Project Design Document (PDD)

Emiti Nibwo Bulora

"*Trees sustain life*"

Karagwe and Kyerwa Districts, Kagera, Tanzania

2016 – 04–08

Version 2

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List of Acronyms and Symbols

(M)SEK	(Million) Swedish Krona
AFOLU	Agriculture, Forestry and Other Land Uses
˚C	Degrees Celsius
A/R	Agroforestry/Reforestation
C	Carbon
CAI	Current Annual Increment
CEO	Chief Executive Officer
cm	Centimetre
CO_2	Carbon Dioxide
DBH	Diameter at Breast Height (i.e. at a height of 1.3 metres from ground level)
EA	East Africa
EAC	East African Community
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GHG	Green House Gas
GIS	Geographical Information Systems
GPS	Geographical Positioning System
ha	Hectare
HDI	Human Development Index
IPCC	Intergovernmental Panel on Climate Change
GPG	Good Practice Guidelines
km	Kilometre
KRA	Kagera Regional Authority
KRS	Kagera Regional Secretariat
LGAs	Local Government Authorities
LVBC	Lake Victoria Basin Commission
LZARDI	Lake Zone Agricultural Research and Development Institute
m	Metre
mm	Millimetres
MoU	Memorandum of Understanding
MUCCoBS	Moshi University College of Cooperative and Business Studies
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
PDD	Project Design Document
Pers.	Person
PES	Payment for Ecosystem Services
PV	Plan Vivo
PVC	Plan Vivo Certificate
PVF	Plan Vivo Foundation
PVS	Plan Vivo Standard
RESAPP	Lake Victoria Regional Environmental and Sustainable Agricultural Productivity Programme
t	Tonne
tC	Tonnes of Carbon
tCO_2	Tonnes of Carbon Dioxide
tCO_{2e}	Tonnes of Carbon Dioxide Equivalent
THDR	Tanzania Human Development Report
TS	Technical Specification
Tshs	Tanzanian Shillings
UNDP	United Nations Development Programme
Yr	Year

Executive Summary

This Project Design Document (PDD) describes an application of the Plan Vivo Standard and carbon accounting method that involves working withsmall-scale farmers in two districts of the Kagera region of North-western Tanzania to improve their land management methods through tree planting, by giving them access to carbon revenue streams through the adoption of sustainable agroforestry techniques. The project directly involves small-scale farmers in the mitigation of climate change, whilst delivering livelihood benefits to communities.

The overall objective of the *Emiti Nibwo Bulora* project is "*improved living conditions for farmer households in Kagera Region*." It has been implemented since 2008 and to date has reached 620 actively involved farmers. The pilot project was validated and registered in 2010 and has since scaled by recruiting more farmers.Upto 56,992 Plan Vivo Certificates have been issued to date involving more than 370 hectares of landand over 90 km planted under the various Technical Specifications. The project is implemented under theLake Victoria Farmers Organisations Agroforestry (FOA).

The programme supports small-scale farmers to learn about and engage in tree planting and other land use management techniques that are both sustainable and deliver economic and social benefits to smallholders and communities. The long term commitment to tree planting and subsequent management under different feasible, controlled and verified farming systems is the major means for participation in mitigating GHG emissions which enables small scale farmers to access carbon finance through a process of aggregation of carbon assets and receive additional carbon revenue streams through the adoption of productivity enhancing practices and technologies. Hence, economic benefits are based on: (i) increased yields and productivity and (ii) additional income sources due to payment for environmental services. An important co-benefit is enhanced resilience to climate variability and change. The project activities are all based on small-scale agroforestry systems which contribute to increased soil carbon storage as well as carbon sequestration in biomass. The agroforestry systems used are boundary planting, dispersed inter-planting, fruit orchards and woodlots. Participating farmers and communities will benefit in the following ways:

- Income diversification
- Improved land use
- Food security
- Poverty reduction
- Soil conservation
- Improved water quality and management
- Capacity development
- Climate change adaptation

The project is implemented with the support of Vi Agroforestry, an International Non-Governmental Organization headed by a CEO in Sweden. Vi Agroforestry is a registered NGO in Kenya, Tanzania, Uganda and Rwanda. The Regional Director heads operations in East Africa assisted by countrymanagers heading various geographical projects who have a team of central staff and field zone coordinators assisting in running the project on the ground. The zone coordinators rely on field officers and external service providers to implement the activities.Vi Agroforestry has had a presence in the region for 30 years, facilitating communities to plant trees as a way of improving their livelihoods and the local environment by increasing tree cover and creating a carbon sink.

This second version of the PDD serves two purposes: 1) it outlines the continuation of the pilot project that began in 2008 and 2) it is a fulfilment of the Plan Vivo Standards, which require periodic review of both the PDD and Technical Specifications.

Specifically, Subsection 5.2 in the revised 2013 version of the Plan Vivo Standard provides:

> "*Sources of data used to quantify ecosystem services, including all assumptions and default*

*factors, must be specified and as **up-to-date**[1] as possible, with a justification for why they are appropriate*."

Furthermore, Subsection 5.3 requires that:

"*Technical specifications must be updated at least every 5 years where they are still being used to sign new Payment for Ecosystem Services (PES) Agreements, by reviewing both available data from project monitoring results, e.g. species growth data, and new available data from outside the project*."

Version 1 of the Project Design Document (PDD) was designed in 2010 for implementing and controlling the *Emiti Nibwo Bulora* project. The PDD describes the project under 11 main sections – A to K. Part describes the Aims & Objectives of the *Emiti Nibwo Bulora* Project; Part B gives detailed Site Information; Part C provides Community & Livelihoods Information; the Project Interventions & Activities are described in Part D; while Part E describes the process of Community Participation. Part F describes the Ecosystem Services & Other Project Benefits under the project; while Part G gives a description of the Technical Specifications. The project is implementing four main agroforestry land use systems referred to as Technical Specifications which include (i) Boundary Planting, (ii) Dispersed Interplanting, (iii) Fruit Orchards and (iv) Woodlots. The species include native and local agroforestry species such as *Maesopsis eminii*, *Markhamia lutea*, *Acrocarpus fraxinifolius*, *Gevillea robusta*, *Persea americana*, and *Cedrela odorata.* The Technical Specifications guide the land use, species selection, altitude, habitat and ecological requirements, growth habits, and management costs as well as incomes, environmental and social benefits and estimate the carbon sequestration potential. Additionality and leakage risks and measures, buffer and carbon credit calculation as well as monitoring indicators are also shown for each of the Technical Specifications. Specific issues relating to Risk Management are addressed in Part H; while the issues relating to project management and administration, namely Project Coordination and Management, Benefit Sharing and Monitoring are addressed in Parts I, J and K, respectively. Finally, annexes present crucial project and participant information not included within the body of the document.

[1]Emphasis the Author's

Part A: Aims and objectives

A1 Project's aims and objectives

The *Emiti Nibwo Bulora*, implemented by Vi Agroforestry, is a ***Plan Vivo*** Standard and carbon accounting project. It is a climate change mitigation project that enables small-scale farmers in two districts of the Kagera region in North-western Tanzania to improve their land management methods through tree planting, by giving them access to carbon revenue streams through the adoption of sustainable agroforestry techniques. The project directly involves small-scale farmers in the mitigation of climate change, whilst delivering livelihood benefits to communities.

Vi Agroforestry is an International Non-Governmental Organization headed by a CEO in Sweden. Vi Agroforestry is a registered NGO in Kenya, Tanzania, Uganda and Rwanda (see **Annex 6:***Certificate of registration*). The Programme Director heads operations in East Africa assisted by project managers heading various geographical projects who have a team of central staff and field zone coordinators assisting in running the project on the ground. The zone coordinators rely on field officers and external service providers to implement the activities.Vi Agroforestry has had a presence in the region for 30 years, facilitating communities to plant trees as a way of improving their livelihoods and the local environment by increasing tree cover and creating a carbon sink.

The overall objective of the *Emiti Nibwo Bulora* project is "*improved living conditions for farmer households in Kagera Region*." It has been implemented since 2008 and , as of April 2016, the area under management represents 733 participants, which are then divided into 708 individuals and 25 community groups, with recruitment of more farmers ongoing. The pilot project was validated and registered in 2010. The project is being implemented under the Lake Victoria Regional Environmental and Sustainable Agricultural Productivity Programme (RESAPP), which supports small-scale farmers to learn about and to engage in tree planting and other land use management techniques that are both sustainable and deliver economic and social benefits. The long term commitment to tree planting and subsequent management under different feasible, controlled and verified farming systems is the major means for participation in mitigating GHG emissions, which also enables small scale farmer to access carbon finance through a process of aggregation of carbon assets and to receive additional carbon revenue streams through the adoption of productivity enhancing practices and technologies. Hence, economic benefits are based on: (i) increased yields and productivity and (ii) additional income sources due to payment for environmental services. An important co-benefit is enhanced resilience to climate variability and change. The project activities are all based on small-scale agroforestry systems that contribute to increased soil carbon storage as well as carbon sequestration in biomass. The agroforestry systems used are boundary planting, dispersed inter-planting, fruit orchards and woodlots. Participating farmers and communities will benefit in the following ways:

- Income diversification
- Improved land use
- Food security
- Poverty reduction
- Soil conservation
- Improved water quality and management
- Capacity development
- Climate change adaptation

Part B: Site Information

B1 Project location and boundaries

The Emiti Nibwo Bulora Project is located in Kyerwa and Karagwe Districts of the Kagera Region in Northern Tanzania. The project is being implemented in Karagwe and Kyerwa Districts (see FigureB.1 **-** Plan Vivo implementation areas, Kagera). Maps in Annexes 8-11 show additional details relating to the project area.

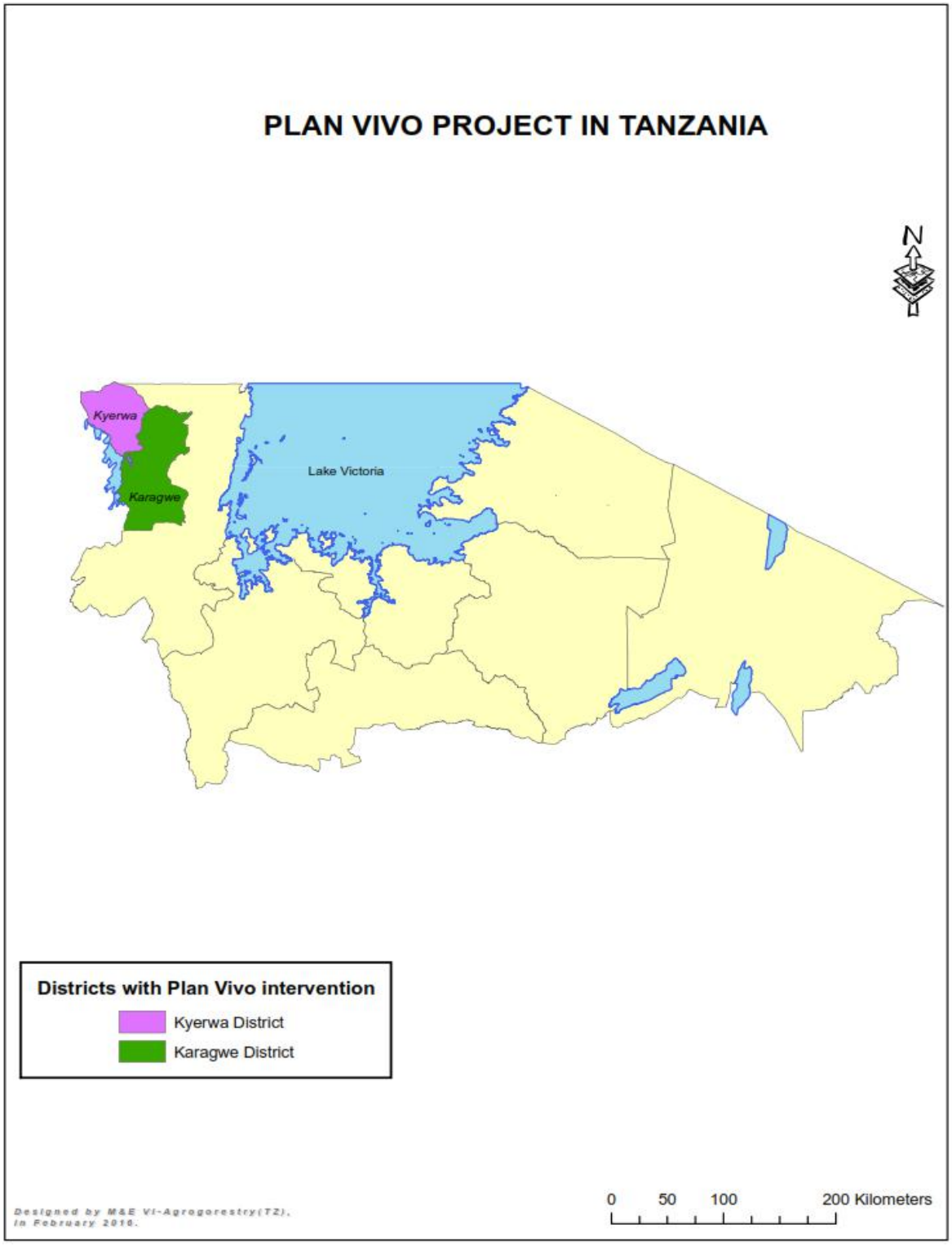

Figure B.1 - Plan Vivo implementation areas, Kagera

B2 Description of the project area

Kagera region is situated in the northwestern corner of Tanzania (see **Annex 8:***Administrative Map – Kagera Region*). The regional capital is Bukoba town, which is about 1,500 km from Dar es Salaam by road. The region shares borders with Uganda to the north, Rwanda and Burundi to the west, Kigoma and Mwanza regions to the south and Lake Victoria to the east. It lies just south of the equator between 1˚00' and 3˚15' south latitudes. Longitudinally, it lies between 30˚25' and 32˚00' east of Greenwich. This region includes a large part of the waters of Lake Victoria. The region covers a total area of 28,388 km^2. Administratively, Kagera region's districts are divided into districts and divisions, which in turn are subdivided into wards. A certain number of villages make up a ward. The Kagera region comprises of eight administrative districts namely: Biharamulo, Ngara, Karagwe, Muleba, Bukoba Rural, Bukoba Urban, Kyerwa and Misenyi. It is made up of 29 divisions, 192 wards and 667 villages as of 2012 population census.

The project sites (Karagwe and Kyerwa) collectively cover an area of 7,709.09 km^2 (770,909 hectares) with a total population of 653,046 with a growth rate of 3.2% as per the 2012 national census (see Table B.1).

Table B.1 - Demographics within the Project Area

Region	District	Ward	Population		
			Male	Female	Total
Kagera	Karagwe	Bugene	7,764	8,103	15,867
		Ndama	5,805	6,082	11,887
		Nyakahanga	10,021	10,263	20,284
		Ihanda	7,216	7,367	14,583
		Chonyonyo	4,020	3,903	7,923
		Nyaishozi	5,910	6,872	12,782
		Ihembe	5,382	5,468	10,850
		Rugu	7,692	6,468	14,160
		Nyakasimbi	5,701	6,109	11,810
	Kyerwa	Kyerwa	9,637	6,907	16,544
		Nyaruzumbura	3,158	3,481	6,639
		Isingiro	7,271	7,913	15,184
		Kaisho	11,018	12,031	23,049
		Rutunguru	6,112	6,069	121,81

The Kagera Region has a series of hilly ridges running north to south parallel to the shores of Lake Victoria (see **Annex 9:***Topographic map – Kagera Region*). It has reasonably fertile but old soils in most parts of the region. Over use in some parts of the region has led to soil exhaustion and a need for the use of fertilizers for agricultural activities. The soils are rich in iron and clay content (see **Annex 10:***Soil map – Kagera Region*). The nitrogen content of these soils is usually low but to some extent is boosted by intercropping with legumes and to a lesser extent by use of manure. Highest levels of erosion have occurred in areas along and near the lakeshores due to high rainfall intensity coupled with poor soil management techniques.

The region has a pleasant climate, with monthly maximum and minimum temperatures of 26°C and 16°C respectively. The region's climate is influenced greatly by its proximity to Lake Victoria. Prevailing winds from the east tend to bring higher rainfall to the shore strip and highlands close to the shore. The shore highlands create a rainfall shadow over the central area. The main rains come twice a year (bimodal) in March to May and during the months of October to December. The average annual rainfall for the whole region ranges between 800 mm and 2000 mm. In the western highlands of Ngara and Karagwe annual rainfall is over 1,000 mm whereas in Biharamulo it ranges between 800 mm and 1000 mm (see **Annex 11:***Rainfall map – Kagera Region*). The dry period begins in June and ends in September. There is also a short and less dry period during January and February.

The region has three main agro-ecological zones: Lakeshore and island, plateau and lowland area. The Kagera Region was well forested with indigenous trees until the early 20th century. The lake and rivers were previously well protected by this vegetation. However, the increased pressure of a growing population and the need for firewood, charcoal and building materials has resulted in severe deforestation. The people in the region are generally poor and therefore their main source of energy for cooking and lighting is biomass energy, which can be obtained freely from the remaining forest areas. The main sources of energy in Tanzania are firewood and charcoal which together account for 93% of total energy consumption in Tanzania.

One of the major features of the Region is the Kagera River, which carries 34% of the annual inflow to the Lake Victoria. The Kagera basin (>20,000 km^2) area in Tanzania conventionally includes the area draining to Lake Ikimba even though this is in fact a closed basin. Sustainable land use management of farms in the Kagera basin will therefore enhance protection of the downstream river (including Lake Victoria) in terms of siltation and eutrophication.

B3 Recent changes in land use and environment conditions

Land use practices within the operating areas (Karagwe and Kyerwa) are mainly agriculture, livestock grazing, infrastructure (settlement and transport) construction, small business (shops, market places), tin-mining firewood fetching and charcoal making. The effect of these practices include less water availability - rivers and swamps drying out; deforestation and increased instances of burning of pastures resulting in vegetation loss (tree and pasture species); reduced productivity of fruit trees (mostly mangos and oranges, the commonest) and a decline in crop productivity.

B4 Drivers of degradation

The main causes of land and ecosystem degradation in the project areas are (1) high population densities leading to pressure on land, (2) diminished farm sizes and land fragmentation, (3) over cultivation/repeated cultivation, (4) farming on marginal areas such as steep hill slopes, river banks and wetlands, (5) lack of fallow periods, (6) lack of crop rotation, (7) inadequate soil conservation measures, and (8) frequent bush/trash burning.

Part C: Community and Livelihoods Information

C1 Description of the participating communities/groups

- **Populations**

The total population of this region is 2,028,157 according to the 2012 population and housing census with an annual growth rate of 3.2%. Table C.1 below shows population growth in Kagera region compared to neighbouring Mwanza and Mara regions.

Table C.1 - Population Density by Regions 2012

		Population density (pers/km^2)
Location	**Land area (km^2)**	**2012**
Karagwe	5,134	65
Kyerwa	2,575	125

Source: Official Statistical information

- **Cultural, ethnic and social groups**

Karagwe and Kyerwa districts have homogenous ethnicity and their people are Bantus in origin. The area is dominated with Banyambo tribe with few Bahaya. People in the area are organized in various social groups like women groups, men groups, youth groups, entrepreneurship groups and so on.

- **Gender and age equity**

The project participants are mainly men who according to local tradition or customs are the ones who own the land. There are few women who are mainly widow or single parents. However, this is slowly changing through gender mainstreaming efforts in the groups and, currently, some men are allowing their wives to be registered/ participate in the project. Many participants are of the age ranging 40 to 70 years. There are very few youth in the project as most of them are prefer business activities with relatively short payback periods.

C2 Description ofthe Socio-economic context

Agriculture is the main economic activity in this region. The main cash crops are bananas and coffee. Bananas and beans are the staple food in the area, which are also traditional food and cash crops. Coffee is commonly grown as a cash crop despite problems of inputs and markets. Communities in the Kagera Region tend to stick (conservatively) to two common farming systems that are locally known as *Ekibanja* and *Rweya/Ekikamba*. All systems are characterized by declining soil fertility due to soil erosion, leaching, inappropriate agricultural practices like growing the same crops on the same piece of land for many years without rotation, ridge cultivation along slopes etc. There is some tradition of growing trees to mix up with coffee and as woodlots (mostly *Eucalyptus* spp.), though there is a serious problem of tree management and species selection, which ultimately contributes to poor benefits. Coffee comprises 89% of the total land area under cash crops.

- **Cultural and religious context**

Residents in Karagwe and Kyerwa are mainly Christian and Muslim. The main tribe in these areas are Banyambo people, followed by Bahaya and few migrants from Rwanda and Uganda. At these places and Tanzania as whole there is harmony and peace among residents. No conflicts due to cultural or religious interest. The prevailing Plan Vivo groups have combination of them, and project activities are running smoothly.

It is a culture of Kagera people to mix crops with trees (within banana/ coffee farms). What are new with Plan Vivo project is technical specifications, but the idea of tree planting is appreciated in the community.

- **Assets and incomes/poverty status**

Ninety per cent of the economically active population in the region is dependent on agriculture, livestock and fishing for subsistence and income. The region is also endowed with several minerals; tin, nickel, iron ore, cobalt, zinc and gold (Tulawaka – Biharamuro). The fall of coffee prices on the world market, the AIDS pandemic, and the influx of refugees from Rwanda and Burundi have all affected the economic performance of this region.

Although Tanzania has generally experienced an impressive annual GDP growth rate averaging 7% since the start of the project, the UNDP's Tanzania Human Development Report (THDR) 2014 reveals that the high growth rate has not resulted in commensurate poverty reduction[2]. With exception of some notable progress in a few areas such as child survival (reduction of child mortality rates) and school enrolment, improvements in the overall status of human development in Tanzania are only marginal. In fact, according to the report, the country has fallen seven positions in the Global UNDP's 2014 Human Development Index ranking. In 2014, Tanzania achieved an HDI score of 0.488, which still falls within the group of countries with low human development.

[2]ESRF (2015).Tanzania Human Development Report 2014 - Economic Transformation for Human Development. Published by the Economic and Social Research Foundation with support from United Nations Development Programme Tanzania Office and Government of the United Republic of Tanzania Ministry of Finance. Dar es Salaam, Tanzania. Available at: http://www.thdr.or.tz

Even though Tanzania as a country is characterized by low levels of human development in general, there are some regions which are slightly better than the others, including Arusha, Kilimanjaro, Dar es Salaam, Iringa, Ruvuma, Mbeya and Tanga. Specifically, only three regions, namely Arusha, Kilimanjaro, and Dar es Salaam have HDI levels comparable to countries of medium levels of HDI. All the other regions have HDI standards comparable to countries with low HDI. The regions with the lowest human development index are Kigoma, Singida, Dodoma, **Kagera**, Tabora, Shinyanga and Pwani as shown in Figure C.1.

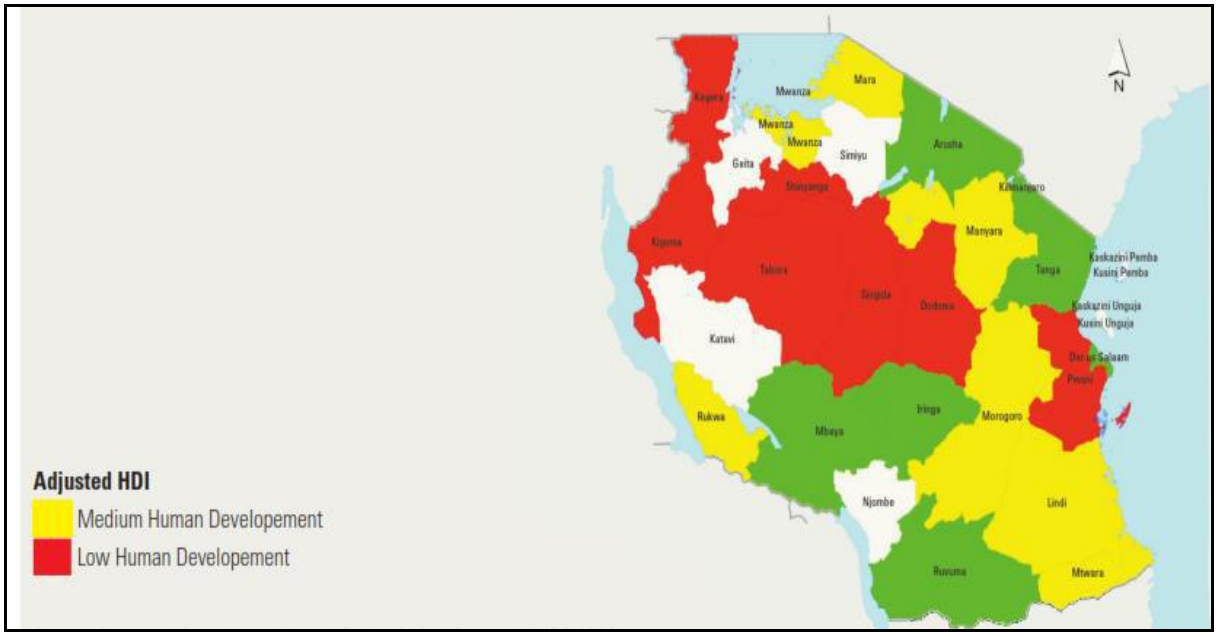

Figure C.1 - Regions of Tanzania Mainland by adjusted HDI categories computed from data collected for Statistical Annex of THDR 2014

C3 Land tenure &ownership of carbon rights

Land is available for the development of the above technical specifications. Although farmers currently do not have title deeds, they are in the process of acquiring them. The Land Tenure Act passed in Tanzania in 1999 makes the tenure of land possible for a long period of time e.g. 99 years. The Village Land Act sets out how each village may declare its village land. This land does not have to be surveyed. The critical criterion is based on agreement between neighbours of property boundaries. It provides for registration of village land at the village level. The most important feature is that this is generally undertaken at the village level by villages.

The decentralization of land registration to the local level is a good example of strategic soundness. Lodging registers at the local level will also enhance their accountability. Accessibility by ordinary villagers has also greatly enhanced land ownership rights.

The law explicitly protects existing rights in land. It does this through removing inequalities between statutory and customary rights. They are made fully equal in the eyes of the law. The bills allow for traditional ways of holding land to be recognised and supported fully in the law and for the fundamental operational base of customary land law and tenure to continue - community assent and direction – through embedding local level authority and management of village land in the hands of villagers (the elected village council).

Tanzania in general has had major reforms in land tenure for the last fifteen years since the British Colonial Administrators Land Tenure Ordinance of 1923. The entire body of land in Tanzania has been declaredpublic lands and land tenure systems facilitate the generation, accumulation and investment of capital within the rural agrarian and pastoral sector. Villages should be self-governing units in which all adult members of the village fully participate in the administration of land matters through their village assemblies. Use of land and pastoral communities for attaining food self-

sufficiency and production of surpluses for domestic and export market is the principal basis of the land tenure system. The land tenure system is based on multiple land regimes all existing side by side and none of which should be considered superior to the other and interests under all of them should enjoy equal security of tenure under the law. In all forms of land tenure regimes, security of tenure is dependent on use and occupation.

According to bulletin on Carbon Rights in REDD+ and their implications in East Africa (2010:2) The concept of carbon rights is still new in the three countries and it is yet to be understood by many of the stakeholders involved. Moreover, none of the countries yet has a policy and legal framework that incorporates carbon rights. So carbon rights in East Africa including Tanzania are likely linked to forest and tree tenure.

Most forest in Tanzania are owned by the state, and trees (farms) are owned by individual farmers. Through Plan Vivo project, farmers do plant trees (own trees). Based on that, the carbon rights are owned by individual participants.

Part D: Project Interventions &Activities

D1 Project interventions

- **Improved land management**

The long term commitment to tree planting and subsequent management under different feasible, controlled and verified agroforestry systems is the major means for participation in mitigating GHG emissions, which enables the small scale farmer to access carbon finance through a process of aggregation of carbon assets and to receive additional carbon revenue streams through the adoption of productivity enhancing practices and technologies. The agroforestry systems used are *boundary planting*, *dispersed inter-planting*, *homestead fruit orchards* and *woodlots*.

D2 Summary of the project activities for each intervention

Table D2 – Description of activities

Intervention type	Project Activity	Description	Target group	Eligible for PV accreditation
Improved land management	Dispersed Interplanting	Intercropping trees with crops	Smallholder farmers	Yes
Improved land management	Boundary Planting	Trees planted along farm boundary	Smallholder farmers	Yes
Ecosystem rehabilitation	Woodlot	Tree planting on degraded areas	Smallholder farmers and community groups	Yes
Improved land management	Fruit Orchard	Intercropping fruit trees with crops	Smallholder farmers	Yes

- **Additional activities to be supported by the project**

Since participants will be encouraged to form farmers groups, it will be easier forViAgroforestry toorganise capacity building workshops to provide them with extra trainingin addition to the required sessions on Plan Vivo sustainable management systems. Indeed, the participants are already receiving and will continue to receive training on farming as a business, sustainable land management, sustainable energy use, saving and crediting under village associations etc. In general, all Plan Vivo groups will have the right to access any additional activity that is facilitated by the project.

Monitoring and management of these activities will be done in the similar way to other groups without Plan Vivo intervention.

D3 Effects of activities on biodiversity and the environment

The Plan Vivo project promotes indigenous and environmental friendly tree species. By so doing it create good environment for biodiversity and ecosystem management. Trees provide both environmental and livelihood benefit to participating communities. Trees conserve soil moisture, reduce soil erosion, act as windbreak and are habitats for birds, insects and some small animals.

Part E: Community participation

E1 Participatory project design

The project design followed a step-by-step-process summarized as follows:

1. Awareness-raising on climate change impacts, adaptation and mitigation is conducted and then followed by sensitization to join the mitigation project. The main emphasis is the benefit of tree planting as proposed by the project.
2. Every interested farmer isasked to apply by submittinga letter that has been approved by village government (assurance of land ownership).
3. Farmers are trained on the chosen Technical Specifications and the connected tree species. The sites to be planted are assessed.
4. Farmers plant trees according to the Technical Specification.
5. One year after the trees have been planted, individual plots are registered under the project by using GPS coordinates, which then allow field staff to record the site'sthe area and position.
6. Sale agreements are signed with participants.
7. After the monitoring, compliant farmers are paidaccording to the payment schedule in the sale agreement.
8. An annual forum meeting is then held where group representatives and village leaders meet. In the forum, project participants share the report of their intervention including success and challenges. Also, they jointly discuss how to overcome any potential issues encountered while conducting the project activities.

- **Target group(s) and their involvement in design**

The individual participating farmers are the owners and implementers of the on-farm *plan vivos*. To be able to own and implement such plans, they have to work both individually and collectively in order to access capacity building services and to aggregate carbon assets to facilitate their entry into carbon markets. To participate in these activities the farmers have to express their willingness by signing an agreement to plant trees and to manage their natural resources according to the conditions stipulated in a carbon sales agreement. The successful implementation of the project in Kagera will involve the participation of various actors. Primarily, the implementers are the individual farmers willing to undertake tree planting while adhering to the technical specifications. The other project participants' main roles are to facilitate farmers to prepare and implement plans that can be acceptable as per Plan Vivo standards and thus be able to trade carbon credits (Plan Vivo certificates). These actors are Vi Agroforestry Tanzania implementing Lake Victoria Farmers Organization Agroforestry Program, the Plan Vivo Foundation, farmer-formed and owned groups/networks.

- **Governance of community groups**

Plan Vivo participants are organised to form groups with leadership (chairperson, secretary and treasurer). All groups have bank accounts through which their payments are channelled. Some groups have been registered at district level. Bank account signatories are selected among the group members (usually are three). Community groups which are participants of Plan Vivo project, are represented by appointed personnel (environmental club teacher, religious leader) and this one join

the respective group in the area. The representative from Community Group gives the feedback to whatever is done/ discussed or decided by the group. The decisions on how to use the fund received by the community group is mainly done by school/ church boards.

- **Addressing barriers to participation to ensure the involvement of women and socially excluded communities**

1. Barriers to participation

   - Customs prohibiting land ownership by women
   - Lack of knowledge on importance of trees
   - Lack of capital (money or human labour) because establishment stage is a very costly undertaking.

2. Addressing the barriers:

   - Gender mainstreaming in the community project
   - Awareness raising on equal rights that will hopefully enable women to legally own land
   - Awareness creation/ facilitation on the importance of trees
   - To address the lack of capital, ViAgroforestryhighlights the pivotal place of women and other socially excluded groups to ensure that they are accepted and supported. Capacity building and training in functional areas such as finance, literacy skills, marketing, production and managerial skills are also offered. Access to credit by women at the level of micro and small-scale enterprises is facilitated through innovative programs and financing arrangements that go beyond the conventional approaches. This requires collateral and capital among other conditional ties. Additionally, strategies have been put in place with different instruments to address access to finance for women, typically mentoring them and helping them prepare proposals for bank funding.

E2 Community-led implementation

The site is assessed for suitability based on established parameters mainly that the proposed land to be put under management is currently not utilized for crop that it generally has few trees (to avoid cutting existing trees to create room for those under the project), and that the proposed planting site is not located between a neighbour's banana farm.Depending on the site and desirable technical specification, participants are advised on trees species suitable to the area, taking into consideration the farmer's preferred species as well.

Using a Global Positioning System (GPS) device, the area and perimeter of the site are measured and recorded including the GPS points. A sketch of their site is then drawn on paper (the *plan vivo*) and the GPS points of the farm's corners and of the centre are also recorded. These maps are subsequently archived at Vi Agroforestry project office. The current practice is to transfer data from the GPS device to papers, but there are future plans to store the data electronically in suitable GIS format.

E3 Community-level project governance

The participating community have received training on self-monitoring. The groups decide on all the ancillary activities other than tree planting to be conducted as part of the project. Through forum meetings, participants decide how to deal with identified implementation challenges and the proposed solution may not contravene the conditions for participation or the technical specifications. The participating groups are also encouraged and facilitated to join or to form a network, which is then supposed to stand alone and to coordinate all Plan Vivo activities when sufficiently trained. This is part of the project's sustainability plan asVi Agroforestry will cease its active involvement in the project.

Currently, no grievances have been recorded, but the Standard operating procedure for the project requires that any grievances related to the Plan Vivo project are declared and recorded as soon as they occur. Once a specific grievance is raised, it will be first reported to the respective group

leadership for a possible solution involving all the members. In the event that the group is unable to resolve it, village leaders of the respective area will be involved. If the village leaders are unable to resolve the grievance in turn, then Vi Agroforestry will be involved. Finally, if Vi Agroforestry is unable to resolve the grievance based on the legal mandate, then ultimately government officials on respective district will be involved. However, the preference is that grievances are solved at the smallest local level whenever possible.

Part F: Ecosystem Services & Other Project Benefits

The carbon benefits are summarized in Table F.1 below. For greater detail, please see the technical specifications for Boundary Planting, Dispersed Interplanting, Fruit Orchards and Woodlots (freely available on the Plan Vivo website).

Table F.1 - Carbon Benefits

Table F1 – Carbon benefits					
	1	2	3	4	2-(1+3+4)
Intervention type (technical specification)	**Baseline carbon uptake / emissions i.e. without project (t CO_2e/ha)**	**Carbon uptake/emissions reductions with project (t CO_2e/ha)**	**Expected losses from leakage (t CO_2e/ha)**	**Deduction of risk buffer (t CO_2e/ha)**	**Net carbon benefit (t CO_2e/ha)**
Boundary Planting (per 100m)	0.33	7.79	0	1.49	5.95
Dispersed Interplanting	7.33	91.12	0	18.12	65.67
Fruit Orchard[3]	7.33	41.47	0	8.197	25.95
Woodlot	7.33	195.35	0	38.97	149.05

F2 Livelihoods benefits

Table F.2 - Livelihoods Benefits

Food and agricultural production	Financial assets and incomes	Environ-mental services (water, soil, etc.)	Energy	Timber & non-timber forest products (incl. forest food)	Land & tenure security	Use-rights to natural resources	Social and cultural assets
Boundary Planting	Sale of poles and timber	Wind break, soil erosion control	Firewood from dropping/ pruned branches	Timber	Assists in marking land boundary	Secure land boundary	
Dispersed Inter-planting	Sale of farm products	Retain soil moisture, improve	Firewood from dropping/	Timber	Adds to the value of the land		

[3]For Avocado which is the only species currently planted under the system

Food and agricultural production	Financial assets and incomes	Environ-mental services (water, soil, etc.)	Energy	Timber & non-timber forest products (incl. forest food)	Land & tenure security	Use-rights to natural resources	Social and cultural assets
		soil fertility	pruned branches				
Fruit Orchard	Sale of fruits	Add organic matter in the soil	Firewood	Fruits			Improved nutrition and health benefit
Woodlot	Sale of poles (thinning)	Retain soil moisture, prevent soil erosion	Firewood from dead/ pruned branches, thinned trees	Timber, charcoal, honey	Adds to the value of the land		

- **Livelihoods aspects that may be negatively of positively affected**

Livelihood aspects that might be negatively affected by the project are:

- Competition of crops and trees (for dispersed inter-planting and boundary planting)
- Misuse of payment received

Mitigation measures for the above negative impacts include:

- Earlier/more frequent pruning of trees to prevent overshadowing of the crops
- Awareness creation on proper utilization of the payments received

F3 Ecosystem &biodiversity benefits

The ecosystem services are summarised in Table F.3 below.

Table F.3 - Ecosystem Impacts

Intervention type (technical specification)	Biodiversity impacts	Water/watershed impacts	Soil productivity/conservation impacts	Other impacts
Boundary Planting	Protection of Animals	Improves water flow	Add soil manure	Act as wind break hence control dust
Dispersed Interplanting	Protection of animals and plants	Improves water flow and reduce soil evaporation	Nitrogen-fixing trees will increase soil fertility and prevent soil erosion	
Fruit Orchard	Protection of Wildlife	Improve water flow	Prevent soil erosion	
Woodlot	Protection of wildlife (birds and other small animals), medicines,	Improves water flow and reduce soil evaporation. Also prevent siltation of water	Prevent soil erosion due to heavy rainfall.	Improved air quality

Intervention type (technical specification)	Biodiversity impacts	Water/watershed impacts	Soil productivity/conservation impacts	Other impacts
	fruits			

Part G: Technical Specifications

G1 Project intervention and activities

Carbon quantification is based on conservative estimates of the expected average increase in carbon stocks in above and below-ground woody biomass over 100 years following IPCC Standard, but adjusted in the case of the *Emiti Nibwo Bulora* project for a twenty-five-year timeframe. The carbon benefits of each eligible land-use system are calculated using the relevant project technical specification. The technical specification for each land-use system specifies the carbon potential based on a simple carbon accounting model and the associated management regime by the use of the *CO2Fix* software. The actions required to develop each technical specifications included baseline studies, biomass surveys, carbon modelling, training workshops and community meetings as well as biodiversity and socioeconomic impact assessments. Based on these actions, four tree planting systems are defined as follows:

a) Boundary planting – 5.95 tCO_2e/100m;
b) Dispersed interplanting – 65.67 tCO_2e /ha;
c) Fruit Orchards – 25.95 tCO_2e/ha);
d) Woodlots of mixed native species – 149.05 tCO_2e/ha.

Table G.1 below provides a brief description of the submitted technical specifications.

Table G.1 - Description of the Proposed Plan Vivo Technical Specifications

Title	Type of Activity	Objectives	Brief Description	Target Areas/Groups
Boundary planting	Agroforestry	Land demarcation, windbreaks, soil erosion control, shade/shelter, poles and firewood.	*Markhamia lutea, Maesopsis eminii, Casuarina equisetifolia, Albizia lebbeck, Grevillea robusta, Acacia polyacantha* and other indigenous and naturalized tree species including *Khayanyassica* and *Albizia* spp. Trees should be planted in a row 3 meters apart. More than one row of trees may be planted (staggered with spacing of 3X2 metres) where the planting is not adjoining neighbouring cultivated land. Thinning may occur between years 4 – 15 trees are harvested in years 20 -25. Full re-establishment required thereafter.	All farmers.

Title	Type of Activity	Objectives	Brief Description	Target Areas/Groups
Dispersed inter-planting	Agroforestry	Improve soil fertility and therefore increase yields of agricultural food products. Additional benefits will include soil conservation, improved water quality, enhanced biodiversity, and income diversification through firewood, medicine, bees and other non-timber forest products (NTFP's).	*Markhamia lutea, Maesopsis eminii, Albizia lebbeck, Albizia coriara, Acacia Polyacantha, Acacia nilotica, Acrocarpus fraxinifolius.* Plant 200 trees per hectare. Grow to maturity and harvest after 30 years. Pruning and weeding required.	All farmers oncultivated land.
Fruit orchard	Agroforestry	Produce fruits for domestic consumption and sales. Additional benefits will include soil conservation, improved water quality, and enhanced biodiversity.	*Mangifera indica, Citrus limon, Persea americana* and *Artocarpus heterophyllus*. Mango and avocado established at 123 trees per hectare. Lemon established at 156 trees per hectare. Pruning and weeding. Harvest at 50 years to re-establish thereafter.	Marginalised farmland or other degraded lands.
Woodlot	Agroforestry	Diversify farm production with timber, firewood, medicine and fodder. Additional environmental and social benefits will include soil conservation, improved water quality, enhanced biodiversity, and income diversification.	*Maesopsis eminii, Casuarina equisetifolia, Podocarpus* spp.,*Markhamia lutea, Acacia nilotica, Albizia lebbeck, Acacia polyacantha, Cedrela odorata.* Plant trees between 3m x 3m and 4m x 4m (depending on species). Typically thinning undertaken between years 6 and 10 with harvest between years 12 and18. Re-plant thereafter.	Marginalised farm land or other degraded lands.

G2 Additionality and Environmental Integrity

A key factor is that the emissions reductions from a project activity or intervention should be additional – i.e. demonstrating that the intervention would not have occurred in the absence of the carbon derived finance. Additionality can be demonstrated through an analysis of the barriers to the implementation of activities in the absence of intervention. In this case, the barriers to the permanent establishment of *plan vivos* that are overcome through the project activity and the reception of carbon finance are:

- Community mobilisation and participation in the planning processes
- Capacity building sessions (on improved land use management systems, agriculture and silviculture)
- Awareness-raising activities (benefits that may be derived from tree planting)
  Establishment of tree nurseries for seedlings
- Establishment of a seedling distribution chain
- Training onparticipatory monitoring and evaluation

As there are no formal means by which communities can access funding to cover these costs, the effect of Plan Vivo carbon finance is strongly additional.

The Emiti Nibwo Bulora project is also helping implement the following elements of the Tanzania Forest Policy:

- Integrated approach to forest management, conservation and development (including sustainability concerns, ecological values and social interests)
- Management to entail sustainable multiple forest uses and benefits (including timber, fuel, food and other forest products, as well as biological diversity and resources, protection of ecosystems and watersheds, recreation and tourism, and other environmental services such as carbon sequestration)

The financial, social, technical and cultural barriers that prevent project activities taking place in the absence of the project include:

- Lack of capital to establish a tree farm
- Interest on commercial tree species like Eucalyptus and Pine
- Lack of forest extension officers to villages
- Land ownership (land is mainly owned by men, if not interested with trees, then no trees can be planted in his plot/ area)

The potential individual *plan vivos* have been assessed before registration to determine if the area is being used for crop production or already contains significant amount of tree vegetation. The eligibility is that the one not used for crop production, not covered by trees (whether planted or growing naturally) and is preferably degraded.

Up to now there are no projects/ interventions of the same kind as Emiti Nibwo Bulora in this region of Tanzania.

The additionality Tool in Figure G.1 below demonstrates step-by-step the process for determining additionality:

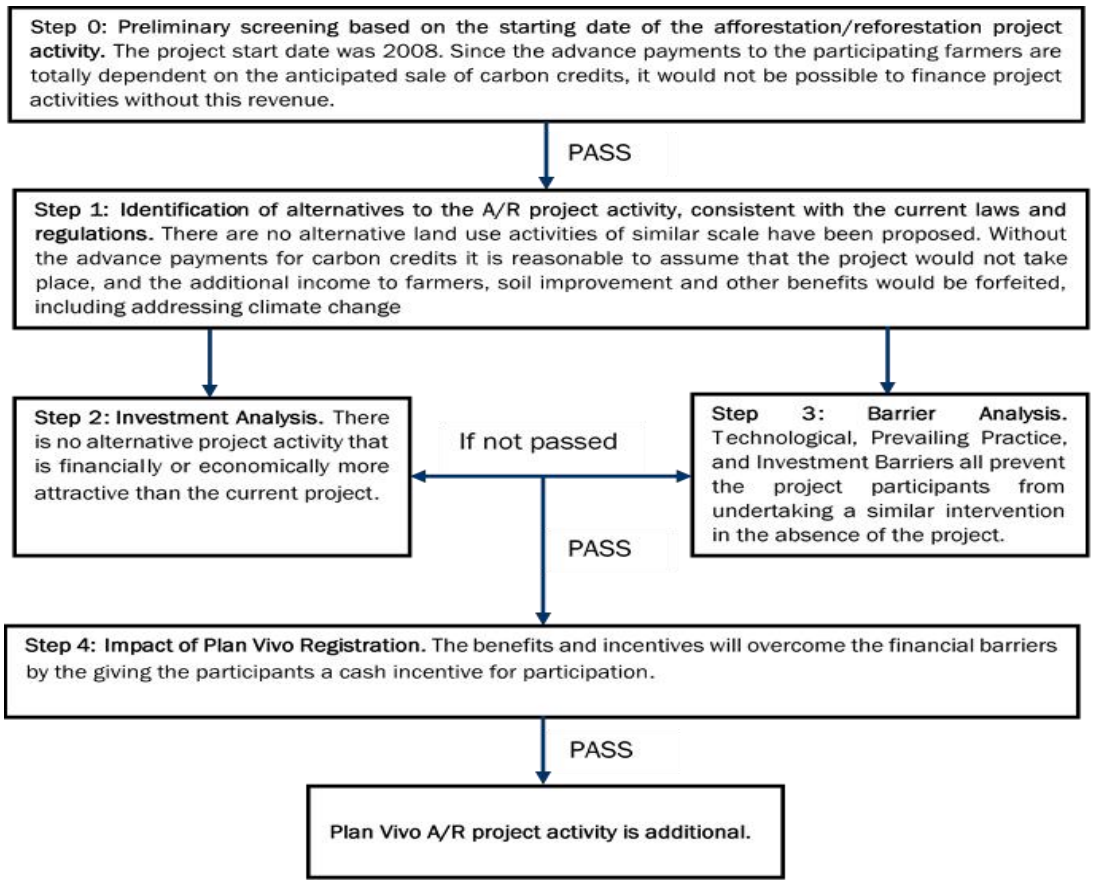

Figure G.1 - Stepwise tool for demonstration of the project activity

G3 Project Period

The project start date is 2008 with a 25-year crediting period.

G4 Baseline scenario

- **Baseline conditions and trends in the project area**

To generate emissions reduction credits agroforestry projects must create real, measurable and long-term benefits related to the mitigation of climate change, and must be additional to the baseline scenario that would occur in the absence of the project activity[4] (Figure G.2). It is therefore necessary to determine carbon stocks at project inception, and the predicted change in carbon stocks in the absence of project activity. The choices and assumptions made during sampling must be transparent, and contribute to a conservative estimate of baseline carbon stocks. It is also important that the cost of sampling, and required expertise, *do not exceed those which can be supplied by the project*. The approach described here ensures that sampling provides a robust estimate of baseline carbon stocks, with minimal reliance on external resources and expertise.

As illustrated in Figure G.2, a static baseline applies to projects where the current land use is unlikely to change in the absence of project activities (for example for planting agroforestry trees on agricultural land). This is the approach selected since majority of land under the project is agricultural

4Kyoto protocol, Article 12.5b,c http://unfccc.int/kyoto_protocol/items/2830.php

land and the baseline carbon stocks are expected to change little (if at all) in the absence of the project.

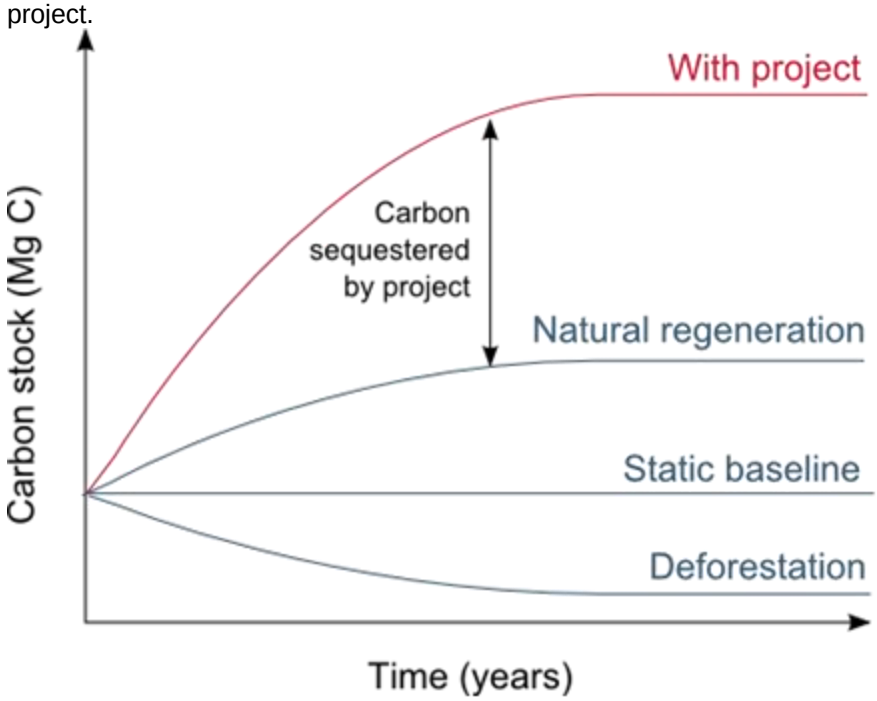

Figure G.2 - Illustration of the carbon offset by the project, equal to the difference between the carbon sequestered by the project, and the baseline.

- **Approach for establishing the baseline conditions and trends**

To quantify the baseline carbon stocks the following steps were followed:

1. Defining the project boundaries and stratifying the project area;
2. Determine the carbon pools to be measured;
3. Carry out the baseline survey; and
4. Calculating the baseline for each stratum.

1. Project Boundaries:

In this project, hand-drawn maps of each farm were developed by farmers with boundaries described with GPS and/or features on the map. It was within these boundaries that the baseline was measured.

The project area was stratified according to two land use categories for baseline data collection namely, cultivated land and neglected land.

- Cultivated land typically is cultivated using annual crops (such as maize, groundnuts beans etc.) and perennial crops such as banana whilst isolated trees may occur (either planted or naturally).
- Neglected land is typically found on hillsides. The high forest has been removed and the remaining vegetation is highly degraded. 'Neglected' areas are typically used for pasture, firewood collection etc.

2. Carbon pools and emission sources:

Table G.2 - Pools included/excluded including the reasons for their inclusion or exclusion

Carbon Pool	Included?	Justification/Explanation of Choice
Above Ground tree biomass	Yes	Major pool affected by project activities
Aboveground non-tree biomass	No	Conservatively excluded as it is expected to be under constant flux hence difficult to monitor
Below-ground biomass	Yes	Major carbon pool affected by project activities.
Deadwood	No	Conservatively excluded because it is insignificant as a proportion of the total biomass (<5%).
Litter	No	Conservatively excluded
Soil Organic Carbon	No	Conservatively excluded as it is expected to remain largely unchanged

Note:

i. The biomass stored in trees and their roots are likely to be the main carbon pools in most areas and should be quantified in all baseline assessments.
ii. The carbon stored in leaf-litter and dead wood will increase as a result of agroforestry activities, but is unlikely to constitute a large proportion of the total carbon pool and is therefore excluded from the baseline.
iii. The effects of agroforestry plantings on non-tree vegetation are less certain but are unlikely to constitute a large proportion of the total carbon pool, so non-tree vegetation is also excluded from the baseline.
iv. The effects of project activities on soil organic matter are also less certain, although the carbon stored in soils is expected to increase, but the cost associated with recording the carbon in soil prevents their inclusion in the baseline.

Table G.3 - GHG emissions from sources not related to changes in carbon pools (emission sources) to be included or excluded in the GHG assessment

Source		Gas	Include?	Justification/Explanation
Baseline	Baseline Deforestation and Degradation	CO_2	Yes	
		CH_4	No	Conservatively omitted
		N_2O	No	Conservatively excluded
Project	Biomass burning from unplanned large and small scale fires	CO_2		Emissions are already included in the changes of carbon pools
		CH_4		Conservatively excluded
		N_2O		Conservatively excluded
	Fossil fuel used during harvesting	CO_2		Insignificant, no mechanized harvesting is planned
		CH_4		Insignificant, no mechanized harvesting is planned
		N_2O		Insignificant, no planned harvesting
	Fertilizer used during planting	CO_2	No	Negligible, no fertilizer will be used as the trees recommended species have been selected for their ability to improve soil quality
		CH_4	No	As above
		N_2O	No	As above
	Increased livestock stocking rates	CO_2		Not expected, hence applicable
		CH_4		Not expected, hence applicable
		N_2O		Not expected, hence applicable
		CO_2	Yes	The timber products from the trees are expected to retain the carbon for a significant period of the crediting period. The CO2Fix Modelling tool provides a simple procedure for estimation.

3. Baseline carbon assessment:

An estimate of the total carbon stored in the project area in the absence project activities was obtained from an average of sample plots distributed throughout the project area. Nested sample plots were used for sampling trees of different sizes in neglected lands greater than 2 ha (see Figure 3). However, whenever planting areas are small (≤ 0.5 ha), contain few trees, and have a known area (as in the case of the typically small agricultural plots) it was considered more efficient to record all trees in that area; being sure to make note of the size of the area surveyed. In all cases, the minimum DBH measured for trees in whichever stratum was 5 cm.

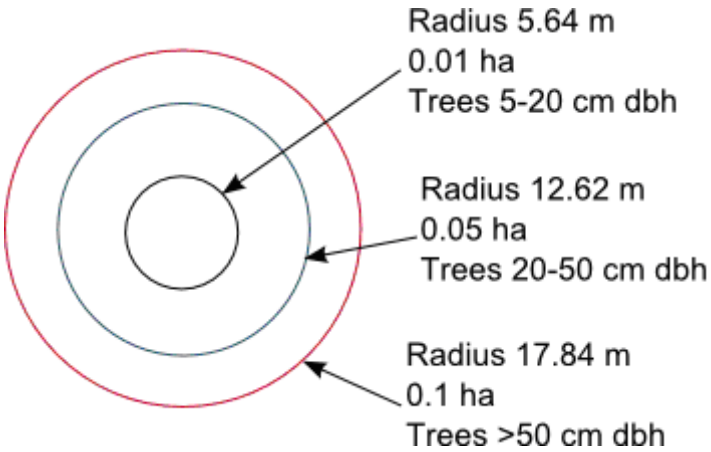

Figure G.3 - Diagram of nested plots for sampling trees of different sizes.

The total number of plots necessary to ensure 95% confidence that the estimated carbon stock in each strata is accurate, with a precision of 20%, was determined from an initial survey of around 10 plots in each stratum[5].

4. Baseline emissions:

Since the carbon stock is expected to remain relatively constant over time for agricultural land, the baseline for the period of the project was therefore estimated to remain at the level recorded in the baseline survey. A static baseline at the mean value for from the baseline survey has therefore been applied across the planting areas.This was done by taking measurements of individual trees to make estimates of carbon stock per hectare.

The basic estimate of carbon was derived from the estimated volume of the tree with the equation:

$$AGB = 1.2 \times \rho \times \left(\frac{\left(\frac{\pi}{200} \right) \times d^2 \times h}{3} \right)$$

Where AGB is aboveground biomass in kg, ρ is wood density in kg/m^3,'d' is DBH in cm, and 'h' is theheight in m. The factor 1.2 is an expansion factor used to convert the stem volume/biomass into the crown and foliage biomass. The value 3 is the 'form' factor for stem volume while 200 is a facto to convert the stem volume form cm^3 to m^3.

5 Pearson et al. (2005)

The aboveground biomass of trees in each nested plot is determined by adding together the values of all trees in that plot. This is done separately for trees 5-20 cm in the 0.01 ha subplot, trees 20- 50 cm in the 0.05 ha subplot, and trees >50 cm in the 0.1ha subplot. The values for each subplot are then multiplied up to give an estimate over a standard area of 1 ha (x100 for 0.01 ha subplot, x20 for 0.05 ha subplot, and x10 for 0.1 ha subplot). Finally the values from all three subplots are added together to give the estimated aboveground biomass per hectare from that plot.

Values for belowground biomass are determined from aboveground biomass estimates by multiplying with the expansion factor 1.25. The expansion factors are derived from the IPCC Good Practice Guidelines on AFOLU (IPCC-GPG).

The total carbon for each plot is then determined by multiplying the biomass per hectare by the proportion of biomass that is carbon. It is assumed that 47% of woody biomass is carbon as per the IPCC GPG.The average value across all plots surveyed on agricultural and neglected land is then applied as the baseline for that stratum.

Table G.4 - Data sources, assumptions and justification for their use

Parameter	Value	Source of data	Justification
Tree DBH/Height	Various	Field measurement	Recommended approach whenever possible
Crown-to-stem ratio	1.2	2006 IPCC Guidelines for National Greenhouse Gas Inventories.	No project-specific data available; based on rigorous scientific research
Root-to-shoot ratio	1.25	2006 IPCC Guidelines for National Greenhouse Gas Inventories.	No project-specific data available; based on rigorous scientific research
Carbon fraction	0.47	2006 IPCC Guidelines for National Greenhouse Gas Inventories.	No project-specific data available; based on rigorous scientific research
$C0_2$/C Ratio:	3.666666667	2006 IPCC Guidelines for National Greenhouse Gas Inventories.	No project-specific data available; based on rigorous scientific research
Dry wood density	Various	ICRAF Agroforestry Tree Database	No project-specific data available; based on rigorous scientific research

In summary:

As the project area is one of long-term human activity and forest/land degradation is documented to have been taking place on these lands for a long period of time, it is projected that without the intervention of the project activities the landscape will, at best, remain the same and under less favourable conditions, continue to degrade.

Poor farm productivity, poverty, population pressure, increased demand for land and other forest products, lack of awareness on the benefits and importance of forest protection have all contributed to the conditions under the baseline scenario. Their continued existence in the absence of the Emiti Nibwo Bulora project indicates that the baseline scenario is a continuation of the pre-project condition, characterized by escalating use and resource extraction, is the most likely future land use.

G5 Ecosystem service benefits

1. Climate benefits:

The identification and justification for inclusion or exclusion of each pool have been provided in Table G.3 for both the baseline and project scenarios.

The methods used to assess the potential carbon sequestration by the four land use systems to be

used as Plan Vivo activities by VI Agroforestry -Kagera are described in greater detail by Nick Berry (2008)[6] and it has also been made available as part of the project documentation. No published tree growth data is available for any of the tree species identified for use by the project. Therefore, to determine how these trees are likely to grow under the conditions found within the project area, field measurements of trees of at known age were made to help determine annual (stem) volume increments (m^3/yr).

The tree measurement data (height and dbh) was used in the following way in order to derive annual increment for different tree species (m^3/ha/yr):

1. Estimate the dbh - age relationship (plotted age vs dbh and calculated best fit line)
2. Estimate height - age relationship (plotted height vs age and calculated best fit line)
3. Calculate individual tree stem volume in (m^3). This is done by using the predicted dbh and heights from trees of age 1, 2, 3, ...5…20, etc. Calculate the predicted stem volume of the tree at ages 1, 2, 3, ...5…20, etc. based on the volume of a cone using the following formula:

$$v_i = \frac{\pi\left(\frac{d_i}{200}\right)^2 h_i}{\rho}$$

Where the terms are as previously defined under the procedure for baseline determination.

4. Calculate annual increment per tree at age in successive years from planting to harvesting. as the increase in volume between the two ages (e.g. volume at age 15 minus volume at age 10) divided by 5 (years)
5. Multiply the CAI per tree by the number of trees in the technical specification (refer to the establishment and maintenance plan) to annual volume increment per hectare (m^3/ha).

The results for CAI (m^3/ha) for the different tree species used to model potential carbon sequestration are shown in **Error! Reference source not found.**. Refer to Appendix I for graphic representation of dbh-age and height-age relationships and CAI.

Table G.5 - Current annual increment (ages 5 to 25 years) for tree species used in the Emiti Nibwo Bulora Project

Tree species	CAI (m^3/ha)				
	5 years	10 years	15 years	20 years	25 years
Maesopsiseminii	14.27	15.29	11.49	15.15	18.68
Acrocarpusfraxinifolius	6.74	5.82	5.02	4.45	4.03
Markhamialutea	0.53	8.7	5.96	6.88	7.46
Grevillearobusta	2.46	5.49	7.88	9.45	10.14
Podocarpus spp.	11.83	27.25	24.58	17.08	22.04
Cedrelaodorata	2.15	3.64	3.82	3.74	3.59
Mangiferaindica	0.74	1.08	1.41	1.74	2.04
Perseaamericana	1.78	2.32	2.25	2.11	1.98
Citrus spp.	0.34	0.26	0.22	0.19	0.17
Artocarpusheterophyllus	0.67	1.29	1.81	2.20	2.44

6 Estimating growth characteristics of agroforestry trees, ECCM (2008) and Carbon modelling protocol, ECCM (2008).

2. Expected climate benefits:

Carbon storage is calculated using the CO2FIX-V3 model (Mohren*et al*. 2004). Carbon sequestration potential is based on average net carbon storage in biomass (i.e. the living parts of the tree including the main stem, canopy and roots) and forest products (i.e. poles, timber used for furniture and construction etc.) Details of the parameters used (basic wood carbon content, timber production, total tree increment relative to timber production, product allocation for thinning, expected lifetime of products etc.) for each tree planting system (technical specification) are listed in Appendix II. Refer to Appendix III for graphical representation of long-term average carbon sink for each planting system. The total carbon benefits for all pools are as presented in Table F.1. The carbon modelling parameters are presented in Annex 12.

G6 Leakage & Uncertainty

Leakage is the unintended loss of carbon stocks outside the boundaries of a project resulting directly from the project activity.

When establishing tree management systems, leakage is most likely to occur where farmers are planting trees on cultivated land (many of these tree species are not suitable to be grown in combination with other cultivated food crops). If this were to occur, it may result in displacement.

The Plan Vivo system requires that the potential displacement of activities within the community should be considered and that the activities should be planned to minimise the risk of any negative leakage. These actions should include:

- All farmers should be assessed individually to demonstrate that they retain sufficient land to provide food for themselves and their families.
- Signatories to Plan Vivo activities will be contractually obliged not to displace their activities as a result of their tree planting.
- A plan to monitor leakage on specific other woodland areas to ensure leakage is not occurring.
- Formation of community based 'policing' to ensure that leakage resulting from displaced activities does not occur.

If communities have a satisfactory plan for managing leakage risks resulting from the establishment of tree systems, it can then be assumed there will be no leakage.

In all probability, the most likely outcome of establishing woodlots or of inter-planting trees with crops is positive leakage as a result of reduced pressure to exploit other forest resources.

A possible source of uncertainty is the estimation of tree growth rates. Growth rate for a particular species is dependent on:

- The quality of genetic material used for propagation;
- How well the establishment of trees and their subsequent management are done, i.e. fidelity to the prescribed TS;
- Unforeseen occurrences such as stress caused by drought, high temperature, livestock damage, flooding, etc. but these are expected to cancel out over a long time;
- Variation in soil quality from farm to farm;
- Inaccurate estimation of the tree age by the farmers during the assessment phase when the carbon models were developed.

The last point is especially important during the first 20 years of a tree's growth as most of the recommended species show a marked reduction in growth rate after 20 years and, as they approach the optimum age, underestimation or overestimation of the age has less significant influence.

However, in the first 10 years, a 10-year old tree marked as 7 years or vice-versa could result in the predicted growth model becoming significantly impaired.

Nevertheless, if subsequent years the monitoring indicators consistently show significant differences from those predicted in the models, the project will have a good indication that the assumptions and values used in the model need to be revisited.

Part H: Risk Management

H1 Identification of risk areas

The risk assessment was done using the VCS Risk Assessment Tool for Agriculture Forestry and Other Land Use (AFOLU) projects, which provides the procedures for conducting the non-permanence risk analysis and bufferdetermination required for this project. Table H.1 is a summary of the results of the risk analysis and measures to address them.

Table H.1 - Identification of Risks and Measures to address them

Risk Type	Risk Level	Frequency of assessment	Management Measures
Permanence risk			
• Land clearance	Low	Annually	• Community mobilisation and participation in planning processes • Capacity building (on improved land use management systems, agriculture and silviculture) • Awareness (benefits that may be derived from tree planting) • Training to enable long term sustainability of programme through participatory monitoring and evaluation • Technical specifications to provide guidance on tree planting and management activities • Contracts for change in land use system in place for 25 years • Only farmers that may make credible claim of carbon asset are eligible • Staged payments • Individual farmer leakage assessments (to avoid displacement of carbon emissions. • Annual internal verification
• Fire	Low	Frequent	• Community based monitoring.
• Drought	Medium	Annually	• Tree planting at onset of rains
• Grazing	Medium	Frequent	• Exclude grazing from tree planting areas
Leakage risks	**Risk Level**	**Frequency of Assessment**	**Management Measures**
• Displacement of agricultural activity	Low	Annually	• All farmers should be assessed individually to demonstrate that they retain sufficient land to provide food for themselves and their families • Signatories to Plan Vivo activities are contractually obliged not to displace their activities a result of trees planting • A plan to monitor leakage on specific other woodland areas to ensure leakage

Risk Type	Risk Level	Frequency of assessment	Management Measures
			is not occurring • Formation of community-based 'policing' to ensure that leakage resulting from displaced activities does not occur

H2 Risk buffer

20% of all VER's generated by the project activities are maintained as a risk buffer. Records of all buffer stock should be maintained in the database.Buffer credits will be released after a number of verifications yet to be determined. The risk buffer was determined using the VCS AFOLU Non-Permanence-Risk Tool.

Part I: Project Coordination& Management

I1 Project Organisational Structure

Table I.1 summarizes the organizations involved in the project.

Table I.1 - Project Organisational structure, Governance and Community

Key Function	Organisation/ group(s) involved	Type of group/organisation and legal status	Brief Description of activities in relation to project governance
Project Administration	Vi Agroforestry Tanzania	NGO	Project developer and implementer.
Project Technical Operations	Vi Agroforestry Tanzania	NGO	Project developer and implementer.
Community Engagement/ Participation	Individual farmers, institutions, Community groups and networks	Formal or non-formal farmer groups	Demanding advisory services. Seedling Production

The project coordinator is Vi Agroforestry, an international non-political, non-religious and non-profit organisation registered in Sweden as a foundation and in Kenya, Uganda, Tanzania and Rwanda as a non-governmental organisation. Its headquarters are situated in Stockholm, Sweden, with a Regional Office in Nairobi, Kenya. Vi Agroforestry also works in partnership with "We Effect" in furtherance of its mission and vision. We Effect (formerly Swedish Cooperative Centre) was funded in 1958. We are a development cooperation organisation applying a long-term, rights-based approach in order to effect change. The organizational structure is shown below in Figure I.1

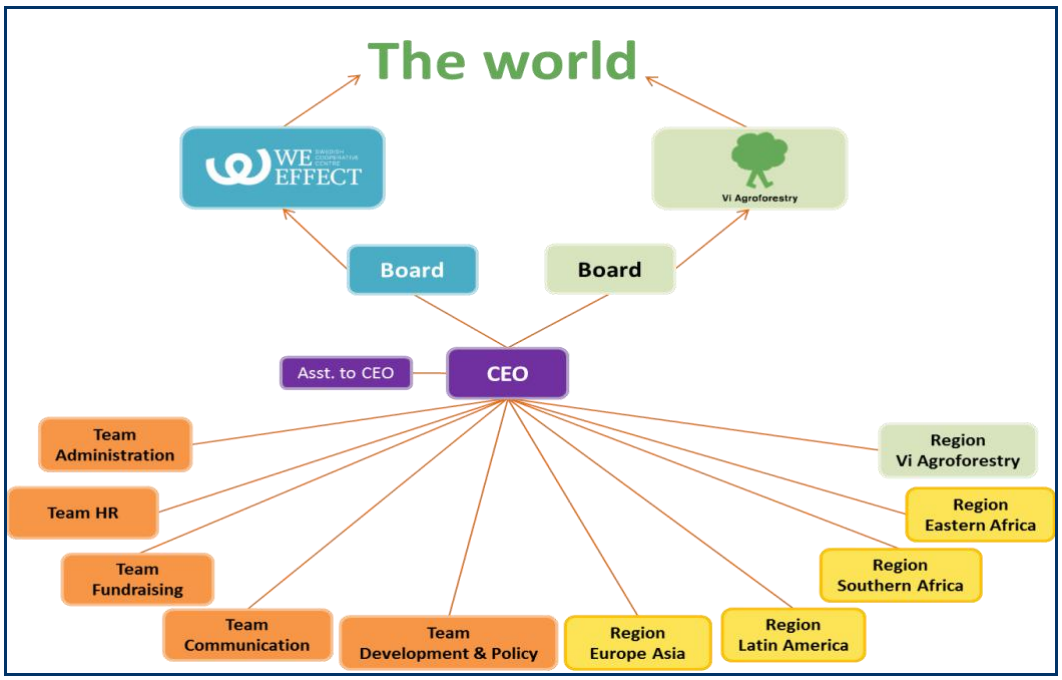

Figure I.1 - Organisational diagram

I2 Relationships to national organisations

The Lake Victoria Basin Commission (LVBC) of EAC

The Lake Victoria Basin Commission (East African Community including Tanzania, Kenya, Uganda, Rwanda and Burundi) prioritizes strategies under Ecosystems, Natural Resources and Environment. The commission lines up several strategies (from Feb 2007) that are consistent with the project, the most important are:

- Improve land use and natural resources management
- Promote proper land use management practices
- Promote the establishment of community forests and woodlots/afforestation/tree planting schemes
- Promote integrated water resource/water catchment management.

The Lake Victoria Basin Commission (LVBC) has signed a Memorandum of Understanding with Vi Agroforestry during 2009 to facilitate cooperation between the two organisations regarding programmes, projects and activities of mutual goals in enhancing cooperation regarding management, conservation and sustainable utilisation of natural resources in the Lake Victoria Basin.

Memorandum of Understanding (MoU) between Vi Agroforestry Kagera and Kagera Regional Authority since 2005

Kagera Regional Secretariat (KRS) provides development, administrative and technical assistance to Local Government Authorities (LGAs) in Kagera Region to enable them to undertake/implement activities and successfully fulfil their obligations. The main objective is to facilitatethetransfer of skills and knowledge to LGAs in areas of management development, economic development, social development, physical planning and infrastructure.

Purpose:

- To reduce poverty and improve food security of farmers in Kagera Region by conserving environment through Agroforestry practices.
- To improve efficiency of delivery of extension services to farmers in Kagera Region through

efficient use of available resources.

MoU with Moshi University College of Cooperative and Business Studies (MUCCoBS)

The Moshi University College of Cooperative and Business Studies (MUCCoBS), is a public University and constituent College of the Sokoine University of Agriculture in Tanzania.

Purpose:

This partnership brought together the two organizations that have a common broad goal of improving the living conditions of poor farming households through the sustainable use and management of natural resources. From that common goal, the purpose of the partnership is to contribute towards livelihood improvement of small scale farmers in the Lake Victoria Basin through capacity building that will enable the sustainable use and management of natural resources and business development. The partnership will be implemented within the framework and structures of the Lake Victoria RESAPP planned to be implemented from 2009 to 2011.

MoU with Lake Zone Agricultural Research and Development Institute (LZARDI)

The Lake Zone Agricultural Research and Development Institute (LZARDI) is one of Tanzania's seven Zonal Agricultural Research and Development Centres under the Directorate of Research and Development (DRD) of the Ministry of Agriculture Food Security and Cooperatives. LZARDI comprises of two research institutions namely Ukiriguru and Maruku with a research and development mandate for Mwanza, Shinyanga, Mara and Kagera regions. LZARDI vision is to have a sustainable research institute focusing on quality outputs and services that will contribute to poverty alleviation through improvement of agricultural productivity.

Purpose:

To contribute to smallholder farmer household livelihoods improvement through empowerment of farmers and staff in knowledge and skills in order to manage available natural resources sustainably for increased and sustainable agricultural productivity, food security and reduced poverty.

Environmental Impact Assessment (EIA)

The Programme carried out an Environmental Impact Assessment (EIA) and Environmental Audit (EA), which was approved by National Environment Management Authority (NEMA) in Kenya (completed in September 2007).

I3 Legal compliance

Vi Agroforestry is a non-profit organization legally registered under *The Societies Act of The United Republic of Tanzania (1954)*. The registration certification is presented in **Annex 6:** *Permits and legal documentation*, in Figure L.3.

Furthermore, Vi Agroforestry has a Memorandum of Understanding (MoU) with the Kagera Regional Secretariat (KRS),which is a statutory body created to provide development, administrative and technical assistance to Local Government Authorities (LGAs) in Kagera Region to enable them to undertake/implement activities and to successfully fulfil their obligations. The main objective is to facilitatethetransfer of skills and knowledge to LGAs in areas of management development, economic development, social development, physical planning and infrastructure. The MoU is shown in **Annex 6**asFigure L.4.

The employment policy of Vi Agroforestry is compliant with Tanzanian laws and prohibits discrimination on any grounds. Vi Agroforestry employement policy considers employing a person of 18 years and above which is in accordance with Tanzania law. The policy is outlined in detail in Vi Agroforestry's Human Resources Manual of 2008 which is still in force. The relevant section of the manual is presented **Annex 6**as Figure L.5.

I4 Project management

The approximate timeline for project establishment, piloting, scaling up and monitoring is summarized as follows:

Project establishment	2008
Pilot activities	2008-2009
Scaling up	2010/2011
Carbon uptake period	25 years
Carbon storage period	25 years

- Project establishment requires two years during which public meetings are held for awareness creation on climate change impacts, adaptation and mitigation. Sensitization about the project is also conducted in order to gauge the willingness of local communities to join the activities;
- Assessing the land of interested farmers (who have applied to join the project;
- Confirmation of land ownership of interested farmers
- Train the interested farmers on technical specification and tree species
- Land preparation and tree planting
- Monitoring one year after planting
- Signing of sale agreement

- **Project record keeping system**

A project group in the headquarters of Vi Agroforestry in Sweden, Stockholm are in charge of business development, customer relations, sales and managing transactions on the Markit environmental registry. This group consists of two key account managers at the fundraising team.

The record keeping system makes use of both electronic data management and hard copies; however, the duly signed sale agreements and *Plan Vivos* are only stored as hard copy documents. There are plans to introduce a GIS system for storing the maps in the near future.

I5 Project financial management

- Vi Agroforestry is both the project developer (in Kagera) and the end sales contractor (in Stockholm). All the certificates are sold in Sweden. The largest portion (60 % of the funds remaining after deduction of the risk buffer) are distributed to the farmers. The farmers are also offered various additional benefits and assistance, through in-kind community payments. These include for example: Tree seeds and facilitation on tree nursery establishment are provided for free to participants, education and advice on agroforestry, agriculture and financial services.

- All the farmers receive the same fee per tonne of CO_2 sold as cash. Farmers recruited in the 2010-2011 period were paid Tshs 10,000 per ton while all newly-recruited farmers will receive Tshs13,000 per ton. Compensation is done in five installments over a period of 10 years.

- 35% of the carbon sales is used by the Vi Agroforestry project office in Kagera for monitoring and for Plan Vivo charges. The remaining 5 % of the compensation remains with Vi Agroforestry in Sweden for administration including marketing.

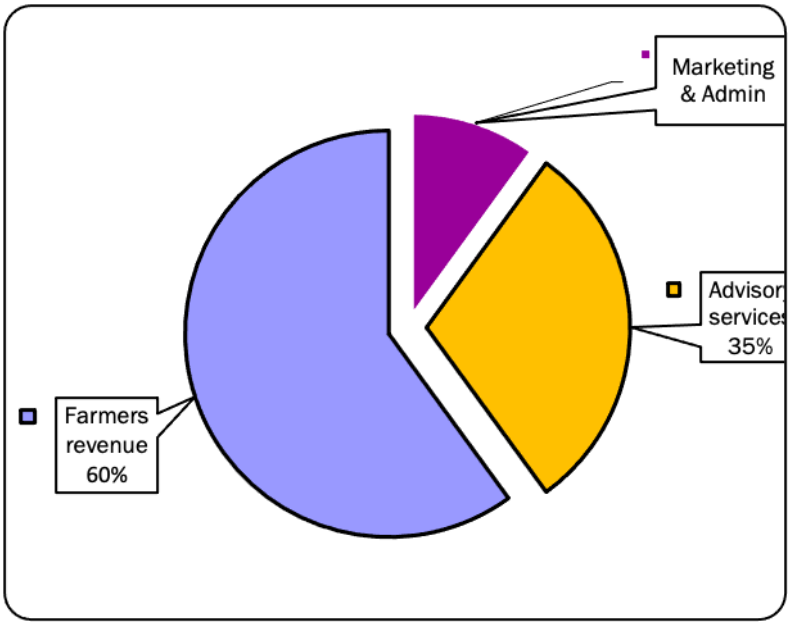

Figure I.2 - Benefit sharing structure

- **Project budget and financial plan**

1. **Co-financing from partner organisations:**

The project is not seeking, nor has obtained, co-financing from partner organisations.

2. **Turnover and purpose costs:**

The total turnover for Vi Agroforestry year 2014 was 66,978,132 Swedish Crowns (SEK) and 2013 - 65,492,349 SEK.

3. **Fundraising in Sweden:**

Fundraising in Sweden by the Swedish public has increased steadily since start of the programme. A total of 45.270 Million SEK was raised 2014 and 44.739 MSEK was raised 2013.

I6 Marketing

The Plan Vivo Certificates are marketed by the key account managers in Sweden through active promotion via sales meetings with various companies, events, marketing through internet, social media and sales material. Today all certificates are sold to companies after contact with Vi Agroforestry sales person, but in the near future it will be possible for both individuals and small businesses to themselves buy certificates via Vi Agroforestry´s web site.

The process for preparing a marketing plan consists of three different stages. The first stage includes analysis of our own business in regards to type of customers, success factors in attracting current customers, volume development, sales price etc. The second stage includes analysing the market in regards to general market development including volumes, competitors and their offerings including pricing and customer demands. The third phase consist of drawing conclusion from this analysis and of drafting a marketing plan that can better define potential target groups, the project'soffer to them and the possible marketing activities to reach them.

I7 Technical Support

Vi Agroforestry will facilitate and enable farmers to establish *plan vivos*. Strategically, the process for capacity building will enable individual farmers, groups and farmers' association to acquire the capacities required to establish and manage *plan vivos* in order to realize sustainable benefits. Vi

Agroforestry as a capacity building agency will not directly deal with carbon trading. That means it will have to assist the farmers engaged in the project to develop their own managed systems for trading the carbon products. In doing so, it will collaborate with farmers' association to develop the mechanisms for ensuring that farmer plans adhere to PlanVivo standards, that they establish and manage their systems in accordance to the specifications contained in their plans and that, eventually, they are able to trade their carbon products. Also, there will be group of lead farmers who will be assisting the monitoring activities.

Part J: Benefit sharing

J1 PES agreements

- **Procedures for entering into PES agreements**

PES agreements are signed with individual participants (even a community group or institution is represented by one member) who have qualified for the first payment and planted at least half of their *plan vivo* plot. The PES agreement has all information regarding conditions to be adhered, performance and payment targets and time and so on. A copy of the project's PES Agreement is included in Annex 3 of this PDD.

Vi Agroforestry has the capacity to meet the payment obligation to its registered participants. If, following the annual monitoring activities conduced by the project's field officers, all participants who fail to meet their target will have their payments withheld until the specified target has been reached. Close and regular follow-up and support are done to ensure project participants meet their targets.

- **Risks and associated mitigation measures regarding PES agreements**

1. **Risks:**

- Withdrawal of some participants from the project
- Harvesting trees before maturity
- Interchange/ mix of technical specification (e.g. a registered Dispersed Inter-planting changed Woodlot because of some perceived advantages of the latter and vice versa)

2. **Mitigation measures:**

- A binding clause in the PES agreement which requires giving back the money received (Annex 3)
- Enforcement of by-laws regarding tree harvesting (with assistance of relevant government officials)
- More training on maintaining the registered technical specification
- Involvement of a member of the village government as participant's referee

J2 Payments &Benefit Sharing

Payments will be disbursed to individual participants through a group account. Participants who receive payments are those who will have qualified based on the minimum monitoring targets agreed and indicated in the PES agreements.

Payments will be withheld to participants who fail to meet the monitoring targets or have significantly less than the required amount of trees specifically in year 5 and year 10. An example of failure to meet the monitoring indicators is where a participant has an average DBHof less than 19 cm in year 10 under the Woodlot Technical Specification.

The carbon money paid by various buyers is distributed to meet the administration costs (salaries, seeds, fuel for vehicles and training/ facilitation cost) as well as paying participants.

Part K: Monitoring

K1 Ecosystem services benefits

The project employs an activity-based (*ex ante*) system where simple models are used to conservatively estimate the expected carbon benefits. These models are described in the project's technical specifications, which also contain the environmental services expected to be generated by the project activities, such as the number of trees planted, the stocking density, the area of land managed and type of tree species planted. The technical specifications also contain guidelines on the monitoring of the performance of each individual farmer throughout the project lifecycle. Each participating farmer has an individual contract with a monitoring plan specifying the expected milestones based on the growth rates of the carbon model used in specific the technical specifications that he/she implements. Each of these milestones is relevant to the achievement of the estimated sequestration potential.

The project then submits an Annual Report to the Plan Vivo Foundation describing the progress in the recruitment of farmers and their annual performance, as well as documenting the progress against achieving the milestones described in the PES Agreement (also reported in K1 below). It is then the actual approval of the Annual Report by the Foundation that triggers the issuance of Plan Vivo Certificates for the new farmers recruited each single year. Moreover, the project undertakes third party verification by an independent Validation and Verification Body (VVB) at least every five years as described in the Plan Vivo Standard (2013).

Table K1 below describes the performance-based monitoring plan described in the PES Agreement and agreed with the participating farmers. In general, monitoring targets are based on tree survival rate until year 3. Starting in year 5, the monitoring targets are then based on the average Diameter-Breast-Height (DBH) measurements for each plot.

Table K.1 - Project implementation monitoring criteria for participating farmers

Year after planting	Criteria	Target
1	50% of plot established	30%
2	90% of plot established	20%
3	Tree surviving not less than 80%	20%
5	Average DBH not less than 8,10,12 cm (depending on TS)	10%
10	Average DBH not less than 19, and 21cm (depending on TS)	20%

Please, refer to table B1 to B4 in annex 3 (Sale Agreement Template) for more information on the monitoring plan of each technical specification.

In general, Vi Agroforestry will carry out the monitoring. Where the number of participants is too big for Vi Agroforestry to monitor in full, the trained lead farmers will be involved in monitoring and Vi Agroforestry will sample a few farmers for verification. The results are then shared with participants within the group.

K2 Socio-economic impacts

A socio-economic baseline survey will be carried out in 2017 and it will be repeated for every additional area that is included in the project until its independent verification is scheduled. The results of the assessment are defined by the social dimensions and key performance indicators below (Table K.2)

The project is expected to improve community well-being by contributing to reducing the number of poor households, to improving land tenure rights and gender inequality for participating farmers. This assessment considers evidence of household income, social capital, access to savings, employment records and it seeks to define how positive change spurred by the project is affecting local

communities. Its results will inform overall project design improvement.

Table K.2 - Methods of measurement of expected socio-economic impacts

Social Dimension	Indicator	Monitoring method	Frequency	Responsibility
Livelihoods	% increase in households with improved diet (Improved diet means at household having least three meals per day of proteins, carbohydrates and fruits/vegetables)	Household Survey	Annually	Field Officers
Livelihoods	Per capita income disaggregated into men and women as a result of PVC sales	Payments database	Annually	Project Staff
Livelihoods	Number of training sessions on entrepreneurship for farmers	Activity (trainings & meetings)	Annually	Project Staff
Gender Equity	Number of women actively participating in the programme.	Activity (trainings & meetings)	Annually	Field Officers
Gender Equity	Number of women-owned enterprises	Household Survey	Annually	Field Officers
Tenure security	Number of project households with documented land ownership	Project/household records	Annually	Field Officers
Social capital	% increase in number of farmers who save money regularly	Household survey	Annually	Field Officers

K3 Environmental and biodiversity impacts

Annual surveys will also assess the positive environmental and biodiversity impacts associated with the project while also seeking to analyze how the project is reducing some of the drivers of deforestation occurring in the project area, typically deforestation caused by the felling of trees for fodder and firewood.

Table K.3 - Methods of Measurement of Environmental Impacts of Proposed Activities

Dimension	Indicator	Monitoring method	Frequency	Responsibility
Drivers of Deforestation	% change in the amount of fodder collected from project plots	Survey of participating households	Annually	Field Officers
Drivers of Deforestation	% change in households using fuelwood from project plots	Survey of participating households	Annually	Field Officers
Biodiversity conservation	% of indigenous tree species planted (as opposed to naturalized	Species list recorded on annual basis from monitoring information	Annually	Field Officers

	species)	and presented in the annual report		
Climate resilience	No of HH adopting Sustainable Agricultural Land Management (SALM) Practices	Survey of participating households	Annually	Field Officers

The monitoring of these indicators will be conducted simultaneously together with the carbon monitoring activities and will be reported in the project's Annual Report. Vi agroforestry staff and/or lead farmers working with the community technicians will carry out the monitoring activities as per the schedule included in the sale agreement.

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Part L: Annexes

Annex 1. List of key people involved with contact information

Vi Agroforestry staffs are well trained in various fields ranging from environment, social sciences, forestry, GIS, agriculture etc. which are important to the project. The skills required in managing Plan Vivo will include background in forestry, agriculture, agroforestry, GIS, Computers operation and Environment.

Beside the staff listed below Vi Agroforestry has a technical team who are out in the field and who shall take responsibility of all the tasks below:

- Provide technical support to participants in planning and implementing project activities:
- Develop forestry and agroforestry systems;
- Evaluate the participants' management plans;
- Monitor activities;
- Collect data associated with calculating carbon sequestration;
- Manage the supply of seeds for tree seedlings, which the farmers themselves using for seedling production in groups or/and individual.

Table L.1 - List of key people involved with contact information

Name	Designation	Location/Country	Email
Henrik Brundin	Deputy CEO	Stockholm, Sweden	Henrik.Brundin@weeffect.se
Ulla Lillie	Key Account Manager	Stockholm, Sweden	Ulla.Lillie@viskogen.se
Arne Andersson	Regional Director	Nairobi, Kenya	Arne.Andersson@viagroforestry.org
Gudrun Bostron	Country Manager	Musoma, Tanzania	Gudrun.Bostron@viagroforestry.org
Grace Eustace	Plan Vivo Coordinator	Kagera, Tanzania	Grace.Eustace@viagroforestry.org
Amos Wekesa	Environment and Climate Change Advisor	Nairobi, Kenya	Amos.Wekesa@viagroforestry.org
Charles Mbekenga	Monitoring and Evaluation Officer	Musoma, Tanzania	Charles.Mbekenga@viagroforestry.org

Annex 2. Information about funding sources

The certificates are sold to Swedish companies. In 2015 the PV certificates were sold to the following companies:

Table L.2 - PV Certificates sold in 2015

Certificates sold in 2015	NumberofCertificates
Folksam ömsesidig livförsäkring	4,265
CCAFS, CGIAR Research Program on Climate Change, Agriculture and FoodSecurity	204
Riksbyggen Ekonomisk förening	426
Kung Markatta AB	1,060
Svenska Motorcykel- och Snöskoterförbundet (SVEMO)	71
Lantz Trafikskola AB	53
LO-TCO biståndsnämnd	117
Olof Palmes Internationella Center	1,377
BioGaia AB	1246
SWCG Swedish Consulting Group AB	6
Ny Reklambyrå i Sverige AB	20
Länsförsäkringar Kalmar Län	127
Västanhem Mäkleri & Interiör AB	10
Sjöstrand Trading AB	2
Konsumentföreningen Stockholm	33
Fält Communications AB	154
EcoOnline	9
Sydskånes Avfallsaktiebolag (SYSAV)	25
Skövdevillan AB	114
Tubman AB	11
Fonus Ekonomisk Förening	975
Onischa AB	20
Billogram AB	3
Getinge Disinfection AB	20
KPA Pension AB	338
Bokus AB	300
Car to Go Sweden AB (Naturrutan)	334
Equator Stockholm AB	43
Societa' per la cremazioneentemorale (SOCREM)	1,000
ZeroMission AB	2,001
AB KE Pettersson Handelsträdgård	241
LRF Samköp AB	5
TOTAL NUMBER OF CERTIFICATES SOLD	14,610

Annex 3. Producer/group agreement template

Emiti Nibwo Bulora

"*Trees sustain life"*

Vi AGROFORESTRY

Plan Vivo Agreement, version 2015

Preamble

On _____/_____/_____ an agreement has been made between _____ of _____Ward, _____village and _____hamlet, hereafter ' 'the participant' and the Vi Tree Planting Foundation, P.O. Box 1315, Musoma, Tanzania, Tel. +255 (0)282622293 hereafter 'Vi Agroforestry' for the provision of carbon services under the EmitiNibwoBulora ("Trees sustain life") Project.

Whereas Vi Agroforestry is an organization with legal status as per the Tanzania Laws that governs establishment and operations of projects for promotion of community based development projects.

Whereas the participant has drawn a plan vivo (land management plan) that has been evaluated and registered as suitable by Vi Agroforestry.

This agreement has the following conditions:

The participant agrees:

1.0 That their plan vivo relates to land over which they have long term user rights, acquired through inheritance or purchase. (Provide proof of land ownership; title deed or other document that confirm ownership).

2.0 To allocate this piece of land to tree planting as indicated by the plan vivo. The plan vivo form part of this agreement and is contained in Annex 1.
3.0 To implement their plan vivo and corresponding activities summarized in Table C, in good faith.
4.0 To allow and cooperate in monitoring of progress by Vi Agroforestry as laid out in Table B.
5.0 To provide the carbon benefit of their Plan Vivo through Vi Agroforestry as per the details in Table A.
6.0 To implement any corrective actions prescribed during the monitoring process.
7.0 To deposit 20% of the total carbon benefit of the plan vivo in a risk buffer maintained by Vi Agroforestry.
8.0 Not to transfer all or part of the carbon benefit of their plan vivo to any person or organization other than Vi Agroforestry.

Vi Agroforestry agrees:

1.0 To carry out monitoring of implementation of the plan vivo by the producer in accordance to the attached monitoring schedule in Table B.
2.0 To provide a reasonable level of development support, capacity building and extension services as required enabling participants and participant groups to execute project activities in accordance with their plan vivos.
3.0 To provide to the farmer the total benefit due according to Table A and Table B where results of monitoring show that the monitoring targets have been met.

Both parties agree:

1.0 That this agreement remains enforceable for 10 years after the date of signing.
2.0 The participant who deliberately withdraws from the project after receiving incentive at least once should be required to bring back all the money received.
3.0 The participant who do not show progress on farm (who fail to finish/ complete planting) after one year of contract signing (after being consulted several times) will be regarded as no longer interested with the project and will be required to bring back the money received.

Having agreed with the above conditions both parties declare this agreement enforceable as from the date signed.

Signatures:

For Vi Agroforestry **Participant**

Signature: _____ Signature:_____

Plan Vivo Coordinator Location: _____

Date: _____ Date: _____

Signature: _____ Date: _____

Country Manager
Vi Agroforestry Tanzania.

Witness Referee (Village Government)

Date:_____ Date: _____

Name;_____ Name: _____

Signature:_____ Title: _____

Signature: _____

Table A: Details

Participant(Organisation/Group/ Institution/Individual)				
Location (Ward/Village)				
Location, coordinates (middle of plantation)	E		S	
Plan Vivo number				
Technical specifications:	tCO_2eper hectare	Area (Hectare or meter)	Calculations	Total Carbon Benefit (tCO_2e)
1. Boundary planting (per 100 meters planted)	5.95		*(5.95×area)*	1
2. Fruit orchard	25.95		*(25.95×area)*	2
3. Woodlot	149.05		*(149.05×area)*	3
4. Dispersed inter-planting	65.67		*(65.67×area)*	4
Total Carbon Benefit (tCO_2)			*(1+2+3+4)*	5
Price to participants (Tshs)			**13,000**	6
Total Transfer Due (Tshs)			*(5×6)*	7

Note: Conversion figures: 1 Acre = 0.4047 Ha; 1Ha = 2,471 Acres

Monitoring & Payment schedule

Table B1: Monitoring and Payment Schedule for Woodlot

Time of monitoring (years after initial planting)	Monitoring target *DBH=Diameter at breast height*	Percentage of total transfer to be made (%)	Calculations *(Brought forward from total transfer calculation, item no. 7 above)*	Transfer (Tsh)
1	50% plot established	30	*(0.30×7)*	
2	100% plot established	20	*(0.20×7)*	
3	Survival not less than 80%	20	*(0.20×7)*	
5	Average DBH not less than 8cm	10	*(0.10×7)*	
10	Average DBH not less than 19cm	20	*(0.20×7)*	
	TOTAL	**100**	***(1.00×7)***	

Note: Monitoring targets may change based on result of reviewing the technical specification

Table B2: Monitoring and Payment Schedule for Boundary Planting

Time of monitoring (years after initial planting)	Monitoring target *DBH=Diameter at breast height*	Percentage of total transfer to be made (%)	Calculations *(Brought forward from total transfer calculation, item no. 7 above)*	Transfer (Tsh)
1	50% plot established	30	*(0.30×7)*	
2	100% plot established	20	*(0.20×7)*	
3	Survival not less than 80%	20	*(0.20×7)*	
5	Average DBH not less than 8cm	10	*(0.10×7)*	
10	Average DBH not less than 19cm	20	*(0.20×7)*	
	TOTAL	**100**	***(1.00×7)***	

Note: Monitoring targets may change based on result of reviewing the technical specification

Table B3: Monitoring and Payment Schedule for Dispersed Inter-planting

Time of monitoring (years after initial planting)	Monitoring target *DBH=Diameter at breast height*	Percentage of total transfer to be made (%)	Calculations *(Brought forward from total transfer calculation, item no. 7 above)*	Transfer (Tsh)
1	50% plot established	30	*(0.30×7)*	
2	100% plot established	20	*(0.20×7)*	
3	Survival not less than 80%	20	*(0.20×7)*	
5	Average DBH not less than 10cm	10	*(0.10×7)*	
10	Average DBH not less than 21cm	20	*(0.20×7)*	
	TOTAL	**100**	***(1.00×7)***	

Note: Monitoring targets may change based on result of reviewing the technical specification

Table B4: Monitoring and Payment Schedule for Fruit Orchard

Time of monitoring (years after initial planting)	Monitoring target *DBH=Diameter at breast height*	Percentage of total transfer to be made (%)	Calculations *(Brought forward from total transfer calculation, item no. 7 above)*	Transfer (Tsh)
1	50% plot established	30	*(0.30×7)*	
2	100% plot established	20	*(0.20×7)*	
3	Survival not less than 80%	20	*(0.20×7)*	
5	Average DBH not less than 12cm	10	*(0.10×7)*	
10	Average DBH not less than 18cm	20	*(0.20×7)*	
	TOTAL	**100**	***(1.00×7)***	

Note: Monitoring targets may change based on result of reviewing the technical specification.

Table C: Plan vivo activities

Compartment	Agroforestry system/Technical specification according to Table A	Area (Acre)	Species	Activity	Proposed date of planting	Rotation period (yrs)

Annex 4. Database template

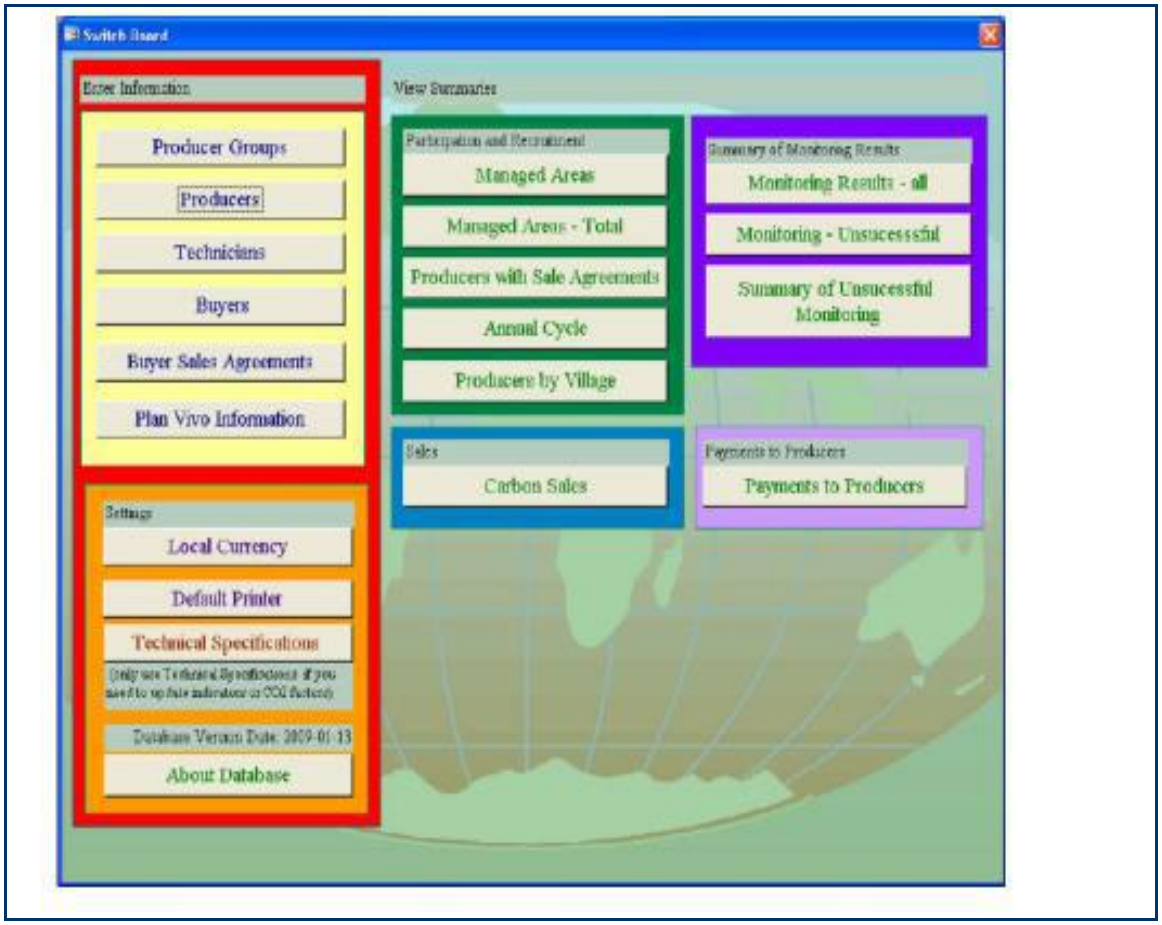


Figure L.1 - Database template

Annex 5. Example forest management plans/*plan vivos*

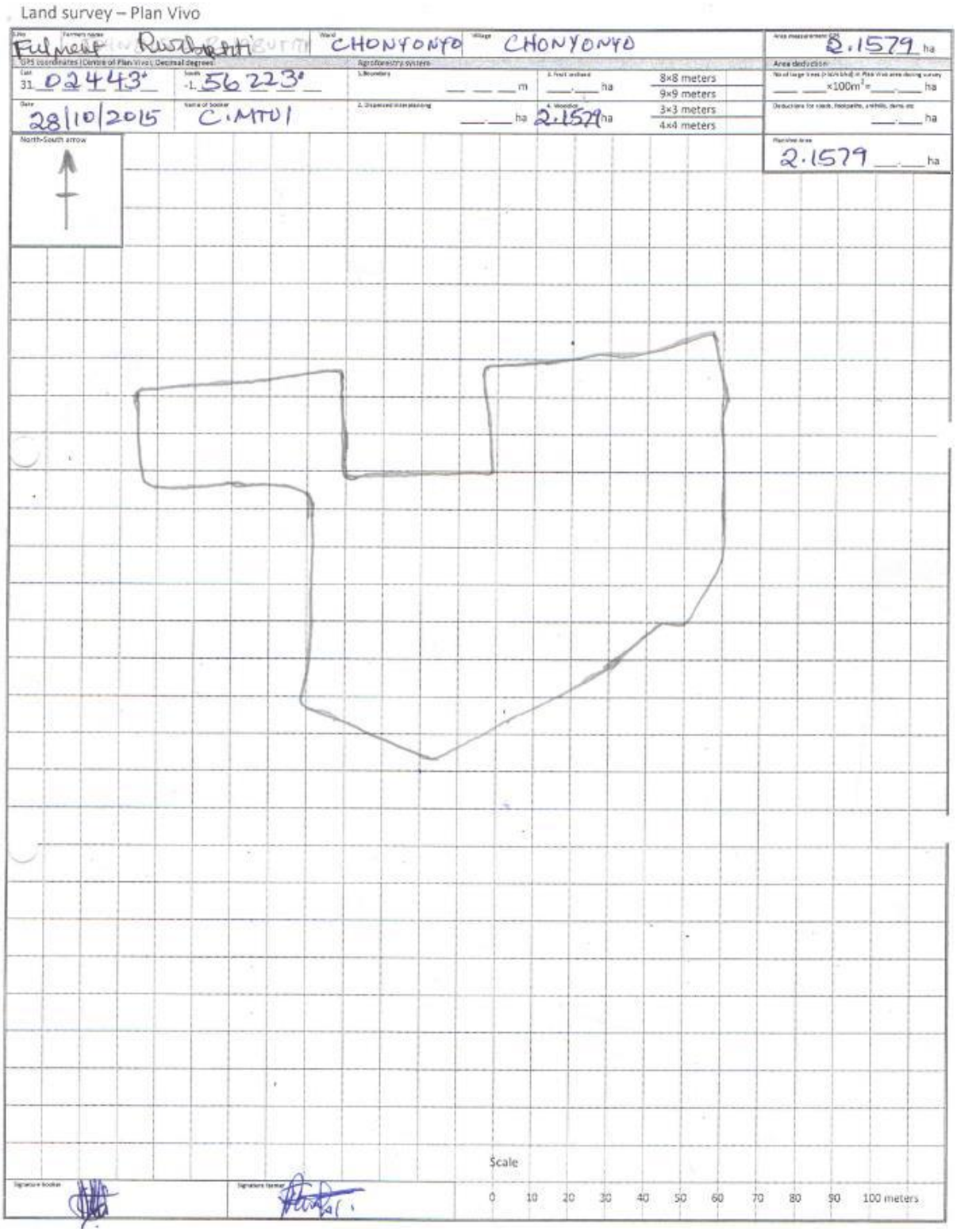
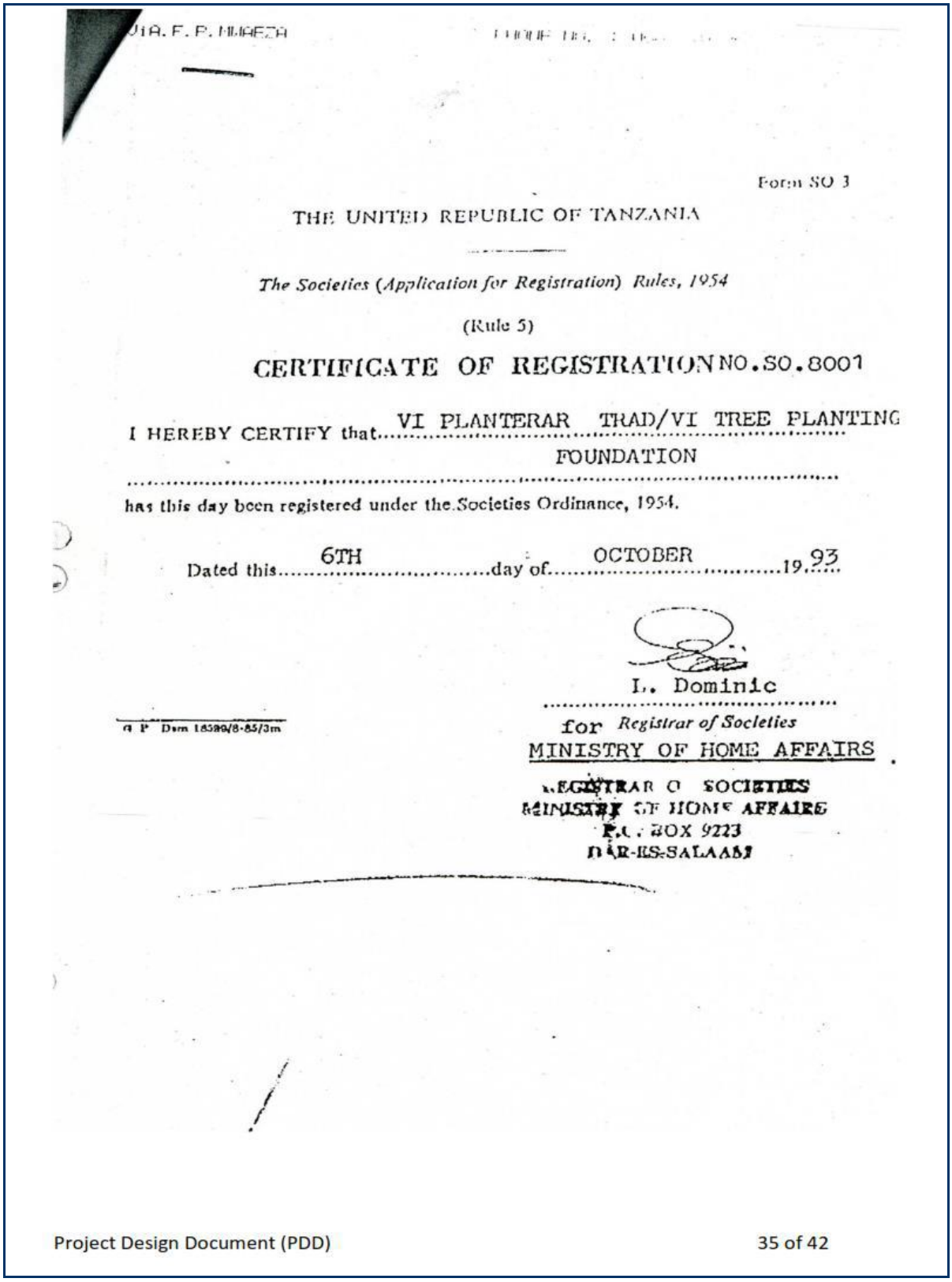


Figure L.2 - Sample forest management plan vivo

Annex 6. Permits and legal documentation



Form SO 3

THE UNITED REPUBLIC OF TANZANIA

The Societies (Application for Registration) Rules, 1954

(Rule 5)

CERTIFICATE OF REGISTRATION NO.SO.8001

I HEREBY CERTIFY that VI PLANTERAR TRAD/VI TREE PLANTING FOUNDATION

has this day been registered under the Societies Ordinance, 1954.

Dated this 6TH day of OCTOBER 19 93

L. Dominic

for *Registrar of Societies*

MINISTRY OF HOME AFFAIRS

REGISTRAR OF SOCIETIES
MINISTRY OF HOME AFFAIRS
P.O. BOX 9223
DAR-ES-SALAAM

G P Dsm 18589/8-85/3m

Project Design Document (PDD) 35 of 42

Figure L.3 - Vi Agroforestry Registration Certificate

MEMORANDUM OF UNDERSTANDING

Between

Vi Agroforestry Project – Kagera

&

Kagera Regional Authority

1.0 PREAMBLE

Long term economic and social development through improving farmer's livelihood and sustainable management of Agriculture and Natural resources in Kagera Region are common objectives of the **Vi Agroforestry Project - Kagera**, and **Kagera Regional Authority.** The development work done by the partners in this MoU is guided by the National Strategy for Economic Development and Poverty Reduction-2004 and the Tanzania Development Vision 2025.

Kagera Region: Background information

The Regional Secretariat was established under the Administration Act No.19 of 1997 in order to perform development and administrative functions.

Kagera Regional Secretariat (KRS) provides development, administrative and technical assistance to six (6) Local Government Authorities (LGAs) in Kagera Region to enable them to undertake /implement activities and successfully fulfil their obligations. The main objective is to facilitate transfer of skills and knowledge to six LGAs in areas of management development, economic development, social development, physical planning and infrastructure. The six LGAs are Bukoba District Council, Bukoba Municipal Council, Biharamulo District Council, Karagwe District Council, Muleba District Council and Ngara District Council.

The vision of KRS is to be **"An institution of excellence that plays a supportive role in achieving a sustainable regional economic growth and prosperity, and as a technical resource base for supporting local development**

opportunities and administrative services between central and local government".

The mission of KRS is **"Facilitation of sustainable regional socio economic development for poverty alleviation, good governance, peace and tranquillity through timely provision of effective and quality advice, consultancy services to LGAs and other development partners by highly motivated and skilled personnel"**

The role of KRS on economic development is to provide technical assistance in agricultural planning and productivity, livestock development and productivity, Co-operative formation and management, trade promotion and investment, natural resources and environmental conservation. KRS also monitors performance of sectoral trends, provides technical and administrative assistance, offer policy interpretation, recommend new strategies and techniques for overcoming bottlenecks to productivity. KRS is responsible for identifying development opportunities, monitor quality and standards for service delivery including training to enhance LGAs capacity.

Vi Agroforestry Project: Background information

The VI Agroforestry Project was founded in 1983 by the Cooperative Movement in Sweden through the Magazine VI. The Project started its operation in West Pokot District of Kenya as a tree planting project to combat desertification. It later extended to Trans Nzoia District in Kenya in 1986. In 1997, the project made a paradigm shift from tree planting to agroforestry extension and development. The project development objective is to contribute towards improved living standards of small-scale farmers. The project operates in Kenya, Tanzania, Uganda and Rwanda. In Tanzania Vi Agroforestry Programme is having 3 projects (Mara, Mwanza and Kagera Regions). The Project field organization in the Districts is organized around Divisions according to Government structure. The Divisions is headed by a Division Manager. Each Division has 15-18 Village Extension staff each managing an Area of Concentration (AoC) of 250-350 households.

2.0 PURPOSE OF THE COLLABORATION

- To reduce poverty and improve food security of farmers in Kagera Region by conserving environment through Agroforestry practices.
- To improve efficiency of delivery of extension services to farmers in Kagera Region through efficient use of available resources.

This will be achieved through:

i) Efficient coordination of activities and location of resources.
ii) Harmonization of approaches.
iii) Harmonization and improvement of participatory monitoring and evaluation (PM&E).
iv) Exploitation of the synergies of collaboration.
v) Cost sharing.

3.0 AREAS OF COLLABORATION

i) Staff capacity building of all partner organizations.
ii) Joint work plans, reporting, Monitoring and Evaluation.
iii) Joint field activities.
iv) Community awareness creation and sensitization.
v) Project coordination and implementation
vi) Resource mobilization

4.0 GUIDING PRINCIPLES

i) Transparency.
ii) Mutual trust.
iii) Willingness to collaborate between partners.
iv) All parties in the collaboration are equal.
v) That the collaboration will be referred to as VI AFP/Regional Authority; in collaboration.

vi) That the geographical area of operation will be in selected areas in Kagera Region.

vii) Each partner shall have an accountable officer for the collaboration who will be referred to as Liaison officer for the Regional Authority and Vi AFP Manager.

viii) That there will be joint meetings, work plans, Monitoring and Evaluation between the partner organisations.

ix) That there will be sharing of relevant information and reports.

5.0 ROLES OF COLLABORATORS

Kagera Regional Authority

- Avail technical personnel in areas of crop production, soil and water conservation, home economics and rural youth, crop protection, farm management and marketing.
- Share transport facilities where available/possible.
- Support in coordination of activities and sharing of lessons and best practices across Districts.

Vi Agroforestry Project - Kagera

- Project implementation
- Provide technical personnel in areas of Agroforestry, soil fertility improvement, participatory planning, Monitoring & Evaluation and farmer group organizations.
- Share transport facilities where available.
- Facilitate the development of Community Action Plans through O & OD (Opportunities & Obstacles to Development methodologies).
- Participate in the sensitization of communities.
- Share Project work plan.
- Staff capacity building of all partner organizations.
- Share Project reports.
- Support in coordination of activities and sharing of lessons and best practices across Districts.

6.0 OBLIGATIONS OF COLLABORATORS

i) Vi Agroforestry Project must follow policies and regulations in relation to agriculture and natural resource management of the Government of Tanzania.

ii) Reports/reporting – each collaborator is obliged to share relevant information with fellow collaborators.

iii) Willingness to share costs (both partners will contribute resources wherever possible i.e. materials, staff and finances).

7.0 BENEFITS/LOSSES

All collaborators will share credit and blame arising from the collaboration equally.

8.0 DURATION

The collaboration agreement is effective from the date of signing the M.O.U. and will remain in force "**until modified with the consent of both parties**".

Signed by ..... Date 09/11/2005
REGIONAL ADMINISTRATIVE SECRETARY

Signed by ..... Date 21st November 2005
PROJECT MANAGER, VI AGROFORESTRY PROJECT - KAGERA

Figure L.4 - MoU betweenKagera Regional Authority and Vi Agroforestry

3 RECRUITMENT OF NATIONAL STAFF

3.1 PRINCIPLES OF STAFF RECRUITMENT

SCC-Vi AF subscribes to the policy of providing equal opportunity for all applicants and respects the doctrine of non-discrimination in employment, regardless of race, colour, tribe, religion, gender, age, HIV status and physically challenged.

The ILO convention on Discrimination (employment and occupation) of 1958, guarantees that everyone is entitled, without discrimination to the protection and equality of the law that give effect to the constitution guarantee in employment. Discrimination includes any distinction, exclusion or preference made on the basis of nationality, tribe, place of origin, political opinion, color, religion, station of life, sex, gender, pregnancy, marital status, family responsibility, physically challenged, HIV/AIDS etc. The constitutions of Kenya, Uganda, Tanzania and Rwanda discourage discrimination.

SCC-Vi AF will always take steps to promote equal opportunity in the workplace and to eliminate discrimination in any employment, policy or practice. The management and all the employees are encouraged to always review their actions both verbally and physical to determine whether or not they discriminate or have the effect of discrimination, and should always strive to promote equal opportunity and eliminate discrimination.

To promote equal opportunity in the SCC-Vi AF, the management will ensure;

1. There will always be equal opportunity for all applicants for employment in the Projects.
2. It will be the duty of the Project Manager to ensure that fair employment policies and practices are adopted, implemented and monitored.
3. The management from time to time reviews the existing employment policies and identify the steps to be taken to address the following issues:

    a) The composition of the workforce. Whether the composition is broadly representative *e.g.* sex, disabled, national demographic etc.
    b) The measures to be taken to eliminate the effects of post discrimination.
    c) The measure to be taken to promote equal opportunity and treatment in the future.
    d) The measure to be taken to accommodate employees who are physically challenged, HIV positive etc.
    e) The regular auditing of the plan.
    f) The Project Manager will ensure that all policies against discrimination are clearly communicated to all employees.

In an effort to promote SCC-Vi AF employees and personal development of staff, SCC-Vi AF may first announce vacancies internally and encourage staff to apply. In the event that appropriately qualified staff cannot be identified internally, the *organisation* may seek candidates externally using advertising or other suitable means.

When eligible candidates have equal or nearly equal qualifications the intention to have gender balance within the Project shall be taken into account.

Figure L.5 - Staff policy of Vi Agroforestry

Annex 7. Evidence of community participation

- Photographs/videos of the planning processes with communities (PV requirement 4.10)

Figure L.6 - Training of the community on climate change in Nyaishozi - 2011

Figure L.7 - Training the plan vivo group in (improved firewood stove construction in Kaishoas part of the Plan Vivo Project activities 2014

Annex 8. Administrative Map – Kagera Region

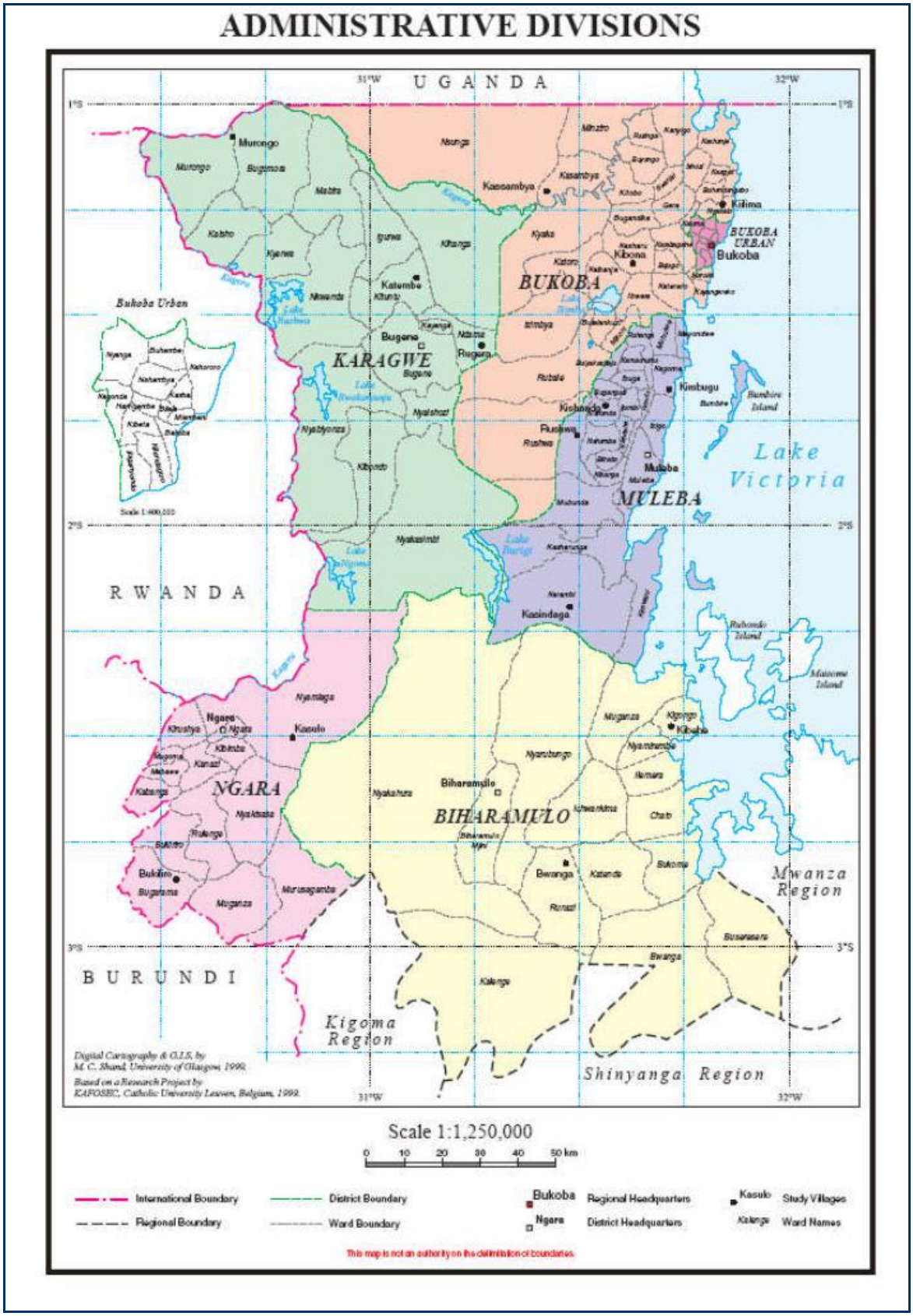


Figure L.8 - Annex 8. Administrative Map – Kagera Region

Annex 9. Topographic Map – Kagera Region

Figure L.9 - Annex 9. Topographic Map – Kagera Region

Annex 10. Soil Map – Kagera Region

Figure L.10 - Annex 10. Soil Map – Kagera Region

Annex 11. Rainfall Map – Kagera Region

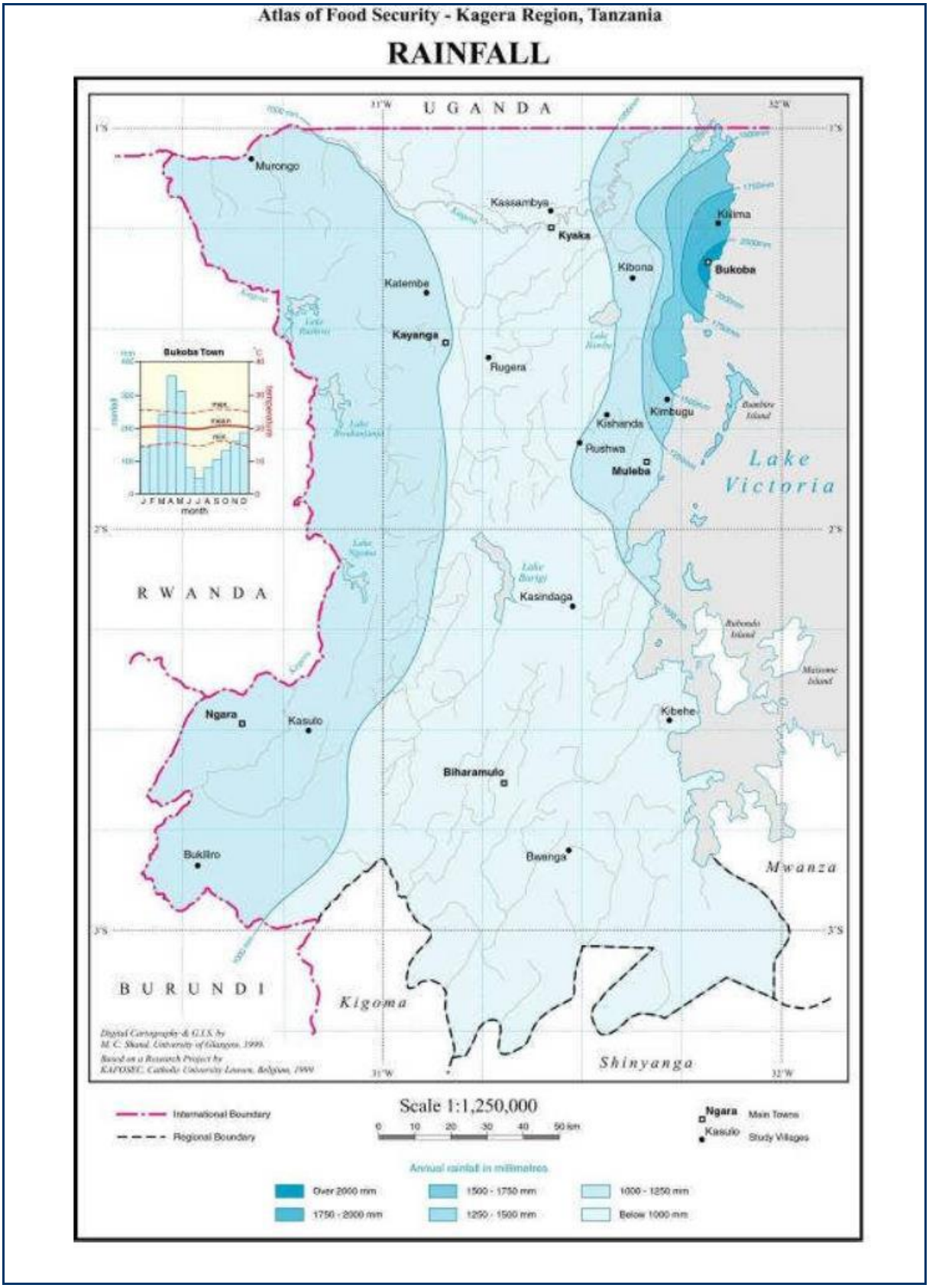


Figure L.11 - Annex 11. Rainfall Map – Kagera Region

Annex 12. Carbon sequestration modelling parameters for all carbon pools

General:

	value	Description
Simulation length	25 yr	
Cohort start age	0 yr	All new plantings

Biomass:

	value	Description
Stems carbon content	0.47 MgC/MgDM	For all species
Stems initial carbon	0.087 MgC/ha	For all species
Foliage carbon content	0.47	
Foliage initial carbon	0	
Foliage growth correction factor	1	
Foliage turnover rate	1	
Cohort foliage relative growth	0.05	
Branch carbon content	0.47 MgC/MgDM	For all species
Branch initial carbon	0 MgC/ha	For all species
Branch growth correction factor	1	No adjustment for non-optimal site conditions for any species
Branch turnover rate	0.05 /yr	5% per year for all species
Cohort branch relative growth	0.2	Branches maintained at 20% of stem volume throughout the life of the tree for all species
Root carbon content	0.47 MgC/MgDM	For all species
Roots initial carbon	0 MgC/ha	
Root growth correction factor	1	No adjustment to account for non-optimal site conditions for any species
Root turnover rate	0.05 /yr	5% per year for all species
Cohort root relative growth	0.25	Roots maintained at 25% of stem volume throughout the life of the tree for all species

Mortality:

	value	Description
Mortality rate	0.01 /yr	1% mortality per year throughout the life of the tree for all species

Management:

	value	Description
Rotation length	various	Depends on species and Technical Specification (see individual TS for details)

Age	various	Depends on species and Technical Specification (see individual TS for details)
Fraction removed	various	100% of initial plantings harvested at rotation age for all species
Stems logwood	0.75, 0.25	75% of Maesopsis used as poles at year 8 and 25% of harvested Grevillea and Markhamia converted to logwood at rotation age.
Stems pulpwood	0	No conversion to pulpwood for any species
Branches logwood	0	No branches used for logwood for any species
Branches pulpwood	0	No branches used for pulpwood for any species
Slash firewood	1	All stems and branches not used for logwood are used as firewood for all species

Products:

	value	**Description**
Fraction of logwood converted to sawnwood	0.25	25% of logwood converted to sawnwood for all species
Fraction of logwood converted to boards	0.15	15% of stemwood is left as off-cuts after conversion to timber and can be used for rough construction
Fraction of logwood converted to paper	0	No logwood converted to paper for any species
Fraction of logwood converted to firewood	0.25	25% of logwood used as firewood for all species
Fraction of sawnwood converted to long term products	0.2	20% of sawnwood used in long term products for all species
Fraction of sawnwood converted to medium term products	0.4	40% of sawn wood used in medium term products for all species
Fraction of sawnwood converted to short term products	0.4	50% of sawn wood used in short term products for all species
Production losses	No losses during production	
Recycling classification	No recycling	All products used as firewood at the end of their life for all species
Half-life of long term products	20 years	For all species
Half-life of medium term products	10 years	For all species
Half-life of short term products	1 year	For all species