

PROJECT DESCRIPTION FOR TIST PROGRAM IN KENYA VCS-006, CCB RE-VALIDATION



Document Prepared By Clean Air Action Corporation

Project Title	TIST Program in Kenya, VCS-006
Version	Version 03
Date of Issue	12 March 2021
Project Location	Kenya: Mt Kenya, Upper Mara River, Laikipia
Project Proponent(s)	Clean Air Action Corporation 250 Old Harbor Rd, Vinalhaven, ME 04863 Telephone 720-394-2112 CharlieWilliams@CleanAirAction.com Tist.org
Validation Body	AENOR Internacional, S.A.U. Jose Luis Fuentes Perez Génova, 6. 28004 MADRID, SPAIN Telephone: (+34) 915 294 961 jfuentes@aenor.com www.aenor.com
Project Lifetime	60 years starting 01-January-2004 and ending 31-December-2063
GHG Accounting Period	30 years starting 01-January-2004 and ending 31-December-2033
History of CCB Status	Validated as KE-CCB-003 (Second Edition): 27-September-2012 First Verification as KE-CCB-003 (Second Edition): 01-January-2004 to 29-June-2012. Verification report dated 05-October-2012. Second Verification as KE-CCB-003 (Second Edition): 30-June-12 to 31-December-2013. Verification report dated 24-September-2014. Re-Validation as KE-VCS-006 (Third Edition): This document. Name

Gold Level Criteria	changed to use the combined CCB/VCS template and due to upgrading to Third Edition. Third Verification as KE-VCS-006 (Third Edition): 01-January-2014 through 05-January-2021. Pending. Name changed to use the combined CCB/VCS template. The edition was changed due to re-validation.
	Climate Change Adaptation Benefits 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. Exceptional Community Benefits 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 Exceptional Biodiversity Benefits The project will plant thousands of indigenous trees while supporting critical ecosystems.
	Expected Verification Schedule 31 May 2021

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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefit

Outcome or Impact Estimated by the End of Project Lifetime	Section Reference
1) Carbon payments to all TIST KE members. Farmers receive a cash stipend for their living trees and 70% of the profits from carbon sales.	4.4.1
2) Members in PD. TIST members in this PD received free training and encouragement in many sustainable development topics that are beneficial to their live.	4.4.1
3) Monetized benefits to the average (generally poor) TIST member. The training and encouragement have an economic value that can be monetized, including higher crop yield, sale of fruits and nuts and sustainable fuel.	4.4.1
4) Monetized benefits to the average vulnerable TIST member. The program is designed to provide a positive economic impact to the poorest and most vulnerable members.	4.4.1
5) Monetized benefits to the average female TIST member. The program is designed to provide a positive economic impact to women.	4.4.1

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	7 million tonnes	3.2.2
	Net estimated emission reductions in the project area, measured against the without-project scenario	not applicable	
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	
	For ARR ³ projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	6,049 ha	5.2.1
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	
	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	6,049 ha	5.2.1
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	27,561	4.2.1
	Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	11,811	4.2.1

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
Employment	Total number of people expected to be employed in project activities, ⁵ expressed as number of full-time employees ⁶	74	2.3.15
	Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	40	2.3.15
Livelihoods	Total number of people expected to have improved livelihoods ⁷ or income generated as a result of project activities	27,561	4.2.1
	Number of women expected to have improved livelihoods or income generated as a result of project activities	11,822	4.2.1
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	not applicable	
	Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	not applicable	
Education	Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	not applicable	
	Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	not applicable	

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
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	
	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	
Well-being	Total number of community members whose well-being ⁸ is expected to improve as a result of project activities	27,561	4.2.1
	Number of women whose well-being is expected to improve as a result of project activities	11,822	4.2.1
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	6,049	5.2.1
	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	Farmers are planting thousands of the endangered <i>Vitex keniensis</i> (Meru Oak)	5.5.2

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

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 Project Proponent (G1.1)

Organization name	Clean Air Action Corporation (CAAC)
Contact person	Charles E. Williams
Title	Vice President
Address	Clean Air Action Corporation (CAAC) 250 Old Harbor Rd, Vinalhaven, ME 04863
Telephone	Telephone 720-394-2112
Email	CharlieWilliams@CleanAirAction.com

2.1.2 Project Objectives (G1.2)

The climate, community and biodiversity objectives of TIST are to:

- increase biomass and carbon sequestered in Project Areas (climate)
- provide a new source of revenue to the members from the sale of carbon credits (community)
- provide training in important social and health related subjects (community)
- provide training in climate change adaptation (climate)
- improve the biodiversity of the area by adding canopy and indigenous trees (biodiversity).

2.1.3 Physical Parameters (G1.3)

Topography: As a re-validated PD, this is an existing grouped project with over 14,000 established instances. As will be noted in 2.1.5, below, the project zone was defined as the entire country of Kenya to facilitate inclusion of thousands of subsistence farmers. A general description of the topography of Kenya focuses on Mount Kenya, the Aberdares, Mt Elgon, and the Rift Valley. The topography of each PA is summarized in Appendix 04.¹²

Watersheds: Lake Victoria, Rift Valley, Athi River, Tana River and Ewaso Ngiro basins form the five water basins of Kenya. The geography of the Rift Valley influences water flows across Kenya, forming a drainage system westward towards Lake Victoria and eastwards to the Indian Ocean. Two of these basins, Lake Victoria and the Tana River have water surpluses, and the rest feature deficits. Groundwater around Mount Kenya is oftentimes highly mineralized, making irrigation

¹² Appendix 04, Validation Data: TIST KE PD-VCS-006e App04 Data 120824 Group.xlsx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

difficult. Generally, there is a water shortage in the country.¹³ This has been made worse by recent droughts.

Hydrology: The area south of a line running northeast from Mt Kenya to beyond Meru is drained by the Tana River. Its tributaries include the Gathita, Thingithu, Kithinu, Nithi, Tungu, Ruguti, Thuci, Rupingazi, Nyamindi, Thiba, Rwamuthambim Ragati, Sagana, and Nairobi Rivers. The area north and west of Mt Kenya is drained by the Ewaso Nyiro. Its tributaries include the Naromoro, Burguret, Liki, Sirimon and Engare Ngare Rivers.

Soils: The Nanyuki area is characterized by tertiary volcanic rocks. In Meru, the rocks are quaternary volcanics, with pockets of basement rocks to the east and tertiary volcanics to the south. The grasslands with low rainfall have dark top horizons and high proportions of clay minerals. The main soil types are Phaeozems, Planosols and Vertisols. On the lower slopes of Mt Kenya, where there is plentiful rainfall, the soils are red, with considerable amounts of clay and organic matter. The main soil groups are Nitisols, Cambisols and Andosols. The upper slopes of Mt Kenya (above 2,400) have dark surface horizons and low bulk density. They are also rich in organic matter and are mainly formed from young pyroclastic rocks. These soils include Regosols, Histosols and Andosols.¹⁴ To the west, the Lake Victoria Basin to Mount Elgon features lava deposits and fertile volcanic soils. Coastal Kenya, near Mombasa, has sandy soils. Whether fertile or sandy, Kenyan soils are vulnerable to erosion and degradation due to deforestation and land use changes.¹⁵ The color and character of the soils in each PA are in Appendix 04.

Climate: The general climate of central Kenya is dry tropical but influenced by the 5,200-meter Mount Kenya. The climate within the general project area is highly heterogeneous, with local conditions being heavily contingent upon elevation, location, and amount of rainfall. The average annual rainfall varies widely by locality but is roughly around 630mm per year for the entire country. Rainfall can be less than 200mm in the arid Rift valley, in the northern-western part of the country, to more than 1,800 mm per year on the south-eastern slopes of Mt Kenya, with high amounts of precipitation south-west of Mt Kenya, near Lake Victoria. Northeast of Mt Kenya there is an intermediate amount of rainfall, with a pattern of increasing precipitation going south toward the coast. Most parts of the country experience two wet seasons each year, with long rains from March-May and short rains from October-December. The dry season occurs around June-July and December-January.¹⁶

Temperature averages and variability change based on geography and time of year. In the Lake Victoria basin, averages range between 27-32 degrees. In the Rift Valley, these ranges are between 16 and 29 degrees, with the highland areas featuring more moderate climates. Tall

¹³ "Kenya Country Paper Wetland Classification for Agricultural Development in Eastern and Southern Africa." *Wetland Characterization and Classification for Sustainable Agricultural Development Table of Contents*, FAO, www.fao.org/3/x6611e/x6611e02a.htm. [accessed December 4, 2019](#)

¹⁴ Exhibit 11 "NAREDA Consultants, Environmental Audit Report For TIST Project Activities, Final Report, April 2010." Page 16-20

¹⁵ Ntarangwi, Mwenda, et al. "Kenya- History, Map, Flag, Climate." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 5 Feb. 2020, www.britannica.com/place/Kenya, [accessed December 4, 2019](#)

¹⁶ "Kenya." *Système D'information De La FAO Sur L'eau Et L'agriculture*, Aquastat, 2015, www.fao.org/nr/water/aquastat/countries_regions/KEN/printfra1.stm, accessed February 10, 2020

mountains form their own climates, including Mt. Kenya. Coastal areas are generally warm (27 degrees or higher) and humid.¹⁷

Ecosystems and Vegetation: The project areas which are located on the slopes of Mt Kenya and on the northeast trending highlands that pass through Meru and include the Nyambeni Hills, as well as isolated mountain ranges both east and west of the Rift Valley, are in the East African montane forest.¹⁸ In the Rift Valley, as well as the area immediately east, southeast, and northwest of Mt Kenya, including Nanyuki and Naro Moru, are part of the Northern Acacia-Commiphora bushlands and thickets.¹⁹ Upper reaches of mountains such as Mount Kenya are classified as “Upper Moorland Zone”.²⁰ The area immediately around Lake Turkana, as well as the area to the east and southeast is Masai xeric grasslands and shrublands.²¹ All of the land east of the Masai xeric grasslands and shrublands and East African montane forest (except for coastal regions) is classified as Somali Acacia-Commiphora bushlands and thickets.²² The coast is made up of two ecosystems, Northern Zanzibar- Inhambane coastal forest mosaic covering the majority of the coast line.²³ The East African mangroves ecosystem is dispersed along much of the coast, but does not reach as far inland as the former.²⁴ With the exception of some protected forests, little of the general area that surrounds the project areas is in a natural state. This is due to high level of human activity, primarily for habitation and subsistence agriculture. The baseline land use is shown on Appendix 04.

2.1.4 Social Parameters (G1.3)

Main Settlements: Nairobi is the largest city in Kenya and seat of government power. Major settlements near TIST operations include Meru, Nanyuki, Nakuru, and Embu. The villages associated with each PA are in Appendix 04.

Main Land use: Subsistence farming

Economic Activities: Subsistence farming

¹⁷ Ominde, Simeon Hongo, and Mwenda Ntarangwi. “Kenya-Climate.” *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., 5 Feb. 2020, www.britannica.com/place/Kenya/Climate, accessed December 4, 2019

¹⁸ Schipper, Jan. “Eastern Africa: Southern Sudan, Central Kenya, Int.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at0108, accessed December 4, 2019

¹⁹ Rowen, Mary. “Northeastern Africa: Sudan, Ethiopia, Uganda, and Kenya.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at0711, accessed December 4, 2019

²⁰ Bussmann, Rainer, “Vegetation zonation and nomenclature of African Mountains - An overview.” *Lyonia*, A Journal of Ecology and Application <http://lib.icimod.org/record/12220/files/908.pdf>, accessed December 4, 2019

²¹ Magin, Chris. “Masai Xeric Grasslands and Shrublands.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at1313, accessed December 4, 2019

²² Magin, Chris. “Eastern Africa: Eritrea, Ethiopia, Kenya, Somalia, and Sudan.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at0715, accessed December 4, 2019

²³ Schipper, Jan. “Eastern Africa: Coastal Areas of Kenya, Somalia, and Tanzania.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at0125, accessed December 4, 2019

²⁴ Tognetti, Sylvia. “East African Mangroves.” *WWF*, World Wildlife Fund, www.worldwildlife.org/ecoregions/at1402, accessed December 4, 2019

Ethnic groups: The main ethnic groups found in Kenya are Kikuyu, Luo, Luhya, Kamba and Kalenjin, collectively accounting for 70% of the population. In Central Kenya the Kikuyu and Kimeru groups are prevalent.²⁵

Other Socio-cultural information: General land ownership is addressed in section 2.5.1 and the ownership of each PA is addressed in Appendix 04. A fuller description of the community follows based on a survey of 416 households in the Meru and Nanyuki project areas. The gender breakdown was 206 (49.5%) males and 210 (50.5%) females. See Table 2.1.4a.

2.1.4a: Distribution of respondents by Gender and the Project Areas

Gender	Total Sample		Meru Project area Sample		Nanyuki Project area Sample	
	Freq.	%	Freq.	%	Freq.	%
Male	206	49.5	123	48.6	83	50.9
Female	210	50.5	130	51.4	80	49.1
Total	416	100	253	100	163	100

The sample shows that young, middle age and elderly respondents were included, although more households in relative young age categories (31 to 45) were interviewed, as compared to other age brackets as indicated in Table 2.1.4b.

2.1.4b: Age Distribution of Household Respondents

Age categories (Years)	Total Sample		Meru Project area Sample		Nanyuki Project area Sample	
	Freq.	%	Freq.	%	Freq.	%
21 to 30	56	13.5	43	17.0	13	8.0
31 to 45	156	37.5	96	37.9	60	36.8
46 to 60	125	30.0	80	31.6	45	27.6
Over 60	79	19.0	34	13.4	45	27.6
Total	416	100	253	100	163	100.0

The majority of the households sampled (88.9%) are married, which is an indication of the household typologies over the project areas. A combined household of the unmarried, of the widowed couples and those separated or divorced represents slightly over 10 percent of the entire households as contained in Table 2.1.4c.

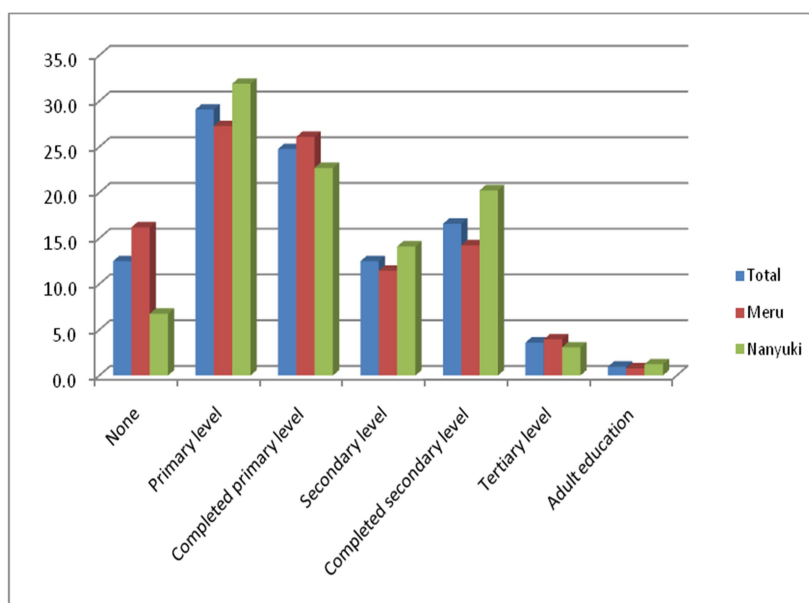
²⁵“Kenya Ethnic Groups,” *African Studies Center*, University of Pennsylvania, <https://www.africa.upenn.edu/NEH/kethnic.htm#:~:text=While%20no%20ethnic%20group%20constitutes,i ts%2032%20major%20indigenous%20groups>. Accessed February 15, 2021

2.1.4c: Marital Status of Households Sampled

Marital Status	Total Sample		Meru Project area Sample		Nanyuki Project area Sample	
	Freq.	%	Freq.	%	Freq.	%
single	19	4.6	10	4.0	9	5.5
Married	370	88.9	229	90.5	141	86.5
Widow/widower	20	4.8	13	5.1	7	4.3
Separated/divorced	7	1.7	1	0.4	6	3.7
	416	100	253	100	163	100

As can be observed in 2.1.4d, the project area's illiteracy levels stand at 12.5 percent. Nanyuki area has less illiteracy level (6.7%) and has a generally higher number of respondents who have secondary education, which is the ordinary education level in Kenya.

2.1.4d: Education Status of the Respondents



Farming is the main occupation of the respondents. Other insignificant livelihood activities are casual labor, employment, business and reliance on pension as presented in Table 2.1.4e.

2.1.4e: Occupational Status

Occupational Status	Total Sample		Meru Project area Sample		Nanyuki Project area Sample	
	Freq.	%	Freq.	%	Freq.	%
Farmer	379	91.1	232	91.7	147	90.2
Casual Labour	2	0.5	1	0.4	1	0.6
Formal employment	14	3.4	10	4.0	4	2.5
Business	14	3.4	6	2.4	8	4.9
Informal employment	6	1.4	4	1.6	2	1.2
Pension	1	0.2			1	0.6

Total	416	100	253	100	163	100
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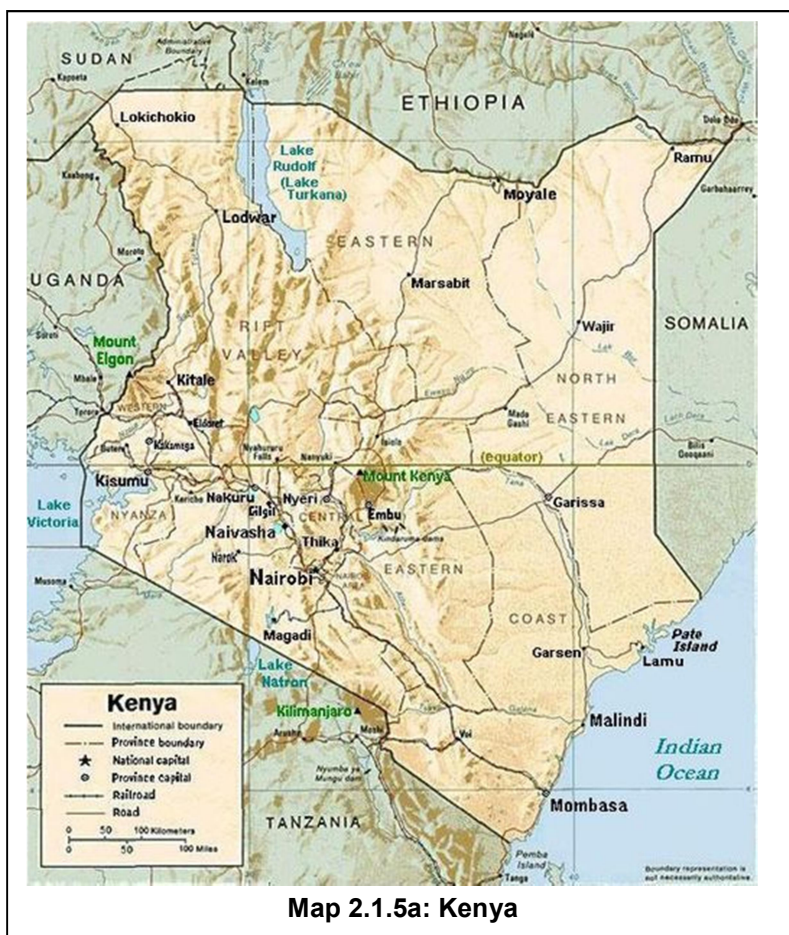
The people that live in the project zone are mostly subsistence farmers. Average annual income is shown in Table 2.1.4f and is based on community data developed by the Kenya Ministry of Agriculture in Meru East and West Divisions, using Participatory Analysis of Poverty and Livelihood Dynamic (PAPOLD).

2.1.4f: Annual Income Brackets

Income Level (Ksh)		Income Level US\$		Pct of Groups
Min	Max	Min	Max	
0	12,000	\$0	\$160	5%
12,000	60,000	\$160	\$800	40%
60,000	180,000	\$800	\$2,400	25%
180,000	300,000	\$2,400	\$4,000	15%
300,000	420,000	\$4,000	\$5,600	10%
420,000	above	\$5,600	above	5%

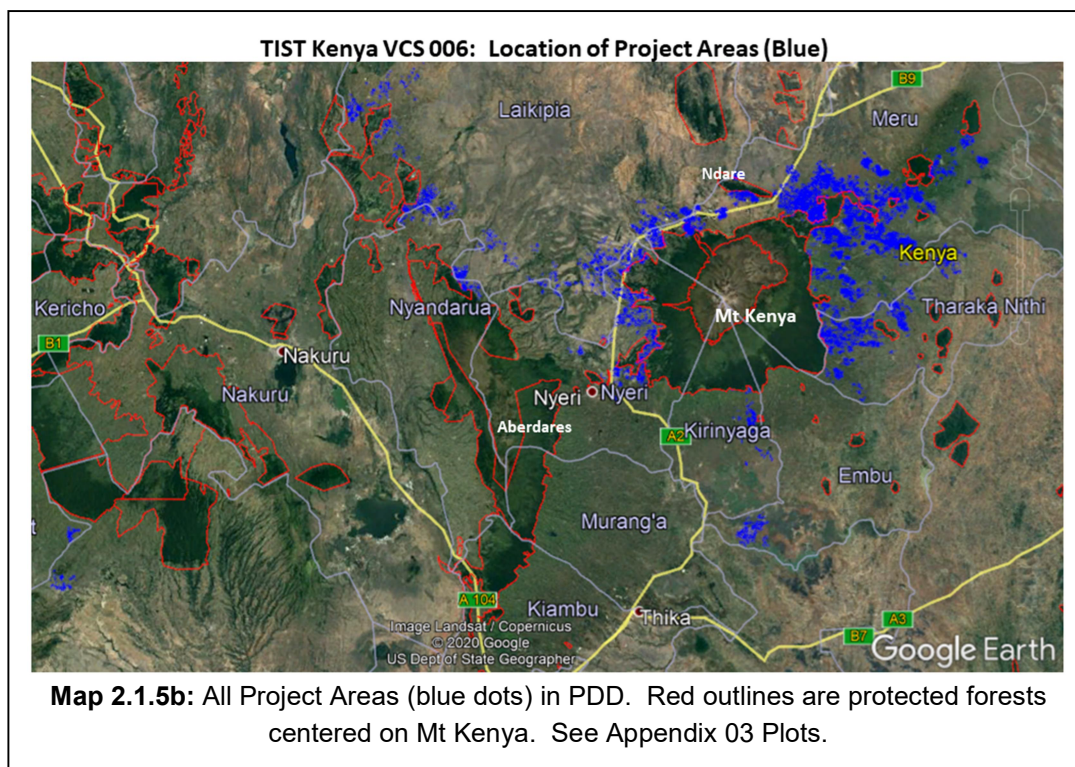
2.1.5 Project Zone Map (G1.4-7, G1.13, CM1.2, B1.2)

The Project Zone was defined in the original PD as the entire country of Kenya to allow for inclusion of as many areas and subsistence farmers into the program. It remains defined as



such.

As of this re-validation there are 14,704 project areas covering 6,049 ha (Map2.1.5b). The PAs of this PD are located in central Kenya in the vicinity of Meru and Nanyuki. The individual Project Areas, their location and their boundaries are presented in Appendix 03, the KML files.²⁶ In addition, a latitude and longitude for each project area is indicated on the monitoring spreadsheets, Appendix 14.²⁷



Mt Kenya and Aberdares have High Conservation Values (red outline on Map 2.1.5b). They are discussed in Section 4.1.3, below.

The entire project zone is predicted to have climate impacts (see Section 3.5, below).

The areas where stakeholders may be impacted are located around the PAs. The general areas are the blue dots on Map 2.1.5b. The specific location are on the KML files (Appendix 03).

²⁶ Appendix 03 PA Plots: TIST KE PD-VCS-006d App03a PA Plots 210105.kml, TIST KE PD-VCS-006d App03b PA Plots 210105.kml and TIST KE PD-VCS-006d App03c PA Plots 210105.kml at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

²⁷ Appendix 14 Monitoring Data V3: TIST KE PD-VCS-006o App14a Verif 03 Monitor Data 210105.xlsx, TIST KE PD-VCS-006o App14b Verif 03 Monitor Data 210105.xlsx and TIST KE PD-VCS-006o App14c Verif 03 Monitor Data 210105.xlsx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

Areas where offsite biodiversity impacts are predicted are the areas located in the vicinity of the PAs (Map 2.1.5b). Additionally, to the extent that the PAs act as stepping stones and corridors for wildlife, it can include the entire country (Map 2.1.5a).

2.1.6 Stakeholder Identification (G1.5)

The stakeholders are primarily the 27,561 individual members that comprise the 3,582 Small Groups of this project as of the re-validation. They are primarily subsistence farmers. They own, or have rights, to the lands where the project activities take place and own the trees and tree products that are the focus of the climate change portion of the project. Members hear about the program and ask to join. TIST holds regular meetings at the Small Group and Cluster level to maintain communications among the members.

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

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

The first TIST seminar of TIST Kenya was held in Nanyuki from February 21, 2005 to February 26, 2005. The seminar began with the process of customizing TIST to the desires and needs of farmers in the Meru and Nanyuki areas. Seventy-three people attended, 40 men and 33 women. A second training seminar was held April 11, 2005 to April 14, 2005 at the Gitoro Conference Centre in Meru. Seventy-five people attended, 39 men and 36 women.

In February 2005, the first “Mazingira Bora” was published and circulated within the communities to TIST members and those interested in the program. Since that time, TIST has published regular newsletters that document an ongoing dialogue and support with members of the community, both inside and outside the program. These documents are available to the public in a transparent form on the internet at [tist.org](http://www.tist.org).²⁸ TIST also has a collection of written stakeholder comments (see PDD).

At the Cluster 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. Changes to the program are announced in the newsletter.

²⁸ <http://www.tist.org/moreinfo.php>

The result of this stakeholder process has led to numerous invitations for TIST to come to new villages and numerous positive comments about TIST.

Other stakeholders are NGOs and government entities we have identified from their activities in the Project Zone. TIST has been active in Kenya since 2004, has seven VCS PDs (including this one) and four CCB PDDs (including this one). TIST had held numerous public meetings that we announced in several Kenya national newspapers. We have collected the names of interested stakeholders in the multiple versions of Exhibit 14 (a-j).

2.1.7 Stakeholder Descriptions (G1.6, G1.13)

The most recent list of communities, Small Groups and Clusters is provided on the PA Summary work sheet of Appendix 14, the monitoring report for the third and current verification. These define the TIST community for this PD. Participating farmers are the primary stakeholders. According to program surveys, TIST participants are largely subsistence farmers, many of whom are living far below national and international definitions of poverty. TIST farmers are a diverse group spanning many different ethnic and geographic backgrounds. Most TIST participants are ethnically Meru or Kikuyu. The most common languages spoken are English, Kimeru, Kikuyu, Kiswahili, Kikamba, Kipsigis. Most of the farmers in this project are centered around the Mount Kenya area in the Great Rift Valley. Vulnerable TIST members are included in this description.

When a farmer, or Small Group, decides to join they begin the application and registration process. It involves training, application, site visit and grove baseline, signing the GHG contract, and registration.

The interested farmer needs to attend a Cluster meeting. The Cluster representative will explain TIST eligibility requirements and what the TIST program is about. The farmers should then form a Small Group and the group should attend the next Cluster meeting. SGs should attend at least two TIST Cluster meetings, before receiving a TIST Application Packet.

The Application Packet includes these materials:

- Introduction to TIST²⁹
- TIST Values³⁰
- TIST Eligibility Requirements³¹
- GHG Contract³²
- TIST Small Group Application³³

²⁹ Exhibit 36 TIST FAQ: TIST KE PD-VCS-Ex36 TIST Intro FAQ 161001.docx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³⁰ Exhibit 39 TIST Values: TIST KE PD-VCS-Ex39 TIST Values 160726.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³¹ Exhibit 37 TIST Eligibility: TIST KE PD-VCS-Ex37 TIST SG Eligibility Requirements.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³² Exhibit 03 and Exhibit 04, GHG contracts: TIST KE PD-VCS-Ex03 GHG Contract 050418.doc and TIST KE PD-VCS-Ex04 GHG Contract 080428.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³³ Exhibit 38 TIST Membership: TIST KE PD-VCS-Ex38 TIST SG Membership Application.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

Groups will receive training on the most important topics in the TIST program during the application phase. The trainings will take place in monthly Cluster meetings, in monthly Small Group training meetings. The trainings include:

- What is TIST? How does it work?
- TIST Eligibility Requirements
- TIST Values and why they matter
- Small Group Best Practices
- Tree species and their benefits
- Starting and maintaining a nursery
- Conservation Farming
- GHG Contract

TIST Kenya has published numerous newsletters that document an ongoing dialogue and support with members of the community, both inside and outside the program. These documents are available to the public in a transparent form on the internet at tist.org.

TIST has also been in contact with other stakeholders. They have been provided project summaries and invited to attend public meetings and comment on the initial PD (2012), this PD, previous MRs and the current MR.³⁴

Other Stakeholders

The following are other stakeholders that are present in the project zone. Unless indicated otherwise, none of these parties have a direct relationship with TIST and most, if not all, activity is that they are included in the CCB comment period notification. They were identified through casual contact while working in the area.

- Africa Wildlife Foundation. An NGO organized to protect African wildlife.
- Agriculture Offices. County government agricultural offices that serve the communities. We have consulted with on different agricultural issues.
- Berkeley Reafforestation Trust. A UK NGO that has provided sustainable development funding to TIST Uganda.
- Care International Kenya. The Kenya arm of global NGO established to saving lives and ending poverty.
- Catholic Relief Services. The international humanitarian agency of the Catholic community in the United States. CRS and TIST partnered on a project in 2010-2011 to investigate expansion to Central America.
- EcoAgriculture Partners. An NGO that assists in long-term collaboration, accessing finance, and influencing policy to advance integrated landscape management.
- KEFRI-Kenya Forestry Research Institute. A Kenya state organization for forestry research.
- Kenya Forestry Service. The Kenya agency in charge of Kenya Forests. TIST has consulted with KFS on the country and local levels.

³⁴ Exhibit 14 Public Comments: TIST KE PD-VCS-Ex14c Public Comments CCB-003 V01.doc, TIST KE PD-VCS-Ex14e Public Comments CCB-003 V02.doc and TIST KE PD-VCS-Ex14j Public Comments VCS-CCB-006 V03.docx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

- Kenya Forestry Society. A membership organization of professional foresters in Kenya
- Kenya Wildlife Service. The Kenya agency that conserves and manages Kenya's wildlife.
- Laikipia Wildlife Forum. A region NGO that addresses conservation. With their headquarters in Nanyuki we have developed a casual relationship with them.
- National Environmental Management Authority (NEMA). The Kenya agency with authority over matters relating to the environment. TIST submitted the required information to NEMA in order to operate.
- Methodist Church. This international religion addresses poverty around the world.
- Northern Rangelands Trust. A membership organization of 39 community conservancies that serve Kenya. A grantee of USAID
- Pact Kenya. An NGO that works directly with local communities to strengthen conflict-management systems. A grantee of USAID
- Paradigm Project. An organization created to positively impact poverty. They have a successful cook-stove project in Kenya. TIST personnel has had discussions with Paradigm but has never partnered with them.
- Pyrethrum Growers Association. A consortium of pyrethrum producers.
- Resource Projects Kenya. A grantee of USAID.
- US Agency for International Development (USAID). The global aid organization for the USA. TIST KE, through I4EI, was a grant recipient to enhance its sustainable development reach for several years until 2014.
- World Agroforestry Center. A research institution that explores and promotes the benefits of trees. It has Kenya country office in Nairobi. TIST has consulted with them.
- World Wildlife Fund. An international NGO working to help improve biodiversity and sustainability.
- Fuelwood and fruit vendors. Subsistence farmers in the project zone that collect firewood or grow fruit and sell them at local markets.
- Other subsistence farmers. While TIST is open to all of the subsistence farmers, not all choose to join. The farmers have the same profile as TIST members. E.g. they speak the same language and have the same socio-economic background.

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

The project activities are for the members to plant trees and improve their lives through sustainable development training.

Activity: Tree Planting

Outputs: Millions of new trees. The TIST members are subsistence farmers that choose to plant trees on their own lands and gain the benefits of the trees: environmental, and economic. They plant the trees by hand. They decide how many to plant considering the trade-offs for subsistence agriculture and pick the species that benefits them. They are paid a stipend for their live trees and 70% of the profits from the sale of carbon.

Outcomes: Sequester carbon. Provide benefits to the farmers in the form of fruits, nuts, fuel, fodder, medicine, improved soil and esthetics. Improve biodiversity by planting indigenous trees, reducing pressure for firewood in protected forests and forming corridors and stepping stones among HCV areas. Provide a new stream of income for the famers from tree payments and carbon revenue profit share.

Impact: Mitigate climate change. Positively impact farmers livelihoods and well-being.

Relevance to project's objectives: This is a primary objective of TIST.

Activity: Sustainable Development Training

Outputs: Thousands of person-sessions of training on a multiple topics at cluster meetings. Regular articles in the newsletter providing information on multiple topics.

Outcomes: As noted by UN researchers, there is a causal relationship between sustainable development education (i.e. training) and implementation and benefits.³⁵ Farmers learn, among other things, 1) about the benefits of different tree species, 2) how to source seeds, 3) how to build tree nurseries, 4) how to plant trees using dryland methods, 5) how to maintain trees, 6) how trees are measured for carbon, 7) how to implement conservation farming and the benefits, 8) the benefits of improved stoves 9) benefits of biodiversity, 9) learn about certain health issues.

Impact: Farmers receive the benefits of fruits, nuts, fuel, fodder, medicine, improved soil and esthetics. Improve biodiversity by planting indigenous trees, reducing pressure for firewood in protected forests and forming corridors and stepping stones among HCV areas. Provide a new stream of income for the farmers from tree payments and carbon revenue share. Mitigate climate change. Positively impact farmers livelihoods and well-being.

Relevance to project's objectives: This is a primary objective of TIST.

2.1.9 Climate, Biodiversity and Community Benefits Assessment Period (G1.9)

- CCB Project Life: 01 January 2004 - 31 December 2063, 60 years
- GhG Accounting Period: 01 January 2004 - 31 December 2033, 30 years

2.1.10 Differences in Assessment Periods (G1.9)

As noted in 2.1.9 there is a difference in the CCB Project Life and the GhG Accounting period. It is the expectation that the project will seek renewal at the end of the GhG Accounting Period.

2.1.11 Implementation Schedule (G1.9)

Date	Milestone(s) in the project's development and implementation
2004	Initial field visit, consultation with local stakeholders, hold initial seminars, registration of initial Small Group members, deploy monitoring system, hire local staff, hire and train Quantifiers, begin training trainers.
2004-2010	Planting of first trees. Project expansion focused on adding new groups, members and trees. Continue with regular monitoring and training. Hold regular seminars. Ongoing and regular consultation with stakeholders.

³⁵Katia Vladimirovaa and David Le Blancb, "How well are the links between education and other sustainable development goals covered in UN flagship reports? A contribution to the study of the science-policy interface on education in the UN system, 2015.
<https://sustainabledevelopment.un.org/content/documents/2111education%20and%20sdgs.pdf>

2012	VCS and CCB validation and first verification.
2012-2033	Periodic verifications to be held in accordance with the minimums required by the CCB and VCS standards. Continue with regular monitoring and training. Hold regular seminars. Ongoing and regular consultation with stakeholders.

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

Contacting and contracting with farmers: TIST Kenya has continued to expand since inception. After year 15 it expected that new expansion will go into a new PD.

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

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 and due to expansion.

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

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

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

Validation and verification (project). Validation takes place around year six, when project areas have been established and trees are already in the ground and growing. It is expected that the initial verification will take place at the same time. While it is a cost trade off, because the monitoring is ongoing, it is possible that verification could take place as frequently as annually.

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

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

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

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

2.1.12 Risks to the Project (G1.10)

The risks to the expected climate, community and biodiversity benefits are basically dependent on the continued participation in the program of the members. If the program ends, the farmers will no longer receive the benefits that provide the incentive to be a member. Since they receive cash from the GhG program and because CAAC uses its share of the revenues from the sale of GhG credits to operate the program, the greatest risk is the lack of a carbon market.

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

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

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

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

As part of the VCS requirements, a risk analysis was conducted.³⁶ Based on their tool, this project has a risk of 1.0, which is exceptionally low.

2.1.13 Benefit Permanence (G1.11)

TIST is a comprehensive program that includes training in climate change, sustainable development practices and biodiversity. The expectation is that training followed by years of implementation will demonstrate that the economic and environmental teachings learned from TIST can be practiced without cost to the farmers and will continue to improve their lives. The following describes some of the trainings 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. Planting fruit, nut and fodder trees will have financial and food security benefit well beyond the financial benefits of the carbon market and will continue to sequester carbon.
- 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).

2.1.14 Financial Sustainability (G1.12)

Whereas TIST has 14 PD in four countries, TIST operates as a single project. The financial plan for the TIST project has been provided to the Validator (confidential).³⁷ TIST has been operating since 2000. In the past, TIST has received revenue from CAAC and various grants, such as from USAID. Since 2013, the sole source of revenue has been from the sale of carbon credits. This was part of the plan. We are on budget for carbon sequestration and on budget for expenses. Future revenues are dependent on the market price of VCUs. In the plan we have held future prices at \$5 per tonne and the project still provides ample cash flow, for the next 30 years. TIST is profitable and has been sharing profits with the farmers for several years.

2.1.15 Eligibility Criteria for Grouped Projects (G1.14)

In order to qualify as an instance, each Project area must meet the grouped projects eligibility criteria:

³⁶ Appendix 12 Risk Analysis: TIST KE PD-VCS-006m App12 Verif 03 Risk Analysis 210105.docx, at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³⁷ Exhibit 09, Financial Plan: "TIST KE PD-VCS-Ex09 Financial Plan.xlsx"

- Meet the applicability conditions set out in the methodology applied to the project.
- Use the technologies or measures specified in the project description. Each new instance shall be and is treated in the same manner as the original instances and in accordance with the verified PD.
- Apply the technologies or measures in the same manner as specified in the project description. Each new instance shall be and is treated in the same manner as the original instances and in accordance with the verified PD.
- Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.
- Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.

1. Applicability of Methodology.³⁸ The following addresses how the new instances address the applicability criteria of the methodology:

- Project activities are implemented on grasslands or croplands. As indicated on "Grove Summary" worksheet of Appendix 04b³⁹, project activities are implemented on grasslands and croplands.
- Project activities are implemented on lands where the area of the cropland, within the project boundary, displaced due to the project activity is less than 50 per cent of the total project area. This condition was deemed met through a survey of the individual members that farm the land and through field observations. In the surveys, 100%⁴⁰ of the farmers indicated there was no displacement of cropland. Field observation shows that many of the farmers have chosen to plant trees along property lines and/or to plant their trees widely spaced in their fields and practice agro forestry. There were no observations that indicate that this condition was not met. In addition, all of this is supported by the overriding fact that TIST members are subsistence farmers that rely on their land for household food production. Carbon has little value compared to food, so they only plant in areas that will not cause them to displace higher value activities such as farming.
- Project activities are implemented on lands where the number of displaced grazing animals is less than 50 percent of the average grazing capacity of the project area. This condition was deemed met through a baseline survey conducted of the individual members that farm the land and through field observations. The survey indicates that displaced grazing only affects about 0.3%⁴¹ of the area of the new instances. Field observation showed no evidence that grazing is significant in the project areas, or in the entire area, in which the project areas are located. Some farmers do keep a few head of cattle, but they are typically confined to pens and fed fodder. There were no observations that indicate that this condition was not met.
- Project activities are implemented on lands where 10 percent of the total surface project area is disturbed as result of soil preparation for planting. The minimum spacing recommended for the trees is two meters x two meters, or four square meters. The recommended size of the holes is 0.3 meters in diameter, or 0.07 square meters. The calculated area disturbed as a

³⁸ Exhibit 46, Methodology: TIST KE PD-VCS-Ex46 CDM AR-AMS0001 Ver06.pdf at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

³⁹ Appendix 04 Validation Data: TIST KE PD-VCS-006e App04 Data 120824 Group.xlsx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁴⁰ Appendix 04b: "Grove Summary" worksheet, Column AG

⁴¹ Appendix 04b: "Grove Summary" worksheet, Column BH

result of soil preparation for planting is less than 2%. 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.

- Carbon pools are above- and below-ground tree and woody perennials biomass. This is demonstrated in Section 3.4.1 whereby the only carbon pools are the above and below ground bio-mass of trees.
- Project emissions are considered insignificant and therefore neglected. As noted in Section 3.4.1, project emission are insignificant because TIST farmers refrain from use of chemical fertilizers, use of nitrogen fixing tree species is insignificant and any fossil fuel emissions are di minimis. This is true for the new instances, too.
- Demonstrate land eligibility (AR-AMS0001, Appendix A): Appendix A states the the PAs must meet the forest definition of the host country. This is superseded by the VCS definition of an Afforestation, Reforestation and Revegetation (ARR) project.
- Demonstrate Additionality (AR-AMS0001, Appendix B): See below.

2. Baseline scenario. The baseline scenario described in the PD can be applied to all of the new instances. The methodology requires justification that “the most likely baseline scenario of the small-scale A/R CDM project activity is considered to be the land-use prior to the implementation of the project activity, either grasslands or croplands.”⁴² The baseline field observations as detailed in the "Grove Summary" worksheet of Appendix 04 indicate the project areas are grassland and cropland prior to implementation of the project activity. That this is also the most likely use of the project areas without the project activity is supported by:

- The project areas are all private lands owned by 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 in the PD, 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.

3. Geographic area. The VCS PD limits the new instances to the country of Kenya.⁴³ All of the new instances are in Kenya, as demonstrated by the KML files.⁴⁴

4. Additionality. The additionality demonstration can be applied to all of the new instances. Regarding the Project Proponent, TIST does not create or sell any products other than GhG credits associated with carbon sequestration. This remains true.

⁴² Exhibit 46, Section II.5.

⁴³ VCS PD KE 006: TIST KE PD-VCS-006a PD Text 120824.pdf at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁴⁴ Appendix 03 PA Plots: TIST KE PD-VCS-006d App03a PA Plots 210105.kml, TIST KE PD-VCS-006d App03b PA Plots 210105.kml and TIST KE PD-VCS-006d App03c PA Plots 210105.kml at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

For the Small Groups or members, several barriers are discussed in 2.2.3:

- Investment barrier – TIST members are poor and lack investment capital to plant trees. TIST provides tree payments that overcome the investment barrier.
- Barriers due to social conditions and lack of organization – tree planting on the scale that TIST has accomplished requires more than a single individual. TIST provides the structure and training to overcome this barrier.
- Laws and regulations requiring tree planting – Tree planting takes place on private lands and there are no laws or regulations requiring this.
- Common practice – while there are farmers planting trees without the expectation of carbon revenues, they lack the financial motivation that TIST farmers have to maintain the trees for the long term through the sale of carbon credits.

5. Capacity Limits. The PD is based on the CDM small scale methodology which establishes a capacity limit of 16,000 tonnes per year.⁴⁵ Under the VCS Grouped Project, this is superseded by the definition of an instance. An instance is limited to one percent which for a 30 year project is 4,800 tonnes. All of the new instances are less than the one percent threshold. This is demonstrated in the "PA Summary" worksheets of the MRs.

6. Engagement and Consent. All of the members are subject to the same engagement procedures outlined in 2.1.6 and 2.1.7. They all sign GHG contracts and undergo training and an explanation of what it means. The contracts state that the members maintain all rights and ownership of their lands, trees and tree products and that TIST only is receiving the carbon rights that the trees may have.

7. Monitoring. All of the PAs are monitored in the same manner. See Section 3.4.1 for climate monitoring, Section 4.4.1 for community monitoring and Section 5.4.1 for biodiversity monitoring.

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

Any scalability limits with regard to TIST are embedded limits established by the methodology (16,000 tonnes per year average) and the definition of the grouped projects (1% of the limits set by the methodology). There is no limit to the number of instances. TIST has taken advantage of the ability to grow using the PA size limits by going from 40 Small Groups (less than 300 people) when it started in 2000, to over 14,000 Small Groups and over 100,000 members in four countries in 2021.

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

Since the major activity is planting trees, an activity that is beneficial to the environment on a local and global scale, the expansion of TIST, or TIST-like programs, is deemed beneficial. As long as there is a carbon market to support these programs, there is a potential to reach more subsistence farmers, plant more trees, sequester more carbon, provide more training, improve

⁴⁵ Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its third session, held in Bali from 3 to 15 December 2007, Decision 9/CMP.3, P. 26

food security, address deforestation, provide sustainable fuel wood supplies, make more islands of biodiversity and provide health benefits and training.

2.2 Without-project Land Use Scenario and Additionality

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

The most likely land-use scenario is based on CDM small scale afforestation reforestation methodology AR-AMS0001 Version 06: Simplified baseline and monitoring methodologies for small-scale A/R CDM project activities implemented on grasslands or croplands with limited displacement of pre-project activities. The most likely scenario without TIST is for the Project Areas to continue to be grasslands and cropland.

The baseline field observation, as detailed in worksheet "Grove Summary" (App 04), indicates the Project Areas were grassland and cropland prior to implementation of the project activity. As areas of long term and continuous human occupancy and activity, they have already undergone deforestation, loss of natural habitat and loss of biodiversity. Literature indicates that the Project Zone continues to undergo deforestation, loss of habitat and loss of biodiversity. It is projected that without the intervention of TIST, that under favorable conditions, at best, the landscape will remain the same. Under less favorable conditions, lands would continue to degrade. This baseline projection is supported by:

- The Project Areas are all private lands owned by subsistence farmers conducting the project activity, or on some sort of communal land that has been affected by human activity. The land has a history of farming and land use other than natural forest or long-term forestry.
- These lands are located in an area populated by subsistence farmers who use wood for their primary fuel. As supported by the references below in section 2.2.2, wood use, agriculture and increasing population have been key factors in deforestation.
- These factors lead to the conclusion that there is little reason to believe that the Project Areas will revert to forest without intervention.
- Without intervention there are no alternative uses of this land that can be reasonably expected.

2.2.2 Most-Likely Scenario Justification (G2.1)

There is a clear pattern of rural firewood use and forest degradation in Kenya that supports the case that carbon stocks on each individual project area would be expected to decline or, at best, increase 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 1957,⁴⁶ forests in the TIST areas are in an extremely precarious position.

⁴⁶ Abwoli Banana, Paul Ongugo, Joseph Bahati, Esther Mwangi and Krister Andersson, "Resource, Recourse And Decisions: Incentive Structures In Forest Decentralization and Governance In East Africa," page 5. Accessed February 10, 2020. http://pdf.usaid.gov/pdf_docs/PDACO151.pdf

According to the Kenya environmental group, Green Belt Movement,⁴⁷ “at the turn of the 20th century, Kenya had a forest cover of well over 10%. Today, this has been reduced to 7.8% due to deforestation, commercial agriculture, charcoal burning, forest cultivation and replacement of indigenous forest with exotic plantations.”⁴⁸

According to the FAO⁴⁹, Kenya has lost over 12,000 ha of forest per year between 1990 and 2005, falling from 3,708,000 hectares to 3,522,000 hectares. Primary forest loss during that period averaged 2,400 hectares/yr, dropping from 742,000 hectares to 704,000 hectares. It was estimated that 26.6 million m³ (over bark) of wood products was removed in 2005, which was equal to 9.5% of the country's growing stock. Of this, 24,256,000 m³ (over bark) was removed for fuel wood.

According to a report from Global Forest Watch, Kenya was losing approximately 5.4k ha of forest cover per year in 2010. From 2001 to 2018, the country saw a 9.8% decline in tree cover loss.⁵⁰

On top of this, the population of Kenya is growing at 2.6%. Since the same population will continue to rely on local wood supplies, there will be added pressure on the existing biomass in and outside the project areas.

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.

2.2.3 Additionality (G2.2)

Additionality of TIST is demonstrated using the “Assessment of Additionality” contained in Appendix B of Clean Development Mechanism Methodology AR-AMS0001, which demonstrates that the project benefits would not have occurred in the absence of the proposed project activity. The barriers selected were "investment barrier" and "barriers due to social conditions, lack of organization".

⁴⁷ “Community Action for Mt. Kenya Forest, the Environment And Sustainable Livelihoods of Adjacent Communities” *Green Belt Movement* , UNDP/GEF, www.tist.org/tist/docs/PDD-Documents/TIST%20KE%20PD-CCB-Spt%202024%20UNDP%20Greenbelt%20Grant.pdf, February 10, 2020

⁴⁸ "Forest Area (% of Land Area) - Kenya." *Forest Area*, World Bank, data.worldbank.org/indicator/AG.LND.FRST.ZS?locations=KE, accessed 10/1/2020.

⁴⁹ Global Forest Resources Assessment, 2005 (FAO). <http://www.fao.org/forestry/fra/fra2005/en/>

⁵⁰Kenya: Dashboards: Global Forest Watch." Kenya, World Resources Institute, [www.globalforestwatch.org/dashboards/country/KEN?map=eyJkYXRhc2V0cyI6W3siZGF0eXNldCI6ImZkYzhkYzFiLTl3MjgtNGE3OS1mIjNmLWlwOTQ4NTA1Mml4ZCIsImxheWVycyl6WwYl2Jy3OThlNi0zOWVjLTQxNmMtOTc5ZS0xODJhNzRjYTlZWUilCjNwQxZTAxMC0zODNhLTQ3MTMtOWFhYS00NGY3MjhjMDU3MWMiXSwiYm91bmRhcnkiOnRydWUsIm9wYWNPdHkiOiEsInZpc2liaWxpdiHkiOnRydWV9LSiZGF0eXNldCI6Ilg5N2VjYzcyLTlzMdGtNGM1MS-1hZWlzLTQ5NWRIIMGJKy2E3OSIsImxheWVycyl6WwYlJmZA3NWM1YS01NTY3LTRiMDktYmMwZC05NmVkMTY3M2Y4YiYiXSwib3BhY2I0eSI6MSwidmIzaWJpbGl0eSI6dHJ1ZSwicGFyYW1zljp7InRocmVzaCl6MzasInZpc2liaWxpdiHkiOnRydWV9f0slmNlbnRcil6eyJsYXQiOiJl3LCJsbmciOiEyfSwiYmVhcmluZyl6MCwicGl0Y2giOiAsInpvb20iOiJslmNhbkdvdW5kljpmYWxzZSwiYmJveCI6W119](http://www.globalforestwatch.org/dashboards/country/KEN?map=eyJkYXRhc2V0cyI6W3siZGF0eXNldCI6ImZkYzhkYzFiLTl3MjgtNGE3OS1mIjNmLWlwOTQ4NTA1Mml4ZCIsImxheWVycyl6WwYl2Jy3OThlNi0zOWVjLTQxNmMtOTc5ZS0xODJhNzRjYTlZWUilCjNwQxZTAxMC0zODNhLTQ3MTMtOWFhYS00NGY3MjhjMDU3MWMiXSwiYm91bmRhcnkiOnRydWUsIm9wYWNPdHkiOiEsInZpc2liaWxpdiHkiOnRydWV9LSiZGF0eXNldCI6Ilg5N2VjYzcyLTlzMdGtNGM1MS1hZWlzLTQ5NWRIIMGJKy2E3OSIsImxheWVycyl6WwYlJmZA3NWM1YS01NTY3LTRiMDktYmMwZC05NmVkMTY3M2Y4YiYiXSwib3BhY2I0eSI6MSwidmIzaWJpbGl0eSI6dHJ1ZSwicGFyYW1zljp7InRocmVzaCl6MzasInZpc2liaWxpdiHkiOnRydWV9f0slmNlbnRcil6eyJsYXQiOiJl3LCJsbmciOiEyfSwiYmVhcmluZyl6MCwicGl0Y2giOiAsInpvb20iOiJslmNhbkdvdW5kljpmYWxzZSwiYmJveCI6W119), accessed February 10, 2020

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.

From the Small Groups or member's perspectives, there are several barriers that have prevented reforestation of these lands.

Investment barrier: 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."⁵¹

At a more local level, a Kenya Participatory Management Study⁵² revealed:

"access to credit and extension services is limited. The majorities are excluded from the formal financial sector due to lack of collateral and bankable proposals, and thus mainly rely on merry-go-rounds. Those who can afford seek such services from private extension providers, who in turn charge them exorbitantly. The study reinforces the findings of the first PPA conducted in 1994 that showed that only 3.7% of the responding households had access to the formal credit market."

TIST members are the people described above. They are subsistence farmers with little access the credit required for a plantation. Table 2.2.3a is based on community data developed by the Kenya Ministry of Agriculture in Meru East and West Divisions using Participatory Analysis of Poverty and Livelihood Dynamic (PAPOLD).

⁵¹ Accessed 22 September 2010 at <http://www.ifad.org/media/press/2004/38.htm>.

⁵² John Thinguri Mukui, "Poverty Analysis in Kenya: Ten Years On," Study conducted for the Central Bureau of Statistics (CBS), Society for International Development (SID), and Swedish International Development Agency (SIDA) February 4, 2005, p.10. Accessed 22 September 2010 at <http://www.worldbank.org/afr/padi/Poverty%20Analysis%20in%20Kenya%20by%20John%20Mukui.pdf>.

Table 2.2.3a Annual Income Brackets				
Income Level (Ksh)		Income Level US\$		Pct of Groups
Min	Max	Min	Max	
0	12,000	\$0	\$160	5%
12,000	60,000	\$160	\$800	40%
60,000	180,000	\$800	\$2,400	25%
180,000	300,000	\$2,400	\$4,000	15%
300,000	420,000	\$4,000	\$5,600	10%
420,000	above	\$5,600	above	5%

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 Ksh 5 to Ksh 30 per seedling. A farmer wishing to plant 500 trees would need Ksh 2,500 to Ksh 15,000 of upfront capital to finance a tree plantation. This is a significant portion of their annual income and, in the case of subsistence farmers, would take that land out of farming for 8 to 30 years (depending on the type of trees).

The following table provides a cost 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.⁵³ 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 2.2.3b Start-up Cost Comparison: 1 ha Plantation⁵⁴		
	Without TIST	With TIST
Live Trees	500	500
Income	\$ -	\$ 10
Cost of a 500 Tree Plantation		
Seedlings	\$ 141	\$ -
Labor	\$ 38	\$ -
Total Yearly Cost	\$ 178	\$ -
Income/(Loss)	\$ (178)	\$ 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 Kenya has

⁵³ "Exhibit 04: TIST KE PD-VCS-Ex04 GhG Contract 080428.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁵⁴ Appendix 04, "Plantation Costs" worksheet for assumptions and references.

had Forestry Policies since 1957 but is still seeing annual losses in forest cover. 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.

Laws and regulations requiring tree planting. The trees are planted on private lands and there are no laws or regulations that require the TIST farmers to plant them.

Common Practice. 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;⁵⁵ 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.

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

Climate benefits as established under the Verra VCS standard are the only benefits to be used as offsets. They are being qualified under the VCS standard for sale to other parties. The expectation is that the buyers will use them to voluntarily offset their own emissions (personal, organizational or corporate). Additionality is established per section 2.2.3.

TIST was formed to generate emission reductions and sell them. The revenues are shared between the farmers and the proponent. The proponent uses the revenues to fund the program. TIST creates no other products.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

Stakeholders are given access to the full project documentation in several ways:

The CCB project documents are posted with the CCB as part of the 30-day comment period.

⁵⁵ Exhibit 04. Agreement is for 60 years.

Emails are sent to the stakeholders listed in Exhibit 14⁵⁶ with a link to the CCB project web page and notice of the public meeting. Links to the CCB project web page are included, as well as links to all of the CCB and VCS documentation.

The email notices contain a summary of the project.

For those TIST members without internet, the project has developed its Mobile TIST website that is low bandwidth and designed to work with a mobile phone.⁵⁷ For those without a smartphone, they can see the results of their Small Group's quantification on their vouchers or discuss the results when the Quantifier is monitoring their PAs or come to the monthly cluster meetings and ask. For those with no other access, they can also go to a local cyber café and see the full reports on-line. The monitoring results have also been published in the TIST Kenya newsletter.⁵⁸

2.3.2 Dissemination of Summary Project Documents (G3.1)

Summary project documents are available to stakeholders with the email notice referenced in 2.3.1 above. The farmers are given a project summary and a link to all the PD documents and references in the Mazingira Bora newsletter.⁵⁹

The summary information of each verification are available to stakeholders with the email notice sent to notify them of the CCB comment period. The farmers are given a project summary, MR summary and a link to all the PD documents in the Mazingira Bora newsletter.

For those TIST members without internet, the project has developed its Mobile TIST website that is low bandwidth and designed to work with a mobile phone.⁶⁰ For those without a smartphone, they can see the results of their Small Group's quantification on their vouchers or discuss the results when the Quantifier is monitoring their PAs or come to the monthly cluster meetings and ask. For those with no other access, they can also go to a local cyber café and see the full reports on-line. The monitoring results have also been published in the TIST Kenya newsletter.⁶¹

2.3.3 Informational Meetings with Stakeholders (G3.1)

Informational meetings with communities and local stakeholders are conducted three ways. First, as described in Section 2.1.6 and 2.1.7, when TIST comes to a new area, we contact stakeholders directly. Since these are generally introductory meeting to determine interest, there is no publication of the meeting. Second, are at the Cluster meetings. Small Groups are assigned to a Cluster when they join and each meeting is announced at the previous Cluster meeting. Third are the formal announcements for CCB certification. Public notice is given in a

⁵⁶ Exhibit 14 Public Comments: TIST KE PD-VCS-Ex14j Public Comments VCS-CCB-006 V3.docx at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>

⁵⁷ TIST Mobile: <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6dofd7q3>

⁵⁸ Mazingira Bora, May 2021

⁵⁹ Mazingira Bora May 2021 at <http://www.tist.org/i2/moreinfo.php>

⁶⁰ TIST Mobile: <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6dofd7q3>

⁶¹ Mazingira Bora, April 2021

major newspaper, emails are sent to stakeholders and in some cases, invitations are given by personal or telephone contact.⁶²

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

Section 2.1.7 discusses how stakeholders are introduced to TIST and the steps required for them to join. This includes their commitments to plant and maintain trees on their own land. They are given the GHG contracts and training as to what it means before they sign it. They are reminded that TIST membership is voluntary. They are invited to talk to other members and attend Cluster meetings where they can ask more questions.

The identified risks are:

- The farmers could use too much of their farm land for tree planting and jeopardize their food security. TIST addresses this with training. 1) We ask that they only plant trees on land they don't need for crops. Sometimes this means that they just plant around their boundary or house. 2) We encourage them to plant some fruit and nut trees that can supplement their food supply and possibly lead to a cash crop allowing them to buy other food. 3) We train them in Conservation Farming to lead to higher crop yields than the traditional methods.
- They could spend money on seedlings but have their trees die. We do not want them spending money on seedlings. We train them to collect seeds to build Small Group nurseries. TIST was designed to have zero cost of entry for the subsistence farmer.
- Their trees could die. Early mortality is the biggest problem and it requires that the farmers follow the Conservation Farming method for their trees. Usually the trees thrive past the first year. If the trees die, they are free to use them for firewood. Historically, this has not been a common problem.

As noted in the negative impact sections (e.g. 4.2.2), and a worldwide membership of 100,000 volunteers, there is little risk and what risk there is does not seem to actually happen.

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

This has been done at Public Meeting and through any comments that result from the CCB comment period. TIST will announce this re-validation in the newsletter and through emails to stakeholders. Specifics regarding the announcements, public meeting, emails and email recipients are in Exhibit 14.⁶³

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

Stakeholders were advised by email that there would be no public meeting or auditor's visit due to the pandemic. The letter requesting that the auditor's visit be conducted virtually is posted on the registry.

The virtual site visit was conducted over Zoom. The VVB interviewed numerous farmers, quantifiers, cluster servants and members of the leadership council. Each was invited to

⁶² The public meeting is not being held for this re-validation or the third monitoring period due to the COVID pandemic.

⁶³ Exhibit 14 Public Comments

comment on the project and ask questions. Comments were that they would like to see TIST expand and provide benefits to more farmers.

2.3.7 Stakeholder Consultations (G3.4)

TIST was formed in response to problems expressed by Tanzanian subsistence farmers who participated in Small Group seminars starting in 1999. These problems – recurrent famine, declining soil fertility, disease, and lack of shade and firewood – are shared by millions of smallholder farmers in Kenya. When TIST was invited to expand to Kenya by USAID, we used the same consultation approach to build a program that worked for Kenyan farmers.

TIST Kenya began with a trip around Mt Kenya, where community leaders in Meru and Nyeri were briefed on TIST to gauge the level interest that local farmers might have. The first TIST seminar of TIST Kenya was held in Nanyuki from February 21, 2005 to February 26, 2005. The seminar began with the process of customizing TIST to the desires and needs of farmers in the Meru and Nanyuki areas. Seventy-three people attended; 40 men and 33 women. This consultation is documented in the first TIST Kenya newsletter, the February 2005 issue of Mazingira Bora.⁶⁴ Subsequent initial consultations are documented in the April 2005 Mazingira Bora.⁶⁵ Because TIST is for the farmers and by the farmers, the consultations are ongoing. A full library of Mazingira Boras is available to demonstrate what has transpired in the program.⁶⁶

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 KFS and USAID have addressed maintaining high conservation values
- TIST has a constant consultation process in effect. There are opportunities at Cluster Meetings, seminars and direct contact with the Cluster Servants, Cluster Leaders, and Leadership Council.

Stakeholder consultation for this PD was done as part of the CCB public comment period and Mazingira Bora. A notice of the validation and description of the project were sent to external stakeholders and selected internal stakeholders on 07 April, 2021. The description of the project and requests for comments were published in the May 2021 Mazingira Bora. No comments were received from either notifications.

⁶⁴ TIST KE PD-VCS-Ex19 Mazingira Bora 050201.pdf at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁶⁵ TIST KE PD-VCS-Ex20 Mazingira Bora 050401.pdf at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁶⁶ <http://www.tist.org/i2/moreinfo.php>

2.3.8 Continued Consultation and Adaptive Management (G3.4)

The plan developed to continue communication and consultation between the project proponent and communities and other stakeholders about the project is to continue to hold Cluster meeting where all members and interested parties can attend. There are hundreds of clusters and meetings are held about every month at each one. Stakeholders have an opportunity to give input about the project to Cluster Servants and Cluster leaders, who in turn communicate with the Leadership Council (LC).

The plan also calls for higher level regional seminars to continue to be held. These meetings have been held in the past and have allow input and for management to adapt accordingly. The LC facilitates these meetings and gains direct input from the members.

In addition, part of the project plan is to continue receiving CCB certification which will require public comment periods wherein input can be given that the management can consider and adapt to, as the circumstances dictate.

As comments come in, the LC and the US Management team discuss them and considers their implications regarding compliance with the VCS and CCB standards, the methodology, impact on the members, delivery of service, legality, cultural norms, etc. Ideas of merit are addressed.

2.3.9 Stakeholder Consultation Channels (G3.5)

As noted in the other sections regarding stakeholder consultations, TIST Kenya holds thousands of Cluster meetings each year. There are over 360 Clusters, and each holds multiple meetings each year (as many as 12 per year). There were over 17,000 meetings in Kenya during the monitoring period of the third verification of this PD. The Clusters are located among the Small Groups so that the members can walk to them. During the meetings they receive training and information about TIST and have ample opportunity to ask questions and provide input. Our justification that adequate levels of information sharing has occurred is the close proximity of the Cluster to the Small Groups, the frequency of meetings and the fact that we encourage attendance.

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

Farmers, however, are in full control of how they themselves participate. They are the ones making the decision about where to plant, what to plant and which sustainable development activities to adopt. As such, they are the “culture”; what is done by them as individuals and Small Groups is done voluntarily and, therefore, within their cultural norms.

Regarding gender, TIST is gender sensitive. We try to keep the leadership council balanced at 50% women. The Cluster Servants are over 59% women. Section 4.5.5 discusses the way women benefit from TIST.

2.3.11 Anti-Discrimination Assurance (G3.7)

TIST has a sexual harassment policy⁶⁷ and non-discrimination policy.⁶⁸ These policies are available on TIST Mobile,⁶⁹ shared at the Cluster meetings and with the staff. There have been no complaints filed with TIST Kenya.

2.3.12 Feedback and Grievance Redress Procedure (G3.8)

All grievances will be guided by the TIST Grievance Procedure.⁷⁰ Grievances will first be brought to the attention of the Kenya Staff, where the issues can be compared to standard TIST policy, TIST values⁷¹ and/or the Greenhouse Gas agreement among the Small Group members and CAAC. The policies and values are the subject of training at seminars, in the field and are published in the newsletter. A formal response will be made within 30 days. Unresolved issues will be presented to TIST Management. Where precedence or policy exists, they will be used in final decision-making. Where new issues arise that are outside the existing precedence, or policy, decisions will be made by Kenya Staff and TIST Management. A formal response will be made within 30 days. If conflicts or grievances cannot be resolved internally, CAAC will submit to arbitration in accordance with the Kenya Arbitration and Conciliation Act, 2000 within 30 days of notice by the aggrieved party indicating they wish to appeal the internal process.

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

Public feedback and grievance redress will be done at the Cluster Meetings and in the newsletter. The grievance will be stated and the resolution announced. Question will be taken and any unanswered questions will be reported back to TIST management. Any resulting change in policy will be documented and announced at the Cluster Meetings.

2.3.14 Worker Training (G3.9)

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. Training is passed on to new workers through the seminars and working with an experienced TIST member.

⁶⁷ Exhibit 34, Sexual Harassment: TIST KE PD-VCS-Ex34 Sexual Harassment 170120.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁶⁸ Exhibit 35, Non-discrimination: TIST KE PD-VCS-Ex35 Non-Discrimination 170120.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁶⁹ <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6difd7q3>, login required.

⁷⁰ Exhibit 33 Grievance Policy: TIST KE PD-VCS-Ex33 Grievance Policy 170120.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁷¹ Exhibit 39 TIST Values. We are Honest. We are Accurate. We are Mutually Accountable. We are Transparent. We are Servants to each other.

Quantifiers receive ongoing training as needed and attend training seminars. They are given access to the Quantifier Manual.⁷² During the seminars, they are trained on the TIST monitoring plan, which includes use of the smartphones with 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 meeting place. The Cluster meetings are supposed to be held monthly. While attendance is voluntary, Small Groups are encouraged to send one man and one woman representative to every meeting. Training includes biodiversity, the GHG contract, climate change, selecting tree species, the benefits of different species, preparing nurseries, tree management, HIV/AIDS and other subjects of interest to the members.

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 Kenya program is run by Kenyans. The Quantifiers are 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 Ugandan and Indian farmers establish their own best practices more suitable to their areas). The local managers (Leadership Council) are from Kenya. Cluster meetings and Small Group meetings are run by Kenyans. All TIST members have an opportunity to be group leaders, regardless of education or gender. TIST members are utilized as 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 also have teams of specialists, all of whom are TIST members. The tech support and QAQC is led by TIST members that rose through the program based on their abilities. They are in charge of daily desk reviews and keeping the field monitoring system operational. Voucher payments are handled by a team of TIST farmers that have proven their ability. The expansion team is responsible for expanding TIST to new areas. There are about 74 people that serve as leaders and Cluster Servants (Quantifier, trainers and liaison for one or more Clusters) as of this re-validation. The team consists of 43 women.

The measures designed to ensure community members, including women and vulnerable and/or marginalized people, are given a fair chance to fill positions for which they can be trained start with rotating leadership and required gender balance. At the Small Group level, policy is for groups to meet weekly and rotate leadership so that every member can gain leadership experience.

There is rotating leadership at the Cluster level. There are three Cluster leader positions per Cluster: Cluster Leaders, Co-leaders, and Accountability people. After four months the Leader rotates off, the Co-leader becomes Leader, the Accountability person becomes Co-leader and a

⁷² Exhibit 40 Quantifier Manual: TIST KE PD-VCS-Ex40 Quantifier Manual 101221.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

new Cluster member becomes the Accountability person. This allows the Clusters and Cluster Servants to identify people with ability that can be nominated for other positions such as Cluster Servant of Leadership Council.

We require gender balance and 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 have widow groups that care for orphaned children, who are rotating leaders in their Small Groups and are picked to attend seminars. 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)

The employment laws are listed below. CAAC uses Kenya counsel to advise on issues relating to employment. CAAC is not in violation of these laws.

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

Per the requirements of this section, we hereby provide assurance that the project meets the requirements of the above listed laws. In addition, the employees have contracts that include many of the statutory employment requirements which informs the workers of their rights.

2.3.17 Occupational Safety Assessment (G3.12)

TIST members are conducting activities that they normally do, i.e. farming using manual labor. TIST workers such as Cluster Servants walk or use public transportation. Their job does not require them to engage in activities that are inherently unsafe. The risks facing TIST workers are minimal and no different than those affecting anyone living in the area. Such risks and mitigation factors are:

- Matatus and Boda-bodas. Do not take rides if the driver appears to be intoxicated or drives in a reckless manner. If the driver is driving too fast or unsafe tell the driver to drive slower and safer. If it persists, ask to be let out or off the vehicle. In case of a robbery, do not resist and surrender the TIST equipment if it is demanded. Report the incident to the KE Team within 24 hours.
- Snakes. Be aware when moving through areas where you cannot see where you are placing your foot. If unsure, use a long stick to prod the bushes or grass to identify the presences of snakes. If a poisonous snake is seen, leave the area and notify the farmer. There are NO first aid treatments for poisonous snake bites. If you are bitten by a poisonous snake you must go to the nearest hospital for anti-venom. The bite may be fatal if not treated. You could lose a limb or suffer permanent injury if bitten. You, your partner or the farmer should try to identify the type of snake so that the correct anti-venom can be selected. Even if the snake is killed it can still bite!

- Elephants. Elephants are extremely dangerous. The best way to avoid an elephant attack is to not get in that situation. If an elephant is present in a project area, back away trying not to disturb it. If it attacked, your choices are:
 - i) stand your ground, it may be a bluff charge.
 - ii) if you are close enough to shelter (house, vehicle, fence, large tree), try to back away slowly (keep facing the elephant) and move to the shelter. Elephants run much faster than humans so if you cannot reach shelter, running may just trigger an aggressive response.
- Encountering dangerous people. Should you encounter hostile or dangerous TIST or community members, leave the area and try to get to a place where there are other people present. Do not engage in arguments or physical confrontation. If you are with a partner, stay together and support each other. In case of a robbery, do not resist and surrender the TIST equipment if it is demanded.
- Sexual Assaults. Females should work with a partner in new areas to avoid sexual assaults. If you end up in a situation where you fear an assault, leave the area and try to get to a place where there are other people present. If attacked, yell for help. Report any assault to the police and to the KE Team.
- Dogs. If a hostile dog is present or you are concerned about a dog that is present, ask the farmer to secure it until you finish quantifying. If the farmer refuses, leave the area and notify the TIST Team. If bitten by a dog, go to the doctor. Since dogs can carry rabies, try to determine who owns the dog for in case it needs to be tested. Rabies are fatal without treatment and treatment is necessary within days.
- Bees. The effects of bees stings can range from annoying and painful to fatal, depending on whether you are allergic to the venom. Avoid being stung by avoiding swarming bees and try to remain calm if they are present. Do not agitate the bees. Avoid wearing perfume or scents. If stung, remove the stinger as soon as possible because the longer it stays in the body, the more severe the reaction. If you know you are allergic to bee stings; get stung in the mouth, nose or throat; have shortness of breath; or have severe swelling or swelling away from the site of the sting; get medical help immediately. If you know you have severe allergic actions to bees stings, you should carry an epi-pen (ask a doctor about this).
- Crossing rivers. Do not attempt to cross rivers with high, fast flowing water. You could drowned.
- Working on Steep Slopes. Take extra care when working on steep slope. Do not put yourself in a situation where a fall could hurt or kill you.

TIST has a Standard Operating Procedure to address safety. To ensure that safety policy and safety issues are understood, each Quantifier are briefed on the safety policy annually.⁷³

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:

⁷³ Exhibit 15 Quantifier Safety: TIST KE PD-VCS-Ex15 Quantifier Safety 191124.doc at <http://www.tist.org/PD-KE-VCS-006%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 is the Project Proponent.
- **TIST Kenya Leadership Council** is a group of TIST farmers that provides oversight of the program. They are in regular contact with CAAC management.
- **TIST Clusters:** One of hundreds of administrative groups usually made up of 20 to 60 Small Groups. The Small Groups are within walking distance. They are run by a Cluster leader and two assistances. Each position rotates so that they all rotate off after several months.
- **Small Group:** 6 to 12 neighboring farmers that are co-signers on their GHG agreement. They are supposed to meet weekly and use rotating leadership.
- **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.

2.4.2 Required Technical Skills (G4.2)

The required technical skills are community engagement, biodiversity assessment and carbon measurement and monitoring skills. These were brought to TIST Kenya under the leadership of the two founders of CAAC. Together they have over 90 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 by the founders of CAAC 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 Mpwapwa 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, 100,000 farmers and planted over 20,000,000 documented trees. The monitoring system they developed won a Computerworld Honors Laureate in 2007. TIST has 14 VCS PDs, most of which have gone through three verifications. TIST has validated and verified seven CCB PDs under the 2nd edition, two under the third edition, and all are CCB Gold for exceptional community benefits. 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 management team has chosen to train local TIST members and build local capacity rather than use expat specialists.

2.4.3 Management Team Experience (G4.2)

The following summarizes CAAC GHG 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 centered around Mpwawa and Morogoro and includes over 1,300 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 6,900 farmers and 1.8 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 (IN 001).
- TIST Program, Uganda, a small-hold farmer A/R project. It began in 2003 and is centered around three towns in southwest Uganda (Bushenyi, Kabale and Kanungu). There are about 16,000 farmers and over seven million trees. The DNA approved the project contingent on submitting a PD based on an approved methodology. They also approved the EIA. There are six validated and verified VCS projects, all of which have been validated and verified under CCB (Gold for exceptional community benefits) and all of which have undergone a third successful verification.
- TIST Program, Kenya, a series of small-hold farmer A/R projects. The project started in 2004 and is centered around Mt Kenya. There are about 76,000 farmers and 10 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 seven validated and verified VCS projects, all of which were also validated and verified under CCB (Gold for exceptional community benefits) and all of which have undergone a second successful verification.
- 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.

The Kenya Leadership Council are all Kenyans and are in charge of day-to-day operations. Several of the positions are rotational, giving new people a chance and place to learn. Many have been with TIST for over 10 years.

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

This PD was developed internally by CAAC and TIST Kenya. Due to the existing skill set, no outside partners were needed. No gaps were identified in the previous CCB validation and verification.

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 and is currently sharing 70% of the profits with the Small Group members. Financial statements and a financial plan (confidential) have been made available to the Verifier.

TIST began, in late 1999, on the expectation that once the trees were large enough, the project would be self-funding. A series of financial projections were developed that showed that after 6 to 10 years (depending on different financial cases regarding market price, growth rate, tree mortality, etc.) the project would be sustainable based solely on carbon revenues. The key to success was very low costs. TIST has designed the program to minimize cost, developing an award winning monitoring system, building Host Country capacity and relying on voluntary effort. Still, there was a cash shortfall in the early years of the project. This was made up by external sources. CAAC 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 USAID (Kenya and Tanzania) and private donors. The fact that TIST is in its 21st year demonstrates its longevity.

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 operation 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. The USAID grants also contained prohibitions of these types of corruption. USAID completed an audit of TIST Kenya in 2016 and found no evidence that these have occurred.

2.4.7 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

The financial plan, Exhibit 07 is confidential.

2.5 Legal Status and Property Rights

2.5.1 Statutory and Customary Property Rights (G5.1)

Land tenure is mostly by registered deed to the individual members participating in TIST. The Project Proponent has no rights to the land; all land is owned by the farmers.

No land disputes have been identified. As part of the GHG contract agreement, Small Group members attest their ownership and/or right to use the land where they plant trees. Additionally, TIST meetings and seminars are open to the public. While there have been cases of land disputes, it was between farmers and family and did not involve TIST.

2.5.2 Recognition of Property Rights (G5.1)

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. All farmers have voluntary signed contracts which explicitly states that they maintain their land tenure rights and property rights over the trees and all the tree products.

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

The following demonstrations are provided:

- The project will not encroach uninvited on private property, community property, or Government property. TIST is voluntary and does not take any lands or encroach on any lands. The lands are controlled by the farmers. By the GHG contract, they maintain ownership of the land and trees.
- The Free, Prior, and Informed Consent has been obtained of those whose property rights are affected by the project through a transparent, agreed process. As noted in this report, TIST has a series of trainings for the farmers about the project before they register and sign the GHG contract. The contract was vetted by DLA Piper as a pro bono action on behalf of the farmers. The farmers only sign the contract and join if they chose to. If they join, they choose the trees they plant, where they are planted and what programs they wish to implement.
- Appropriate restitution or compensation has been allocated to any parties whose lands have been, or will be affected, by the project. By contract, the members receive an advanced carbon payment (tree payment), 70% of the profits from the sale of their carbon and all the tree products. They keep the trees and land and any other benefits that they derive from membership.

2.5.4 Property Rights Protection (G5.3)

Land tenure is by registered deed to the individual members participating in TIST. The Project Proponent has no rights to the land; all land is owned by the farmers.

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 and clearly states in the GHG contract with the farmer that TIST does not infringe on their ownership.

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. 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)

A few land disputes have been identified. They were among other farmers or family members, not TIST. As part of the GHG contract agreement Small Group members attest their ownership and/or right to use the land where they plant trees. Additionally, TIST meetings and seminars are open to the public. Where there is a dispute over grove ownership that can't be resolved, the farmers are released from their GHG contract and removed from TIST.

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. They are, however:

- The employment laws listed herein (Section 2.3.16).
- Companies Act, (Law of Kenya Cap. 486). CAAC is registered as a branch and must remain in good standing to operate in Kenya.
- Environmental Management and Co-ordination Act, 1999.⁷⁴ In conformance with the Act, TIST submitted an EIA to the National Environmental Management Authority (NEMA) and because it received no further communication from NEMA, completed all of its obligations under the Act.
- Kenya Forest Act of 2005. Establishes that all forest in Kenya other than private and local authority forests are vested in the state, and gives the duty of oversight to Kenya Forest Service.

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

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

⁷⁴ Exhibit 01 and Exhibit 02. Environmental Co-ordination and Management Act states that all Kenyans have the right to a clean and healthy environment and sets up the administrative and legal structure to provide it. It sets up the National Environmental Management Authority (NEMA) to oversee this effort. It requires a national environmental plan and district plans. It also requires environmental impact assessments conducted by an authorized consultant for any project that is "out of character with its surroundings." Included in this category is "reforestation and afforestation." Relying on Section 59.8 and 59.9 of the Act, if there is no response from NEMA within 6 months of submitting the EIA, the proponent may begin its undertaking.

15. Regulations Governing Employees (AUG 1992)
 16. Conversion of United States Dollars to Local Currency (NOV 1985)
 17. Use of Pouch Facilities (AUG 1992)
 18. International Air Travel and Transportation (JUN 1999)
 19. Ocean Shipment of Goods (JUN 1999)
 20. Local Procurement (APR 1998)
 21. Voluntary Population Planning Activities – Mandatory Requirements (MAY 2006)
- I4EI was subject to audit by the US government.

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

2.5.8 Approvals (G5.7)

Planting trees on your own land is unregulated in Kenya and requires no approvals. As noted above, we were required to submit an EIA to NEMA and did so.

2.5.9 Right to Claim Benefits (G5.8)

The Project Proponent has a GhG contract among all of the Small Groups that covers all of the Project Areas. The contract gives the rights to the carbon to the Project Proponent.

2.5.10 Other Programs (G5.9)

"TIST Program in Kenya CCB-003" was the CCB certification for KE-VCS-006. It has been renamed to KE-VCS-006 and has become part of the VCS PD. The Project does not participate in any emission trading programs, other binding limits, other forms of social or environmental credit or any other GHG program..

2.5.11 Double Counting (G5.9)

The VCS program has its own backstops in place to prevent double counting. The Project Proponent states that it is not registering these credits with any other entity and that the Host country is not making any claim to them. In addition, the project is not claiming any tradable credits for community or biodiversity credits.

3 CLIMATE

3.1 Without-Project Climate Scenario

3.1.1 Without-Project Estimated Greenhouse Gas Emissions (CL1.1)

CDM methodology AR-AMS0001 Version 06 considers the baseline carbon stock changes to be zero. Therefore, the without project removals are considered zero.

3.2 Net Positive Climate Impacts

3.2.1 With-Project Estimated Greenhouse Gas Emissions (CL2.1)

The project has been validated under VCS as TIST KE-PD-VCS-006 (VCSPD899) and the PD is available on the VCS project website.⁷⁵ Project emissions are emissions caused by the operations of the project. Under methodology CDM AR-AMS0001, project emissions are considered zero. As addressed in the VCS PD-KE-006, this is also true due to the manner in which the Project is operated. TIST has no vehicles, manual labor is conducted by the small-hold farmers on their own land, there are restrictions on chemical fertilizers, no clearing of baseline trees and minimal disturbance of the ground for planting.

3.2.2 Net Impact (CL2.2)

Based in the original VCS PD-KE-006 (2012), the net ex-ante removals are estimated to be 6,998,259 tonnes.

3.3 Offsite Climate Impacts (Leakage)

3.3.1 Types of Expected Leakage (CL3.1)

For ex-post leakage, the methodology requires the monitoring of cropland, domesticated grazing animals and domesticated roaming animals displaced by the project activity during the first verification period. If the indicators were less than 10%, leakage is set to zero. The monitoring results provided in the PD indicated cropland and grazing leakage is below the thresholds that require further monitoring and that the ex-post leakage can be set at zero.

3.3.2 Quantity of Expected Leakage (CL3.1, 3.3)

Zero.

3.3.3 Leakage Mitigation (CL3.2)

None necessary.

3.4 Climate Impact Monitoring

3.4.1 Climate Monitoring Plan (CL4.1)

Organization 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

⁷⁵ <https://registry.verra.org/app/projectDetail/VCS/899>

procedures for monitoring the GHG. CAAC was responsible for the PD, monitoring plan and for selling any GHG that becomes available.

The operational processes for monitoring the actual GHG removal by the sinks are for TIST Quantifiers (also known as Cluster Servants to include their other leadership responsibilities) to visit each grove, at minimum, once every five years, to count trees and collect circumference, GPS, and other data. Quantifiers are audited by the TIST Kenya staff. 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's Quantifiers and office staff. CAAC is responsible for tabulating carbon stocks.

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. Kenya LC members and auditors visit selected project areas and observe quantifications and audits.

Monitoring and Carbon Calculations

Emissions Caused by the Project

The emissions caused by the Project are considered zero. This is due to methodology and the manner in which the Project is operated, such as: no vehicles, manual labor conducted by the small-hold farmers on their own land, restrictions on chemical fertilizers, no clearing of baseline trees and minimal disturbance of the ground for planting.

Project Removal Calculations

The following provides the step-by-step procedure used to determine the Project GHG removals:

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 is monitored. They are documented in the "PA Summary" worksheet of Appendix 14. The location of each PA was obtained with a GPS and is also provided in the "PA Summary" worksheet of Appendix 14. The boundary of each project area was obtained using a GPS and provided in PD Appendix 03. The area was calculated and is listed with each project area in the "PA Summary" worksheet of Appendix 14.

Step 2. The strata for the ex post estimation of the actual net greenhouse gas removals was done by species and year similar to the ex-ante estimate as described in PD Section 3.2. Stratification was done within each individual project area. The area of a stratum in a project area ("Area of a Stratum (ha)") was determined by multiplying the area of project area (see Step 1) by the percentage of trees of that stratum in the respective project area. The results are provided in the "Ex post Strata" worksheet of Appendix 14.

Step 3. Where a tree species exceeded 10% of the total tree inventory, it was assigned to a Major Strata. All other tree species were assigned to an "Other" strata. Based on the tabulations in Appendix 14, there are four major strata: eucalyptus, grevillea, cypress and other.

Step 4. Allometric equations were used to convert DBH values to biomass. An allometric equation for each Major Strata was identified. If a species specific equation for a Major Strata was unavailable, it used the "Other" equation as a default. Allometric equations were researched and the most appropriate ones identified by the Proponent were assigned to the

major strata. Because no better allometric equation could be found for grevillea and cypress, they were assigned to the "other" equation. The following is the assignment.

Eucalyptus⁷⁶: $\text{Log } Y = -2.43 + 2.58 \text{ Log } C$

Grevillea: no species specific equations, will use "Other" equation

Cupressus: no species specific equations, will use "Other" equation

Other (default)⁷⁷: $Y = (0.2035 \times \text{DBH}^{2.3196}) \times 1.2$

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

The result is that there are only two Allometric Strata: eucalyptus and other. See "Circ" worksheet, Appendix 14.

Step 5. The DBH of up to 20 trees per stratum, per project area, were measured. The results of these measurements are presented in the "Circ (cm)" column of the "Circ" worksheet of Appendix 14. Each DBH value for each tree measured was applied to the appropriate allometric equation and the above ground biomass ("AG Biomass, kg") of each per tree in the stratum was obtained.⁷⁸

The "Average Above Ground Biomass per Tree (kg)" of the "Ex post Strata" worksheet was created by processing the "AG Biomass (kg)" values in the "Statistics" worksheet. The individual "AG Biomass" values were transferred by strata to the "Sample Data" section of the "Statistics" worksheet. To be conservative, where the strata age was one year, a zero was entered in the column. The "Statistics" worksheet has a row ("Mean, t BM"), which used the Excel "Average" function to derive the average biomass for each stratum.

The values from "Mean, t BM" of each allometric/age strata were transferred to the "Biomass/ Tree, kg" column of the "Circ" worksheet using an Excel "Lookup" function.

Step 6. For each stratum in each project area, the average above ground biomass per tree ("Biomass/ Tree, kg" column "Ex post Strata" worksheet) was multiplied times the number of

⁷⁶ 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).
<https://www.publish.csiro.au/bt/BT9760397>

⁷⁷ Exhibit 05 Winrock Report: 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) at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁷⁸ The "AG Biomass (kg)" column is the result of this operation. The "Code" function in the formula is looking for an "E" (ASCII 69) in the first letter of the entry in the "Allometric Strata" column to indicate eucalyptus. If the "Code" is E, then the first (eucalyptus) equation applies. If not, the "other" equation applies.

trees, to yield the above ground biomass in stratum (kg), and divided by 1,000 to obtain above ground biomass in stratum ("AG Biomass in Stratum, t").

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

$$\text{Above Ground Biomass in Stratum (t/ha)} = \frac{\text{Above Ground Biomass in Stratum (t)}}{\text{Area of the Stratum (ha)}}$$

Step 8. The above ground biomass in stratum ("AG Biomass in Stratum, t/ha") was multiplied by 0.5 to convert biomass to carbon. The result is above ground carbon in stratum ("AG Carbon in Stratum, t/ha").

Step 9. The carbon stocks of the below ground biomass of each stratum ("BG Carbon in Stratum, t/ha") were calculated by multiplying "AG Biomass in Stratum, t/ha" by the appropriate roots to shoot ratio and by 0.5, the carbon fraction of the biomass. A root to shoot factor of 0.27 is used.⁷⁹

Step 10. The total carbon stocks (CO₂e) are determined by adding the above and below ground carbon (C) of each stratum in each project area, 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.

$$P(t) = \sum_{i=1}^I (PA(t)_i + PB(t)_i) * A_i * (44/12)$$

Where:

$P(t)$ = carbon stocks within the project boundary at time t achieved by the project activity (t CO₂e)

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

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

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

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

The first part of this equation required adding the "AG Biomass in Stratum, t/ha" and "BG Carbon in Stratum, t/ha" and multiplying the sum by the area of each stratum and by 44/12 to convert carbon to CO₂. This is accomplished in the "CO₂ in Stratum (t)" column.

The second part of this formula required summing the values in the "CO₂ in Stratum (t)" column. The result is in the "CO₂ in Stratum (t)" column of the "Ex post Strata" worksheet on the "Project Total" row (bottom of worksheet).

The Steps 1 through 10 result in the cumulative removal from the trees as of the end of the current monitoring period. To obtain the Net GHG Emission Reductions and Removals for Section 3.2.4, the removals from the previous monitoring periods must be subtracted.

⁷⁹ Exhibit 10 GPG-LULUCF: TIST KE PD-VCS-Ex10 GPG-LULUCF 2003 Root-Shoot.pdf, Table 3.A.1.8, at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

Leakage

For ex post leakage, the methodology requires the monitoring of cropland, domesticated grazing animals and domesticated roaming animals displaced by the project activity during the first crediting period. If the indicators were less than 10%, leakage is set to zero. The monitoring results provided in the PD indicated cropland and grazing leakage is below the thresholds that require further monitoring and that the ex post leakage can be set at zero.

Removing Project Activity Instances

When a member or Small Group quits or harvests their trees, or if it is determined that a PD should be removed from the PD, they are no longer active in the PD. The name of the grove is kept on the monitoring spreadsheets, the reason for the removal is listed, and the carbon sequestered from the PA is set to zero. By zeroing the carbon, all of the carbon credits previously issued from the PA are replaced by carbon demonstrated by the most recent verification.

Data Management and QA/QC

TIST uses the following QA/QC procedures:

Quantifier Training: Quantifiers receive explicit training in regard to TIST's Quantifier Manual,⁸⁰ so that quantifications are performed in a standard and regular fashion. 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 custom 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 at least once every five years. 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 be corrected with the new visit.

Cluster Meeting Updates: The Cluster provides an alternate method of gathering intelligence about what is happening at the Small Group level and to individual groves including information that might assist in monitoring the actual GHG removal.

Multiple Tracks: In order to ensure that the location and perimeter of each discrete project area is accurate, each GPS track of the parcel was measured at least twice, or until two tracks that reliably define the project area, are obtained. Quantifiers re-trace the track 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 was used that compares the outline of all project areas. If an overlap was detected,

⁸⁰ Exhibit 40 Quantifier Manual

the project areas were visually compared. If an overlap was determined, the overlapping project area is removed from the PD.

Data Quality: TIST Quantifiers counted every tree in each discrete project area. Counting each tree is 100% sampling and provides greater than 10% precision at the 95% confidence level. Up to 20 circumference readings for each stratum in a project area were taken and archived, to develop a localized database of growth data by strata. This data provided the circumference data for each stratum. This sampling exceeds the 10% precision at the 95% confidence level required by the methodology.

TIST Data System: The data system is an integral part of TIST's quality assurance and quality control plan. The customized 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 being stored in an electronic format on the TIST server. Currently, the server hardware is operated by a third party company that specializes in web and data hosting. They were on the Amazon Cloud (AWS) during the monitoring period. However, CAAC could, in the future, change hosts or choose to host the server at its offices.

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

All of the CCB and VCS documents including the results of the monitoring plan are available on the respective CCB and VCS project web sites. CAAC also makes all of the documentation available to the public on a dedicated web page.⁸¹ Stakeholders are informed of this when they receive the email⁸² advising them of the CCB project, through reading this report that will be made public on the CCB project page and through reading the VCS registry posting.

For those TIST members without internet, the project has developed its Mobile TIST website that is low bandwidth and designed to work with a mobile phone.⁸³ For those without a smartphone, they can see the results of their Small Group's quantification on their vouchers or discuss the results when the Quantifier is monitoring their PAs or come to the monthly cluster meetings and

⁸¹ <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁸² Exhibit 14 Public Comments

⁸³ TIST Mobile: <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6difd7q3>

ask. For those with no other access, they can also go to a local cyber café and see the full reports on-line. The monitoring results are also published in the TIST Kenya newsletter.

A full monitoring plan was developed prior to the first verification. The following provides the monitoring results for this monitoring period. Worksheet references are to Appendix 14, the monitoring data spreadsheets used for the VCS verifications that apply to the monitoring period.

1. Total hectares of the project.
2. Number of discrete project areas (PA).
3. Location and boundary of project areas:
 - See Appendix 03 to PDDs, track files of each PA in KML format (Google Earth).
 - See "PA Summary" worksheet, "Latitude" and "Longitude" columns.
4. List of PAs including administrative information, tree counts, area and last monitoring date.
5. Circumference Data.
6. Tree data including count and species.
7. Carbon sequestration data by Strata.
8. Total Carbon Sequestered.

3.5 Optional Criterion: Climate Change Adaptation Benefits

3.5.1 Regional Climate Change Scenarios (GL1.1)

The likely regional climate change scenarios are identified as changes in rainfall and increasing temperatures.

Changes in Rainfall: As noted by the Government of Kenya's National Climate Change Response Strategy (NCCRS):⁸⁴

The evidence of climate change in Kenya is unmistakable. Temperatures have risen throughout the country. Rainfalls have become irregular and unpredictable, and when it rains, downpour is more intense. Extreme and harsh weather is now a norm in Kenya.

As regards rainfalls, the most visible feature is the increased variability year to year, and during the year. There is a general decline of rainfall in the main rainfall season of March-May (the "Long Rains"). In other words, drought in the Long Rains Season is more frequent and prolonged. On the other hand, there is a general positive trend (more rains) during September to February. This suggests that the "Short Rains" (October-December) season is extending into what is normally hot and dry period of January and February.

As described by Reliefweb:⁸⁵

The first rains are sometimes insufficient to support a harvest or even livestock rearing.

While the average number of rainy days during the short-wet season has reduced from 60 to 30, rainfall has become more intense and the season is being prolonged into January and February, leading to higher total rainfall for this season. Rainfall intensity has increased all over the country, but especially in the coastal area. The area of west-central Kenya receiving

⁸⁴ <http://www.environment.go.ke/wp-content/documents/complete%20nccrs%20executive%20brief.pdf>

⁸⁵ https://reliefweb.int/sites/reliefweb.int/files/resources/Kenya_2.pdf

500 mm of rain or more has shrunk since 1960 and is likely to keep shrinking over the next 30 years. Mean annual temperatures have increased significantly, at a rate of 0.34°C per decade over the last 30 years. These trends are accompanied by an increase in extreme events such as droughts and floods.

The Kenya National Adaptation Plan 2015-2030 provides long term rainfall predictions:⁸⁶

Global Climate Modelling (GCM) predicts an increase in average rainfall by the 2060s especially for the short rains from October to December. However, it further predicts the numbers of heavy events will increase. The range of increase varies from 2 to 11 per cent by the 2060s and 2 to 12 per cent by the end of the century.

Increasing Temperatures: NCCRS discusses the increasing temperatures in Kenya:

Since the early 1960s, both minimum (night time) and maximum (daytime) temperatures have been on an increasing (warming) trend. The minimum temperature has risen generally by 0.7–2.0° C and the maximum by 0.2–1.3° C, depending on the season and the region.

Reliefweb provides another summary of temperature changes:

Temperature projections are more consistent across climate change models. An average increase of 0-2.5° C is expected for the country between 2000 and 2050, with 1-2° C as the most likely range. For 2100 a warming ranging between 1.3° C and 3.9° C is likely, with some models suggesting an increase of 4°C by 2100. Highest increases are expected for the far northeast, and smallest increases for the southeast. In general, the plateaus, mountain ranges and coastal area will remain cooler than inland lowlands. Temperature increases will be seasonal, with the smallest increase expected for the start of the long wet season (March – May).

The Kenya National Adaptation Plan 2015-2030 present the results of long term temperature modelling:

Global Climate Modelling (GCM) data indicates that the mean annual temperature is projected to increase by between 0.8 and 1.5°C by the 2030s and 1.6°C to 2.7°C by the 2060s ... There is good model agreement of temperature increases of up to 3°C by 2100.

3.5.2 Climate Change Impacts

Current and anticipated climate changes are having an impact on the well-being of communities and/or the conservation status of biodiversity in the project zone and surrounding regions.

Drought: From 2014-Present, Kenya has been experiencing severe drought.⁸⁷ The impact of drought is felt acutely in certain regions where this project is active. These include Nanyuki, Mara, and Machakos. The reader is referred to the reference for more detail, but the impacts include:

⁸⁶ https://www4.unfccc.int/sites/NAPC/Documents%20NAP/Kenya_NAP_Final.pdf

⁸⁷ "Kenya: Drought - 2014-2020." *ReliefWeb*, reliefweb.int/disaster/dr-2014-000131-ken, accessed February 10, 2020

- “Food insecurity had more than doubled - from 600,000 (Aug 2015 - March 2016) to 1.25 million people (August 2016 – Feb 2017).”
- “Drought conditions that were expected to persist into 2018 left 3.4 million people severely food insecure and an estimated 500,000 people without access to water.”
- “In marginal agricultural areas, the October to December [2017] short rains season were significantly below average and short rains crop production were expected to be 70 percent of average. “

Irregular Rainfall: In addition to acute drought, irregular rainfall dramatically impacts farmers’ ability to grow food. The success of Kenya subsistence farmers has been to plant in time for seasonal rains so that their crops take advantage of the two rainy seasons. Early rains means they don’t get the seeds in the ground in time. Late rains mean the seed lie dormant and become food for birds and rodents. The lack of a consistent rainy season can mean the crops may get a strong start, only to dry out before they are ready to harvest.

Floods: The increased intensity of the short rains has led to flooding. In 2020, 237 people were killed and 100,000 displaced.⁸⁸ Combined with drought, heavy rains cause significant erosion. A healthy ecosystem can reduce erosion by absorbing the rain and providing a strong root system to stabilize the soil. The drought weakens the biosphere and reduces its ability to protect the soil. When the heavy rains come, high rates of erosion are likely to ensue. The down-stream effect is mud clogged streams, poor water quality and possibly physical damage to infrastructure.

Fire: Drought in turn has led to more wildfires in Kenya. This has impacted various regions, including widespread fires in and around Mount Kenya National Park in 2019 where over 20,000 hectares were burned. Because of sub-average short rains in 2018 (October-December), the vegetation was very dry going into 2019. The fires release carbon dioxide, methane, carbon monoxide, and nitrous oxide, all greenhouse gases, so beside having a negative impact on the biodiversity of Mt Kenya, it acerbates climate change.⁸⁹

High Wind: Climate change is contributing to unpredictable wind patterns in Kenya. They can take off roofs, blow down trees and cause sand storms. Two major event occurred around October 1, 2019 and July 15, 2020.⁹⁰

Effects on Wildlife: Changes in weather negatively impact HCVs and many of the flora and fauna in Kenya.⁹¹

The KWS says climate change and ecological disturbances could have caused a recent increase in deaths in wildlife populations from infectious diseases. Birds and mammals have been the worst affected, with climate change blamed for the sudden mass death of flamingos around Lake Nakuru in central Kenya last year.

⁸⁸ https://en.wikipedia.org/wiki/2020_East_Africa_floods

⁸⁹ <https://theconversation.com/why-mountain-kenya-is-burning-and-what-can-be-done-to-stop-the-fires-112842> accesses March 25, 2021.

⁹⁰ <https://www.youtube.com/watch?v=Blrjn2aDEoc> accesses March 25, 2021.

⁹¹ <https://www.scidev.net/global/news/climate-change-devastating-wildlife-in-east-africa/#:~:text=told%20SciDev.Net,-,The%20KWS%20says%20climate%20change%20and%20ecological%20disturbances%20could%20have,in%20central%20Kenya%20last%20year.>

According to the report, Kenya's 66 animal parks are all experiencing changes in animal disease patterns.

Impact on TIST members: The climate change impacts, in turn, have a significant impact on the well-being of TIST project participants. They are the same people affected by the food security issues caused by drought and irregular rainfall. They live in proximity of the Mt Kenya fires. They were affected by the high winds, sand storms and floods.

Drought, fire, and unpredictable rainfall could potentially render agricultural land less productive. It can impact TIST participants' ability to grow food and in the worst cases, this can lead to widespread famine. More mild cases lead to food shortages and diminished economic prospects.

In seminars, farmers have provided stories about how they are being impacted.

- Loss of crop from drought has led to the death elderly parents. When there is a food shortage, the elderly may forgo their meals so that the younger can eat.
- Some farmers have reported having to move their crops up the hillsides to seek cooler temperatures.
- TIST has received anecdotal reports of flooding and landslides caused by irregular but intense, rainfall.

Fires are less pervasive on the farms but can 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. As an A/R project, fire has the potential of destroying a PA's carbon stock.

Through TIST, farmers are able to identify, share, and implement strategies to mitigate these risks.

3.5.3 Measures Needed and Designed for Adaptation

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 in Kenya have removed more than 5M tonnes of CO₂ by planting and maintaining trees. TIST will monitor the amount of carbon it has sequester in the PD from the start date to end of the monitoring period.

Conservation Farming: Erratic rainfall and higher temperatures have a negative impact on food security. TIST trains farmers on climate resilient agricultural techniques to directly address that. 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. TIST will monitor the training (person-session) in improved farming methods (predominantly Conservation Farming) provided during the monitoring period and provide an estimate of the benefits.

Trees: By planting fruit and nut trees, members can help mitigate food security. Trees can help retain soil moisture during droughts and reduced the erosion that can occur from heavy rains. Increasing temperature are mitigated by tree canopies that can create microclimates on TIST farms by providing cooling shade 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. TIST will monitor the number of living trees as of the end of the monitoring period. Information about tree species, including fruit and nut trees, are reported in the community and biodiversity sections of the monitoring report.

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 will report on the number of Clusters and Cluster meetings held during the monitoring period. The training by subject (person-session) is provided in the community section of the monitoring report.

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 Kenyan standards and virtually all of them are poor by global standards. A detailed survey of the population can be found below including gender, age distribution, marital status, education status and literacy rates, income distribution, and occupational status.

The following community information is based on a survey of 416 households in central Kenya, where much of the project areas are clustered.⁹²

Table 4.1.1a: Distribution of respondents by Gender

Gender	Freq	%
Male	206	49.5
Female	210	50.5
Total	416	100

The sample shows that young, middle age and elderly respondents were included, although more households in relatively young age categories (31 to 45) were interviewed, as compared to other age brackets as indicated in the table below:

Table 4.1.1b: Distribution of respondents by Age

Age Categories (Years)	Freq	%
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⁹² Kenya Ministry of Agriculture in Meru East and West Divisions, using Participatory Analysis of Poverty and Livelihood Dynamic (PAPOLD).

21-30	56	13.5
31-45	156	37.5
46-60	125	30.0
61 and above	79	19.0
Total	416	100

The majority of the households sampled (88.9%) are married, which is an indication of the household typologies over the project areas. A combined household of the unmarried, of the widowed couples and those separated or divorced represents slightly over 10 percent of the entire households as contained in table below:

Table 4.1.1c: Distribution of respondents by Marital Status

Marital Status	Freq	%
Single	19	4.6
Married	370	88.9
Widow/Widower	20	4.8
Separated/Divorced	7	1.7
Total	416	100

Farming is the main occupation of the respondents. Other insignificant livelihood activities are casual labor, employment, business and reliance on pension as presented in table below:

Table 4.1.1d: Distribution of respondents by Occupation

Occupational Status	Freq	%
Farmer	379	91.1
Casual Labour	2	.5
Formal Employment	14	3.4
Business	14	3.4
Informal Employment	6	1.4
Pension	1	.2
Total	416	100

The people that live in the project zone are mostly subsistence farmers. Average annual income is shown in Table 2.1.4f and is based on community data developed by the Kenya Ministry of Agriculture in Meru East and West Divisions, using Participatory Analysis of Poverty and Livelihood Dynamic (PAPOLD).

Table 4.1.1e: Annual Income Brackets

<i>Income Level (Ksh)</i>		<i>Income Level US\$</i>		<i>Pct of Groups</i>
<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	
0	12,000	\$0	\$160	5%
12,000	60,000	\$160	\$800	40%
60,000	180,000	\$800	\$2,400	25%
180,000	300,000	\$2,400	\$4,000	15%
300,000	420,000	\$4,000	\$5,600	10%
420,000	above	\$5,600	above	5%

TIST farmers in this project are further united by their nationality. As Kenyans, they have shared experiences with governance. This is demonstrated by their relationship with land ownership; the Kenyan 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 Kenyans, are Christian.

The TIST farmers in this project are diverse in many respects. They speak many languages, including English, Kimeru, Kikuyu, Kiswahili, Kikamba, and Kipsigis. Farmers are members of numerous ethnic groups and tribes. This 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.

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

The interaction between communities and community groups at the project start was peaceful. Although Kenya has several dominate ethnic groups and tribes their interaction is normally harmonious. While there have been ethnic conflicts in the past 30 years, they have not been in the Mt Kenya area. There have been terrorist incursions from Somalia by Al Shabaab which has included Nairobi, these took place after project start and did not directly affect or involve TIST communities.

The interaction between communities, community groups, and TIST at the project start is described in Sections 2.1.6 and 2.1.7. The following are summaries of some of the comments TIST has received from non-participant stakeholders.

- D.K. Mbugua, Chief Conservator of the Forest, in a letter to the Director General of the National Environment Management Authority on 08 January 2007. "The forestry Department has looked at the proposal [the TIST PIN for Kenya] and is of the view that the proposal can easily be implemented, and the carbon resources can be secured over the proposed time frame. The purpose of this letter is to request your office allow the group [to] develop the project further while preparing a PD for transmission to the UNFCCC Executive Board."
- Dr. A. Muusya Mwinzi, Director General, National Environment Management Authority in a letter dated 19 March 2007. "We wish to refer to the Forest Department on behalf of Clean Air Action Corporation that the above mentioned programme [TIST] be allowed to proceed... As the authorized representative of Kenya, I hereby confirm that we have no objection to the further development of the TIST project."

- N.M. Ndwiga, for the District Forest Officer, Meru North District, in a letter to the Administrator, TIST Kenya, dated September 13, 2007. "This office highly appreciates what your organization is doing and its ready to liaise with your office to enable them achieve their goals which are of enormous importance to this district and the nation at large."
- Shieni K. Kioyiet, NEMA, Bomet District, Chemaner Area – invites TIST to come to this area to plant trees for long-term conservation and climate advantages.
- Waweru Kimani, District Commissioner, Bomet District – invites TIST to Bomet District to advise farmers on reforestation, carbon trading and suitable agriculture.
- Friar Patrick Nkaai, Parish Priest of Ngong, Mulot Catholic Mission – are in support of TIST to help community in training of sustainable farming.
- S.M. Gighohi, District Officer, Mulot Division – fully invites TIST to share efforts in this region and guarantees full cooperation and support.
- Wawire, District Environmental Officer, Narok South District – very willing to support TIST program in this area and believes it will help restore Mara Basin.
- Edward Aubey, Office of the President, Meru North District – agrees for TIST team to enter Meru North and train their people in planting trees to clean the air.
- Joseph K. Thirtu, Office of the President, Meru North District – gives permission of Jeremiah Murangiri [a TIST leader] to participate as TSE to facilitate environmental conservation.
- Chief, Meru District – John Kinyua is introduced and approved to train and work as TSE in Kiorimba location to plant trees and conserve soil.
- F.D. M. Mugwimi, District Forest Officer, Kirinyaga – his office gives support to Benard Githui [a TIST leader] in working with Community Groups in his District.
- Rev. John Mararo Gachoki, Admin. Secretary, Diocese of Kirinyaga – extend invitation to TIST to promote tree planting in this area and work with to improve farming methods.
- C.M. Wamola, District Forest Officer, Isiolo District – has no objection to the program, and is ready to assist in TIST activities pertaining to forestry.
- Samuel K. Mukundi, District Forest Officer, Laikipia West District – willing to cooperate/add support and believes TIST will add value to their area like it has in Laikipia East District.
- John Maine, African Inland Church, Nyahururu – very interested in TIST and wants a seminar with the community.
- Pastor L.M. Miltiru, Truevine Apolistic Ministry, Nyahururu – requests a date for a seminar to inform them about the program.
- NJuli K. Jeremiah, Kenya Assembly of God, Nyahururu – invite TIST to come to the Salama area and present a seminar and teach them more.
- Rev. J. Mimitha, Jesus Victory Ministry, Mara Meru – invite TIST to come their deforested area and help them improve thru tree planting.
- Fr. John Mbanbum, St. John the Baptist Church, Meru-Kenya – he invites Fabiano Kobia, TSE [a TIST leader], to train farmers in this parish in areas of Thanantu, Macegene, Rurii, Kagwuru and Kiguru.
- L.R. Njagi, District Officer, Tigania West – introduces Jeniffer Kithure [a TIST leader] and supports her as the appointed person to work with TIST in their area.
- H. Kayes, District Officer, Buuri Division-Meru – supports Jeniffer Kithure [a TIST leader] to work in their division with local farmers in planting trees.
- J.M. Kamau, District Environmental Officer, Igembe/Tigania District – supports Mary Wanyoike, TSE [a TIST leader], to support environmental activities in this district.
- District Officer, Igembe/Nekunudeth Districts – supports Mary Wanyoike, TSE [a TIST leader], in assisting the community in growing trees and cleaning the environment.

- B.M. Muriuki, District Officer, Meru North – supports Mary Wanyoike [a TIST leader] to educate and sensitize people to the need of planting trees in Nguyaya location.
- Jacob J. Mugambi, Assistant Chief of A/NJoune sub-location - agrees to the TIST tree program in his jurisdiction.
- Adam Kubai M"umbeal, Chief, Kiengu location – invites and will assist TIST's noble activities in his area.
- K.M. Ndwiga, District Forest Officer, Meru North District – his office appreciates Mary Wanyoike [a TIST leader] and the TIST organization and is ready to liaison with us.
- B.K. Nanyo, Forest Extension Officer, Igembe South/West Division – is allowing Augenio Akwalu as TSE [a TIST leader] to work in their division.
- C.W. Mwangi, District Environment Officer, Kirinyaga – Bernard Githui [a TIST leader] has their support to improve environment and livelihood thru tree planting.
- C. Wafula, District Officer, Muthambi Division – accords their assistance in supporting a successful program and highly appreciates TIST.
- Brother Timothy Mathenge, Presbyterian Church of E. Africa, Gituamba Parish – interested in the good works of TIST and ready to work and obtain more information.
- Rev. Sammy Kithinil Majuri, Presbyterian Church of E. Africa, Chogorja South – supports a church elder, who is retired teacher, to work with TIST to improve environmental innovation of this area.
- B.M. Birichi, District Environment Officer, Tharaka District – supports Susan Muita, TSE [a TIST leader], and shall collaborate and assist her as necessary.
- J.M. Kamau, District Environment Officer, Igembe/Tigania Districts – welcomes Susan Muita, TSE [a TIST leader], to support environmental activities in this district.
- K.M. Ndwiga, District Forest Officer, Meru North District – his office highly appreciates TIST organization and is ready to work with us to reach enormously important goals.
- Rev. Michael Simba, Methodist Church in Kenya, Marimanti, Tharaka, Kenya – church highly recommends and supports Susan Muita [a TIST leader] in the task of tree planting.
- Dominic Kirimi, Assistant Chief, Kuja sub-location - accepts Susan Muita [a TIST leader] in this location to plant trees and supports community to do same.
- Chief Phillip Kobo, Ntunene Location – TIST is a viable endeavor and gives permission to Susan Muita [a TIST leader] to begin work with group in this location.
- Rev. Justus Mwenda, Superintendent Minister, Laare Circuit – Susan Muita [a TIST leader] presented program to church and find the mission worthy for their district. They will assist her as necessary.
- Chief D. Mutino, Nguyuyu Location – acknowledges and welcomes Susan Nuita as TSE [a TIST leader] in their location.
- Julius Kiruneya, Chairman, St. Julius Catholic Church, Khurene –they are very thankful and request program members come teach their church more about TIST/CAAC.
- B.M. Kinyili, for District Forest Officer, Nyeri – request TIST collaborate, supervise, follow-up and assist in all activities to reforest their area.
- The Chiefs Office, Kabuthee Location – welcomes TIST program and reports residents are very happy to have in their area.
- Group letter from Foresters, Chiefs, Reverend and Pastor Geruasio Kobia Mutia – they are thankful for the TIST – TSE program in all 13 areas of Kenya, and vouch for Paulina Nyoroka [a TIST leader].

- Rev. Solomon Mukindia and Meru North Tree Farmers, Mbaranga/Karama location – acknowledge the good work TIST is undertaking and request extension to the areas of Mbaranga, Uuru, and Antuaduran.
- Pastor Muangi Charles, Full Gospel Church of Kenya – he is sure the program will improve the farmers land, supports TIST and John Kingua [a TIST leader].

There have been no negative comments received.

4.1.3 High Conservation Values (CM1.2)

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

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

Aberdare National Park was established in 1950. The mountains in which it is located are considered one of the five "water towers" of Kenya. As a water tower, Aberdare National Park is an HCV due to its provision of critical environmental services.

High Conservation Value	Mount Kenya National Park
Qualifying Attribute	Areas that provide critical ecosystem services
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	Aberdare National Park
Qualifying Attribute	Areas that provide critical ecosystem services
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.

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

The expected changes in the well-being conditions and other characteristics of communities and community groups under the without-project land use scenario would be expected to be minimal. The community would likely continue to be comprised of subsistence farmers, many of whom are living far below national and international definitions of poverty. This has been the case for generations. Due to the increasing population and decrease in available land per capita, it could degrade. According to USAID:⁹³

“More than 75 percent of Kenyans make some part of their living in agriculture, and the sector accounts for more than a fourth of Kenya’s gross domestic product (GDP). However, agricultural productivity has gradually stagnated in recent years, despite continuous population growth. Moreover, only about 20 percent of Kenyan land is suitable for farming, and in these areas maximum yields have not been achieved, leaving considerable potential for increases in productivity.

The majority of farmers work without basic agricultural inputs or updated technology and lack adequate financial or extension services. Recurrent crises such as drought in Kenya’s arid and semi-arid areas have exacerbated the vulnerability of basic livelihoods. This has posed critical challenges to food security and over two million Kenyans receive food aid annually.

The same overview notes that recurring drought and other climatic crises are contributing to challenging conditions. These dynamics would likely continue without project activities. Furthermore, Kenya is experiencing rapid population growth and urbanization. Under the without project scenario this would likely persist.

4.2 Net Positive Community Impacts

4.2.1 Expected Community Impacts (CM2.1)

Community Group	TIST members in Kenya
Impact	Number of new job opportunities
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	Direct employment was demonstrated to be 74 as of this re-validation. TIST requires a Host Country staff to operate. 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. Affected groups have participated in the evaluation of impacts

⁹³ *Agriculture and Food Security Overview*, USAID, <https://www.usaid.gov/kenya/agriculture-and-food-security>, accessed February 11, 2021

	by either receiving employment or seeing others receive positions with TIST.
	Source of data: administrative records

Community Group	TIST members in Kenya
Impact	Amount of carbon payments Small Groups
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	Carbon payments to members were demonstrated to be \$1,261,793 as of this re-validation. Number of members receiving carbon payments were demonstrated to be 43,698 (17,886 women; 25,812 men) as of this re-validation. Affected groups have participated in the evaluation of impacts by either receiving cash benefits or seeing others receive cash benefits. 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. When the project became self-funding from the sale of carbon credits this monitoring period, they began to receive 70% of the net carbon revenues. Source of data: database query

Community Group	TIST members in PD
Impact	Number of members benefiting from Small Group structure
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	Number of Small Group members in the PD were demonstrated to be 27,372 as of this re-validation and 3,582 Small Groups in this PD. Empowerment of Small Groups and creation of “best practices” improves farm production, health, and farmer life. Small Groups use “rotating leadership” which supports gender equality and develops the capacities of each member. The visible success of the TIST groups and the availability of wood, shade, lumber, fruit, and improved crop yields provide the entire community with positive examples. Affected groups have participated in the evaluation of impacts by part of a Small Group and experiencing rotating leadership

	and sharing best practices with their neighbors. Source of data: database query
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Community Group	TIST members in PD
Impact	Number of trees with fruits or nut products
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	Number of fruit and nut trees were demonstrated to be 198,379 as of this re-validation. 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. Affected groups have participated in the evaluation of impacts by planting fruit tree and reaping their fruit or seeing others in the TIST community doing so. Source of data: Appendix 14

Community Group	TIST members in PD
Impact	Number of trees producing other wood benefits
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	There are 1,946,149 trees in the PD, representing 159 different species demonstrated as of this re-validation. Many, such as <i>Grevillea robusta</i> and <i>Cupressus</i> spp. can be pruned and used for firewood. <i>Eucalyptus grandis</i> can provide poles. Affected groups have participated in the evaluation of impacts by planting trees and gaining the benefit of wood products and limited timber or by seeing their TIST neighbors doing so. Source of data: Table 5.1.6

Community Group	TIST members in PD
Impact	Number of trees producing natural medicines, insecticides and other benefits
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	There are at least 200,000 trees from 80 species that fall in this category demonstrated as of this re-validation.. This includes medicinal trees such as <i>Azadirachta indica</i> trees, multi-use trees such as <i>Moringa oleifera</i> and ornamental trees such as

	Callistemon spp. Affected groups have participated in the evaluation of impacts by planting trees and benefiting from natural medicines, insecticides, etc. or by observing their neighbors doing so. Source of data: Table 5.1.6
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Community Group	TIST members in Kenya
Impact	Number of capacity building person training sessions on agricultural improvements, business skills, nursery development, and reforestation
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	TIST has provided the following person-session training since the project start date to the time of this re-validation. Conservation Farming: 220,895 Nursery development: 182,873 Reforestation and natural resource management: 630,118 Climate change: 129,238 Biodiversity: 279,755 Health topics: 132,929 Affected groups have participated in the evaluation of impacts by attending training sessions and implementing what they have learned. Source of data: Cluster meeting data

Community Group	Small Groups in PD
Impact	Number of person training sessions that address social and economic problems
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	TIST provided the following training in Conservation Farming and health topics since the project start date to the time of this re-validation: Conservation Farming: 220,895 Health topics: 132,929 Affected groups have participated in the evaluation of impacts by attending training sessions and implementing what they have learned. Source of data: database query, Table 5.1.6

Community Group	TIST members in PD
Impact	Number of trees providing improved landscape
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	1,946,149 trees, representing 159 species that re-green the landscape have been demonstrated as of this re-validation. Affected groups have participated in the evaluation of impacts by planting trees and observing the beauty of the improved landscape. Source of data: Table 5.1.6, Table 5.3.1

Community Group	TIST members in Kenya
Impact	Number of hectare of High Conservation Value negatively affected
Type of Benefit/Cost/Risk	Actual direct benefit
Change in Well-being	No TIST PAs have encroached on HCV areas as of this re-validation. TIST tree planting activities provide alternative sources of wood resources reducing external pressure on the HCV areas. Affected groups have participated in the evaluation of impacts by planting trees, using them as alternatives to their firewood need, improving on-farm biodiversity and hearing about the benefits to HCVs. Source of data: Appendix 03 PA Plots, Table 5.1.6, Table 5.3.1

As noted in the tables, affected groups have participated in the evaluation of impacts by taking actions and seeing how that affects their own lives and their neighbors. In addition, many are active participants at Cluster meetings and help establish best practices that further benefit the members. If their internal evaluation were to conclude the impacts were not worth staying a member, they would quit. Instead TIST has grown to over 100,000 farmers and we receive regular request to expand to more.

4.2.2 Negative Community Impact Mitigation (CM2.2)

Certain risks were identified in Section 2.3.4. While clearly risks, they have not been identified to have resulted in negative community impacts and therefore do not require mitigation. The reason is that they are addressed through project design and training to prevent negative impacts from happening.

To reiterate the risks and their mitigation:

- The farmers could use too much of their farm land for tree planting and jeopardize their food security. TIST addresses this with training. 1) We ask that they only plant trees on land they

- don't need for crops. Sometimes this means that they just plant around their boundary or house. 2) We encourage them to plant some fruit and nut trees that can supplement their food supply and possibly lead to a cash crop allowing them to buy other food. 3) We train them in Conservation Farming to lead to higher crop yields than the traditional methods.
- They could spend money on seedlings but have their trees die. We do not want them spending money on seedlings. We train them to collect seeds to build Small Group nurseries. TIST was designed to have zero cost of entry for the subsistence farmer.
 - Their trees could die. Early mortality is the biggest problem and it requires that the farmers follow the Conservation Farming method for their trees. Usually the trees thrive past the first year. If the trees die, they are free to use them for firewood. Historically, this has not been a common problem.

In addition, 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, no negative impacts were identified as of this re-validation. The addition of trees on private land benefits the HCVs by reducing the pressure on them.

4.2.3 Net Positive Community Well-Being (CM2.3, GL1.4)

Without the TIST program, the communities carry on as they have. They are subsistence farmers doing what they can to eke out a living. They grow their own crop and raise their own livestock. Most do not practice any kind of Conservation Farming. Many don't have a stream of cash income that can pay for needed items such as other food and livestock, or even school fees for their children. They must face issues regarding clean water and air. TIST was designed to address these issues. The monitoring report will itemizes the positive benefits our different programs and trainings. Each one is available to the members at zero cost.

Weighing the positives and the negatives, it will been demonstrated that the project has a net well-being impact compared to the "without project" land use scenario.

Per Section 3.5, the project intends to meet the Gold Level for climate change adaptation benefits. TIST assists communities to adapt to the probable impacts of climate change by providing training and encouragement in several adaptation techniques. As noted in Section 3.5.3:

- **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.
- **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.

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.

4.3 Other Stakeholder Impacts

4.3.1 Impacts on Other Stakeholders (CM3.1)

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 not trees, there will be more local food.
- As TIST members undergo training, there will be spill over to friends and neighbors outside the TIST community. This includes Conservation Farming, successful tree planting, construction tree nurseries, use of trees for stabilizing soil and water courses, ways to mitigate climate change and all the other training themes.
- More locally sourced fuelwood. As the TIST trees grow, some of the farmer 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 potential 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.

There have been no reports of this happening as of this re-validation.

4.3.2 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

As of this this re-validation, these problems have not materialized. Until it happens and the scope and impact can be determined, we do not believe there is any mitigation necessary.

4.3.3 Net Impacts on Other Stakeholders (CM3.3)

After comparing the positive and negative effects listed above, it seems reasonable to conclude that the net impact on Other Stakeholders is and will remain positive.

4.4 Community Impact Monitoring

4.4.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

The monitoring will be of the TIST members, both within this PD and of TIST Kenya as a whole. The following are the components of the Community Impact Monitoring plan.

All population (members and SGs) statistics are physical counts of all participants maintained on our database and are updated real-time. New members are added through enrollment. Departing members are tracked by the Cluster Servants from quantitation visits and Cluster meetings. The numbers are obtained by queries of the database at the end of each monitoring period.

1. Number of Small Group members in PD (male and female).
2. Number of Small Groups in PD.
3. Number of community members in TIST Kenya (male and female).
4. Number of Small Groups in TIST Kenya.

Activity based reporting are subsets of the TIST population that have been correlated to a specific activity. Data collection is ongoing by comparing the population to the current activity status on the database.

5. Number of community members active in TIST Kenya. Active members are a subset that the database indicates to have trees, engaged in conservation farming or has been flagged as having done any TIST activity other than just enrolling.
6. Number of TIST members in Kenya adopting natural resource management practices. These are a subset that either engages in tree planning or conservation farming.
7. Number of TIST members in Kenya adopting Conservation Farming. These are farmers that have engaged in Conservation Farming.
8. Number of TIST members in Kenya with greenhouse gas agreements. These are the farmers that have signed a GhG contract.

Payments to members come from the payments records are collected real time with every payment. They are based on either tree counts (tree stipend) or carbon (profit share). The tree stipends are based on the on-going tree counts. The carbon payments are calculated annually once CAAC's annual audit is complete and the profit is known, using the carbon calculation run

on the database. The database has a voucher system that calculates moneys due to a Small Group. The KE payment team schedules the payments for a Cluster meeting and receives funding from CAAC. They hand out vouchers for SGs to take home to be reviewed and signed by the other SG members. They are brought back signed to the next Cluster meeting and are paid. The payments are by mobile money (Mpesa). The TIST Data System captures a record of the Mpesa text and records it in the database. Total payments reported are cash to the SGs during the monitoring period as obtained by a custom query.

9. Total payments to TIST members in Kenya.

Training person sessions is obtained real-time and on-going at the Cluster meetings. The numbers of attendees (by gender) and general training categories are recorded on our smartphone app and uploaded to the server. The database tables are accessed to provide the information for the monitoring report.

10. Number of person-training sessions in climate change (male and female).
11. Number of person-training sessions on HIV/AIDS (male and female).
12. Number of person-training sessions on biodiversity (male and female).

All tree data are based on physical counts of each tree by age and species strata. This information is collected with each visit to a PA by a Cluster Servant/Quantifier. See Section 3 for more details.

13. Number of live surviving trees in PD.
14. Number of fruit or nut trees in PD.
15. Number of eucalyptus trees in PD.

Number of people employed is monitored by the LC and the count is provided for the MR when the MR is being written.

16. Number of people employed by TIST or under contract to deliver services.

Specific Gold Level Monitoring for Community Benefits

These are based on periodic surveys of a sample of the members. The current surveys in use are from 2011 and 2015. The data is extrapolated for the monitoring period based on the theory that we have not changed the TIST since that time and continue to focus on providing training and benefits to the members. Further detail will be presented in Optional Criterion: Exceptional Community Benefits, Section 4.5 of the MR.

17. Monetized benefits to average members.
18. Monetized benefits to vulnerable members.
19. Monetized benefits to female members.
20. Negative impacts identified by members.

Specific Gold Level Monitoring for Adaptation

The indicators for climate change adaptation benefits for communities are discussed in Section 3.5.3. They will be presented in the climate change adaptation section of the MR. To summarize, they are:

- Drawdown of CO₂: Tonnes sequestered to date are per Section 3.4 as determined by the on-going tree monitoring, culminating in the creation of Appendix 14 at the end of the monitoring period.
- Conservation Farming: TIST will monitor the training (person-session) in improved farming methods (predominantly Conservation Farming). It is the same indicator and collected the same way as item 10, above.
- Trees: TIST will monitor the number of living trees as of the end of the monitoring period. This is the same indicator and collected the same way as item 13, above.
- Community Organization: TIST will report on the number of Clusters and Cluster meetings held during the monitoring period. The numbers of Clusters is a count from the administrative records on the database. The number of meetings is a summation of all the meetings recorded on the database. The information is collected by Cluster Servants at the meetings, recorded on our smartphone app, uploaded to the database and compiled for the MR.

Enhancing HCVs

As noted elsewhere in PD, the project does not take place inside the HCVs. As such, the monitoring plan indirectly assesses the effectiveness of measures taken to maintain or enhance all identified HCVs related to community well-being. As a tree planting program, TIST establishes an alternative fuel supply for a population that relies on fuelwood. If it doesn't exist on the farms and private lands, the subsistence farmers will go into the protected forest. The metric is the number of trees planted and maintained by the TIST farmers. It is the same metric as item 13, above. The measurements, sampling, frequency and reporting are discussed with that item.

In addition, more program components, such as tree counts and GPS tracts of all the Project Areas, are being obtained in the climate change monitoring plan. Tree counts are an indicator of program participation and expected carbon revenues. The GPS tracks of the PAs shows where the main community activities are located.

Monitoring will be done as part of the overall monitoring of TIST. This means monitoring is ongoing. Data will be collected by TIST Quantifiers as they visit each Small Group to count trees by species. 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.

The date of each monitoring visit for the PD will be provided.

4.4.2 Monitoring Plan Dissemination (CM4.3)

All of the CCB and VCS documents, including the results of the monitoring plan, are available on the respective CCB and VCS project web sites. CAAC also makes all of the documentation

available to the public on a dedicated web page.⁹⁴ Stakeholders were informed of this when they received the email⁹⁵ advising them of the effort to re-validate this PD.

For those TIST members without internet, the project has developed its Mobile TIST website that is low bandwidth and designed to work with a mobile phone.⁹⁶ For those without a smartphone, they can see the results of their Small Group's quantification on their vouchers or discuss the results when the Quantifier is monitoring their PAs or come to the monthly cluster meetings and ask. For those with no other access, they can also go to a local cyber café and see the full reports on-line. The monitoring results have also been published in the TIST Kenya newsletter.⁹⁷

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 the project. Their actions are what create 100% of the benefits. Ownership is attested to in Exhibit 03 and 04.⁹⁸

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 are eligible to receive a carbon pre-payment. These prepayments serve as a bridge until their carbon stock is verified. At this point, they are able to share in 70% of the program's profits.

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 cook stove construction, and leadership development are ongoing.

Through surveys and data collected for the project, TIST demonstrates and monetizes the benefits received by the farmers. TIST farmers also benefit from the sustainable development training they receive.

⁹⁴ <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

⁹⁵ Exhibit 14 Public Comments

⁹⁶ TIST Mobile: <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6difd7q3>

⁹⁷ Mazingira Bora May 2021 at <http://www.tist.org/i2/moreinfo.php>

⁹⁸ Exhibit 03 and Exhibit 04, GHG contracts: TIST KE PD-VCS-Ex03 GHG Contract 050418.doc and TIST KE PD-VCS-Ex04 GHG Contract 080428.doc at <http://www.tist.org/PD-KE-VCS-006%20Documents.php>.

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 all carbon sequestered by project trees, and to qualify them as carbon credits and sell them. 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 have been no changes to the land use and legal property rights in the project zone, since the start of the PD.
- 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.
- 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.

The program was designed so that there is minimal potential for risk to the members. Enthusiasm is evidenced by over 100,000 voluntary members.

4.5.4 Marginalized and/or Vulnerable Community Groups (GL2.4)

Community Group	Vulnerable TIST Members
Net positive impacts	Vulnerable TIST Members increase access to food, create direct and indirect economic benefits, access leadership positions, and receive education on a range of issues. As of this re-validation, TIST has demonstrated \$2,170 in monetized benefits to Vulnerable TIST Members for the project lifetime.

Benefit access	TIST is designed to improve the livelihoods of all subsistence farmers that participate. There is no restriction to participation. 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 both men and women can access the program in equal measure. Based on three monitoring reports for this re-validated PD, it has been demonstrated that there are no program barriers or additional risks to for Vulnerable TIST Members.
Negative impacts	TIST provides on-going benefits to its vulnerable member. As of this re-validation, no negative impacts have been identified.

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

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

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

Although table 4.1.1e does not have a bin for the lowest quartile, it shows that 5% of the PAPOLD survey make less than \$160 per year. The original TIST survey (2011) indicates that 35.5% of the respondents make less than KES 12,000 (US\$112) per year and a cumulative total of 85% make less than 60,000 Ksh (US\$560) per year. The Yale/NEC survey (2015) indicates 16% of the respondents make less than KES 12,857 per year (US\$120) and more than 72% make less than KES 64,286 (US\$600) per year. Since income level for abject poverty varies between US\$365 per year (\$1/day) and US\$730 per year (\$2/day), it is clear that most of the members of TIST are poor. Further analysis in the original report identified 15% of TIST members as particularly vulnerable, meaning their income is at the poverty level and they meet the following criteria:

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

As the surveys indicate, TIST is pro poor, and has addressed any barriers to entry so that no one is excluded from membership based on income or net worth. As has been demonstrated in two previous MRs and one being verified with this PD, membership in TIST provides monetized benefits to all the member based on their activities in the program, not their economic status.

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. TIST Kenya adopted this approach and was designed to do as much of this as possible at the subsistence farmer level. Because this was the approach to the project, no poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project have been identified.

4.5.5 Net Impacts on Women (GL2.5)

TIST has been designed to provide benefits to all participants, with a focus on gender balance. Efforts have been made to include women in all of the benefits, including tree payments, profits and training. TIST strives for balanced gender representation in all the administrative structures. Due to rotating leadership, every woman in an SG has the opportunity to lead the SG meetings. Women are invited to all meetings; we require that both a man and a woman from an SG to attend Cluster meeting. All seminars are gender balanced. All this means that women have the same opportunity to receive training as men. We require women to participate in Cluster leadership giving them more leadership experience. We issue vouchers based on trees, not necessarily property ownership so that if a woman plants the trees on her husband's land, she is eligible to receive the money. The data collected for the current and past MRs demonstrates the positive impact that TIST has had on women.

4.5.6 Benefit Sharing Mechanisms (G.L2.6)

TIST was developed for and by the subsistence farmers in the program. The Project Proponent gets one thing from this program, carbon credits. In exchange, the farmers get a prepayment based on tree count and will 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 program is best for them and keep all the benefits derived from their adoption. They decide when to plant, where to plant and what to plant.

4.5.7 Benefits, Costs, and Risks Communication (GL2.7)

As mentioned throughout this document, TIST has a several month period between applications and registration where the farmers learn about the program. This includes the benefits, costs and risks. The training is done by farmers, so what they are told is based on their own membership. The evidence for this is 100,000 enthusiastic members world-wide. As will be demonstrated by the program data, they attend Small Group and Cluster meetings where they share their experience. As individuals, they are the direct recipients of the benefits. The carbon prepayments are done at Cluster meeting in a transparent fashion.

4.5.8 Governance and Implementation Structures (GL2.8)

As noted throughout this document, TIST relies on self-governance. There are seven people in the US management team. We do the marketing, PD work, oversee the TIST data system, provide tech support, provide funding for the Host Countries and provide guidance. The Host Countries are run by the farmers. There are no ex-pats overseeing them.

The small holders are part of a Small Group. They generally meet weekly for training, review the results of quantification, plant trees, tend nurseries, review the payment vouchers and work together on projects too big for one person.

They are members of a Cluster. Clusters generally meet once per month at a location within walking distance of the members. Each Small Group sends representatives to each meeting, where they receive training from, get the payment vouchers, and get their carbon prepayment.

The Host Country is managed by the Leadership Council, a group of TIST farmers that have shown their knowledge and dedication to the program. They oversee day-to-day operations and maintains regular contact with the US Staff.

The TIST program has certain aspects that are un-changeable. The program and benefits to the farmers are based on the ability to create and market GhG credits and all governance decisions must be made with that in mind. Also, the voluntary carbon market demand and prices have been historically weak. Any discussion impacting the budget must involve US managers. We have many documents, including the TIST values, to help the members manage the day-to-day operations.

4.5.9 Smallholders/Community Members Capacity Development (GL2.9)

The project relies on local membership and a locally trained staff. The TIST Small Group and Cluster structure was designed to provide training and capacity building for thousands of subsistence farmers. This is highlighted throughout in the PD.

5 BIODIVERSITY

5.1 Without-Project Biodiversity Scenario

5.1.1 Existing Conditions (B1.1)

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.

The information regarding the biodiversity within the Project Zone at the time the project began was based on field observations and literature research.

Kenya is widely known for its abundant and diverse wildlife, especially large mammals. Although many of these animals are occasionally present in the Project Zone, the long history of human habitation and agriculture have pushed them to isolated pockets of protected areas such as the Mt Kenya National Park, Mt Kenya Forest, Meru Forest, Aberdares, Upper Imenti Forest, Nyambini Forest and Ndare Forest. Human animal conflicts are present in the general area. For example, there are many long distance fencing systems present in the Meru area to keep elephants away from areas of human habitat. Both the Project Areas and the non-protected parts of the Project Zone are lands under the control of subsistence farmers, where wildlife has been long removed and replaced by domesticated animals and plants.

The native ecology of the parts of the Project Zone that is located on the slopes of Mt Kenya and on the northeast trending highlands that pass through Meru and include the Nyambeni Hills, is the East African montane forest. The East African montane forest ecology type is found in areas of high elevation in East Africa and contains moderate levels of species richness, relative to other areas of equatorial Africa. In its natural state this region was, at lower elevations, composed of montane and sub-montane forest with areas of grassland, bamboo forests, and rock outcroppings interspersed; at higher elevations the cover changes to heathland and moorland.

There are several birds endemic to this region, many of them restricted to relatively small geographic areas. They include Aberdare cisticola (*Cisticola aberdare*), Abbotts starling (*Cinnyricinclus femoralis*, VU) and Kenrick's starling (*Poeoptera kenricki*), Hunter's cisticola (*Cisticola hunteri*), Jackson's francolin (*Francolinus jacksoni*), and Sharpe's longclaw (*Macronyx sharpei*). There are no endemic large mammals, likely due to the lack of vegetation, which is more readily available at lower elevations. However, there are many small mammals native to the area, mostly from the shrews and rat families, as well as certain species of mongoose, squirrel, and hyrax. They include *Crocidura gracilipes*, *Crocidura raineyi*, *Crocidura ultima*, *Surdisorex norae*, *Surdisorex polulus*, *Grammomys gigas*, *Tachyoryctes annectens*, and *Tachyoryctes audax*. There are also six different species of chameleons found in certain areas of the eco-region, as well as the montane viper (*Vipera hindii*).⁹⁹

⁹⁹ World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0108_full.html

Fauna include trees such as *Podocarbs*, *Prunus africana*, *Hagenia abyssinica*, *Juniperus procera* and *Olea* and plants from the *Ardisiandra*, *Cinnobotrys* and *Stapfiella* genera.¹⁰⁰

While this area has always been fragmented by mountains, over time it has become further fragmented by human disturbance. Clearing of forests for agricultural purposes (i.e. subsistence farming) has become commonplace across much of the eco-region. This clearly decreases habitat for native flora and fauna and has led to an increase in soil erosion and degradation, and therefore the degradation of the water supply as well. This trend was acknowledged by the Kenya Forest Service in their 1999 report entitled “Aerial survey of the destruction of Mt. Kenya, Imenti and Ngara Ndare Forest Reserves,” which essentially compares Landsat imagery from different years to determine deforestation trends. The report also states the dangers posed by conversion of land from its natural state for use as tea and coffee plantations.¹⁰¹ In addition, there are many other documented cases of this clear history of land degradation which can be found on the website for the World Wildlife Fund (these can be found in the footnotes).

The lower altitude areas in the vicinity of Nanyuki and Naro Moru are part of the Northern Acacia-Commiphora bushlands and thickets. The Acacia-Commiphora bushlands and thickets cover type is a transition zone between wetter climates in southern Kenya and the drier climates bordering Somalia to the north; meaning that there are flora and fauna species which thrive both in tropical conditions as well very dry conditions. In a natural state, the ground cover would be dominated by *Acacia*, *Commiphora*, and *Boswellia*, and *Aristida*, *Stipa*, and *Chloris* grasses. Many of the large mammals commonly found across equatorial Africa, such as zebras, elephants, oryx, and rhinoceros, would naturally inhabit this region, but due to human encroachment are now restricted to the above mentioned parks and reserves. There are a few important endemic groups of species found in isolated locations, these include gerbils, rats, geckos, and larks.¹⁰²

Much of this land has been converted for agricultural use, and so lacks most of the naturally occurring species. Due to a decrease in elephant populations, there has been an increase in forest cover (as opposed to more open scrublands). This is because elephants naturally suppress tree growth by knocking down trees for food. As mentioned above, there are many gazetted forests around Mount Kenya, with people living immediately adjacent to the forests.¹⁰³ This history of human habitation threatening the biodiversity of areas around Mt Kenya has been acknowledged by the Kenya Forest Service and is in fact being addressed in a national campaign to raise awareness of deforestation and increase forest cover.¹⁰⁴ The World Wildlife Fund also acknowledges these issues on their website and sites several of the above mentioned reports.

With the exception of some protected forests, little of the area that surrounds the Project Areas is in a natural state. This is due to high level of human activity, primarily for agriculture.

¹⁰⁰ White, F. (1983), *The vegetation of Africa: a descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa by F. White*. UNESCO, Paris. cited by Wikipedia at <http://en.wikipedia.org/wiki/Afromontane>, viewed August 15, 2011.

¹⁰¹ World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0108_full.html

¹⁰² World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0711_full.html

¹⁰³ World Wildlife Fund. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0711_full.html

¹⁰⁴ Kenya Forest Service. http://www.kenyaforestservice.org/index.php?option=com_content&view=article&id=157:forestry-minister-assures-lifting-of-logging-ban&catid=223:hict&Itemid=98

5.1.2 High Conservation Values (B1.2)

High Conservation Value	Mount Kenya National Park
Qualifying Attribute	Globally, regionally or nationally significant concentrations of biodiversity values i) Protected areas. ¹⁰⁵
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	Aberdare National Park
Qualifying Attribute	Globally, regionally or nationally significant concentrations of biodiversity values i) Protected areas ¹⁰⁶
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 the baseline scenario described in Section 2.2.2. See that section for references to firewood use, deforestation and population impacts.

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."¹⁰⁷

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.

¹⁰⁵ Centre, UNESCO World Heritage. "Mount Kenya National Park/Natural Forest." *UNESCO World Heritage Centre*, whc.unesco.org/en/list/800/, [accessed February 10, 2020](https://whc.unesco.org/en/list/800/)

¹⁰⁶ Centre, UNESCO World Heritage. "Aberdare Mountains." *Aberdare Mountains - UNESCO World Heritage Centre*, whc.unesco.org/en/tentativelists/5506/, [accessed February 10, 2020](https://whc.unesco.org/en/tentativelists/5506/)

¹⁰⁷ 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

5.2 Net Positive Biodiversity Impacts

5.2.1 Expected Biodiversity Changes (B2.1)

Biodiversity Element	Trees planted by the project
Estimated Change	Change with project : 1,946,149 trees Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	Trees were planted as part of the program. The number of trees in each PA was counted by species. This is beneficial to biodiversity because they improve soil, provide food and cover for wildlife and reduce pressure to take illegal firewood.

Biodiversity Element	Hectares in project
Estimated Change	Change with project: 6,049 hectares under tree cover Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	Trees were planted as part of the program. The number of trees in each PA was counted. The area of each PA was determined by GPS. These are all the PAs including ones without with trees. This is beneficial to biodiversity because these areas could all see improved soil, provide food and cover for wildlife and reduce pressure to take illegal fire wood.

Biodiversity Element	PAs with trees
Estimated Change	Change with project: 14,704 PAs with program trees. Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	Trees were planted as part of the program. The number of PAs with trees was counted. This is beneficial to biodiversity because isolated PAs are stepping stones and buffers for wildlife.

Biodiversity Element	Indigenous trees planted by the project
Estimated Change	Change with project: 277,961 indigenous trees Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	These trees were planted as part of the program. The inventory was determined by a physical count. The count by species is provided in each monitoring report.

Biodiversity Element	Hectares of indigenous tree
Estimated Change	Change with project: 1,084 hectares of indigenous trees Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	Indigenous tree were planted as part of the program. The number of trees in each PA was counted by species. The area of each PA was determined by GPS. The hectares of indigenous tree are the ration of indigenous trees over the total trees, times the area of the PA.

Biodiversity Element	PAs with indigenous trees
Estimated Change	Change with project: 11,810 discrete PAs with indigenous trees. Actual direct change, positive for biodiversity as demonstrated by TIST data as of this re-validation.
Justification of Change	Indigenous trees were planted as part of the program. The number of PAs with indigenous trees was counted. This indicator is beneficial to biodiversity because isolated PAs with indigenous trees are stepping stones and buffers for wildlife.

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. However, the Kenya Forest Service (formerly the Kenya Forest Department) had historically encouraged the planting of eucalyptus, for years, to meet local needs for timber and utility poles. Kenya Power and Lighting Company has been very vocal about their need for poles. Because of this, there remains a small number of eucalyptus trees in the project.

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)

None of the tree planting would occur without the project. In the case of the indigenous trees, the biodiversity benefit is clearly positive.

The members of TIST also plant non-indigenous trees. While they would not have been planted without the project, and some lack the clear biodiversity benefit of the native species, they too have a net biodiversity benefit. Going back to the on-going deforestation affecting the entire country and the obvious continued need for fuel wood and timber by the expanding population, a

fuel wood alternative is necessary. The non-native trees such as eucalyptus, cypress and grevillea fill this niche, and by doing so, reduce deforestation and indirectly contribute to biodiversity. The "without project" scenario would mean more pressure on the natural forests and more loss of biodiversity. Therefore, even looking at the project from the vantage of the non-native species, the project has a net biodiversity benefit when compared to the "without project" case.

An Environmental Impact Audit was carried out by Natural Resources Management & Development Agency (NAREDA Consultants) in Meru and Nanyuki areas of Kenya, to assess the environmental conditions and biodiversity of the area and to assess positive and negative environmental impacts of TIST project activities. The EIA and other assessments indicate that the project areas themselves are not areas rich in biodiversity. However, some areas border Mt Kenya and conserved forest, 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 forest land 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, both in specific riparian 'biodiversity' groves, and through dispersed inter-planting, homestead planting 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.

Project activities assist biodiversity in adapting to the probable impacts of climate change. Tree planting itself creates microclimates on farms which increase flora viability.¹⁰⁸ Shade and the retention of water provided by both indigenous and non-indigenous trees assists biodiversity in project areas. Furthermore, tree planting prevents erosion. Conservation Farming practices and the introduction of organic matter through compost manure techniques indirectly benefit the growth of indigenous trees. Current and future trees will provide windbreaks for seedlings. These environmental benefits support both biodiversity and the economic prosperity of subsistence farmers. As drought and high winds become more common, these benefits will be of increasing importance.

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 and stepping-stones. 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.

¹⁰⁸ Wilken, Gene C. "Microclimate Management by Traditional Farmers." *Geographical Review*, 1 Oct. 1972, www.jstor.org/stable/213267?read-now=1&seq=6#page_scan_tab_contents, pages 3-17, accessed February 10, 2020

The program further provides education and trainings on biodiversity and climate change related issues to local populations. 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 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.

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. Table 5.2.5 lists species TIST farmers have chosen to plant. Additional species may be added over the life of the project as planting takes place.

Table 5.2.5, Species used by TIST

Species
Acacia abyssinica
Acacia mearnsii
Acacia nilotica
Acacia seyal
Acacia spp.
Acokanthera schimperi
Afzelia quanzensis
Albizia gummifera
Anacardium occidentale
Aniba rosaeodora
Annona muricata
Annona senegalensis
Annona spp.
Artocarpus heterophyllus
Azadirachta indica
Azanza garckeana
Bersama abyssinica
Blighia unijugata
Bombax ceiba
Brachychiton acerifolium
Brachystegia spiciformis
Brachystegia spp.
Bridelia taitensis

Burkea africana
Callistemon spp.
Canarium schweinfurthii
Casimiroa edulis
Casuarina equisetifolia
Celtis durandii
Citrus aurantifolia
Citrus limonum
Citrus reticulata
Citrus sinensis
Cocos nucifera
Combretum molle
Cordia Africana
Cordia monoica
Croton macrostachyus
Croton megalocarpus
Croton Sylvaticus
Cupressus spp.
Cussonia holstii
Dendrocalamus giganteus
Dichrostachys cinerea
Dombeya rotundifolia
Dombeya spp.
Dovyalis abyssinica
Ehretia cymosa
Endiandra glauca
Entada abyssinica
Erythrina abyssinica
Eucalyptus grandis
Euclea divinorum
Ficus sycomorus
Ficus thonningii
Fraxinus berlandieriana
Fraxinus pennsylvanica
Grevillea robusta
Grewia bicolor
Hagenia abyssinica
Harungana spp.
Hectares
Jacaranda mimosifolia
Khaya nyasica
Kigelia africana
Landolphia Petersiana
Leucaena leucocephala
Lovoa swynnertonii
Lumnitzera racemosa
Macadamia spp.
Maesopsis eminii
Mangifera indica
Markhamia lutea
Melia azedarach
Melia volkensii
Moringa oleifera

Morus alba
Musa spp.
Newtonia buchananii
Ocotea kenyensis
Ocotea usambarensis
Olea europaea
Olinia rochetiana
Ozoroa insignis
Parkinsonia aculeata
Pavetta gardeniifolia
Pentas longiflora
Persea americana
Phoenix reclinata
Pinus Patula
Pinus spp.
Pithecelobium dulce
Podocarpus falcatus
Polyscias fulva
Pouteria sapota
Prunus africana
Prunus persica
Prunus spp.
Psidium guajava
Pterocarpus angolensis
Pterocarpus spp.
Punica granatum
Rapanea melanophloeos
Rhamnus spp.
Rhus vulgaris
Rubus spp.
Rumex usambarensis
Salacia madagascariensis
Sapium ellipticum
Schinus molle
Senna septemtrionalis
Sesbania grandiflora
Sesbania sesban
Solanum aculeastrum
Spathodea campanulata
Strychnos henningsii
Strychnos madagascariensis
Swietenia mahagoni
Syzygium cordatum
Syzygium guineense
Tamarindus indica
Teclea nobilis
Terminalia brownii
Toddalia asiatica
Toona ciliata
Trichilia emetica
Vangueria spp.
Vitex keniensis
Warburgia ugandensis

Withania somnifera
Ximenia americana
Zanthoxylum chalybeum

5.2.6 Invasive Species (B2.5)

All listed species have been screened against the global database of invasive species.¹⁰⁹ While two on the above list are included for Kenya, they are high value trees in Kenya, and, according to the Kenya Forest Service, are not invasive.¹¹⁰

The first is the guava tree, *Psidium guajava*. It is a mainstay of the Kenyan diet and provides one of the most popular fruit. According to one study in western Kenya, over 25% of the households surveyed consumed guava in a seven day period and 87.5% gathered guava.¹¹¹ Believed to be from Central America, it was brought to Africa in the 1800s, where it has become an important fruit that adds to the economic well-being and food security of Kenyans. It is being planted on agricultural lands and not in the natural forest.

The second, *Leucaena leucocephala*, is widely planted for forage production and reforestation. It was introduced generations ago, probably from Central America, and while it may be invasive in the natural forest, it is very popular and useful in agriculture. It benefits the soil, is a better fodder than alfalfa, has year-round blooms to foster honeybees, has seeds that can be used for biofuels and is an excellent firewood. It is being planted on agricultural lands and not in the natural forest.

In addition to these two species, the only other tree with a known adverse effect is eucalyptus. Eucalyptus trees can overconsume water, negatively impacting waterways.

A table of all non-native species used, as well as justification for their selection, can be found in Section 5.2.7. 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)

The following are the non-native species that could be planted as part of this PD.

Species	<i>Acacia mearnsii</i>
Justification of Use	wood products
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Acrocarpus fraxinifolius</i>
Justification of Use	nitrogen fixing, shade
Adverse Effect	Minor use. Not introduced by project. No negative impact.

¹⁰⁹ "GLOBAL INVASIVE SPECIES DATABASE." *GISD*, www.iucngisd.org/gisd/, Accessed 11 February 10, 2020,

¹¹⁰ Anampiu G.M., Kenya Forest Service, letter to Charles Ibeere, Clean Air Action Corporation, October 28, 2010.

¹¹¹ African Journal of Food, Agriculture, Nutrition and Development (ISSN: 1684-5358) Vol 9 Num 8 ER - accessed February 6, 2020

Species	<i>Alangium salvifolium</i>
Justification of Use	holy tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Alstonia scholaris</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Anacardium occidentale</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Aniba rosaeodora</i>
Justification of Use	endangered hardwood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Annona muricata</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Annona squamosa</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Artocarpus heterophyllus</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Azadirachta indica</i>
Justification of Use	medicinal tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Bixa orellana</i>
Justification of Use	annatto seeds
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Blighia unijugata</i>
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Justification of Use	shade tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Bombax ceiba</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Bombax sp</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Brachychiton acerifolium</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Callistemon spp.</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Camellia sinensis</i>
Justification of Use	tea
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Canavalia sp.</i>
Justification of Use	useful legumes
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Carica papaya</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Casimiroa edulis</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Casuarina equisetifolia</i>
Justification of Use	firewood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Casuarina junghuhniana</i>
Justification of Use	firewood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Cedrela odorata</i>
Justification of Use	termite resistant
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Ceiba pentandra</i>
Justification of Use	source of nectar
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Cinnamomum tamala</i>
Justification of Use	herb (malabathrum)
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Citrus aurantifolia</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Citrus limonum</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Citrus medica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Citrus reticulata</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Citrus sinensis</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Cocos nucifera</i>
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Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Coffea arabica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Cupressus spp.</i>
Justification of Use	well established
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Cyphomandra betacea</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Dendrocalamus giganteus</i>
Justification of Use	fast growing
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Elaeis guineensis</i>
Justification of Use	palm oil tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Endiandra glauca</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Eriobotrya japonica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.
Species	<i>Eucalyptus citriodora</i>
Justification of Use	fast growing
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Eucalyptus grandis</i>
Justification of Use	fast growing
Adverse Effect	Not introduced by project. This tree has a reputation of using more water than others. In part, this is due to its rapid growth. It is widely planted and promoted in Kenya. No negative impact.

Species	<i>Eugenia caffra</i>
Justification of Use	medicinal tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Ficus elastica</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Fraxinus berlandieriana</i>
Justification of Use	fast growing long living
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Fraxinus pennsylvanica</i>
Justification of Use	fast growing long living
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Gmelina arborea</i>
Justification of Use	drought tolerant
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Gravellea pteridifolia</i>
Justification of Use	resistant to wood rot
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Grevillea robusta</i>
Justification of Use	resistant to wood rot
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Jacaranda mimosifolia</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Jatropha curcas</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Leucaena leucocephala</i>
Justification of Use	soil fertility, fodder
Adverse Effect	Minor use. Not introduced by project. While considered by some to be invasive, KFS does not, in the context of planting on farms where the benefits to soil fertility are well known. No negative impact.

Species	<i>Macadamia spp.</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Mangifera indica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Melia azedarach</i>
Justification of Use	fodder
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Morinda tinctoria</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Moringa oleifera</i>
Justification of Use	herbal and edible seeds
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Morus alba</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Morus nigra</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Morus spp.</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Musa spp.</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Parkinsonia aculeata</i>
Justification of Use	drought tolerant
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Persea americana</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Phoenix dactylifera</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Phyllanthus emblica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pinus Patula</i>
Justification of Use	popular tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pinus spp.</i>
Justification of Use	popular tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pithecelobium dulce</i>
Justification of Use	drought tolerant
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pongamia pinnata</i>
Justification of Use	shade, windbreak, medicinal
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pouteria sapota</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Prunus dulcis</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Prunus persica</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Prunus spp.</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Psidium guajava</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. While considered by some to be invasive, KFS does not, in the context of planting on farms where its fruit is a mainstay of the Kenyan diet. No negative impact.

Species	<i>Pterocarpus santalinus</i>
Justification of Use	exotic wood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Pterocarpus spp.</i>
Justification of Use	exotic wood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Punica granatum</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Rapanea melanophloeos</i>
Justification of Use	bird eat the berries
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Salacia madagascariensis</i>
Justification of Use	edible seeds
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Santalum album</i>
Justification of Use	essential oils
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Schinus molle</i>
Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Senna septemtrionalis</i>
Justification of Use	medicinal tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Senna siamea</i>
Justification of Use	shade tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Senna spectabilis</i>
Justification of Use	Ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Sesbania grandiflora</i>
Justification of Use	medicinal, edible leaves
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Swietenia mahagoni</i>
Justification of Use	exotic wood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Syzygium cumini</i>
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Justification of Use	fruit tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Tecoma stans</i>
Justification of Use	fodder, ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Tectona grandis</i>
Justification of Use	valuable hardwood
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Thespesia populnea</i>
Justification of Use	exotic wood, ornamental
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Toona ciliata</i>
Justification of Use	fast growing shade tree
Adverse Effect	Minor use. Not introduced by project. No negative impact.

Species	<i>Trigonella foenum-graecum</i>
Justification of Use	semiarid crop
Adverse Effect	Minor use. Not introduced by project. No negative impact.

5.2.8 GMO Exclusion (B2.7)

The Project Proponent guarantees no GMOs will be used by the project to generate GHG emissions reductions or removals.

5.2.9 Inputs Justification (B2.8)

Table not applicable. It is TIST's policy to not use chemical fertilizers and pesticides. Farmers are trained to make and use their own compost and to use dung. In addition, the cost of chemical fertilizers and pesticides is prohibitive.

5.2.10 Waste Products (B2.9)

No wastes are expected from the project. Trees will shed leaves, fruits and nuts but they will either be used as fodder or food for humans or animals or be left as litter. Dead branches and trees will be used as fire wood.

5.3 Offsite Biodiversity Impacts

5.3.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Measures (B3.2)

Table not applicable. There should not be any negative impacts on biodiversity outside the Project Zone from the project.

5.3.2 Net Offsite Biodiversity Benefits (B3.3)

TIST activity should provide a net off-site biodiversity by:

- Increasing the on-farm firewood inventory and therefore reducing pressure to take fuelwood from the natural forest.
- Increasing crop yields reducing pressure to clear natural forest for more farm land.
- Providing thousands of islands of biodiversity that help connect the natural forests that are separated by active farms.

5.4 Biodiversity Impact Monitoring

5.4.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

The plan uses TIST's strength in gathering, verifying, and analyzing field data to measure critical biodiversity metrics in the farms and groves where TIST farmers work and live. Trees are the main focus of biodiversity impact monitoring since they provide important habitat diversity and structural features for biodiversity. Tree biodiversity is expected to increase as a result of awareness raising, training and incentives. We monitor and report on the TIST website the species planted, number of trees of each species planted in each area, and, as the trees grow, the age and circumference of these trees. Quantification is a constant process and as a Project Area is monitored, new data populates the website. To qualify for "active" status and eligibility for VCUs, each site is monitored at least within the last five years.

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 have been obtained. The location and perimeter of each Project Area is provided.

Data is collected by TIST Quantifiers as they visit each Small Group, to count and measure trees by species. The data reported is collected periodically and at different times for each PA. Only the most recent data is used.

See the Climate section of this PD for additional details on how data is collected.

The following are the variables to be monitored and types of measurements and sampling methods, and the frequency of monitoring and reporting for each type and method:

1. Total hectares of the project. This is done by a direct measurement using a GPS when the baseline is taken for a PA. After consultation with the farmer, the area to be planted in trees is walked with the GPS on, collecting sufficient track points to define the PA. Two tracks are taken at baseline to confirm the boundary is correct. The best one is selected. The tracks are uploaded to the database and a subroutine calculates the area. In accordance with the methodology and standard, this becomes the permanent record for the PA. Although the

- original boundary is permanent, a new track is taken at every quantification to demonstrate the correct trees are being monitored.
2. Area and location of each Project Area. This is an outcome of obtaining the area. The database holds the track points and generates the KML file, Appendix 03. The KML file is a composite of all or a subset of the PAs in the PD. While the raw data is only collected at baseline, a new KML file was compiled for this PD to remove PAs that are no longer active. See the MR for details on specific PAs.
 3. Number of trees by species. As covered in detail in Section 3, TIST has an ongoing monitoring plan whereby a CS visits every PA and counts every tree by age and species strata.
 4. Number of indigenous trees by species. As an outcome of item 3, the indigenous trees are identified. At the end of a monitoring period, each species is compared to a list of indigenous species in Appendix 14 and the number in each PA is determined. They are summed to provide this indicator.
 5. Hectares of indigenous trees. The area of each strata in a PA is determined mathematically as the ratio of the number of trees in a stratum divided by the total trees in the PA times the area of the PA. The area of the indigenous strata are summed for this indicator. It is done at the end of the each monitoring period.
 6. The tree inventory of each Project Area. The strata data is compiled by PA in PA Summary of Appendix 14. This is done at the end of the monitoring period.

Optional Criterion: Exceptional Biodiversity Benefits

The indicators for gold level biodiversity benefits is the number of *Vitex keniensis* trees per Section 5.5. As described in Section 3, TIST Cluster Servant/Quantifiers (CS) visit every PA periodically but as part of an ongoing process. The date of the most recent visit is provided in PA Summary of the monitoring spreadsheets. At the PA, the CS counts every tree by species and age strata. As such, they count and record every *Vitex keniensis* in the PD.

7. Endangered/Vulnerable/Threatened Species planted. Another outcome of the quantification by strata is the identification of all of the *Vitex keniensis*, which is used to address Section 5.5.

Adaptation benefits for biodiversity

Regarding the indicators for adaptation benefits for biodiversity, these are included with all four climate change adaptation benefits listed with the Gold Level Monitoring for Adaption, 4.4.1. We refer to Section 3.5.2 for the impacts of climate change and 3.5.3 for more details on the four change adaptation benefits for communities. The CO2 drawdown mitigates climate change which addresses the Effects on Wildlife discussed in Section 3.5.2. Conservation farming improves crop yield which reduces the pressure to expand farming into areas of biodiversity. The benefits of planting trees include cover for wildlife, barriers for HCVs and corridors and stepping stones to connect the HCV to improve connectivity. We use the community organization as a training platform for biodiversity and other topics regarding natural resource management. The methods, frequencies and reporting for these indicators have been previously discussed.

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 is will incorporate biodiversity concerns into their decision-making process and actions.

5.4.2 Biodiversity Monitoring Plan Dissemination (B4.3)

All of the CCB and VCS document including the results of the monitoring plan are available on the respective CCB and VCS project web sites. CAAC also makes all of the documentation available to the public on a dedicated web page. Stakeholders are informed of this when they receive the email advising them of the public meeting, at the public meeting, through reading this report that will be made public on the CCB project page and through reading the VCS registry posting.

For those TIST members without internet, the project has developed its Mobile TIST website that is low bandwidth and designed to work with a mobile phone.¹¹² For those without a smartphone, they can see the results of their Small Group's quantification on their vouchers or discuss the results when the Quantifier is monitoring their PAs or come to the monthly cluster meetings and ask. For those with no other access, they can also go to a local cyber café and see the full reports on-line. The monitoring results have also been published in the TIST Kenya newsletter.¹¹³

5.5 Optional Criterion: Exceptional Biodiversity Benefits

5.5.1 High Biodiversity Conservation Priority Status (GL3.1)

TIST has a direct impact on the *Vitex keniensis* (Meru Oak), an endangered species in the Mount Kenya region. Due to the presence of "at least a single individual of a species on the IUCN Red List that is critically endangered or endangered," the project has a high biodiversity conservation priority status.

5.5.2 Trigger Species Population Trends (GL3.2, GL3.3)

Trigger Species	<i>Vitex keniensis</i> (Meru Oak)
Population Trend at Start of Project	The IUCN is not able to provide population estimates. However, the IUCN Red List assesses a continuing decline in the habitat and ecology of <i>Vitex keniensis</i> ; they further report a continuing decline of mature individuals and a decreasing population. The species was listed as vulnerable in 1998, and in 2018 (the most

¹¹² TIST Mobile: <https://www.tist.org/mobile/secure/login.php?ses=gea0rj8ej2odmk314l6difd7q3>

¹¹³ Mazingira Bora, April 2021

	recent reporting year) was listed as endangered. TIST farmers a planting new <i>Vitex keniensis</i> on their land. The population was zero at the start of the project.
Without-project Scenario	Without the project, farmers would not be planting thousands of <i>Vitex keniensis</i>. Furthermore, farmers in the Mount Kenya region would have increased needs to harvest forest products from within Mount Kenya National Park. The IUCN reports potential exploitation of the species within the park.
With-project Scenario	Farmers are choosing to plant thousands of <i>Vitex keniensis</i> on their farms through TIST.