for forest products will further improve the HCV's viability.

The precautionary principle calls for the adoption of precautionary measures when scientific evidence is uncertain and the stakes are high. There does not appear to be a lack of scientific evidence about the need to reduce discrimination and harassment, need to address employee safety or to reduce pressure for forest products in HCVs.

4.2.3 Net Positive Community Well-Being (CM2.3, GL1.4)

Impacts on community. The project will create a positive socio-economic impact. Some of the benefits that will be realized by the Small Group members and their families:

- **New job opportunities:** TIST requires a Host Country staff to operate. There are currently 75 employees. 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 thousands of Small Group members by providing a new source of income. Small Group members are paid for each tree they plant and maintain. Because the project has become self-funding from the sale of carbon credits, they are receiving 70% of the net carbon revenues.
- **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 provides the entire community with positive examples.

- **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.
- **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 ongoing management of the project area and sell the harvested stems as timber.
- **Natural medicines, insecticides and other benefits from trees:** Some of the trees, such as the neem and moringa, provide other non-wood related benefits.
- **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.
- **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 nuts).
- **Improved beauty of the landscape:** This is a welcome attribute in an overused and degraded landscape.

Climate change adaptation benefits. Some of these benefits specifically help farmers adapt to the probable and current impacts of climate change. These include:

- **Conservation Farming:** TIST trains farmers on climate resilient agricultural techniques. Education of FAO Conservation Farming techniques allows farmers to gather minimal rainfall in specially dug and spaced holes. Even in times of drought or limited rainfall, this technique allows crops to grow.
- **Trees:** Trees retain moisture and create microclimates on TIST participants farms. Trees provide shade to cool farms and introduce new organic matter to restore soil health. This makes farms more productive in adverse conditions. Trees prevent erosion and can serve as windbreaks when planted near structures. Trees further help to prevent against catastrophic landslides and flooding. As flooding, extreme wind, and landslides become more common, trees help to mitigate their impacts for TIST farmers.
- **Community Organization:** TIST farmers organize themselves in local and regional groups that share knowledge in monthly meetings. These meetings provide an opportunity for farmers to share experiences and find locally appropriate solutions to local issues. This organization makes TIST farmers better able to navigate the challenges posed by climate change.

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.

4.2.4 High Conservation Values Protected (CM2.4)

The project will 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 trees for the program will 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. These HCVs will in turn provide critical environmental services to the surrounding communities, such as serving as water catchments.¹⁵³

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

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.

The positive effects on the well-being of the Other Stakeholders are:

- Improved food security. As TIST farmers grow more food through Conservation Farming and from fruit and nut trees, there will be more local food.
- As TIST members undergo training, there will be spill over to friends and neighbours outside the TIST community. This includes Conservation Farming, successful tree planting, construction tree nurseries, building and using more fuel-efficient stoves, indoor cooking pollution, use of trees for stabilizing soil and water courses, using mosquito nets, ways to mitigate climate change and all the other training themes.
- More locally sourced fuelwood. As the TIST trees grow, some of the farmers will have sustainable woodlots. Others will have more fuel wood from pruning, thinning and natural mortality. Some will have an excess that they can sell. The overall reduction in demand by TIST farmers will mean more supply for the Other Stakeholders.

The negative effects on the well-being of the Other Stakeholders are

- If TIST training and program adoption is extremely successful, it could lower food cost, which would have a negative effect on food vendors.
- If TIST farmers are extremely successful, it could lower fuelwood cost, which would have a negative effect on fuelwood vendors.

4.3.2 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

As shown in Section 4.3.1, the positive effects on the well-being of the Other Stakeholders are improved food security; the spillover of training from TIST to other community members and more local fuelwood. The negative effects are the potential of lower food sales revenue to food vendors and lower fuelwood sales revenue for fuelwood vendors.

The potential negative effects on the few food and fuel vendors would be minimal and only affect a small subset of Other Stakeholders. It would be beneficial to a major portion of the Other Stakeholders.

¹⁵³“Virunga – Bwindi Region: Republic of Rwanda, Republic of Uganda, Democratic Republic of Congo” *USDA Forest Service Technical Assistance Trip*, USDAFS, https://web.archive.org/web/20090704070413/http://carpe.umd.edu/resources/Documents/rpt_usdafsip_virunga_h2o_trip_3_2005.pdf, accessed February 12, 2021

Comparing the positive effects and negative effects the project activities are not anticipated to result in net negative impacts on the well-being of other stakeholders.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

The positive effect on other stakeholders is improved food security, the spillover of training and increased local supplies of firewood. The negative effects are the possibility that an increased food and fuel supply could reduce the sales price and therefore revenues for a small portion of the other stakeholders, i.e. the food and wood vendors. On the other hand, this would be beneficial to the rest of the other stakeholders. After comparing the positive and negative, it seems reasonable to conclude that TIST is not anticipated to result in net negative impacts on the well-being of other stakeholders.

4.4 Community Impact Monitoring

4.4.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The following are the components of the initial Community Impact Monitoring plan.

Membership

1. Number of Small Group members in PD (female and male)
2. Number of Small Groups in PD
3. Number of active community members in TIST Uganda (female and male)
4. Number of Small Groups in TIST Uganda
5. Number of community members in TIST Uganda (includes new members not yet active)

GHG Payment Program

6. Number of community members with greenhouse gas agreements in TIST Uganda (female and male)
7. Number of Small Groups receiving Payments
8. Number of Members receiving Payments (female and male)
9. Total payments to community in TIST Uganda

Cluster Based Training

10. Number of person-training sessions on climate change in TIST Uganda
11. Number of person-training sessions on HIV/AIDS in TIST Uganda
12. Number of person-training sessions on tree planting and biodiversity
13. Number of person-training sessions on natural resource management (NMR) in TIST Uganda
14. Number of person-training sessions on TIST in TIST Uganda
15. Number of vocational person-training sessions in TIST Uganda

Personnel

16. Number of people employed by TIST or under contract to deliver services

17. Percentage of women in leadership positions
18. Number of people receiving ICT Training
19. Number of people receiving healthcare

Tree Planting and NMR

20. Number of live trees planted by TIST Small Groups in active project areas
21. Number of active hectares
22. Number of active project areas
23. Number of fruit or nut trees in project
24. Number of eucalyptus trees in project
25. Hectares of riparian tree planting
26. Hectares of trees planted on steep hillsides

Gold Level Community Benefits

27. Monetized benefits to average members.
28. Monetized benefits to vulnerable members.
29. Monetized benefits to female members.
30. Negative impacts identified by members.

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 will be done annually as part of the overall monitoring of TIST. Data will be 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 will collect training information at meetings, which will include the subjects covered and the numbers of people attending. The metric for training will be person-sessions meaning the numbers reported are expected to exceed the number of members. Contracts will be 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 will be obtained from administrative records.

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

Climate Change Adaptation Benefits for Communities. Impacts included in this monitoring plan directly assess the adaptation benefits of the project. In person training sessions on natural resource management and tree planting help farmers to create farms that are resilient and productive in the face of drought and erosion.

The planting of fruit and nut trees will diversify food access, rendering farmers more resilient to climatic changes that impact certain food crops. Similarly, access to carbon payments diversifies farmers' incomes in the face of poor crop yields.

By assessing the location of tree planting, along waterways and hillsides, the TIST program is able to monitor how trees are being planted strategically to protect natural resources. Already the program is receiving reports of regular, devastating landslides and intermittent flooding. As climate change

increases, this is expected to intensify. The planting of trees in riparian and hillside areas will help to protect farms and communities.

Well-Being Impacts and Risks for Smallholder/Community Members. As discussed in section 4.2.2 there are minimal threats to stakeholders presented by the project, largely due to its voluntary nature on private lands. Because the project is entirely composed of Smallholder and community members, the impacts listed above apply entirely to these groups.

Impact on Women. Several of the indicators are designed to assess the projects impact on women. TIST disaggregates participants by gender to assess if the project is meeting its goals of equal access to participation. At the community, regional, and national level the project is monitoring the participation of women in leadership roles to ensure the program is meeting its commitment to gender parity in positions of power. Further discussion is found in section 4.5.5.

HCVs. As discussed in section 4.2.4, the planting of trees will have a direct benefit on the health of HCVs, which will in turn provide environmental services to community members. The monitoring of riparian and hillside planting in the project areas nearby to HCVs will have a particular impact on the health of HCVs whose hillsides abut project areas or whose waterways traverse project areas. The reduction of pressure for forest products will further improve the HCV's viability.

4.4.2 Monitoring Plan Dissemination (CM4.3)

This information is included in the process described in Section 2.3.1.

The data monitoring process is communicated to farmer prior to the entry into the program. As part of this entry, the agree to allow TIST representatives to come and collect data on their farm. This information is collected and made publicly available on the TIST website. Directions to this website are included on newsletters distributed at Cluster meetings. Prior to validation and verification, TIST announced a summary of results of the monitoring plan in a monthly newsletter. This summary was disseminated in 6 languages: English, Runyankore, Ateso, Luganda, Luo, and Kiswahili.¹⁵⁴

4.5 Optional Criterion: Exceptional Community Benefits

4.5.1 Exceptional Community Criteria (GL2.1)

Community members attest to ownership or right of access to 100% of the land in initial project areas. Their actions are what create 100% of the benefits. Ownership is attested to in Appendix 01. For planned project areas, TIST is continuing to collect information on ownership and right of access issues. Planned project areas will only be verified upon confirmation of ownership by community members.

4.5.2 Short-term and Long-term Community Benefits (GL2.2)

Community benefits are generated before members formally join TIST. During the registration and application stage, farmers are invited to attend Cluster meetings where they are able to receive training and education on issues that are important to them.

Once farmers have planted trees, they receive a carbon pre-payment starting at six months. These prepayments serve as a bridge until their carbon stock is quantifiable (typically when the trees are older than one year). At this point, they are able to share in 70% of the program's profits.

¹⁵⁴ <http://www.tist.org/i2/docs/NL/2020.11.November.UG%20Newsletter.pdf>

Tree planting has short and long-term economic and environmental benefits. The planting of trees can create fruit, nut, and medicinal harvests for farmers. Trees can further provide deadfall, fuelwood, windbreaks, and improved soil quality.

Farmers sign contracts to share in the program's profits for 60 years. The benefits from education on health issues, improved agricultural practices, improved cookstove construction, and leadership development are ongoing.

4.5.3 Community Participation Risks (GL2.3)

The TIST program is entirely voluntary and to a large degree relies on word of mouth. The program does not demand membership but rather relies on farmer's actively seeking to join. The potential costs, risks, and benefits are best articulated by farmers who are currently participating in TIST. In addition to word of mouth, TIST relies on both the newsletter and local leaders to share information. To join TIST, farmers must complete a lengthy application process which includes attending meetings to learn about benefits and costs. In order to be accepted into TIST, farmers must attend training sessions on each element of the program.

TIST farmers give the program the rights to sell the carbon credits they create. In exchange, the farmers get a prepayment based on tree count and ultimately receive 70% of the profits. The farmers maintain ownership of their land, the trees and the tree products. They get 100% of any firewood, fodder, fruits or nuts that come from the trees. They receive training in many life improving topics at no cost. They choose which elements of program are best (for example health training, Conservation Farming practices, raised seed bed construction, etc.) for them and keep all the benefits derived from their adoption.

The risks and opportunity cost to farmers are minimal. This is true for several reasons including:

- There is no change in the land use and legal property rights in the project zone, since the validation of the project.
- Unlike in traditional cash crop programs, farmers are not changing the productive use of their arable land. Rather, TIST farmers are planting trees using agroforestry methods in conjunction with their extant activities. Tree planting often occurs on property boundaries, around homesteads, or between rows of crops.
- Existing property rights are recognized, respected and supported
- The project does not encroach uninvited on private, community or government property.
- The free, prior and informed consent has been obtained of those whose property rights are affected by the project.
- Project activities do not lead to the involuntary removal or relocation or property rights holders from their lands or territories and does not force them to relocate activities important to their culture or livelihood.
- Actions have been taken, if necessary, to reduce illegal activities that could affect the project's impacts.
- No activities are undertaken by the project that could prejudice the outcome of an unresolved dispute relevant to the project over lands, territories and resources in the project zone.

Enthusiasm is evidenced by over voluntary 100,000 members.

4.5.4 Marginalized and/or Vulnerable Community Groups (GL2.4)

Community Group 1	Women
-------------------	-------

Net positive impacts	TIST assess direct and indirect economic benefits to women, including access to education and leadership opportunities. The program has not found any negative impacts on women and thus the net impact is positive.
Benefit access	In order to facilitate participation by women, the program has adopted a Payment for Environmental Services model that does not tie payments to land ownership. At the Cluster, regional, and national level, the program implements Rotational Leadership (described in Section 4.5.9). The goal is to have 50% of all Cluster Servant and managerial roles be filled by women. TIST monitors Cluster elections to ensure this practice is implemented. There are no barriers to entry and both men and women can access the program in equal measure
Negative impacts	The program does not assess any negative impacts on women

Community Group 2	Poor Farmers
Net positive impacts	Poor farmers increase access to food, create direct and indirect economic benefits, access leadership positions, and receive education on a range of issues.
Benefit access	The program's Payment for Environmental Services model that does not tie payments to land ownership, allowing for access by the very poor. There are no barriers to entry and farmers do not need to provide any material resources in order to participate.
Negative impacts	TIST does not assess negative impacts on the poor.

Impact on the Poor: The project has been designed to benefit the poorest of the poor and in this case the subsistence farmers of rural Uganda. 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.

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. 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.

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 increased probability of extreme climatic conditions.¹⁵⁵ These will affect every farmer in rural Uganda,

¹⁵⁵ McGuigan, Claire. *POVERTY AND CLIMATE CHANGE: ASSESSING IMPACTS IN DEVELOPING COUNTRIES AND THE INITIATIVES OF THE INTERNATIONAL COMMUNITY*. London School of Economics Consultancy Project for The Overseas Development Institute,

including the lowest quartile. TIST has quantified climate change benefits, which will mitigate these negative impacts.

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.*¹⁵⁶

According to the UNEP, trees help "conserve soil and water."¹⁵⁷ 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."¹⁵⁸ The lowest quartile are the people most likely to be negatively affected by drought. Trees also retain soil moisture and help mitigate the effects of drought. TIST tree planting ameliorates these negative results of deforestation and degradation and benefits the lowest quartile.

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

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 will help 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 will benefit the non-members in the lowest quartile.

Negative impacts on the poor identified. TIST was developed through visioning sessions with poor small-hold subsistence farmers in Tanzania in 1998 and 1999. They 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.

www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3449.pdf, accessed February 10, 2020

¹⁵⁶ "The Magnitude of the Problem." *Land and Environmental Degradation and Desertification in Africa*, FAO, www.fao.org/3/x5318e/x5318e02.htm, Accessed February 10, 2020

¹⁵⁷ 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"

¹⁵⁸ Coping with Water Scarcity." *FAO Site*, www.fao.org/newsroom/en/focus/2007/1000521/index.html. page 6, Accessed February 10, 2020 at <http://www.fao.org/nr/water/docs/escarcity.pdf>.

Net impacts will be examined in the surveys to determine whether TIST has a net positive effect on the poor.

4.5.5 Net Impacts on Women (GL2.5)

In order to facilitate participation by women, the program has adopted a Payment for Environmental Services model that does not tie payments to land ownership. At the Cluster, regional, and national level, the program implements Rotational Leadership (described in Section 4.5.9). This ensures that 50% of all managerial roles are filled by women. TIST monitors Cluster elections to ensure this practice is implemented.

Surveys will also examine the effects of TIST on women and whether it has a net positive effect on them.

4.5.6 Benefit Sharing Mechanisms (GL2.6)

TIST was created to serve smallholders. The program was created through visioning sessions with subsistence farmers, who developed the program as a way to address their local needs. Farmers are invited to provide feedback at thousands of monthly Cluster meetings, and at seminars where they send representatives.

TIST shares 70% of the program's benefits with farmers, as described in the GHG contract.¹⁵⁹ At each Cluster meeting, Small Group representatives are given a voucher with the number of trees they have planted (according to the database) and the corresponding payment amount. They must return to their Small Group and procure signatures from each member of the group. Upon receipt of the signed voucher, payment will be made generally through mobile money services. Once farmers have verified carbon, they receive a second type of voucher that explains the amount of carbon they have verified, and the corresponding profit share. At local seminars, TIST representatives have explained the programs costs, revenues, and pricing per tonnes to Cluster Servants and farmer representatives.

In addition to direct payments, TIST farmers receive 100% of the non-carbon benefits they create from tree planting. In similar projects in TIST Uganda, these benefits have been verified to average approximately \$4,700 per farmer. These include fruits, nuts, medicine, deadfall, improved agricultural yields, and honey. Many benefits are harder to quantify, such as vocational and technology education, leadership training, health education, and community organization.

4.5.7 Benefits, Costs, and Risks Communication (GL2.7)

Current TIST participants are best able to explain benefits, costs, and risks to applicant smallholder and community members. During the application and registration process, new participants are invited to Cluster meetings where they are provided with the opportunity to speak directly with farmers who have been participating in the program. During this process, they undergo training on TIST best practices, benefits, and potential risks. As described in Section 4.5.3, these risks are minimal.

Monthly Cluster meetings provide constant contact between farmers and representatives of the TIST program. The program is entirely voluntary, and farmers can choose the amount to which they participate (in tree planting and other sustainable development activities).

4.5.8 Governance and Implementation Structures (GL2.8)

The project proponent is Clean Air Action Corporation (CAAC). The role of CAAC and other parties involved with TIST are summarized:

¹⁵⁹ Exhibits 03 and 04: GHG Contracts

- Clean Air Action Corporation (CAAC) is a for profit US corporation that manages the GHG component of TIST. CAAC is TIST's largest contributor, provides technical assistance and uses its host country subsidiaries to manage operations.
- Institute for Environmental Innovation (I4EI), a US based non-profit organization, manages the TIST sustainable development program components. I4EI provides funding from government agencies, foundations, and private donors.
- Thousands of TIST Farmers make up the Small Groups, plant the trees on their lands, manage their own trees and make up the core of TIST.
- Management and governance structures of TIST Uganda are described in Section 2.4.1

TIST participants organize themselves into local and community groups where leadership is identified and cultivated to meet the positions listed above:

Small Groups: A Small Group is a group of 6-12 people who want to improve their lives and environment by planting trees and adopting sustainable agriculture best practices. The formation of Small Groups helps TIST to service the needs of participants, while allowing information sharing at the local level. Farmers must join TIST as a Small Group.

Small Groups are particularly powerful because they maximize accountability on a local, daily level. By organizing in Small Groups, each person is responsible to their neighbors. This is a more real and meaningful responsibility.

The nature of Small Groups also facilitates innovation. Small Groups allow for the success of a single “early adopter” to be seen by other group members. This experience of action and direct outcome is a powerful force that cannot be reproduced with publications or Seminars. Similarly, farmers can experiment with a new practice using shared resources or labor, thus sharing the costs of failure.

Certain best practices allow Small Groups to be successful. These include rotating leadership, practicing Kujengana, weekly meetings, preventing one person from dominating discussion, accepting viewpoints without criticism, and identifying Best Practices specific to the environment of the Small Group. Using these best practices, Small Groups are able to plant trees, support one another, quantify their progress, refine their practices, and share their success with one another.

Clusters: Clusters are units of Small Groups that are within walking distance of a central meeting point. Clusters are designed to provide services such as training, administration, payment, and newsletter distribution to Small Groups, easing some of the logistical challenges of a being spread out. Organizing in Clusters also helps keep costs low and helps create organizational partnerships. Each Cluster has about 20-70 Small Groups, and thus consists of several hundred farmers. When a Cluster grows too large, it splits in two. Each Cluster aims to plant specific quantities of trees planted and hectares.

Clusters are meant to meet every month for training, sharing of best practices, distribution of newsletters, and any other matters they have. Activity at Cluster meetings is recorded and submitted, along with Cluster accounting forms. A good Cluster is constantly working to improve the quality of the data it provides and the data it receives from its Small Groups. Cluster Best Practices also include making on-time payments, recruiting new members, and embodying TIST values. Every four months, Clusters will hold an election to choose new leadership.

A Cluster is led by a Cluster Leader, a Cluster Co-Leader, and an Accountability Person. A Cluster Leader should be a servant to the whole Cluster and exemplify TIST Values, while promoting a strong, unified Cluster. They are responsible for leading Cluster activities such as meetings and quantification trips, recruitment, and payment. The Co-Leader takes over when the Leader cannot attend, keeps minutes of meetings, and helps to train the Accountability person. The Accountability Person helps with budgeting, payments, and record keeping. Clusters rely on rotation, alternating genders, and democratic elections to determine leadership.

4.5.9 Smallholders/Community Members Capacity Development (GL2.9)

TIST Uganda is managed by local stakeholders, as described in Section 2.3.15. In order to identify and cultivate local leadership, the project implements practices of Kujengana and Rotational Leadership.

Kujengana: Kujengana is a critical component of TIST. The Swahili translation of Kujengana literally means, “to build each other up”. Within the context of TIST, Kujengana has two parts. Before the end of a meeting, participants say one specific, positive thing that the meeting leader did. In addition, people can mention gifts that the leader has demonstrated. A leader responds to the reception of Kujengana with a simple “thank you,” without any further discussion. Most cultures are taught to criticize, and thus implementing Kujengana takes practice and training.

Kujengana is a useful best practice for many reasons. The use of positive reinforcement allows leaders to develop their gifts and talents. When combined with another best practice, Rotating Leadership, everyone in the group is given Kujengana in turn. This practice allows for the group to learn what each member thinks is important in a good leader; each member is able to develop leadership skills simply by listening, even when they are not serving as a leader.

TIST has found the focusing on positives enables otherwise timid people to speak out and grow as leaders. Focusing on negatives can reinforce hesitance to participate. This is particularly true with youth, women, and other social groups that already face cultural barriers to participation.

Rotating Leadership Rotating Leadership dates back to the program’s founding. The concept of Rotating Leadership is one of the original components of Small Group formation and supports other TIST best practices. Rotating Leadership takes place in the Small Group, Cluster, and Group of Cluster levels. At the Small Group level, a new leader and co-leader can be selected each meeting to lead the group. At the Cluster and Group of Cluster levels, a new Accountability Person is elected every four months. At this time, the current Accountability Person becomes the Co-Leader, and the Co-Leader becomes the Leader.

Rotating Leadership best practices include: agreeing from the beginning to rotate leadership, giving every person a chance to lead and co-lead, not letting anyone dominate discussion, and remembering to wait for people to speak before posing questions.

The practice of Leadership Rotation allows for Kujengana to work well. With Rotating Leadership, people are able to learn from the Kujengana received by previous leaders and implement these lessons when they become leader. Without Rotating Leadership, this would be a practice that only benefits the leader of the group; with Rotating Leadership, the entire group learns from the experiences of each member and has a chance to apply these lessons when it is their turn to lead. People are also less likely to be critical of leadership if they know that they will have an opportunity. They will try to learn from the successes and failures of previous leaders, rather than engaging in negativity and criticism.

This practice facilitates a democratization of access, allowing youth and women to take on leadership roles that they might otherwise be barred from. By implementing Rotating Leadership practices at each level, TIST is able to develop leaders who can assume increasing responsibility if they want to. In particular, groups such as women and youth report that their experience with Rotating Leadership often encourages them to take more active roles in their community, church, or other civic enterprises. The practice of Rotating Leadership is further connected to the TIST Values, which stress service to one another in place of a tiered model of power; without a single source of administrative power, issues of honesty and transparency are often easier to deal with.

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

The biodiversity within the project zone at the start of the project was a combination of isolated natural areas that are typified of the HCVs described in scribed in Section 4.1.3. and the settled parts of the project zone which include the cities, settlements and, most importantly to the PD, the rural areas settled by 84% of the population.¹⁶⁰

The UNEP describes the biodiversity of the natural areas of Uganda:¹⁶¹

Uganda is a landlocked country located where seven of Africa's biogeographic regions converge, making it a country with a high level of biodiversity. Despite its small size, Uganda has an extraordinary amount of diversity in both terrestrial and aquatic habitats, with surveys reporting occurrence of over 18,783 species of flora and fauna. Most of the biodiversity can be found in natural forests, but a considerable number is also found in other natural ecosystems such as mountains, savannahs, wetlands, lakes and rivers. Protected Areas (PAs) in Uganda mainly fall under two resources, namely forestry and wildlife. Out of a total surface area of 241,551sq.km (both land and water), 25,981.57sq.km (10%) is announced as wildlife conservation areas, 24% is announced as forest reserves and 13% is wetlands .

Uganda has 10 National Parks, 12 Wildlife Reserves, 10 wildlife sanctuaries, 5 community wildlife areas, 506 central forest reserves and 191 local forest reserves. It is however estimated that over 50% of Uganda's wildlife resources still remain outside designated protected areas, mostly on privately owned land which is of most urgent concern for protection and development.

Uganda's nature and biodiversity are rapidly declining globally, with the pace of species extinctions being accelerated levels. The rate of biodiversity loss in Uganda was calculated in 2004 to be between 10-11% per decade (MWLE, 2003) with a high number of known species recorded on the IUCN Red List. This portends grave impacts on people across many parts of the country. From an estimated 1,400 indigenous plant species in Uganda, 30 species are known to be endangered, 43 are rare and 10 are vulnerable, according to the country's national biodiversity strategy and action plan.

Section 2.1.5 describes the rare and endangered species.

The biodiversity in the rural areas serve as a stark contrast. There are 199,807sq km of land in Uganda of which almost half, 99,019 sq km are cultivated and a quarter (51,153) are grasslands.¹⁶² And while agriculture employs 72 percent of the work force, it only accounts for less than one-quarter of national GDP. "Many farmers—particularly women—work on very small plots of land, and lack the training and equipment to generate significant income."¹⁶³ This describes subsistence farming. Looking at Appendix 02, the vast areas outside of the protected areas are farm lands that are grasslands or croplands. They

¹⁶⁰ <https://www.macrotrends.net/countries/UGA/uganda/rural-population#:~:text=Uganda%20rural%20population%20for%202021,a%202.66%25%20increase%20from%202018.>

¹⁶¹ <https://dicf.unepgrid.ch/uganda/biodiversity>

¹⁶² https://www.ubos.org/wp-content/uploads/publications/03_2018Statistical_Abstract_2013.pdf

¹⁶³ <https://www.dfc.gov/investment-story/empowering-ugandas-subsistence-farmers>

are private lands owned by subsistence farmers. They have a history of farming and as such, the baseline biodiversity is extremely low. The threat this had to biodiversity came true before the project start. 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 areas must start with the basics and, in this case, means planting indigenous trees and developing isolated woodlots that will improve the connectivity of wildlife between natural forests.

5.1.2 High Conservation Values (B1.2)

High Conservation Value	Bwindi Impenetrable Forest
Qualifying Attribute	Globally, regionally or nationally significant concentrations of biodiversity values i) protected areas ii) threatened species v) Areas that support significant concentrations of a species during any time in their lifecycle ¹⁶⁴
Focal Area	TIST activities will continue to support this area through the formation of buffer zones and biodiversity corridors which mitigate the need to remove forest products from this protected area.

High Conservation Value	Queen Elizabeth National Park
Qualifying Attribute	Globally, regionally or nationally significant concentrations of biodiversity values i) protected areas ii) threatened species ¹⁶⁵
Focal Area	TIST activities will continue to support this area through the formation of buffer zones and biodiversity corridors which mitigate the need to remove forest products from this protected area.

5.1.3 Without-project Scenario: Biodiversity (B1.3)

The without-project scenario is a continuation of the baseline scenario. The project areas were small plots settled by subsistence farmers planting crop for food and collecting firewood for cooking and heat. The growing population and need for more firewood would mean continued deforestation.

There is a clear pattern of rural firewood use and forest degradation in Uganda. The lands of and surrounding the project areas have been degrading for decades, due to human intervention. Despite a series of forest policies that began in 1929,¹⁶⁶ forests in the TIST areas are in an extremely precarious position.

The Uganda Forest Policy¹⁶⁷ cites a decline in forest resources:

(T)he trend in Uganda is one of loss of forest cover and degradation of the remaining forest resource base:

¹⁶⁴ Centre, UNESCO World Heritage. "Bwindi Impenetrable National Park." UNESCO World Heritage Centre, whc.unesco.org/en/list/682/. accessed February 10, 2020

¹⁶⁵ "Queen Elizabeth Biosphere Reserve, Uganda." *UNESCO*, 4 Apr. 2019, en.unesco.org/biosphere/africa/queen-elizabeth, accessed February 10, 2020

¹⁶⁶ The Uganda Forest Policy, Ministry of Water, Lands and Environment, Republic of Uganda, 2001. Accessed December 16, 2019 <https://www.nfa.org.ug/images/UgandaForestryPolicy2001.pdf>

¹⁶⁷ Ibid, p. 2

- in tropical high forest, about 280,000 hectares are now degraded, representing at least a third of the country's valuable high forest;
- in woodlands, the degradation and clearance is more marked, as most of the current loss of forest cover is in woodland areas;
- in the government Forest Reserves, which cover over 1.1 million hectares, there is less than 740,000 hectares of forest cover, a loss of 35% of forest cover. Of the 20,000 hectares of timber plantations planted on this government land, as little as 6,000 hectares of well-stocked softwood plantations currently remain standing.

According to the FAO¹⁶⁸ Uganda has lost 86,000 ha of forest per year between 1990 to 2005, falling from 4,924,000 hectares to 3,627,000 hectares. That is 1,297,000 total ha, equal to over a 25% loss. It was estimated that 46.4 million m³ (over bark) of wood products was removed in 2005, which was equal to 29.8% of the country's growing stock. Of this, 42,0416,000 m³ (over bark) was removed or fuel wood.

The loss of forests and forest resources is likely to have dramatic impacts on biodiversity additional the loss of trees themselves. According to the FAO, half to two-thirds of global biodiversity is found in forests, and 50-90% of the world's species are found in tropical forests. Moreover, forests systems, humans, and biodiversity form a symbiotic relationship wherein "Ecological processes such as tree growth, carbon sequestration, pollination, seed dispersal and nutrient recycling depend on biodiversity, which is also fundamental to food security and nutrition."¹⁶⁹

Thus, the loss of forests in the baseline scenario can be understood to have a secondary impact on a broad diversity of plant and animal life.

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

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. Non-indigenous trees indirectly contribute to biodiversity by limiting deforestation and improving environmental conditions. The project will measure all endangered, threatened, or vulnerable tree species planted. In addition, TIST provides wildlife corridors and buffer zones around several HCVs.

TIST farmers will receive training and organization around biodiversity issues. TIST's networks supports farmers in learning about and identifying locally appropriate best practices around biodiversity issues.

The one potential negative impact of tree planting identified is damage to water tables caused by planting of eucalyptus trees nearby to waterways.

Biodiversity Element	Indigenous Trees
Estimated Change	Increase in number and hectares of indigenous trees
Justification of Change	Farmers choose to plant indigenous trees. As described in the monitoring plan, TIST will regularly quantify and monitor the increase all trees planted by TIST farmers, stratifying to specifically analyze indigenous planting. See section 3.3.3 for more information.

¹⁶⁸ Agriculture Organization of the United Nations. "Global Forest Resources Assessment 2005." *Global Forest Resources Assessment*, FAO, www.fao.org/forestry/fra/fra2005/en/. Accessed February 10, 2020

¹⁶⁹ Food and Agricultural Organization of the United Nations. "SFM for Biodiversity Conservation." *Natural Forest Management*, FAO, <http://www.fao.org/forestry/sfm/85292/en/>. Accessed February 12, 2021

Biodiversity Element	Trees
Estimated Change	Increase in number of trees
Justification of Change	Farmers choose to plant trees. As described in the monitoring plan, TIST will regularly quantify and monitor the increase all trees planted by TIST farmers. See section 3.3.3 for more information.

Biodiversity Element	Endangered/Vulnerable/Threatened Tree Species
Estimated Change	Increase in number of Endangered/Vulnerable/Threatened trees
Justification of Change	Farmers choose to plant Endangered/Vulnerable/Threatened trees. As described in the monitoring plan, TIST will regularly quantify and monitor the increase Endangered/Vulnerable/Threatened trees planted by TIST farmers. See section 3.3.3 for more information.

Biodiversity Element	HCVs protected
Estimated Change	2 HCVs protected
Justification of Change	TIST activities will protect HCVs through the reduction of pressure for forest products, as well as the creation of buffer zones and wildlife corridors. TIST will monitor activities proximity to national parks through quantification and use of GPS technology to map program activities around identified HCVs

Biodiversity Element	Trees Planted on Steep Hillsides
Estimated Change	Increase in trees planted on steep hillsides
Justification of Change	Farmers choose to plant their trees on steep hillsides. Oftentimes this is to reduce the possibility for erosion, which has both community and biodiversity benefits. TIST will monitor the location and topography of tree planting during baseline surveys

Biodiversity Element	Riparian Tree Planting
Estimated Change	Increase in riparian tree planting
Justification of Change	Farmers choose to plant their trees in riparian areas. Oftentimes this is to reduce the possibility for erosion and protect waterways, which has both community and biodiversity benefits. TIST will monitor the location and topography of tree planting during baseline surveys

5.2.2 Mitigation Measures (B2.3)

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 biodiversity.

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.

In order to reduce the number of eucalyptus trees, TIST has trained farmers about the negative impacts of eucalyptus trees. In addition, TIST has had special programs in riparian areas to encourage the replacement of eucalyptus trees with indigenous alternatives.

5.2.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

As noted, the project areas are 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 areas must start with the basics and, in this case, means planting indigenous trees. Isolated woodlots with indigenous trees will improve the connectivity of wildlife 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 Table 5.2.3 lists some of the indigenous species that may be planted by TIST in Uganda.

Table 5.2.3

Scientific Name	Common Name (if different)
Acacia abyssinica	Flat-top Acacia
Acacia albida	White Acacia
Acacia mellifera	Black Thorn
Acacia nilotica	
Acacia senegal	Gum Acacia
Acacia seyal	Whistling Thorn, White Thorn
Acacia spp.	Acacia
Acacia tanganyikensis	Mheme
Acacia tortilis	Umbrella Thorn Acacia
Acokanthera oppositifolia	Poison Arrow Tree
Acokanthera schimperi	
Adansonia digitata	Baobab
Albizia gummifera	Peacock Flower
Annona senegalensis	Wild Soursop
Annona spp.	Annona
Boscia coriacea	Boscia coriacea
Brachystegia spiciformis	Bean-Pod Tree
Brachystegia spp.	miombo
Burkea africana	
Calypotrothea taiensis	Mwolowolo
Cordia Africana	East African Cordia
Canarium schweinfurthii	Bush Candle, Gum Resin
Celtis africana	
Celtis durandii	White Stinkwood
Combretum longispicatum	Mlama, Mgombogombo
Combretum molle	Velvet Bush Willow
Commiphora africana	African Myrrh
Commiphora stuhlmanni	mdonho
Cordia sinensis	Nyamate, Gundi
Croton megalocarpus	Croton
Croton sylvaticus	Woodland Croton
Croton macrostachyus	Broadleaf Croton
Cussonia holstii	Cabbage Tree
Dalbergia lactea	Large-Leaved Climbing Dalbergia

Scientific Name	Common Name (if different)
Dalbergia melanoxylon	African Blackwood
Delonix elata	Flamboyant Tree
Dichrostachys cinerea	Sickle Bush
Diospyros abyssinica	
Diospyros mespiliformis	
Dombeya rotundifolia	Wild Pear
Dombeya spp.	Dombeya
Dovyalis abyssinica	Abyssinian Gooseberry
Ehretia cymosa	Du-Tsho, Murembu
Elaeis guineensis	African Oil Palm
Ensete ventricosum	Wild/Abyssinian Banana
Entada abyssinica	Tree Entanda
Entandrophragma bussei	Wooden Banana
Erythrina abyssinica	Coral Tree
Euclea divinorum	Magic Gwarra
Euphorbia friesiorum	Spurge
Euphorbia tirucalli	Pencil
Faidherbia albida	Apple-Ring Acacia
Ficus sur	
Ficus sycomorus	Sycamore Fig
Ficus thonningii	Common Wild Fig
Flacourtia indica	Indian plum
Garcinia buchananii	Garcinia buchananii
Garcinia livingstonei	Low Veld Mangosteen
Grewia bicolor	Bastard/False Brandy Bush, Two-Coloured Grewia
Hagenia abyssinica	African Rosewood, Kousso
Harungana spp.	Blood Tree, Orange-Milk Tree
Khaya nyasica	African Mahogany
Kigelia africana	
Landolphia Petersiana	
Lonchocarpus capassa	Rain Tree, Apple Leaf
Lovoa swynnertonii	Brown Mahogany
Lumnitzera racemosa	Black Mangrove
Maesa lanceolata	False Assegai
Maesopsis eminii	Umbrella Tree
Markhamia lutea	Minguani, Miahangua
Melia volkensii	
Myrianthus holstii	
Newtonia buchananii	Newtonia
Ocotea usambarensis	East African Camphor
Ocotea kenyensis	
Olea capensis	East African Olive Tree
Olea europaea	Olive
Olinia rochetiana	Kaavagariet
Ozoroa insignis	Tropical/African Resin Tree
Pavetta gardeniifolia	
Pentas longiflora	Pentas longiflora
Phoenix reclinata	Senegal Palm, Coffee Palm
Podocarpus falcatus	East African Yellow Wood
Polyscias fulva	Parasol
Populus ilicifolia	Tana River Poplar
Prunus africana	Iron Wood, Red Stinkwood

Scientific Name	Common Name (if different)
Prunus spp.	
Rhus vulgaris	Muthura
Rubus spp.	Rubus
Rumex usambarensis	Rumex
Salvadora persica	Toothbrush Tree
Sapium ellipticum	Jumping Seed Tree
Sesbania sesban	Common Sesban
Solanum aculeastrum	Bitter Apple
Spathodea campanulata	African Tulip Tree
Strychnos cocculoides	Monkey Orange
Strychnos henningsii	Walking Stick
Strychnos innocua	Monkey Orange
Symphonia globulifera	Symphonia globulifera
Syzygium cordatum	Water Berry
Syzygium guineense	Snake-Bean, Woodland Water Berry
Syzygium spp.	Syzygium
Teclea nobilis	
Terminalia brownii	mbarao
Toddalia asiatica	Forest Pepper
Trema orientalis	Pigeonwood
Trichilia emetica	Cape Mahogany
Vangueria apiculata	Wild Medlar
Vangueria infausta	Wild Medlar
Vangueria spp.	Wild Medlar
Vernonia amygdalina	Bitter Leaf
Vernonia brachycalyx	Ironweed
Warburgia ugandensis	East African Green Wood
Withania somnifera	Winter Cherry
Ximenia americana	Tallow wood, Sour Plum
Zanthoxylum chalybeum	
Zanthoxylum gillettii	East African Satinwood
Ziziphus mauritiana	Ber

Additionally, increasing the forested area in the project area improves biodiversity indirectly, by providing a sustainable supply of wood that reduces pressure on the natural forest. An Environmental Screening was submitted to the National Environment Management Authority (NEMA) of Government of Uganda, to assess the environmental conditions and biodiversity of the area and to assess positive and negative environmental impacts of TIST project activities in 2006. The assessment indicates that the project areas themselves are not areas rich in biodiversity. "The area where the TIST Program operates is deforested. According to researchers, "it is immediately apparent that in Kisoro, Kabale, Rukungiri, [Kanungu], Bushenyi and Kasese, no extensive areas of natural vegetation remain outside the main [Protected Areas]." However, some areas border areas rich in biodiversity. By providing fuel wood from sustainable wood lots and improving livelihoods, the project should have a positive effect on biodiversity. Promotion of Conservation Farming will further reduce pressure on forestland by increasing food productivity by, and consequently decreasing pressure for, land clearing for agriculture. Biodiversity is also enhanced directly through the planting of indigenous trees in homesteads and woodlots. Increases in tree biodiversity should also enhance diversity of associated species, including pollinators, and other beneficial species, while protection of riparian areas will improve water quality and provide other important ecosystem services.

Adaptation to climate change. Rapid climate change is impacting forests and the biodiversity found within forests. These impacts can include flooding, fires, drought, pestilence, and human encroachment. By creating access to forest products outside of old growth forests, the project is mitigating the pressure for human encroachment into forests, thereby rendering the forests more resilient to climatic threats. TIST project areas based near forests serve as part of an interconnected system helping to prevent landslides, erosion, and other impacts made worse by climate change.

TIST woodlots not only serve as buffer zones to forests, but also as connective corridors. Providing access between forests and protected areas is likely to increase the capacity for migratory and threatened animals to move from one location to another in response to climatic impacts.

The program further provides education and trainings on biodiversity and climate change related issues to local populations.¹⁷⁰ These trainings, indigenous trees, climate change adaptation benefits, and benefits to protected areas outweigh any potential impact of small numbers of eucalyptus trees and thus the project has net positive biodiversity impacts.

5.2.4 High Conservation Values Protected (B2.4)

The project will not have a negative effect on the HCV areas. The project areas are in the vicinity of HCVs and provide 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.

In addition, research has shown that the presence of TIST activities leads to a “leadership effect” in neighboring plots of land and woodland areas. A 2021 study claims, “Discussions with TIST farmers suggest that in areas with numerous TIST groves there can be benefits to local woodland as well as agricultural land...[t]his strong positive trend is noticeable within the borders of these woodland areas and is in addition to improvements in farmland due to the restorative activities of TIST farmers. This woodland greening trend serves as an additional environmental benefit to the positive trends seen in agricultural land adjacent to TIST sites. Woodland improvements are attributed to a reduction in human pressures on woodland for firewood and forage for animals. Other reasons given by farmers is the creation of woodland protection and education groups due to the increased environmental awareness promoted by TIST membership.”¹⁷¹

TIST’s impact greening landscapes is observable on areas of land over 800% greater than the size of TIST groves themselves. Considering this benefit, and the lack of negative impacts, project activity has had a positive effect on HCVs.

5.2.5 Species Used (B2.5)

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. The table below lists the species that may be planted in the project areas. Additional species may be added over the life of the project as additional planting takes place.

Scientific Name	Common name	Purpose/Value
Acacia mearnsii	Australian Acacia	wood products

¹⁷⁰ Exhibit 46: Cluster Meetings

¹⁷¹ <https://www.researchsquare.com/article/rs-334324/v1>, accessed March 29, 2021

Scientific Name	Common name	Purpose/Value
<i>Acacia polyacantha</i>	African Catechu Tree, White Thorn	medicinal
<i>Acrocarpus fraxinifolius</i>	Shingle Tree, Misspelled as Agricapacy	nitrogen fixing, shade
<i>Azalia quanzensis</i>	Lucky Bean	wood products
<i>Alangium salvifolium</i>	Sage-Leaf Alangium	holy tree
<i>Alstonia scholaris</i>	Indian Devil Tree	Ornamental
<i>Anacardium occidentale</i>	Cashew	fruit tree
<i>Aniba rosaeodora</i>	Brazilian rosewood	endangered hardwood
<i>Annona muricata</i>	Custard Apple	fruit tree
<i>Annona squamosa</i>	Custard Apple, Sugar Apple	fruit tree
<i>Artocarpus heterophyllus</i>	Jackfruit	fruit tree
<i>Azadirachta indica</i>	Neem	medicinal tree
<i>Azanza garckeana</i>	Snot Apple	fruit tree
<i>Bersama abyssinica</i>		medicinal, ornamental
<i>Bixa orellana</i>	Lipstick Tree	annatto seeds
<i>Blighia unijugata</i>	Triangle tops	shade tree
<i>Bombax ceiba</i>	Silk Cotton	Ornamental
<i>Bombax sp</i>	Silk Cotton	Ornamental
<i>Boscia mossambicensis</i>	Broad-Leafed Shephard's Tree	medicinal
<i>Brachychiton acerifolium</i>	Flame Tree	Ornamental
<i>Bridelia taitensis</i>	<i>Bridelia taitensis</i>	fuel, medicinal, fruit
<i>Callistemon spp.</i>	Bottlebrush	Ornamental
<i>Camellia sinensis</i>		tea
<i>Canavalia sp.</i>	<i>Canavalia</i>	useful legumes
<i>Carica papaya</i>	Papaya	fruit tree
<i>Casimiroa edulis</i>		fruit tree
<i>Casuarina equisetifolia</i>	<i>Casuarina</i>	firewood
<i>Casuarina junghuhniana</i>	Forest Oak	firewood
<i>Cedrela odorata</i>	Spanish Cedar	termite resistant
<i>Ceiba pentandra</i>	Kapok Tree	source of nectar
<i>Cinnamomum tamala</i>	Indian Bay Tree, Malobathrum	herb (malabathrum)
<i>Citrus aurantifolia</i>	Lime tree	fruit tree
<i>Citrus limonum</i>	Lemon	fruit tree
<i>Citrus medica</i>	Citron	fruit tree
<i>Citrus reticulata</i>	Tangerine, Mandarin Orange	fruit tree
<i>Citrus sinensis</i>	Orange	fruit tree
<i>Cocos nucifera</i>	Coconut Palm	fruit tree
<i>Coffea arabica</i>	Coffee Tree	fruit tree
<i>Cupressus spp.</i>	Cypress	well established
<i>Cyphomandra betacea</i>	Tree Tomato, Cape Tomato	fruit tree
<i>Dendrocalamus giganteus</i>	Giant bamboo	fast growing
<i>Endiandra glauca</i>		fruit tree
<i>Eriobotrya japonica</i>	Loquat, Japanese Plum	fruit tree
<i>Eucalyptus citriodora</i>	Eucalyptus	fast growing
<i>Eucalyptus grandis</i>	Flooded Gum	fast growing
<i>Eugenia caffra</i>	Mareru	medicinal tree
<i>Ficus elastica</i>	Rubber Fig	Ornamental
<i>Fraxinus berlandieriana</i>	Mexican Ash	fast growing long living
<i>Fraxinus pennsylvanica</i>	Green Ash	fast growing long living
<i>Gmelina arborea</i>	beechwood	drought tolerant
<i>Gravellea pteridifolia</i>	Fern-Leaved Silky Oak, Golden Tree	resistant to wood rot
<i>Grevillea robusta</i>	Grevillea, River Oak, Silk Oak	resistant to wood rot

Scientific Name	Common name	Purpose/Value
Jacaranda mimosifolia	Jacaranda	Ornamental
Jatropha curcas	Fig Nut, Castor Oil	fruit tree
Leucaena leucocephala	Leucaena	soil fertility, fodder
Macadamia spp.	Macadamia Nut	fruit tree
Mangifera indica	Mango	fruit tree
Melia azedarach	Chinaberry, Bead Tree	fodder
Morinda tinctoria	Indian Mulberry, Nuna	Ornamental
Moringa oleifera	Drumstick, Moringa	herbal and edible seeds
Morus alba	Indian Mulberry	fruit tree
Morus nigra	Black Mulberry	fruit tree
Morus spp.	Mulberry	fruit tree
Musa spp.	Bananito, Siam Ruby	fruit tree
Parkinsonia aculeata		drought tolerant
Persea americana	Avacado	fruit tree
Philenoptera violacea	Apple Leaf	wood products, medicinal
Phoenix dactylifera	Date palm	fruit tree
Phyllanthus emblica	Nelli	fruit tree
Pinus Patula	Patula pine	popular tree
Pinus spp.		popular tree
Pithecelobium dulce	Blackbead Tree, Madras Thorn	drought tolerant
Pongamia pinnata	Indian Beech Tree	shade, windbreak, medicinal
Pouteria sapota	Sapota	fruit tree
Prunus dulcis	Almond	fruit tree
Prunus persica	Peach	fruit tree
Prunus spp.		fruit tree
Psidium guajava	Guava	fruit tree
Pterocarpus santalinus	Red Sandalwood	exotic wood
Pterocarpus spp.	Red Sandalwood	exotic wood
Punica granatum	Pomaganate	fruit tree
Rapanea melanophloeos	Cape Beech	bird eat the berries
Salacia madagascariensis	Salacia madagascariensis	edible seeds
Santalum album	Sandlewood	essential oils
Schinus molle	Pepper tree	fruit tree
Sclerocarya birrea subsp. caffra	Marula	fruit tree
Senna septemtrionalis	arsenic bush	medicinal tree
Senna siamea	Kassod	shade tree
Senna spectabilis	Yellow Shower	Ornamental
Sesbania grandiflora	Corkwood tree	medicinal, edible leaves
Spirostachys africana	Tamboti, Cape Sandalwood	exotic wood
Swietenia mahagoni		exotic wood
Syzygium cumini	Java Plum	fruit tree
Tecoma stans	Yellow Elder	fodder, ornamental
Tectona grandis	Teak	valuable hardwood
Thespesia populnea	Portia	exotic wood, ornamental
Toona ciliata	Red Cedar	fast growing shade tree
Trigonella foenum-graecum	Fenugreek	semiarid crop
Unknown	Unknown	na
Uvaria acuminata	Mganda simba	fruit, medicinal
Vitex keniensis	Meru Oak, muutu	endangered

Others could be added to this list.

5.2.6 Invasive Species (B2.5)

All listed species have been screened against the global database of invasive species.¹⁷² None of the species above are included as invasive species in Uganda.

The only tree species with a known adverse effect is eucalyptus. Eucalyptus trees can overconsume water, negatively impacting waterways. In order to reduce the number of eucalyptus trees, TIST has trained farmers about the negative impacts of eucalyptus trees. Further discussion of eucalyptus can be found in section 5.2.7.

A table of all non-native species used, as well as justification for their selection, can be found in Appendix 04.¹⁷³ Ultimately, TIST farmers choose these species based on their knowledge of what trees will provide the maximum benefits.

5.2.7 Impacts of Non-native Species (B2.6)

As stated in 5.2.4, 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 Uganda since its introduction in 1912, for its fast growth, is known to set deep roots that may deplete water resources without sustainable management. Eucalyptus is very common in many parts of the country and is promoted by the Ugandan government.

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. Trainers grow indigenous tree seedlings, including stinkwood, in their nurseries, to increase awareness and access for TIST members.

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 pine, eucalyptus and cypress, 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 developed to substitute natural forest being lost through deforestation. Uganda National Forestry Authority promotes pine and eucalyptus for their fast growth to conserve biodiversity, since cultivated wood can replace indigenous species otherwise harvested for fuelwood degrading natural forests. No fast-growing indigenous alternatives have been identified. Another, *Acacia mearnsii*, though listed as invasive some places, is considered an agro-forestry tree by Uganda Forest Service, with “no invasive tendencies.”¹⁷⁴

5.2.8 GMO Exclusion (B2.7)

¹⁷² GLOBAL INVASIVE SPECIES DATABASE.” *GISD*, www.iucngisd.org/gisd/, Accessed 11 February 10, 2020,

¹⁷³ Appendix 04 Validation Data: “Species List” worksheet

¹⁷⁴ Exhibit 31 *Acacia mearnsii*

TIST guarantees that no GMOs will be used by the project to generate GHG emissions reductions or removals. TIST does not supply seedlings but instead trains farmers to grow their own seedling from local seed. To our knowledge no GMOs are used in the region. If TIST learns of GMO use, those trees will be removed from the project so that it can maintain its guarantee that no GMOs are used to generate GHG emissions reductions or removals.

5.2.9 Inputs Justification (B2.8)

Not applicable. TIST's policy is for farmers not to use fertilizers, chemical pesticides or biological control agents. The program seeks to enforce this policy by training farmer not to use these treatments and by not supplying them. Use of chemical treatments is rare in the area because the cost is disproportionately high for subsistence farmers and are not readily available. Also, as subsistence farmers, their most valuable products are food such as grains, beans and vegetables. If they were going to buy and use chemicals, this would be their priority and is outside the scope of the project. Instead TIST provides training to use natural alternatives that are free, such as dung and fodder. With thousands of farmers and discrete PAs, we cannot ensure 100% compliance with this treatment policy but we have not seen any indication that they are being used either for the project or for non-project related agriculture. The VVB visited random farms and saw no evidence of their use or their presence. If there is any use of chemical treatments, it is di minimis.

5.2.10 Waste Products (B2.9)

Project design mitigates the creation of waste products. TIST does not distribute seeds or seedlings. The project trains farmers to replace chemical fertilizers with organic compost fertilizers. The project does not distribute any materials into project areas. Farmers use materials readily available to them.

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Measures (B3.2)

No negative offsite biodiversity impacts are expected. As pointed out in Section 3.2.3, evidence that there has not been any displacement of members has been provided in the form of a survey of the landowners 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 will have a beneficial effect on area deforestation; instead of causing it, it will ameliorate it.

No mitigation measures are applicable, since no negative offsite biodiversity impacts are expected.

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

No negative offsite biodiversity impacts are anticipated. Therefore, the net effect of the project on biodiversity is positive.

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

TIST has been operation in Uganda since 2003 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 2.3.1, 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 will be 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 will 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 will populate the website. Annual monitoring of each site is expected, and a minimum of every two years should be achieved.

At a landscape level, we will 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 indigenous trees to help preserve the area and reduce erosion caused by runoff and flooding will 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. There are 2,821 hectares of new forest (active) hectares¹⁷⁵ and a total of 3,876 initial (active) or planned project areas. The location and perimeter of each project area are presented in Appendix 03. Though TIST will continue to add project areas, the project areas in this PD will be fixed for the life of the project.

The following indicators will be used to assess gold level biodiversity benefits:

1. Number of indigenous trees
2. Hectares of indigenous trees
3. Number of trees planted
4. Endangered/Vulnerable/Threatened Species planted
5. HCV's impacted

Some of these benefits are intersectional and are thus also used in the community benefits analysis.

HCVs and Biodiversity Adaptation. The protection of HCVs and the support of biodiversity are intrinsically linked. The biodiversity monitoring plan described above includes the monitoring of project areas located nearby to HCVs. The benefits these woodlots provide as buffer zones and wildlife corridors are monitored through regular visits and measurements of these woodlots. Location of these woodlots and proximity to both HCVs and other woodlots support monitoring of the creation of buffer zones and corridors. These buffer zones and corridors will both buttress HCVs themselves and provide opportunities for animals to adapt to changing climatic impacts.

In addition, TIST trains farmers on the impacts of tree planting and biodiversity. A more knowledgeable and engaged public will incorporate biodiversity concerns into their decision-making process and actions.

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

This information is included in the process described in Section 2.3.1.

¹⁷⁵ Appendix 08 Monitoring Data, "PA Summary" worksheet, Cell AG4499.

The data monitoring process is communicated to farmer prior to the entry into the program. As part of this entry, they agree to allow TIST representatives to come and collect data on their farm. This information is collected and made publicly available on the TIST website. Directions to this website are included on newsletters distributed at Cluster meetings. Prior to validation and verification, TIST announced a summary of results of the monitoring plan in a monthly newsletter. This summary was disseminated in 6 languages: English, Runyankore, Ateso, Luganda, Luo, and Kiswahili.¹⁷⁶

5.5 Optional Criterion: Exceptional Biodiversity Benefits

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

The presence and status of species on the IUCN Red List that are found in the project zone is listed in Section 2.1.5.

TIST has a direct impact on the *Prunus Africanus* (Red Stinkwood), *Cedrela Odorata* (Spanish Cedar), and *Jacaranda Mimosifolia* (Blue Jacaranda), all vulnerable species. Due to the presence of “at least 30 individuals or 10 pairs of a vulnerable species” the project has a high biodiversity conservation priority status. Collectively, 4.49 hectares meet this definition and there a total of 4.7 hectares of these species.¹⁷⁷

5.5.2 Trigger Species Population Trends (GL3.2, GL3.3)

Trigger Species	Prunus Africana (Red Stinkwood)
Population Trend at Start of Project	IUCN assessed the habitat as degrading but does not have adequate information on the prunus Africana population
Without-project Scenario	As with the baseline scenario in 3.1.4, the without project scenario is likely the baseline scenario
With-project Scenario	TIST farmers have planted and maintain 1,423 Prunus Africana, a clear, direct benefit to the species. As discussed, TIST operations also mitigate some of the pressures of deforestation. ¹⁷⁸

Trigger Species	Cedrela Odorata (Spanish Cedar)
Population Trend at Start of Project	IUCN assesses the population trend as decreasing
Without-project Scenario	As with the baseline scenario in 3.1.4, the without project scenario is likely the baseline scenario

¹⁷⁶ <http://www.tist.org/i2/docs/NL/2020.11.November.UG%20Newsletter.pdf>

¹⁷⁷ Appendix 04, Strata worksheet

¹⁷⁸ Lovett, J. & Clarke, G.P. 1998. *Zanthoxylum holtzianum*. *The IUCN Red List of Threatened Species* 1998:

e.T34693A9879129. <https://dx.doi.org/10.2305/IUCN.UK.1998.RLTS.T34693A9879129.en>. accessed on 12 February 2020.

With-project Scenario	TIST farmers have planted and maintain 29 <i>Cedrela Odorata</i> , a clear, direct benefit to the species. As discussed, TIST operations also mitigate some of the pressures of deforestation. ¹⁷⁹
Trigger Species	Jacaranda Mimosifolia (Blue Jacaranda)
Population Trend at Start of Project	IUCN assesses the population trend as decreasing
Without-project Scenario	As with the baseline scenario in 3.1.4, the without project scenario is likely the baseline scenario
With-project Scenario	TIST farmers have planted and maintain 11 <i>Jacaranda Mimosifolia</i> , a clear, direct benefit to the species. As discussed, TIST operations also mitigate some of the pressures of deforestation. ¹⁸⁰

¹⁷⁹ Mark, J. & Rivers, M.C. 2017. *Cedrela odorata*. *The IUCN Red List of Threatened Species* 2017: e.T32292A68080590. <https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T32292A68080590.en>. accessed on 29 March 2021.

¹⁸⁰ Hills, R. 2020. *Jacaranda mimosifolia*. *The IUCN Red List of Threatened Species* 2020: e.T32027A68135641. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T32027A68135641.en>. accessed on 29 March 2021.

Additional Information

All Appendices and Exhibits are at <https://www.tist.org/PD-UG-VCS-011%20Documents.php>

Appendix 01: Landsat1990 Examples

Appendix 02: Landsat2000 Examples

Appendix 03: KML Files of Project Areas

Appendix 04: Validation Worksheet

Appendix 05: KML File of Uganda (Project Zone)

Appendix 08: Monitoring Data

Exhibit 01: Environmental Screening

Exhibit 02: NEMA EA Approval

Exhibit 03 and 4: GHG Contracts

Exhibit 09: Financial info

Exhibit 12: UG Pests and Disease

Exhibit 13: "TIST Dist Enviro Profile National Environment Management Authority (NEMA), District Environment Profiles: Bushenyi"

Exhibit 14: Public Comments

Exhibit 15: Quantifier Safety

Exhibit 16: TIST UG Employee Rights

Exhibit 20: "TIST Dist Enviro Profile National Environment Management Authority (NEMA), District Environment Profiles: Kabale"

Exhibit 22: Benefit Survey Results

Exhibit 26: World Agroforestry Pinus Patula

Exhibit 27: World Agroforestry Eucalyptus Grandis

Exhibit 28: Uganda NFA Pinus Patula

Exhibit 31: TIST Acacia mearnsi

Exhibit 33: Grievance Policy

Exhibit 34: Sexual Harassment Policy

Exhibit 35: Non-Discrimination Policy

Exhibit 36: TIST Intro FAQ

Exhibit 37: TIST SG Eligibility Requirements

Exhibit 38: TIST SG Membership Application

Exhibit 39: TIST Values

Exhibit 40: Quantifier Manual 190613

Exhibit 41: Brown Allometric

Exhibit 42: Android Forms SOP

Exhibit 46: Uganda Cluster Meetings

Exhibit 47: Theory of Change

Exhibit 48: Ethnic Groups of Uganda

Exhibit 50: GPG Annex 3A.1 Tables.pdf

Exhibit 51: IPCC 2006 AFOLU Annex 4A.2.pdf

Exhibit 53: UG Newsletter Index

Exhibit 54: Cluster Meetings Checklist

Exhibit 55: UG Seminar Notes

Exhibit 56: TIST Phase II Report 030403

Exhibit 57: UG Stakeholder Notices