Shamba Murang’a ReFi project

Document prepared by Shamba Dynamic

Project Document Template (Version 1.0)	
Name of the project	Shamba Murang’a ReFi project
Project proponent	Shamba Dynamic
Project proponent’s contact information	Pelum Hq, House 114, KU Boma Estate, Kenyatta Road, Kenya.
Project holder	Shamba Dynamic
Project holder’s contact information	Pelum Hq, House 114, KU Boma Estate, Kenyatta Road, Kenya.
Project participants	Youth Action for Rural Development (YARD), Premier Peak Foundation, Greatplan Foundation, Dozens of Community Based Organizations (CBOs)
Version	1
Date	08-06-2023
Project type	AFOLU
Grouped project	Yes
Applied methodology	BCR0001 Quantification of GHG Emission Reductions, GHG Removal Activities

Project location (City, Country)	Murang'a County, Kenya
Starting date	January 2019
Quantification Period of GHG emissions reductions	5 years
Estimated total and average annual GHG emission reduction amount	60,000 tons of CO_2 removed per year, 1.5 million tons of CO_2 over a 20 year period
Sustainable Development Goals	2, 5, 6, 8, 10, 13, 15
Special category, related to co-benefits	Biodiversity, Soil and water benefits

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1 Project eligibility

1.1 Scope

The scope of this project is the implementation of activities related to carbon removal through a methodology that involves agro-forestry and ecological agriculture activities.

1.2 Project type

This project falls under the AFOLU (agriculture, forestry and landuse) type.

1.3 Project scale

The scale of the project is at county level with the specific sites falling within Murang'a county.

2 General description of the project

2.1 GHG Project name

Shamba Murang'a ReFi project.

2.2 Objectives

Carbon removal through agro-forestry in agricultural land, as well as through adoption of ecological agriculture practices to sequester carbon in the soil.

2.3 Project activities

Agro-forestry in farmlands, ecological agriculture

2.4 Project location

Specific sites in Murang'a county

2.5 Additional information about the GHG Project

The project groups together sub-projects across Murang'a county.

3 Quantification of GHG emissions reduction

3.1 Quantification methodology

3.1.1 Applicability conditions of the methodology

Agricultural lands, Agroforestry culture, AFOLU

3.2 Project boundaries

3.2.1 Project area

Sites within Murang'a county as detailed in the polygons attached to this document as annex.

3.2.2 Carbon reservoirs and GHG sources

Above-ground carbon (this is mainly from the trees planted under the agroforestry methodology)

Below-ground carbon (this is mainly from the root system of the trees planted under the agro-forestry methodology).

Soil Organic Carbon (this is mainly from the implementation of ecological agriculture activities)

3.2.3 Time limits and periods of analysis

Project start date

2019

Quantification period of the GHG emissions reduction

5 years (2019 - 2023)

Monitoring periods

The monitoring is done quinquennially (every 5 years)

3.3 Identification and description of baseline scenario

The baseline scenario identifies the most likely land use at the beginning of the project from which the changes in carbon stock are referred. In this case we used land use maps created from satellite data captured at the start of the project. The prevailing land use is therefore known to a high degree of accuracy and this is the land use that would have persisted if the project had not been implemented. In this project, the original land use was cropland and this is what would have persisted. This is therefore the baseline.

3.4 Additionality

The project would not be viable without the sale of the VCC since the activities implemented do not generate any economic benefits on their own. Both the agroforestry and the ecological agriculture activities have a cost to implement but do not generate economic benefits on their own. The sale of VCCs is necessary to make the projects economically viable and sustainable.

3.5 Uncertainty management

To account for uncertainty in the estimation of GHG removal by this project, we considered the source of the estimation model/data. We used project-specific above ground biomass data and (R:S) for below-ground biomass factor. The data was derived from direct measurement by satellite borne sensors. A discount factor of 5% was therefore used to manage uncertainty in the estimations.

3.6 Leakage and non-permanence

There is no displacement of agricultural activities and thus leakage emission is accounted as zero.

3.7 Mitigation results

3.7.1 Eligible areas in the GHG project boundary (if applicable)

3.7.2 Stratification (if applicable)

Project area has uniform biomass distribution so stratification is not needed here.

3.7.3 GHG emission reductions in the baseline scenario

The baseline scenario is the use of the land exclusively for crop production which would not have had any reductions in GHG emissions.

3.7.4 GHG emission reductions in the project- scenario

In the project scenario where agro-forestry is implemented, GHG emissions are reduced by new trees. Approximately 2 tons of CO2 removed per hectare per year.

4 Compliance with applicable legislation

The project was carried out in compliance with applicable local laws and regulations. This includes the Climate Change Act of 2023 which regulates carbon credit trade in Kenya.

5 Carbon ownership and rights

5.1 Project holder

The project holder is Shamba Dynamic.

5.2 Other project participants

There are two other categories of participants in the project. The first are the project developers, consisting of grassroots organizations working directly with farmers. The second category are the farmers' groups, community-based organizations around which small farmers organize. Attached to this document is an annex with the letters of participation of all the three categories of participants.

5.3 Agreements related to carbon rights

The project is being implemented in areas with defined land rights. Smallholder farms are owned by individual households and have title. The carbon rights are related to land tenure as

each smallholder owns the rights to their land. These rights are delegated to the project through the hierarchical structures composed of farmers' groups, project developers and the project holder. All participants have signed letters of participation showing this agreement and these are attached as an annex.

5.4 Land tenure (if applicable)

Land tenure is in the individual hands of the farmers. They delegate the carbon rights to the overall project.

6 Climate change adaptation

The planting of trees in the project sites under the agro-forestry methodology is a form of climate change adaptation as it helps make the farmland more sustainable. The trees shield the ground from direct sunlight and prevent soil moisture from drying out.

7 Risk management

7.1 Reversal risk management

The project adheres to the permanence principle by aiming to have the planted trees stay on the ground for up to 30 years. By periodically assessing the carbon credits generated and making payouts to land stewards, they are incentivized to keep the trees on their land for the long term. This is how we manage reversal risk over the long term.

8 Environmental Aspects

This project has various environmental benefits beyond carbon removal. It has a positive effect on rejuvenating exposed and vulnerable farmlands. Through agro-forestry soil degradation is reduced and this leads to improved farm productivity. Water resources including groundwater are also recharged since rain water more easily percolates into soils when they are healthy. Beyond soil and water improvement, the trees planted under the project also contribute to biodiversity conservation. They provide habitat for various species of birds, lizards, squirrels and other small animals. Their flowers also sustain insects such as bees, butterflies, and other pollinators. Therefore the project has environmental co-benefits across several dimensions.

9 Socio-economic aspects

The project will have socio-economic impacts. It will lead to carbon income which will add to the household income and thus have a livelihood component. The co-benefits of the project include improved food security since the trees being planted under the agro-forestry methodology include fruit trees which will give households fruit in addition to removing carbon. The improve in the soil health that will come from the project in the long term will improve farm yields and thus farm incomes, again having a livelihood impact.

10 Consultation with interested parties (stakeholders)

10.1 Summary of comments received

Stakeholder consultation forums have been held since the project's conception. Comments received have focused on the needs of the farmers that the project have co-benefits especially related to food security. Farmers were specific on their wishes to go with fruit trees for the agro-forestry methodology on their farms.

10.2 Consideration of comments received

The comments received from stakeholder consultation were considered and implemented in the project plan. The eventual trees chosen for the project were trees that could also give fruits to farmers I addition to removing carbon.

11 Sustainable Development Objectives (SDG)

Our project aims to have impact across 7 of the UN SDGs. These are highlighted below:

SDG 2: Zero hunger. Our project helps restore farmlands and ensure agricultural sustainability in the long term. It also has co-benefits such as providing fruits for households which contributes to their food security.

SDG 5: Gender equality. Our project empowers women who form the bulk of the smallholder farmer base. These women are empowered economically through the project and thus are able to play a bigger role at the household and community level.

SDG 6: Clean water and sanitation. Our project contributes to the sustainability of water resources through improved land management in upstream river watersheds. This ensures the sustainability of the quantity and quality of water received downstream and which is used for residential and commercial purposes.

SDG 8: Decent work and economic growth. Our project seeks to make smallholder agriculture more profitable and sustainable as it forms the base of the employment in Africa. By making climate-smart agriculture a viable career alternative, we aim to make farming a more attractive option for millions of unemployed youth seeking economic opportunities.

SDG 10: Reduced inequalities. Our project aims to reduce economic inequalities between people living in rural areas and those from urban areas. By introducing economic opportunities in land management, we make rural areas attract just as much resources and capital as urban areas. This reduces inequalities around standard of living and leads to more even economic development in a country/region.

SDG 13: Climate action. Our project directly removes carbon from the air through nature based approaches, thus contributing to climate action.

SDG 15: Life on land. Our project directly contributes to biodiversity conservation and regeneration through restoring habitat. This leads to the diversification of fauna and flora.

12 REDD+ Safeguards (if applicable)

This is not applicable to the project.

13 Special categories, related to co-benefits

There are environmental and socio-economic co-benefits arising from this project as detailed above.

14 Grouped Project (if applicable)

This project is a grouped project and adheres to all the requirements of clustered projects under the BCR guidelines.

15 Other GHG programs

Not applicable

16 Monitoring plan

16.1 Data and parameters for quantifying emission reductions

Satellite data at 4.7 meters resolution was processed using remote sensing techniques to measure the increase in area under tree cover across the project sites. This increased area under tree cover was characterized in terms of average tree density, tree mix and tree dimensions through statistical field sampling. The mean above ground and below ground carbon per unit area was estimated from this characterization using allomeric equations and scaled out across the project sites to get the total carbon removed.

(a) Project boundary monitoring

The project was carried out across several sites in Murang'a county of Kenya. A shapefile of the project sites is attached as an annex.

(b) Monitoring of the execution of project activities

Project activities were executed under supervision of the project holder and grassroots partners who acted as the project developers. This monitoring was periodic and involved following up on the growth of the trees from when they were planted.

(c) Monitoring of the quantification of project removals

Remote sensing and geostatistical techniques were used to quantify the average carbon removed by the project across the various project sites. Periodic monitoring of the changes in tree cover across the project sites was done annually.

(d) Quality control and quality assurance procedures

All quantification of removals done through remote sensing was validated against field data. Ground truthing data was captured to first calibrate then validate model

outputs from the carbon removal quantification. All outputs coming from the analytics team were assessed by a separate QC/QA team to confirm compliance with international data quality procedures.

(e) Verification of field data

Field data was collected through stratified random sampling and was used in the carbon removal calculation. This primary data was also verified separately by the QC/QA team.

(f) Review of information processing

Analytics were performed using a combination of information processing tools. GIS and remote sensing software were used for the satellite data analysis, while statistical packages in Python were used for the statistical work. Field data was collected using mobile apps and analyzed on the cloud.

(g) Data recording and archiving system

All data involved in the quantification of the carbon removed has been organized, documented and archived online. A link to its location is provided in the annex.

16.2 Additional information to determine the baseline or reference scenario

Additional information on the baseline scenario attached as annex.

16.3 Information related to environmental impact assessment of GHG project activities

An environmental impact assessment of the project was carried out to assess the impact of the project on communities in the project site and nature. A report of this is linked in the annex.

16.4 Procedures established for the management of GHG emission reductions or removals and related to quality control

The following procedures were developed and used during the project.

1. **Planning the GHG Project**:
    - Define the project scope, objectives, and boundaries.
    - Identify and select relevant GHG sources, sinks, and reservoirs (SSRs) related to the project and baseline scenario.
    - Establish a baseline against which emission reductions or removal enhancements will be measured.
2. **Quantification and Monitoring**:
    - Monitor and quantify GHG emissions or removals throughout the project lifecycle.
    - Use standardized methods to calculate emissions or removals.
    - Ensure data accuracy and reliability.
    - Document the monitoring procedures.
3. **Reporting and Documentation**:
    - Prepare regular GHG inventory reports detailing project performance.
    - Include information on SSRs, emission factors, and methodologies used.
    - Document any changes or updates during the project.
    - Maintain transparency and traceability.
4. **Quality Control Measures**:
    - Implement robust data quality management practices.
    - Conduct internal reviews and audits to verify data accuracy.
    - Address any discrepancies promptly.
    - Ensure consistency in reporting across different periods.
5. **Verification and Validation**:
    - Engage independent third-party verifiers to assess project compliance.
    - Verify that emission reductions or removals are accurately quantified.
    - Validate the project’s adherence to established procedures.