CLIMATE, COMMUNITY AND BIODIVERSITY STANDARDS PROJECT DESIGN DOCUMENT FORM FOR AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES (CCB-AR-PDD) Version 2

Reforestation in Grassland Areas of Uchindile, Kilombero, Tanzania & Mapanda, Mufindi, Tanzania

CONTENTS

I. Basic Data

II. **General Section**

G1. Original Conditions in the Project Area

G2. Baseline Projections

G3. Project Design Goals

G4. Management Capacity and Best Practices

G5. Legal Status and Property Rights

III. **Climate Section**

CL1. Net Positive Climate Impacts

CL2. Offsite Climate Impacts (‘Leakage’)

CL3. Climate Impact Monitoring

IV. **Community Section**

CM1. Net Positive Community Impacts

CM2. Offsite Stakeholder Impacts

CM3. Community Impact Monitoring

V. **Biodiversity Section**

B1. Net Positive Biodiversity Impacts

B2. Offsite Biodiversity Impacts

B3. Biodiversity Impact Monitoring

Basic Data

Green Resources Limited (GRL) is a subsidiary of Green Resources AS of Norway. Green Resources AS is the leading plantation, carbon offset and renewable energy company in Eastern Africa. Green Resources conducts reforestation activities in a number of locations in Tanzania, Uganda and Mozambique deriving revenue streams from the sales of carbon offset and high quality timber and transmission poles, whilst simultaneously bringing community and environmental benefits. The Uchindile and Mapanda Forest Project also validated under the Afforestation Revegetation and Reforestation (ARR) category of the Voluntary Carbon Standards (VCS), applies CDM approved methodology AR-AM0005 version 03.

Version 01: November 5th, 2012.

General Section

G1. Original Conditions in the Project Area

G1.1. Location of the project and basic physical parameters

Location

The Uchindile and Mapanda Forest Project consists of two discrete parcels of land covering a total of 13,334 ha located in Kilombero and Mufindi Districts, Morogoro and Iringa Regions of Tanzania respectively. The project boundaries and geographical locations are indicated below. The specific geographical positions (longitude/latitude) have been determined from topographic sheets, satellite images and actual planting area coordinates of the boundaries (polygons) established using GPS and stored in GIS.

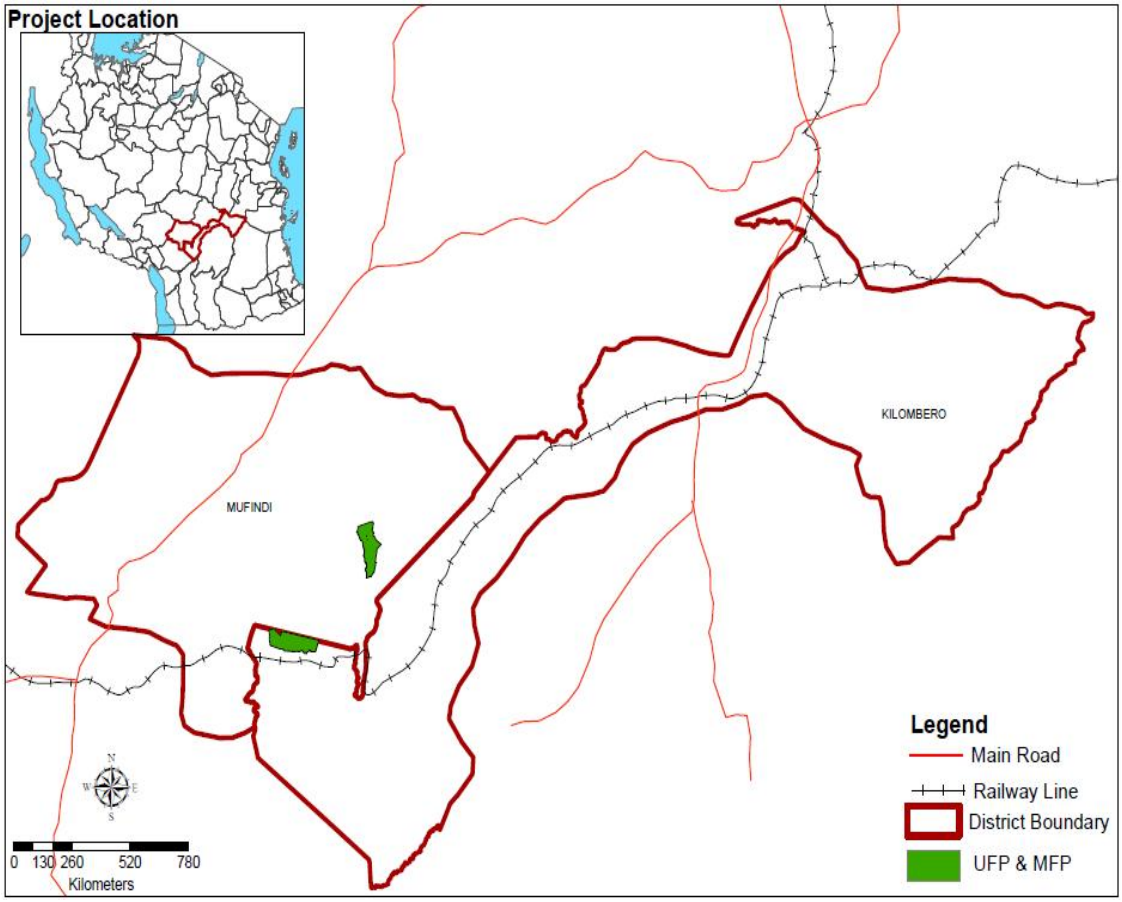

Figure G1: Location of the proposed project activity

Physical Features

Hydrology

UFP: The hydrology of the area is characterised by several rivers and small streams flowing through the area including the ones marking the borders of the project. Almost every valley bottom consists of swampy grounds portraying springs and rivers flowing out of the valleys. The major rivers flowing through Uchindile/Lugala are Ngokomiche, Kihata, and Luiga whose banks are covered with natural vegetation. A few small streams have their sources within the area of the Forest Project. Most of the streams flow into the Kilombero Valley which is to the south of the area.

MFP: The hydrology of Mapanda project area is characterized by major rivers, namely Mwenga river to the west and Mkungwe, Kiverege, Mvino and Kiumbo rivers all flowing into the Mwenga river. A few other small streams also have their sources in the project area. The river banks and valleys are covered by natural vegetation dominated by riverine tree species e.g. *Syzygium cordatum* and grassland that are left intact for protection purposes.

Climate

UFP: area has a bi-modal climate, characterised by a long dry season and a bi-modal rainfall distribution in short and long rain periods. On average, it receives an annual rainfall of about 1000 mm. The project area is located in a zone of potential evaporation varying between 800 - 1200 mm/year. The annually variation in potential evaporation is smaller and steadier as compared to rainfall. The short rainy season occurs during November-December and a longer season between March and May. The area is predominantly dry between July and October. The average temperature is around 16°C with the coldest months between May to August/ September. Winds normally blow from the North-East.

MFP: the mean annual precipitation is about 1050 mm, most of it falling between December and April/May, but with drizzles (showers) extending to June and sometimes July. The prevailing winds blow from East to West during the dry season and may blow from South-East to North-West during the wet season. The mean temperature is 12°C and the coldest months are May to July.

Soil

UFP: The soil in most of the areas originates from granites which are deeply weathered. This type of soil is moderately acidic, poor, freely drained and markedly compacted near the surface where there is often a very high coarse grained soil fraction. The top soil have been exposed to annual fires and therefore exhausted in humus content and the pH varies from 4.4 - 6.5. The soil is in general red loamy sand (latosol). The slopes of the ridges are high and in some places range from 20 - 40%.

MFP: The soil in Mapanda project area is a mixture of red and yellow clays often with dark humus top soil whose agricultural productivity rating is medium. In some areas the top soil has been exposed to excessive annual fires and erosion, and therefore exhausted in humus content.

Soil colour ranges from red clays to yellow. Soil pH ranges from 5.3 - 6.0. Some parts are prone to hardpans formation, which in most cases are found on ridges.

Ecosystems

UFP: Within the boundary of the project area there are existing patches of naturally growing shrubs and trees and vegetation cover, which are mainly observed along river banks, valleys and steep slopes. These are left as conservation areas so as to protect the areas from erosion by rainwater, as well as protect the rivers and streams from any negative hydrological impacts from the tree planting. The main species dominating native vegetation cover are *Combretum sp*. *Nuxia congesta*, grasses dominated by species of *hyperenia, aristida* and *themada* and shrubs species. The remaining areas are degraded grassland lands, and are not currently used for any activities due to poor soil and grasses which are not suitable for grazing.

MFP: The plantation area has patches of natural vegetation consisting of tree species such as *ficus, albizia,* savannah tree species and bushes. In river valleys riverine tree species can be observed dominated by *Syzygium cordatum, Syzygium guinense*. The present vegetation in the area is savannah - like commodities derived from montane forest. Remnants of the dominant species include *Parinari curatelifolia, Catha edulis, Maesa lanceolata, Albizia gumifera, Prunus Africana and Nuxia congesta*. At present the area is mainly grassland. Within the plantations the natural undergrowth is mainly *Hyperrhenia* grasses with few scattered trees and shrubs. The soil is a mixture of red and yellow clays, often with humus top soil.

G1.2. Types and condition of vegetation within the project area

The vegetation in the project area is categorized mainly into two major types; grassland and some scattered trees and shrubs. Before the project`s inception the area was covered with 90 % grass[1]. The vegetation of the hill tops and along the hills slopes are dominated by grass. The natural undergrowth is composed of patches of scattered trees and shrubs. The common species found in these slopes are *Prothea angolensis*, *Syzygium cordatum*, fern (*Tyelypteris confluens*). River forest areas and valley bottoms are rich in tree species including *Syzygium cordatum, Bridelia micrantha* and *Gardenia imperialis* and fern (*Tyelypteris confluens*). In the absence of the project activity theses patches of existing vegetation are threatened by frequent wild fires, caused by

[1] Ecological survey, Munishi and Wambura, 1996

anthropogenic burning (see also annex 3 in the VCS PDD, section 2 for vegetation classification and stratification). Tree planting shall take place in degraded grassland regarded as the project area.

G1.3. Boundaries of the project area and the project zone

Uchindile Forest Project (UFP) (see figure G1.3a)

- **Project Boundary**: This area of land is confined within a parcel of 6647ha of land, located on the lower elevation of Mufindi Escarpment, between latitudes 8°39′ 34″ S to 8°44′ 55″ S and longitudes 35°23′ 28″ E to 35°32′ 59″ E , in an altitude of between 1100m and 1437m above sea level. The external boundaries are mainly rivers with Kihata to the West, Luiga to the North, and Mgelela to the South. The area is grassland where the landscape is dominated by undulating ridges with steep slopes. The topography is generally covered with steep valleys. The area is degraded grassland from frequent anthropogenic caused fires.

Mapanda Forest Project (MFP) (see figure G1.3b):

- **Project Boundary**: The MFP project activity is confined within a parcel of 6,258 ha of land located on the lower elevation of Mufindi escarpment, within latitudes 8°24′30″S to 8°33′19″S longitudes. The altitude varies from 1400 m to 1753 m above sea level. The external boundaries are rivers and the government owned Sao Hill Forest plantation in the Western parts. In the north-east is village land and to the south is convergence of Mkungwe and Mwenga rivers. The area is degraded grassland from frequent anthropogenic caused fires.

The project zone

Five villages surround the two project sites make up the project zone. These are Uchindile, Kitete and Lugala for Uchindile project site, and Mapanda and Chogo for Mapanda project site. The Bena and Hehe are natives' ethnic groups in these villages. These are small holder farmers who produce crops mainly for subsistence. They are defined as primary stakeholders to the project and their villages make up the project zone.

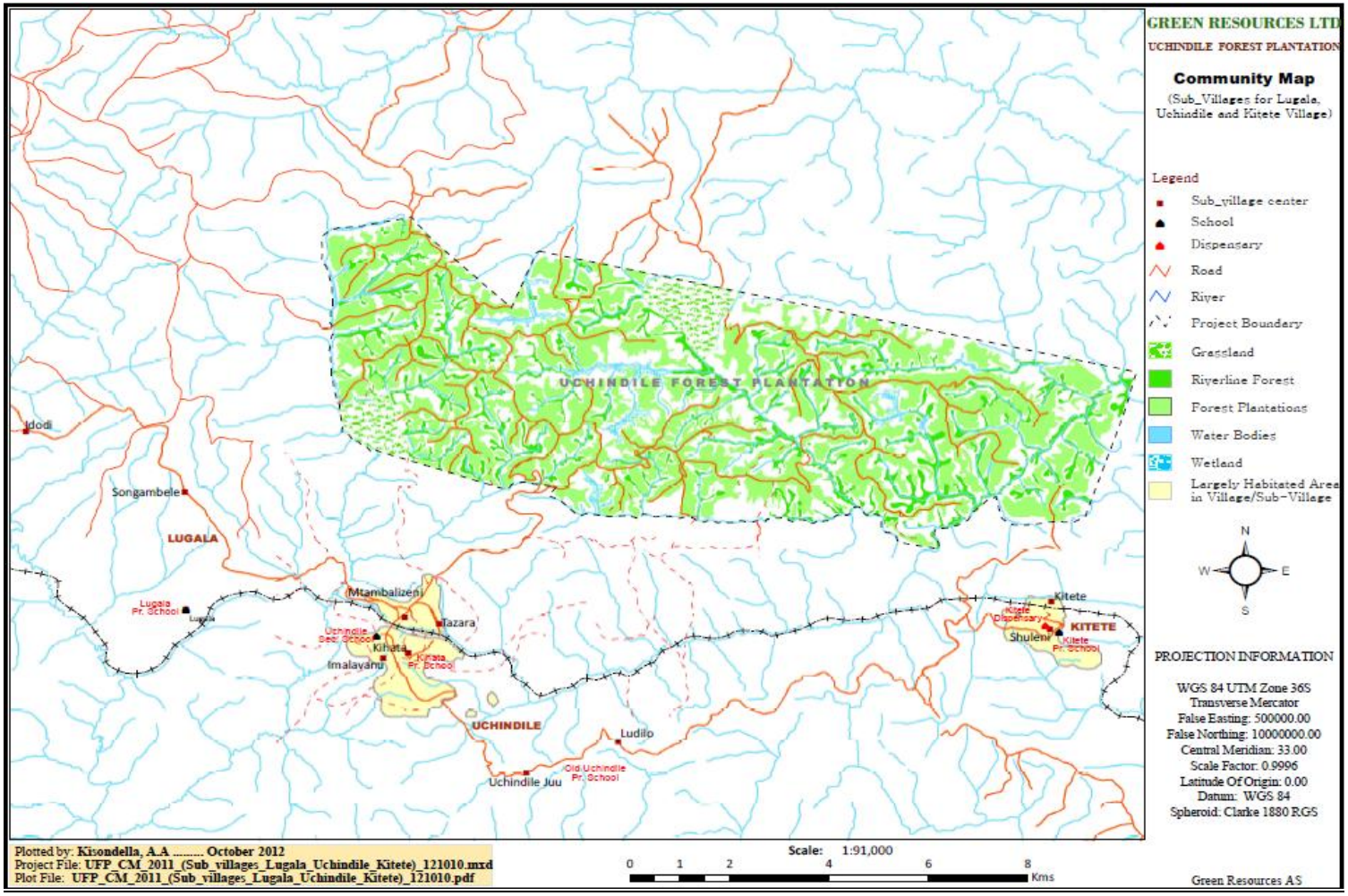

Figure G2.3a: Map of the Uchindile project zone

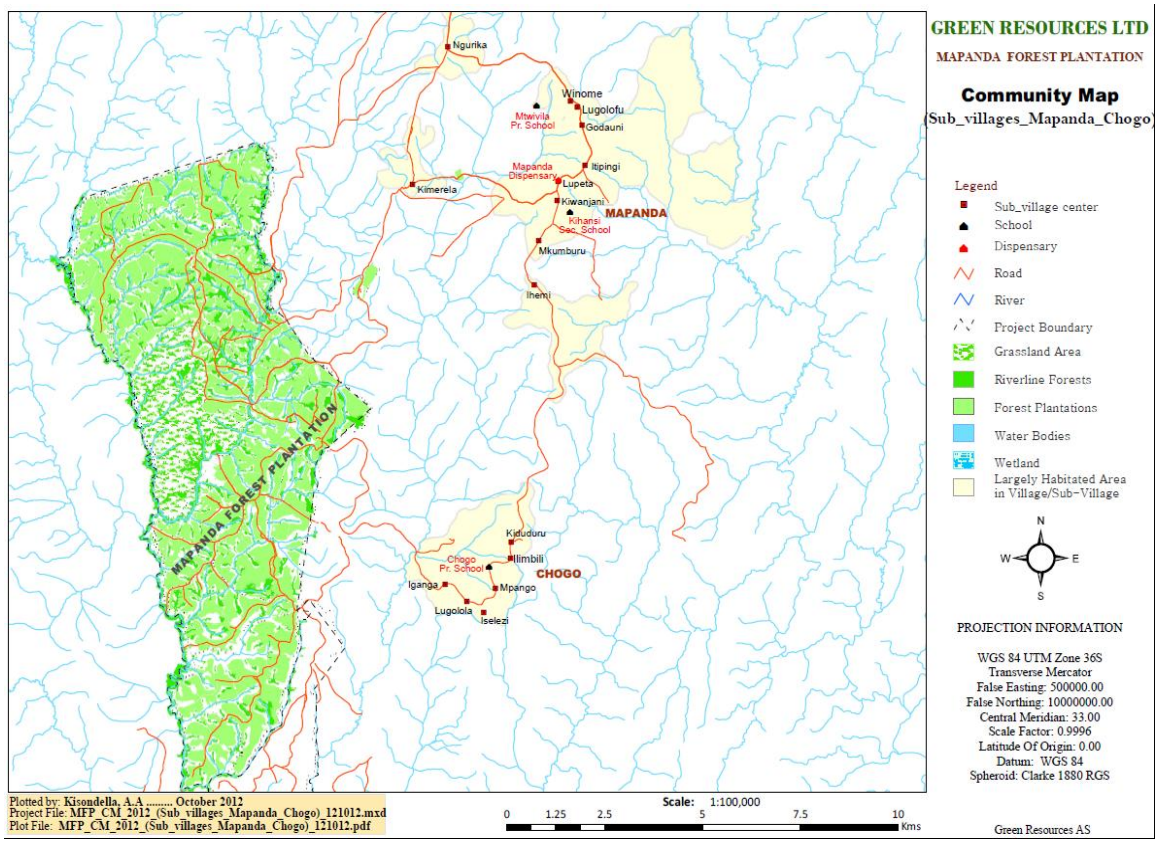

Figure G3.3b: Map of the Mapanda project zone

Both of the two blocks of Uchindile and Mapanda have similar characteristics; in that they are degraded grasslands with riverine forest and valley bottoms creating a mosaic between the grassland areas. The baseline environmental conditions are described below.

G1.4. Current carbon stocks within the project area(s), using stratification by land-use or vegetation type and methods of carbon calculation from the Intergovernmental Panel on Climate Change's 2006 Guidelines for National GHG Inventories for Agriculture, Forestry and Other Land Use or a more robust and detailed methodology

The existing carbon stock was calculated following approved CDM methodology A/R-AM0005 version 03 for project activity in the area. The approved methodology recommends a hierarchical approach to stratification for both pre-project and with project scenarios. The methodology outlines factors to be considered during *ex-ante* stratification to be based on the regional scale,

such as climate, topography or geographical conditions. Based on this stratification methodology, the baseline strata are based on variables that influence carbon stock changes in above-ground and below-ground biomass pools. These variables were identified as climate, soil, topography, vegetation type and anthropogenic pressure. The land use within the project boundary was identified as a continuation of the existing grassland thus not influencing baseline carbon stocks, and therefore not included as the stratification criteria. The two land areas included in this project, although located in two sites, occur within one climatic region, have similar soil types, topography and human induced pressure (e.g. uncontrolled fires). Official topographical map series with topographic details at 1:50,000 scale were used to identify land use/cover data and the information was ground-truthed with field surveys. Satellite images and interpretation of land cover images from the Institute for Research Assessment were acquired to determine the pre-existing conditions and the status of grassland before the project starts. The ground-truthing confirmed the presence of individual scattered trees and shrub vegetation in areas of unmanaged grasslands. The preliminary (*ex-ante*) stratification was carried out based on baseline land use/cover and topography information where vegetation was used to distinguish grasslands from forest lands along the river valley with insignificant variation. Two strata were identified during *ex-ante* stratification are:

1. Grassland with scattered trees and shrubs
2. Riverine vegetation with trees and shrubs

According to the methodology, in applying equation B.3, the participants may choose to use the methods described in the step 5 of Section II.5 (2) for estimating the biomass in isolated trees. One of the suggested methods is the use of allometric equation (Equation B.13) which is considered good practice by the IPCC. The allometric equation linking above-ground diameter to mean diameter at breast height (DBH) used during baseline biomass estimation is the general biomass regression equation developed by Brown (1997) for moist tropical zones with trees DBH range from 5 – 148 cm.

$$Y = Exp\ (-2.134 + 2.530 In\ DBH)$$

The DBH of most trees estimated was below 5cm. The allometric equation linking above-ground biomass to mean diameter at breast height uses dominant trees to determine biomass.

The assessment of the pre-project biomass determined an average carbon stock of 0.557 t C/ha. (See also Annex 3 of the updated VCS PDD for a detailed description of the calculations of the baseline).

G1.5. Description of communities in the project zone, including basic socio-economic and cultural information that describes the social, economic and cultural diversity within communities, identifies specific groups such as Indigenous Peoples and describes any community characteristics

The project is located on the land of the "Hehe" people. The Hehe tribe is an ethnic and linguistic group based in the Iringa Region in south central Tanzania. The Hehe began as a number of chiefdoms made up of mixed people who were in some instances related to one another. Historically, no chiefdom had over 5 000 people. In contemporary Hehe society, the political authority of chiefdoms has been replaced by locally elected chairmen and village councils. In 1994 the Hehe population was estimated at 750,000[4] The Hehe society is comprised mainly of Christians. The largest town in the region is Mafinga and the main employment in the region is from agriculture, forestry, and tea industry.

GRL conducted two socio-economic[7] study in 1999 and 2006 (one for each project area) to understand the livelihoods of the villagers in the communities adjacent to the project areas.
Orgut Consultancy carried out an environmental impact assessment together with a socio-economic study of the surrounding communities in the area of study. This study analyzed the pre-existing conditions of the communities in the area. The project area itself was largely abandoned prior to the projects inception. This dates back to 1975 of Tanzania's historic move towards 'villagization' under 'Ujamaa Village Programme' in which families living in rural isolation were moved into villages to live together and share common goods and properties. Few families were reported living in the area before the project commenced, as most of them were living in the village of Mapanda (Mapanda and Chogo) and Uchindile (Uchindile, Lugala and

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[4] Gordon, Raymond G., Jr. (ed.), 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas, Tex.: SIL International. Online version: http://www.ethnologue.com/

[7] EIA/SEIA prepared by Orgut Consultancy, Tanzania Branch 1999.

EIA/SEIA prepared by Environmental Association of Tanzania (ENATA) 2006.

Kitete). The main land use was agriculture with limited livestock grazing. The economy was based on smallholder agriculture where crops were grown for food and the surplus sold. It was observed that the households within the area were very poor in terms of housing, education (illiteracy rate as high as 68 %) and health facilities. The majority were living in mud houses roofed with thatched grasses and most were living below the poverty line with access to a maximum of 2 meals a day. Poor access to proper health facilities and medication led to high maternal and infancy death rates. Only 30 people stated that they were employed.

G1.6. Description of current land use and customary and legal property rights including community property in the project zone, identifying any ongoing or unresolved conflicts or disputes over land tenure that were resolved during the last ten years

Land use

The existing vegetation in the area at the project start is unmanaged grassland that is exposed into annual fires (picture G1.6 below). There are scattered trees, shrubs and small patches of vegetations on the hills, and more of this concentrate on the river banks. Concentration of trees on the valley bottoms is most probably due to annual fires that forced the vegetation back into river banks where moisture content is high. The subsistence farming was practised alongside limited livestock grazing where cattle were mainly kept in kraals. At the time of the project inception, baseline assessments[15] show that the farmers were harvesting their last food crop from this area as the poor soil would not manage to give enough crops.

[15] GRL, Uchindile EIA. Orgut Consult, 1999

Figure G1.6: Site conditions prior project commence

Land tenure

GRL inherited the land titles from Escarpment Forestry Company Ltd (EFC) which was taken over by GRL in 2001 and has a long term lease for the discrete areas of land from the Government for the purpose of long-term reforestation (Table G1.6). There was a land dispute relative to the north part of Uchindile due to an erroneous demarcation of land by the cadastre services during the land acquisition process; this is now resolved since GRL decided to exclude this area from the VCS and CCBA project boundary.

Table G1.6: Land tenure and legal title

Name	Villages	Area	Tenure	Deed
Uchindile	Uchindile, Kitete	7076ha	99yrs from yr. 2000	50742
Mapanda	Chogo	1,606ha	99yrs from yr. 2003	8954 – MBYLR
	Chogo & Mapanda	4,652ha	99yrs from yr. 2003	8955 – MBYLR

G1.7. Current biodiversity within the project zone and threats to that biodiversity, using appropriate methodologies, substantiated where possible with appropriate reference material

The project is developed on undulating hills and valleys, and is dominated by grassland. The land is generally poor in ecological terms due primarily to poor soils caused by frequent burning of the vegetation by communities while attempting to open land for small scale farming and hunting. Also, due to lack of seed source or poor regeneration of fauna due to same reason of continued burning. As such, reforestation is taking place at the later stages of a successive fire regime where much of the natural forest has been removed.

Ecological and botanical studies[16] have been carried out at the project's inception. Such studies employed a transect method for species habitat analysis in which transects were laid in all strata to represent the various habitats in the project. Such studies show that the area is generally poor in biodiversity due to effects of annual fires. In addition valley bottoms and river banks have more forms of plant and animal life especially concentrated near rivers and streams. In addition, there are flora and fauna that are rare, endemic, threatened or endangered species in the project area, most of which are found in the riverine forest. These species are collectively termed as RTEs at Green resources Ltd (GRL). GRL's GIS department is using remote sensing system for analysis of land cover along with GPS to track and collect information such as key species habitats on the ground prior to tree planting. This analysis has been used to advise areas that should be planted and which should not, based on set criteria for planting sites, which is degraded grassland. This data is then stored in GIS database for comparison over time.

In the animal, bird and plant life study[17] a transect method was adopted for species habitat analysis in which transects were laid in a variety of habitats to produce a representative sample of the study area. Based on these studies it was revealed that the area also contains high conservation

[16] Ecological study by P. Munishi and J. Wambura (2006), Botanical study by Tanzania Tree Seed Agency (2006), Wildlife Conservation Society (2008)

[17] Ecological study by P. Munishi and J. Wambura (2006), Botanical study by Tanzania Tree Seed Agency (2006), Wildlife Conservation Society (2008)

value forest (HCV). In the ecological study done by Wildlife Conservation Society of Tanzania (WCST), emphasis was made to the Blue swallows, *Hirundo atrocaerulea* a bird that appears in the IUCN/Red list as endangered and threatened for East Africa. This bird was spotted during the survey at Uchindile project area. The Blue swallow *Hirundo atrocaerulea* is an intra-African migrant with breeding populations in South Africa, Swaziland, Zimbabwe, Mozambique, Malawi, Zambia, Democratic Republic of Congo and Tanzania (Turner & Rose 1989). During the breeding season the blue swallow comes to southern Tanzania (Earle 1987, Oatley 2001). In Eastern Africa the Blue Swallow breeds in northern Malawi, north-eastern Zambia, south-eastern Democratic Republic of Congo and south-western Tanzania (Turner & Rose 1989). The birds arrive at their breeding grounds in September to October, and depart again in April (Keith et al. 1992). As this species was sighted during an Ecological survey, this area must be considered as a potential for the blue swallows' survival. Areas of 440 ha and 731 ha for Uchindile and Mapanda respectively have been put aside specifically for the conservation of blue swallow and other native ecosystems. This area contains the basic requirements for blue swallows breeding including pure grass for nest building, wetlands and river banks for foraging, an altitude between 1,100m and 2,000m as well as protea tree species which are suitable for blue swallow perching and roosting. Only one pair was spotted at Uchindile forest project during the survey and one bird far outside the project area at Mapanda village. Nest density in South Africa ranges from 1 pair in 52 ha to as little as 1 pair in 300 ha (Allan et al. 1987).

The presence of the RTEs in the project has meant that the project zone contains High Conservation Value Area (HCVAs), and thus, High Conservation Value Forests (HCVFs) as defined by applying the HCVF toolkit. GRL has carried out a careful study to identify and conserve all HCVFs within the Uchindile and Mapanda project zone. These areas have been demarcated and mapped, and monitored with project implementation to see effects of reforestation on such species.

The biodiversity in the project zone is under threat from frequent anthropogenic fires by local communities for hunting and for preparing the land prior to carrying out small scale farming in the region. This has degraded the natural forest areas and is still threatening the remaining biodiversity in the riverine forest areas.

G1.8. Evaluation of whether the project zone includes any of the following High Conservation Values (HCVs) and a description of the qualifying attributes:

G1.8.1. Globally, regionally or nationally significant concentrations of biodiversity values; protected areas; threatened species; endemic species; areas that support significant concentrations of a species during any time in their lifecycle

Listed in Table G1.8.1 below are species in the IUCN Red List or local database that are of global, regional or national or local values; species that are either endemic or endangered found within the project zone. Assessment of HCVF[18] with an aid of the toolkit has shown that the project zone contains HCVFs due to presence of these species.

Table G1.8.1: Overview of mammals, birds and plant species found in the IUCN Red List and CITEs index.

S/N	Species Name	Life form	Source	Status
1	*Prunus africana*	tree	IUCN Red List	Vulnerable
2	*Hirundo atrocaerulea*	bird	IUCN Red List/WCST, 2008	Vulnerable
3	*Protea welwistchii and Protea rupestris*	tree	Munishi et al., 2009	Threatened
4	*Poeoptera kenricki*	bird	WCST, 2008	East African endemic
5	Uhehe fiscal	bird	WCST, 2008	Endemic to Iringa
6	*Osyris lanceolata*	Tree	*Munishi et al 2009*	Threatened
7	Abbott's Duiker	Animal	IUCN RED List	Endangered
8	*Anas sparsa*	Bird	Munishi, et al., 2009	Rare

Sources: Ecological/botanical study, Environmental Impact Assessment reports

[18] GRL high Conservation Value Forest Report, Kimey, V. and Mtupile E (2012).

However such species are not abundant or only use the project area in certain seasons of the year. Although, very few of these species have been found; however, all areas with suitable habitat for such species have had areas set aside for conservation through applying the precautionary principle. These areas include valley bottoms, riverine forest along streams and in rivers banks and grassland conservation area. The HCVFs have been mapped and will be protected and monitored following requirements for each species as shown in section B3.2.

G1.8.2 Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance

No HCVFs falling under this category were found in the project zone.

G1.8.3 Threatened or rare ecosystems

No threatened or rare ecosystems were found in the project zone.

G1.8.4. Areas that provide critical ecosystem services

The VCS project activity which is being implemented along with this CCBA project and is taking place within parcels of land that are titled to GRL. GRL has use right to areas within the project boundary, which communities are not expected to use for any economic activities; and with exception of very few families, the communities settlements are far from the project (over 5 km by road). The only ecosystem service that can link communities to the project are water resources through rivers. There are abundant alternative sources of water in the villages including springs and rivers which are used by the communities.

Therefore, under the directive of the HCVF toolkit, because of available alternatives to these resources, communities are not entirely depending on these rivers for their survival. Hence, there are no areas that provide critical ecosystem services in the project zone that are likely to be affected by the project activity.

G1.8.5. Areas that are fundamental for meeting the basic needs of local communities

As stated in section G1.8.4 above, communities do not obtain their basic needs within the project boundary due to alternatives available outside the project area. Therefore, the project area does not provide basic needs for the communities.

G1.8.6. Areas that are critical for the traditional cultural identity of communities

The Uchindile and Mapanda project area was once inhabited with some few families, thus there were cultural sites in the area when the project started. This project applies principles and criteria of FSC and is certified under this standard. FSC requires that prior to any activity communities must be involved in the process of identifying areas that are used for cultural or traditional purposes. Similarly, the requirements for land title are such that compensation is not issued to cultural and traditional sites, as they belong to people who own them. The only cultural sites that were identified during land acquisition were ritual sites and grave yards. The identification of these sites was done in consultation of the communities in the project zone to whom such sites are of cultural importance.

According to GRL's guideline, these are identified and GPS coordinates are taken for mapping. On site, a radius of 10 m from the centre is left intact for protection of such sites. The periphery of the radius is screefed and a path made to the nearest road. At the road signs are posted showing the direction of the grave, grave number and distance from the road. Grave owners are welcomed to visit these sites at anytime that they want. However, they are asked to give notice to the project manager prior to making such visits.

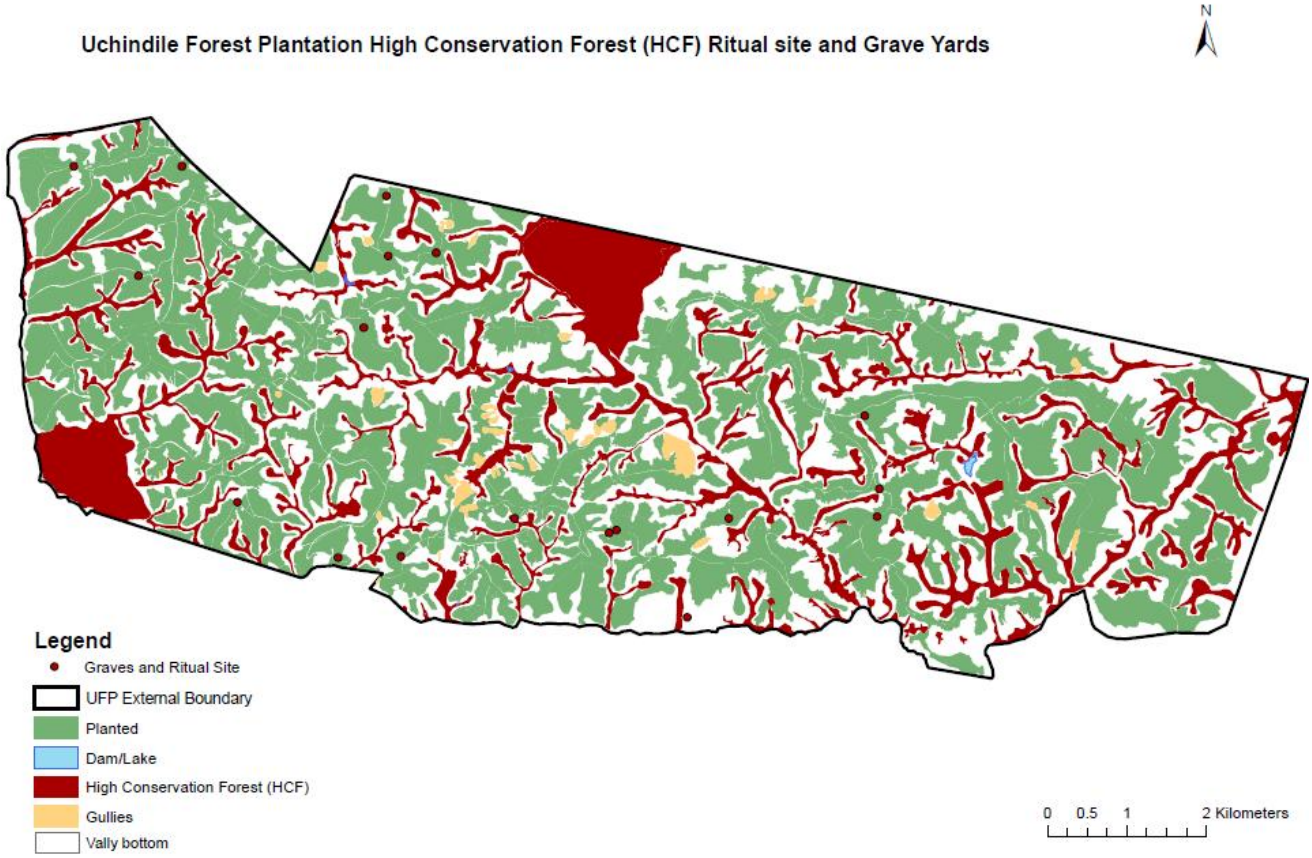

Figure G1.8.6a: Map Showing HCVF at Uchindile Forest Project

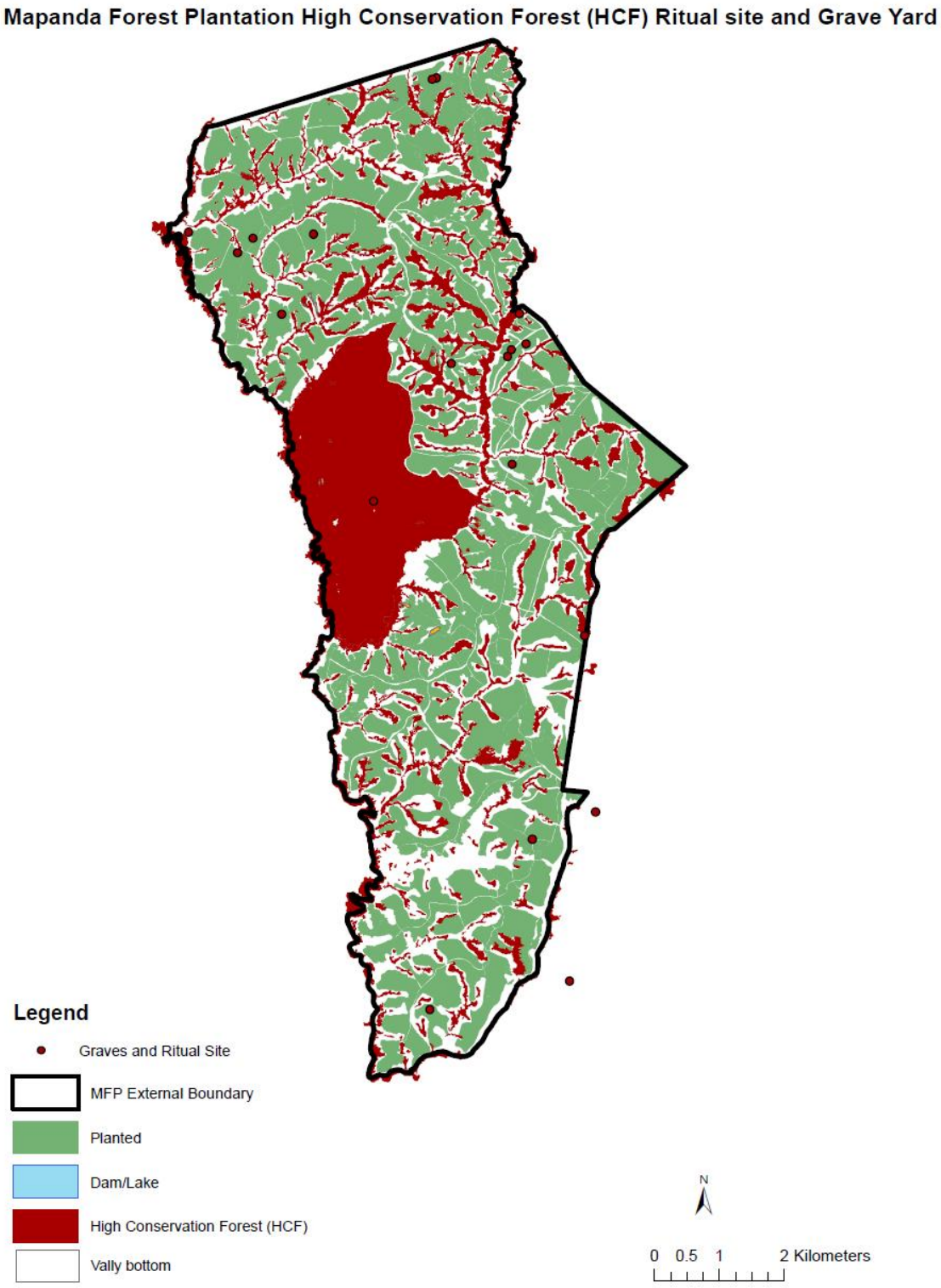

Figure G1.8.6b: Map Showing HCVF at Mapanda Forest Project

G2. Baseline Projections

G2.1. Most likely land-use scenario in the absence of the project following IPCC 2006 GL for AFOLU or a more robust and detailed methodology, describing the range of potential land-use scenarios and the associated drivers of GHG emissions and justifying why the land-use scenario selected is most likely

The procedure to identify the most plausible scenario is based on the strata identified in section C.4 Step 1 of the VCS PDD, and on this basis, only one stratum is considered during identification of the baseline scenario. The work steps which reflect the changes in carbon stocks in above-ground biomass from the most likely land use at the time the project starts as described in the approved methodology AR-AM0005 Version 3 (Section II.4, Step 1-6) are followed in identifying the most plausible baseline scenario:

Step 1: Demonstration of the most likely land use at the time the project starts

The scenario anticipated for the land use and land cover within the project boundary in the absence of the project, is the continuation of unmanaged grassland. Similar lands, in the vicinity, are under similar land cover and are not expected to be used for private large scale plantation as alternative land use. The Tanzanian land law allows allocation of land for specific investments based on a land use plan. For forestry to be authorised as the alternative land use, it must be clear that the area will not be subjected to certain land pressure. The changes in the land uses in similar lands in the vicinity can be small scale (woodlots) forests or large scale plantation by the Government in areas already declared as forest reserve. In the region, the main large scale planter is the Government through the Sao Hill Forest Project (SHFP) that is doing mainly replanting. In addition, SHFP is being established in a forest reserve which legally restricts other land uses. The land use at the time the project starts, in absence of the VCS finance, is economically unattractive. Although there is no pressure on land availability within the region, the economical, technical and institutional barriers prevent the possibility of land to be converted to large scale plantation forests. In addition, the lands have poor soil condition and the topography prevents them to be used for agricultural land uses. In the project participants' views, and as per approved methodology, before the start of the proposed ARR VCS project activity, supplementary field investigation by the district development committee before the issuance of the title from the

landowner and confirmation by ecological and botanical surveys demonstrates the fact that the land cover before the project starts is grassland. The land use was identified during the field visits and was predominantly unmanaged grassland, a little bit of subsistence agriculture and very small patches of tree planting (woodlots). All of these activities have been listed in section A.4.3 of the VCS PDD and have been compensated.

Step 2: Assessment of national and sector policies and legislation

Tanzania has extensive cross linkages between sectoral policies and legislations, especially governing lands and natural resources development. In order to adequately reflect the impacts of prevailing policies, an assessment of the relevant national or sectoral policies results in the following:

a) Policies related to the creation of wood sources

The forestry sector is guided by the *National Forest Policy* adopted in March 1998, whose overall goal is to enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of natural resources for the benefit of present and future generations. A *Beekeeping Policy* was also adopted in 1998. The *National Forest Programme* (NFP) is a ten-year framework (2001-2010) which guides implementation of the *Forest Policy* (FBD, 2001). The NFP is based on four implementation programmes: Forest Resources Conservation and Management; Institutions and Human Resources; Legal and Regulatory Framework; and Forestry Based Industries and Sustainable Livelihoods. The Forest Act (No. 14 of 2002) provides for the management of forests which came into operation on the 1st July 2004 (Forest Act (Date of Commencement) Notice, 2004; Government Notice No. 160). The Forest Regulations, 2004 (Government Notice No. 153) were made under section 106(1) of the Forest Act (2002). During 2006, further revisions to forest legislation have included the Forest Amendment Regulations, 2006 and the Forest (Charcoal Preparation, Transportation and Selling) Regulations, 2006.

b) Legislation related to the requirements of ARR activities and wood use

1. The National Land Use Planning Commission Act No. 3 of 1984. The proposed ARR VCS project activity has been incorporated in the land use planning of the districts as per this act;
2. National Water Policy of 1991 empowers rural people/land owners to communally own water resources within their areas;

3. The Water Utilization Act of 1974 with amendment done in 1981 Act No. 10 (Miscellaneous amendment Act No. 8 of 1997) – this act with its amendments provide a guide for controlling the extraction of water for different uses as well as protection of water resources;
4. National Forest Policy of 1998 provides guidance on sustainable supply of forest products and services, and the conservation, development and management of forest resources for future generations;
5. National Land Policy of 1995 recognizes a dual system of land tenure i.e. customary and statutory rights of occupancy. Section 4.2.18 provides conditions for transactions of land, which has a market value. The project participants have adhered to this policy as well as the Village Land Act No. 5 of 1999;
6. Village Land Act No. 5 of 1999 provides procedures to transfer of village land to general or reserved land that can be used for investment. The project participants followed guidelines provided in this act in acquisition of the discrete areas of land for the ARR VCS activity;
7. National Strategy for Growth and Reduction of Poverty (NSGRP) of June 2005 is committed to the Millennium Development Goals (MDGs). The proposed ARR VCS activity will create employment and contribute to the national GDP;
8. Poverty Reduction Strategy of 2000 – with strategies to improve rural development, export and private sector development;
9. The Environmental Management Act No. 20 of 2004 (section 63 on forest management according to the Forest Act No. 14 of 2002;

10. Forest Act No. 14 of 2002 provides requirements for establishment and management of forests.

Policy and legislative revision took place in light of the linked forces of *decentralizing forest management, encouraging participatory forest management* (e.g. Joint Forest Management or Community Based Forest Management), and *ensuring forests contribute towards national poverty alleviation goals*. Although these programs have set overall development goals for forestry development, they are not legally-binding, and meeting the goals depends largely on the availability of funds. Participatory Forest Management (PFM) guidelines were drawn up in 2001. A key issue facing the forestry sector is that despite a relatively comprehensive institutional and legal framework (as detailed above), implementation is severely limited by *inadequate human and financial capacity and the delayed finalisation of various institutional arrangements*. As the domestic funds for the reforestation are limited, local farmers are usually not able to fully finance forest establishment because it is hard for them to get loans from banks for the purpose of

afforestation or reforestation activities. Loans for agricultural activities are much easier to pay back because there is a three year payback condition. In addition, forest management in Tanzania is also dependent upon a range of other sectoral policies and actors. For example, Participatory Forest Management (PFM) is dependent on land titling (*Land Act, 1999* and *Village Land Act, 1999*) and the enactment of village by-laws (*Local Government Miscellaneous Amendments Act, 1982*), all of which lie outside the jurisdiction of Forestry and Beekeeping Division. Other specific examples include the influence of infrastructure developments and energy demand on forests.

c) Other policy incentives and constraints

An assessment of sectoral policies with respect to opportunities and constraints for improving forest governance included promotion of private investment in forests plantation and management of the existing forests. The strategy for poverty reduction (NSGRP) also contains many direct references to the forestry sector. Environment and natural resources management have been mainstreamed in the Tanzanian National Strategy for Growth and Reduction of Poverty (NSGRP). 14% of the targets in the strategy relate to environment and natural resources management and there are a considerable number of environmental interventions under non-environment targets. Development partners provide over 60% of the budget of the forestry department since 1990. These are allocated mainly to conservation of the already depleting natural forests while the forest plantations are expected to be self-financed. Therefore, without the proposed ARR VCS project activity the project area will not be reforested, and with the project activity the goals of the on-going reforestation programs or policies will not be met. The investment constraints barriers in finance, technique and institutional barriers indicates that the only realistic and credible alternative available to the project participants is to establish forest plantations with incentives from VCS and replace the current land cover due to the economic reasons.

Step 3: Assessment of demand and supply of wood resources for industrial and commercial Purposes

The analysis of demand and supply balance of wood sources for industrial and commercial purposes, taking into account the factors influencing the ARR activities (e.g. end-uses of wood from the plantations) indicates that industrial plantations are the major sources of wood resources both locally and for export into major markets. There is a potential market for sawn timber and

other wood products locally and world wide, this can be evidenced by the diminishing of the current forest resources and the high demand of the forest products worldwide. In Tanzania timber supply is mainly dominated by state owned forests with Sao Hill Forest Project (SHFP). The other government owned forest plantation projects in Tanzania has run short of raw material supply due to overexploitation, lack of capital and poor Management, thus SHFP has remained the sole prime supply of softwood in Tanzania17. Logging ban in the neighbouring countries, has forced timber traders to start operating in the SHFP, going by the current logging pace in this forest, it is obvious that the state owned forests can no longer sustain to be the only raw material supplier to the ever increasing demand of saw millers/timber traders. The demand for wood resources in Tanzania and in the neighbouring countries is ever increasing. Besides the project entity, the only other large private owner of plantation forests is the Tanwat Company. The company had started reforestation activities in the late 1980s; it is estimated to have about 4,500 ha pine and 900 ha eucalyptus forest which already reached its rotation age. The company is currently harvesting and processing timber using its own sawmill.

Step 4 Assessment of land-use practices and prevailing land uses in the project region

The land use practices in the region and the project area are forestry and subsistence agriculture. The management practices of agriculture outside the project boundary are likely to impact the carbon stocks inside the project boundary due to fires being caused. The forestry land use is mainly government forests plantations (SHFP) and woodlots being established by private individuals mainly used for planting trees on the economically attractive lands or more accessible lands. Since independence in 1961, the forest policy on plantations targeted establishment of government owned plantations. The government industrial plantations cover 83,000ha located in different blocks countrywide. The main species planted are pines, cypress, eucalyptus and teak. These plantations are under poor management and don't supply quality wood to support modern and efficient industries. The main reasons are18:

• No incentive for increasing plantation productivity and maximizing revenue on a sustainable manner

• The net planted area and growing stock are declining in terms of quality and quantity

• Mostly understocked where fire and/or encroachment occurs, or overstocked where there has been a lack of proper silvicultural treatments (e.g. thinnings)

• Shortage of investment capital, unsupportive/incentive framework

• Poor functioning of timber markets as described in Section A. 4.1.4 and A.4.3 of the PD, the project lands are located in remote areas which are not attractive for timber markets and are

usually not target lands for commercial reforestation/afforestation programs. In addition, local farmers/communities are usually not able to fully finance forest establishment because it is difficult to get loans from local commercial banks for the purpose of reforestation because of longer moratorium period required until harvesting.

Therefore, loans for agriculture and forestry activities, even on economically attractive lands, can be obtained from international financial institutions but not from commercial banks. Therefore, without the proposed ARR VCS project activity the project sites will not be reforested as a result of national or sectoral policies and with the project activity the government or private individual reforestation programs will not be affected. The management of natural forests and protection of existing natural trees in unmanaged grassland indicates that there is no possibility of natural encroachment of trees because there are few seed sources that can disperse onto the project sites. The large pieces of adjacent lands have no forests, and the grass cover prevents seed from landing on soil and competes with young seedlings, if any, even on lands with some growing trees. In addition, the soil properties have degraded and are often not suitable anymore to spontaneous establishment of forest cover.

Step 5: Identification of plausible and credible land-use alternatives

Since the lands to be forested are grasslands, plausible and credible land-use alternatives are based on the scope of maintaining current land use, including the possibility of undertaking ARR as per the applicable trends. Three scenarios have been identified as plausible and credible land-use alternatives:

1. Maintaining the current land-use without ARR to occur:

The current land use has been unmanaged grassland – baseline and is likely to continue

2. Small-scale ARR:

   The lands have been owned by villages where villagers which majority are subsistence farmers have the right of use to the land for establishing small-scale/woodlots within the lands. The seeds source and technology to establish woodlots is small. The possibility of having both the natural plantation is limited to seeds availability and high costs for establishing and managing plantations. Barrier of new income streams drives farmers to be conservative and hence maintain a constant income stream.

3. Establishment of plantations on grasslands for commercial purpose:

   Not realistic since large investment is required. This is only possible with the incentive from VCS. Interviews with stakeholders and land use surveys show that similar lands in the vicinity are not being converted to either commercial plantation. They largely remain

as grasslands except in farms where scattered woodlots (about 1 ha size) can be seen. Investment barriers prevents small land holders the finances to invest in commercial timber or necessary equipment; Institutional barriers prevent farmers from manipulating the chain from investment through production and sales; Technological barriers limit the access of farmers to either quality seed or the necessary skills for successful commercial timber plantations.

Step 6: Identification of the most likely land-use

The plausible scenarios identified in Step 5 can be evaluated to examine their suitability as the project scenario. The analysis indicated that Scenario 2 is not plausible in the near future, because of the relative large investment needed and absence of near term benefits in terms of meeting local needs from the grasslands or small scale ARR since the benefits from these come several years later after establishment. Scenario 1 is the continuation of existing situation, which is identified as the baseline scenario. Scenario 3 is the establishment of large scale plantations which these are aimed for commercial purpose. With the barriers in financing such projects it is unlikely that this project can be established in the lands as an alternative land use. The analysis indicates that the plausible alternative land uses available to the project participants are either continuation of the current status of the land or small scale AR, the latter being less likely because of financial, technical and institutional barriers

Description of the identified Baseline Scenario

Since no natural regeneration of trees can be identified within the project activity boundary, the sum of net carbon stock change in biomass carbon pools of grassland strata, except for trees along rivers and valleys which will not be disturbed and shall continue to be on steady state, is set as zero. For the rest of the project area with grass and shrubs, the sum of carbon stock change in biomass carbon pools can be estimated based on the carbon stock pools in grass and shrubs. The projected growth rate of these pools is assumed to be constant for the project lifetime. As per the provisions of the approved methodology, the soil carbon, dead wood and litter is not expected to increase in the baseline compared to the project scenario when the grassland is planted with trees than in the baseline, and thus can be omitted.

In summary:

• The Grassland with scattered trees and shrubs has remained as it is since decades and is therefore assumed to remain in a steady state.

• The riverine vegetation with trees and shrubs will be kept for conservation and will be monitored during the project lifetime: PSPs are established to monitor all relevant parameters. A buffer zone of 30 or 60 meters (approximately one tree height) is established during ex-ante stratification around all pockets of indigenous vegetation and riverine areas and these are protected and will be mapped.

G2.2 Document that project benefits would not have occurred in the absence of the project, explaining how existing laws or regulations would likely affect land use and justifying that the benefits being claimed by the project are truly 'additional' and would be unlikely to occur without the project

The adopted approved methodology recommends application of the "Tool for the Demonstration and Assessment of Additionality in ARR VCS Project Activities" version 2. The steps as outlined in the additionality tool are followed to demonstrate that the proposed ARR VCS project activity is additional and not the baseline scenario.

STEP 0: Preliminary screening based on the starting date of the ARR project activity

This step determines the land eligibility prior to the starting of the ARR VCS project activity; using criteria and procedures set by the government on how to acquire the land for reforestation purpose. The lands within the project boundary undergone authoritative scrutiny and were defined as grassland based on the description provided in section C.1 of the VCS PD.
Further, the ground survey was initiated to delineate the project boundaries, overlaid on topographic sheets details after the land title was leased for 99 years by the government. After the outside boundaries were set the internal mapping of areas with various land cover and proposed land use compartment was prepared and produced on maps and archived GIS database. The project participants believed that the area has been grassland and the possibility of forest regeneration is unlikely, prone to human induced disturbances like wild fires, which, with the establishment of the ARR VCS project activity, will be monitored.

The company (Escarpment Forestry Co. Ltd) that was intended to implement the "carbon offset" project was established in 1997. TreeFarms A/S then took liberty in ensuring financial backstopping while soliciting financing for sustaining the project. In years 1997/98 trial plantings as part of implementing the already existing international standards like FSC were already

underway. When the VCS rules were not established by 2000, the operations ceased until 2003 when the rules were apparent and the investment in forestry plantations with the main driver as "for carbon trading" caught attention of investors. Financing was henceforth made available and planting started as per the original idea of carbon offsets in forestry which we can now define as ARR VCS project activity. The project participants considered the project activity as an ARR VCS project activity when the rules and modalities for ARR VCS are established. In that view, from 1998 a third party (SGS) was invited to conduct training to the project staff as part of the preparatory work and internal capacity building on carbon offset project in forestry. In 2000, SGS was invited to conduct a preliminary survey of project design and issued a certificate of project design and tradable carbon offsets. In 2006, the project was evaluated by SGS as a voluntary emission reduction project and achieved a certificate of voluntary emission reductions achieved up till the end of 2005.

STEP 1: Identification of alternative land use scenarios to the proposed ARR VCS project activity

Sub-step 1a: Define alternatives to the project activity

The lands to be reforested within the project boundary are unmanaged grasslands occupied by scattered trees and shrubs. As elaborated in section C.5, due to the barriers in finance, technique and institutional barriers, the only realistic and credible alternative available to is to continue the current land use as grassland. In this scenario, natural regeneration is not expected to occur, because the lands have poor soils and there are few seed sources that can disperse onto the project sites due to unavailability trees within the project boundary. In addition, the tall grass cover prevents seeds from landing on the soil and competes with young seedlings, if any, which can be demonstrated by the failure of tree-growth. Thus, the continuation of the current situation or establishment of forest plantation represents the only alternative to the project activity.

As described in Section C.5 of the VCS PD, the project lands are located in remote areas which are not attractive for timber markets especially for small scale ARR VCS project activity. The technical capability and economies of scale does not permit small farmers/individuals to target lands for reforestation.

As indicated in Section G2.1 above, with small scale ARR in the form of woodlots or with large scale plantation, it is difficult to secure commercial loans from local commercial banks due to longer moratorium period required normally until harvesting. The continuation of the current situation as unmanaged grassland does not face the identified barriers.

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

As elaborated in section G.2.1, the national and sectoral programmes (PFM or Plantation) have been launched in the last several years, including the yearly planting day (1st January) that may influence the project. The large scale plantation established successfully are those government owned (e.g. SHFP) which is currently overexploited. The less successful ARR projects are privately owned plantations e.g. TANWAT and woodlots program especially for those establishing small scale ARR projects. However, most of the reforestation or conservation programmes are not legally-binding, and meeting the goals of these programmes depends largely on the voluntary participation and availability of financing. Domestic funds available for reforestation in Tanzania are limited, primarily, because the focus is on the sectors and activities that are economically attractive rather than small scale ARR or plantations in areas where the proposed ARR VCS project activity takes place. The identified alternatives on status - quo in Section G2.1 (Step 5) are entirely in compliance with applicable legal and regulatory requirements, currently and in the foreseeable future.

STEP 2: Investment analysis

The barriers for the establishment of the ARR VCS project activity within the grasslands were identified to be the set-back for establishment of the projects. In this situation it was not necessary to conduct investment. The barrier analysis was conducted as described in Step 3.

STEP 3: Barrier analysis

Sub-step 3a: Identify barriers that would prevent the implementation of the type of the proposed project activity

Investment barriers:

The main source of income for local communities around the project region is subsistence agriculture. Problems affecting farmers include absence of a crop market, food shortages, poor access to farm inputs, no access to improved farming tools and weak purchasing power. Under this situation, many farmers live below the national poverty level thus establishing small scale or a large scale plantation ARR VCS project activity is not an economic priority. It is hardly possible for local people to afford establishment investment for reforestation as an alternative in

the early stage, because all income from timber, poles, pulpwood and VCUs is obtained after several years since the start of the proposed ARR VCS project activity.

There are no developed financial facilities that provide financial support to forestry related projects in the form of either loans or grants. This is limited by inadequate access to international capital markets and access to credits due to required bank guarantee. The chances to obtain commercial loans from local banks for the purpose of reforestation activities are very low because of the high economic risk and economical unattractiveness of reforestation projects. Only with the proposed ARR VCS project activity, reforestation on unmanaged grasslands shall become attractive since the funds from the sale of VCUs shall be available in early years of establishment thus making commercial loans easier to be obtained.

Technological barriers:

Technical/Technological barriers are representing a complete array of shortcomings in the successful establishment of either small or large scale plantations. Interview with the technical team at the government owned SHFP, District officials and local communities indicates that there is usually short of access to inputs required and management. Lack of knowledge on quality seed sources and lack skills for producing high quality seedlings has been a major setback. For successful tree planting as well as for preventing planted trees from being subject to fire, pest and disease attack the planting team has to overcome technical and technological barrier, especially for large scale plantations. Small scale planting may suffer less from this barrier as there are some programs that supply seedlings to local communities and private individuals for woodlots establishment as part of environmental conservation.

Institutional barriers:

Although the forestry sector institutional set up exists, individual households or companies are too weak to successfully manipulate the chain from investment, production to market especially for the timber and other forest products which takes a much longer period than annual crop production. In addition, the lack of organizational instruments also prevents them from overcoming technological barriers mentioned above.

Market risks:

The availability of an income stream can be guaranteed by means of a fixed commodity price. However, there is a high market risks for timber and non-wood forest products for which it will take at least 15 years. Currently the risks of timber market prices, especially in such remote areas

like Uchindile and Mapanda with low productivity and high transportation costs, are perceived to be high by the project participants, whereas the carbon price will be guaranteed in the proposed ARR VCS project activity. This provides the certainty of future incomes (subject only to risk of failure of the reforestation per se). Although the market risks do exist for all other reforestation projects, the higher productivity tends to reduce the risks for small scale plantation. In addition, the project participants see the proposed ARR VCS project activity as a pilot for carbon business, which further increases their interest to go ahead with the proposed ARR VCS project activity. Without the sale of carbon offsets, the basic financial considerations and the risk awareness cited above would drive the decision not to go ahead with the project.

G.2.3a Calculate the estimated carbon stock changes associated with the 'without project' reference scenario described above. This requires estimation of carbon stocks for each of the land-use classes of concern and a definition of the carbon pools included, among the classes defined in the IPCC 2006 GL for AFOLU. The timeframe for this analysis can be either the project lifetime (see G3) or the project GHG accounting period, whichever is more appropriate

The baseline scenario represents a situation whereby fire occurs due to natural or athropogenic causes. Fire occurrence is common in the region that the project is located in and has occurred at least once in ten years prior to commencement of the project. This was revealed during socio economic study carried out together with an EIA[22] study at the project's start. Due to annual fires, the project area is degrading and would continue to degrade in the absence of the project. In the project scenario, existing pockets of natural trees and shrubs within the VCS project boundary will be allowed to remain, thus acting as carbon sinks. However, estimates of the project's net GHG removals by sinks will only include planted trees, excluding all carbon stocks from such native species. Following the guidance of the EB 46th meeting report Annex 16, under such a scenario, the baseline carbon stock changes can be set as zero, which is a conservative approach. Therefore, the baseline carbon stock changes for the project are assumed to be zero.

G.2.3b Estimate the net change in the emissions of non-CO2 GHG emissions such as CH4 and N2O in the 'without project' scenario. Non-CO2 gases must be included if they are likely to account for more than 5% (in terms of CO2-equivalent) of the project's overall GHG impact over each monitoring period

[22] GRL EIA report for Uchindile Forest projects, initially the Kilombero Forest Ltd (Orgut Consults, 1999)

According to the methodology non-CO2 GHG emissions such as CH4 and N2O would occur in the 'without project' where burning for site clearance for agricultural purposes and charcoal production takes place, and in the 'with project' scenario due to fossil fuel use in transportation and machinery, as well as from fertilizer application; however, these have conservatively been assumed to be zero in the 'without project' and deemed insignificant in the 'with project' scenario – see section CL.1.2 for further information.

G2.4. Describe how the 'without project' reference scenario would affect communities in the project zone, including the impact of likely changes in water, soil and other locally important ecosystem services

Socio economic study carried out together with an Environmental Impact Assessment to the project in 1999[23] revealed that communities were mainly dependent on subsistence farming and generally with poor access to education and health care and poor housing. The majority of the houses (68%) had mud and pole-thatched roofs while 32 % of the households were constructed of mud bricks (some burnt and reinforced with cement) and roofed with corrugated iron sheets. 68 % of the total adults (above 18 years of age) at Uchindile had attended 7 years of primary school and only 16 % had attended secondary school. The area was affected by waterborne diseases such as diarrhoea, worms, dysentery and amoebiasis. Also eye diseases, venereal diseases, pneumonia, skin diseases, tuberculosis and malaria were predominant as a result of distant medical facilities.

Agriculture and/or labour are the main sources of income for local communities in the project area. However, due to severe soil erosion, agricultural production was very low and there were few other income activities. Without the project the local communities would continue to live below the poverty line, with few improvements.

[23] GRL EIA report for Uchindile Forest projects, initially the Kilombero Forest Ltd (Orgut Consults, 1999)

G2.5. Describe how the 'without project' reference scenario would affect biodiversity in the project zone

The project area in the "without project" scenario would continue under threat from uncontrolled fires. This would result in further degradation of land as a consequence of soil exposure and erosion: exposing the soil surface leads to nutrient depletion and top soil removal, potentially inhibiting natural forest regeneration and maintenance of biodiversity. Continued burning, and lack of knowledge and measures to protect biodiversity under the 'without-project' scenario, would result in the reduction and possible extinction of native animal, birds and plants. Degradation of the riverine forest areas from fires would threaten the RTE species found in this stratum.

Project proponents expect that with the implementation of the project both biodiversity, water and soil resources will be improved rather than diminish. Increased biomass decomposition shall enhance humus and nutrient recycling.

G3.1. Summary of project's major climate, community and biodiversity objectives

Consistent with section A.2 of the VCS PDD, the major project activity is establishment of plantations.

Main objectives of the proposed project activity:

- To establish and manage forest plantations so as to contribute to the demand of high quality wood products from a sustainable managed forest. NB: The Government of Tanzania, through the Forestry Division in the Ministry of Natural Resources and Tourism (MNRT) encourages establishment of private forest plantations and admits that limited government financing has been a major setback in developing new forest plantations in the country[24,25]. The implementation of the proposed ARR VCS project

[24] The forests in Tanzania, mostly public/natural forests, are under pressure of deforestation at an estimated annual rate ranging from 150, 000ha -450,000ha (Source: The Tanzania National Forest Policy (MNRT, 1998)). The Tanzania Forest Action Plan (MNRT, 2000) mentions Kilombero Forest Project (now called Uchindile Forest Project) as the only private plantation forest aiming at CO_2 sequestration and generation of carbon credits.

activity will therefore, benefit the forestry sector through an increase in the resource supply, management and overall sustainability.

- To sequester CO_2 through forest planting in grassland areas, generating high quality emission reductions in greenhouse gases (GHG) that can be measured, monitored and verified. The project participants strive to demonstrate that carbon sequestration from forest plantations is a viable instrument to encourage private investment in the forestry sector especially in grasslands and/or degraded lands.
- To promote environmental conservation, such as soil conservation, protection of water sources and enhancement of biodiversity through the protection and management of existing indigenous flora and fauna and where possible enrichment planting with indigenous species and fruits.
- To facilitate socio-economic development of the local communities through:
  - promotion of tree planting/reforestation activities in the local communities;
  - providing employment opportunities;
  - generation of income for the communities through the sale of carbon credits (10% of the benefits of all carbon credits will be used for community development projects)
- Infrastructure development of roads, buildings and other aspects, such as water supply and communication systems.
- To create employment to other Tanzanians apart from those in the local village communities.

In particular **Socio-economic benefits** to rural communities like:

1. Regular "around-the-year" employment.
2. Training on farming machineries and techniques, land-use planning, management and conservation.
3. The project participants will set aside 10% of the carbon revenues obtained from the sale of the carbon credits for the benefit of the local communities to be spent on projects that support the community as a whole.
4. Improve accessibility to clean water by providing boreholes in the villages and settlements, where necessary.

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[25] The Forest Policy (MNRT, 1998) and Forest Law (Forest Act, 2002) give opportunities to the private sector to play key roles in the national economy, namely through the development of forestry sector: Mugasha et al, , (2004), Indicators and Tools for Restoration and Sustainable Management of Forests in East Africa, I-TOO working paper No. 3, State of Forests and Forestry Research in Tanzania, page 31.

5. Improved infrastructure: An estimated 200 km of roads will be constructed and approximately 100 km renovated, including river crossings and culverts. Road sign and signaling to avoid traffic accidents will be installed along the public roads that are used for the log transports etc.
6. In addition, the project will provide the capital needed to stimulate local sustainable development priorities such as improved social services: hospitals and schools to serve the local population.

Environmental benefits are delivered through creating consciousness among the villagers about effective utilization of their land, and reducing land degradation through fire. The project inspires and provides resources for villagers to create their own community woodlots on their land. The project also promotes environmental conservation, such as soil conservation, protection of water sources and enhancement of biodiversity through the protection and management of existing indigenous flora and fauna – conservation areas to protect RTE, HCV-forests, native species and habitats were demarcated and are being monitored.

G3.2. Describe each project activity with expected climate, community and biodiversity impacts and its relevance to achieving the project's objectives

To achieve the project goals, the following activities have been planned:

Climate:

- Reforestation: The project will plant trees which will generate GHG emission reduction by acting as carbon sinks.
- Community woodlots: Outside the VCS project boundary, communities will be supplied with seedlings or seeds and encouraged to plant trees on their own woodlots. This will go hand in hand with training on management and protection of such woodlots.
- Fire prevention and protection: The project participant will encourage and enforce fire control in the project zone. This will include implementing several prevention and surveillance measures within the project area (e.g. fire towers and fire brigades patrolling the plantations) as well as community sensitization programmes in the project zone.

Community:

- Employment opportunities: the project will act as a source of employment to surrounding communities, which will contribute to poverty alleviation.
- Community support programmes including:
    - Education
        - Through building of classes, teachers houses, and supply of construction and teaching materials
    - Health
        - Through building dispensaries, supply of construction materials and medical equipments
        - Health awareness through meetings and seminars on HIV/ AIDS, malaria and other prevalent diseases
        - Supply of HIV/AIDS brochures in schools and health centres

    - Roads and bridges
        - Construction of roads within and outside project boundaries that can be used by communities to access better services (e.g. health, education).
        - Construction of bridges on community requests that will connect villages and facilitate community activities outside the project boundary
    - Community carbon money
        - 10% of all carbon revenues generated by the project will be given to villages that provided land to the project for community projects
    - Tree Growers Association
        - Initiate Tree Growers Association that will encourage communities to plant trees in their lands and train them in tree management.

Biodiversity:

- ***Community Woodlots***
    - Supply seeds and seedlings to communities and encourage them to own woodlots
    - Through woodlot management programmes encourage communities to protect the environment by avoiding fires

- ***Native Biodiversity Conservation:***

- Carry out research to identify species of conservation status i.e rare, threatened and endangered species (RTE)
- Create conservation areas for RTEs and other biodiversity; which will include creation of buffer zones in wetlands, riverine forest, gullies and steep slopes
- Protect all pockets of natural forest within the project boundary

G3.3. Project location and boundaries of the project area(s), where the project activities will occur, of the project zone and of additional surrounding locations that are predicted to be impacted by project activities

The project location, boundaries of the project area, where the project activities will occur, of the project zone and of additional surrounding locations that are predicted to be impacted by project activities are shown in section G.1.3.

G3.4. Project lifetime and GHG accounting period

The timeframe for the proposed project activity is 99 years; determined by the Tanzanian Land Act 1999, in which land can be leased for a maximum period of 99 years. Therefore the two discrete parcels of land have land titles for 99 each. Uchindile Forest Project has a title deed for period from 1st April 2000 whilst Mapanda Forest Project has two titles of ownership both for a period of 99 years from 06th December 2003.

The crediting period was chosen following the VCS guidance. Therefore the project shall use a 99 years fixed crediting period commencing in 2002. The management plan for this project indicates long term stewardship over the chosen crediting period.

G3.5. Likely natural and human-induced risks to the expected climate, community and biodiversity benefits during the project lifetime and outline measures adopted to mitigate these risks

The likely risks to the climate, community and biodiversity benefits are as described below.

Risks to Climate Benefits

Risk from fires:

Fire outbreak may affect the project in meeting its expected climate benefit of CO_2 removals by sinks. The reduction of tree biomass from fire burning would reduce projects emission reduction target estimated in the PDD.

In order to control fires, project participants have developed an effective fire control system. Firstly there is a fire protection guideline[26] that stipulates an entire process of fire management in GRL plantations. Specific measures to control fires include the following:

1. Compartmentalization

Plantations are divided into compartments of variable but manageable sizes where sufficient buffers around 6 m wide are maintained to isolate operations and problems associated with each polygon.

2. Roads

A good network of roads (see maps in section 2.1 of Monitoring Report) is maintained within the plantations to ensure easy accessibility and mobilization of resources and equipment to all parts in the event of fire outbreak.

3. Fire breaks

Fire lines are put in place to separate compartments. Some fire lines coincide with roads and when they do not, they are graded, and/ or slashed or burnt to about 10 – 30 m wide for internal fire lines. For external boundaries where necessary the firebreak varies from 30 - 60 m depending on the vulnerability of the area. Preparation or maintenance of fire lines/fire breaks in and around the plantations is usually done before the fire season to stop external fires entering the plantations or limit the spread if occurs from within.

4. Fire towers

UFP has 2 fire towers and 1 lookout point while MFP has two fire towers currently with one located within project boundary and one just outside project boundary, which allow for the wide visibility of the forest plantation. These points are manned 24 hours a day on shift basis with patrol team in the night to attend to any fires spotted. The fire tower team is provided with communication systems such as walkie talkie radios and fire fighting equipment.

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[26] GRL, Fire Management Guideline, 5th edition. Velund, H. 2011,

5. Fire Patrolling

A man is always kept on duty at the plantation office, fire tower and in different camps in the plantation. The patrol teams are provided with bicycles and/or motor bikes, walkie-talkie radios, back pack pumps and slashes. The fire patrol team's location and shifts are dependent on the prevailing fire risk level, which are usually increased in intensity as the fire risk increases, like in the peak of drought.

6. Mapping

The preparation of effective fire plan maps covering all firebreaks, fire towers and natural features is underway for all company plantations. Maps have strategic and tactical role in helping to locate fire occurrences so as to know the convenient route to access and the best approach to tackle them.

7. Community involvement in fire reporting and fighting

A good cooperation is maintained between the village community around the project areas and project management/staff. Chains of command have been established so as to provide swift responses to fire messages. Communication in the project areas has been made easy through radio calls and walkie-talkie receivers. Villagers will be asked to report fire incidents to responsible persons.

8. Training of fire fighters

Standby crews, fire tower men and any potential groups are given some training about fire prevention/fighting. Trainings are conducted before the dry season. Controlled burning is also another opportunity for training standby crew and other workers, which has been identified as a major cause of fire in plantations if poorly managed.

9. Fire fighting tools and equipment

Fire fighting tools and equipments have been put in place. These include back pack pumps, fire beaters, walkie-talkie radios, water bowsers and tractors to pull bowsers, trucks to transporter fire fighters, etc. In case of large scale fires outbreak, more people involved will mean more tools and equipment have to be deployed.

10. Recording and replanting of damaged area

All fire incidences are properly recorded with detailed information regarding the incidence including cause/source of fire, species affected, areas destroyed, etc. In addition, plans are always put in place to replant all damaged areas if 30% or more of the area is destroyed.

Risks from Diseases:

Disease infestation affects growth and overall productivity of the forest and the carbon stock. Surveillance programmes and practices are in place to identify and address signs and symptoms. Regular training is given to plantation staff and surrounding communities to identify and report cases. Unfamiliar conditions and signs are also advised to be reported immediately they are noticed in GRL plantations and surrounding community woodlots. In some cases experts are invited to assess the situation and provide expert advice.

Risks to the community

Health and safety risks

Health risks to workers include accidents in the field and spreading of diseases such as HIV/AIDS, Cholera, Malaria and water borne diseases. To prevent accidents, workers are supplied with first aid kits as they work in the plantations. GRL also undertakes health surveys of workers to understand health situation of devastating diseases such as HIV/AIDs. Result from consultations will be used to increase awareness about devastating diseases, and where possible medication will be supplied. On this basis, GRL will facilitate HIV testing and counselling for workers and communities. It will engage with health facilities and NGOs in the area to promote awareness in the communities. The Uchindile and Mapanda project will help sick people to get transport during emergency cases, on patient's request. It will help communities access better health care by building dispensaries in the local villages and supplying medical equipment; this will depend on villages' priorities. In addition, the activities shall be carried out following the GRL plantation working instructions which illustrates safe working procedures.

Risk of fires:

Fires may destroy community belongings including their woodlots which may affect their expected future incomes.

To avoid this, the community will be trained in fire prevention and control specially when using fire for land preparation in their farms.

Risks to Biodiversity Benefits

Risks from Invasive Alien Species, Disease and Pests

All tree species used in plantations will be screened against the list of invasive species to Tanzania before planting. Trial planting will be done to confirm that planted species are not invasive and forest management will prevent alien species from spreading outside plantation areas. Genetically Modified Organisms will not be planted, and species for planting will be selected in such a way that they do not spread disease to local biodiversity.

Risks from Water and Soil Depletion

Great care will be employed to ensure that the plantation does not deplete water flow and quality or soil fertility. To do this, recommendations from the Environmental Impact Assessment as well as ecological studies will be followed. Monitoring of water quality and soil fertility as well as biodiversity will be carried out to check any changes as the project develops.

G3.6. Specific measures to ensure the maintenance or enhancement of the high conservation value attributes identified in G1 consistent with the precautionary principle

As shown in section G1.8.1-6, GRL has applied the HCVF toolkit to assess presence of the HCVFs at Uchindile and Mapanda forest project and therefore implement management strategies to maintain such values. Since the majority of RTE species occur scattered and in low abundance along the river banks and in valley bottoms, these areas will be conserved and a buffer zone of 60 meters on both sides of the streams, valley bottoms or riverine forest is maintained. 811 ha of riverine vegetation and 15 ha of natural forest in Uchindile and 1126 ha of riverine vegetation in Mapanda are left intact and protected. In addition, grassland conservation areas were also kept to ensure an adequate habitat for the blue swallow. Grassland areas of 440 and 731 ha in Uchindile and Mapanda respectively have been conserved for this purpose; this is considered sufficient[27] for conservation given that only one pair of blue swallow was spotted during one ecological study

[27] Evans, S.W., Bowman, H., Habitat Selection by Blue Swallow *Hirundo atrocaerulea* Sundevall 1850 breeding in South Africa and its implications for conservation, African Journal of Ecology, 48, 871-879.

and has not been spotted in monitoring surveys[28] since then; and studies on blue swallow habitats indicate that the bird does not breed colonially and that there is normally only one nest per site[29]. Sample plots will be installed and changes in both flora and fauna will be recorded. Fire may be applied in grassland conservation areas to ensure recovery and maintenance of species that are natural to the area. This will ensure habitat conservation for some RTE species like the blue swallow, which require both grassland areas and valley bottom /riverine vegetation. In addition, the use of high resolution images will be employed to monitor major changes in cover over time. See also section B.3.2 in this document.

G3.7. Measures that will be taken to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime

The main positive climate benefit of the project is climate change mitigation. Although the company land title is for 99 years the project is envisaged beyond that and so is carbon sequestration through maintenance of the forest plantations. Furthermore technology transfer as well as all training and awareness provided by the project on environment conservation and woodlot establishment and management through Tree Growers Association (TGA), which provides a practical window for learning, starting from nursery establishment through harvesting and marketing will provide long-lasting benefits to communities and biodiversity. This is especially significant as it is expected that the demand for wood and forest products will not decrease significantly in the near future due to population growth in the region thus increasing pressure on forest resources. Also awareness raising regarding health issues, like most common diseases and preventive measures or treatments will remain as embedded knowledge within the communities beyond the project lifetime. Moving forward, it is expected that the project participant together with the local communities will identify other avenues that will benefit the local community.

G3.8. Community and stakeholder identification and involvement in project design through effective consultation, particularly with a view to optimizing community and stakeholder benefits, respecting local customs and values and maintaining high conservation values

[28] GRL Biodiversity Monitoring Report for Uchindile and Mapanda plantations, Kimey, V., 2012

[29] Zambian blue swallow action Plan. Mwizabi *et. el,*. 2003.

The local stakeholders were first identified and defined during land acquisition period[30] right at the start of the project when the company introduced itself to communities. These are people residing around or in close proximity to the project sites, and include the local village and ward governments and their departments, community members and community organizations. The local community form an integral part of the work force in the project activity. The project has further categorised stakeholders into primary and secondary; with secondary stakeholders being people from various professions, with interest to the project including government institutions and departments, research persons and institutions, academic institutions, faith based and community based organizations among others.

At early stages of land acquisition, meetings were held in the village. The project participants discussed with the community their aims to start afforestation project and community involvement as well as benefit stream to the communities adjacent to the project. During this time communities were asked to prioritise their needs based on areas the project would sponsor placing emphasis on education, health and infrastructure as major areas of economic development. The environmental impact assessment, done by external agents, also employed participatory approaches to integrate local stakeholder's views and incorporate their concerns in the management of this project.

During project implementation phase the local communities have continued to be defined and respected as primary stakeholders of the project. The project participant applied Participatory approaches to identify community needs and priorities which would be worked together by the project and the community, but also for identification of worries, concerns, opinions and comments to improve management of the project. Further, stakeholders' participation has been planned through Participatory Approaches, including PRAs, meetings, and Focus Group Discussions on regular basis. This is expected to bring feedback on project actions and outcomes, in order to improve management practices and ensure that community values are respected and maintained.
Further evidence of this process is pointed out in section H of the VCS PDD.

[30] For review of stakeholder`s comments please see section H in the VCS PDD.

G3.9. Publicizing the CCBA public comment period to communities and other stakeholders and to facilitate their submission of comments to CCBA

The CCBA PDD will be published for stakeholder comments on the CCBA website. The local community will be interviewed to obtain their views, opinions, doubts and concerns during the validation stage of the project. The timeframe for the publication of the PDD and interviews will be determined by the Designated Operational Entity (DOE) and the CCB standards requirement. Furthermore, the project participant will make publicly accessible most relevant documents to stakeholders including the local community. Some of these documents include the project management plan, CCBA and VCS PDDs. In addition, summaries of PDDs and management plans are made public to the communities.

G3.10. Handling of unresolved conflicts and grievances that arise during project planning and implementation

The company's Standard Operating Procedure (SOP) 03 clarifies how any grievances, complaints and conflicts raised by stakeholders shall be handled and resolved. The procedure describes the methods of possible complaint and conflict resolution, raised about the work or any activities conducted by GRL, so as to guarantee the resolution. The procedure manual for conflict resolution states that every person, inside or outside GRL, can make a complaint against the organization's actions, behavior, documents, certification process, forest management, etc. Complaints, disputes and issues of contention must be submitted in writing to the attention of the Managing Director, either at the reception of the company, by mail or via complaint boxes at the plantation projects which are emptied monthly and delivered to the head office by the plantation managers. Where the complainant is not satisfied these will be resolve through two ways. Where a plantation worker raised their complaint the Tanzania Plantation and Agricultural Workers Union (TPAWU) will be involved as a third party whereas when this happens in other grievances than workers', the Commission for Mediation and Arbitration will be involved. The latter may also resolve complaints or grievances raised by workers.

Suggestion boxes as well as regular meetings held with communities improve communication between the local community and the project. Also ensure that those who cannot read and write, and who have high stake to the project have equal right of expressing their worries, concerns and opinions; or can raise their contention to the company. So far, GRL has learnt that improving

communication as well as building a strong rapport with the local communities improves management, reduces conflicts and ensures early handling of community issues even before they develop into grievances. Stakeholder consultation is ongoing at GRL. The project manager is part of the village development committee at the village and therefore will identify any issues of concern and forward to management for action.

G3.11. Demonstration of financial mechanisms adopted, including projected revenues from emission reductions and other sources are likely to provide an adequate flow of funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits

The dual revenues from the sale of timber forest products and carbon emission reductions make the project financially attractive as an equity investment in Tanzania, and thus should secure the financing of the lifetime of the project for consequent rotations beyond the crediting period pertaining to the VCS.

The project is financed through Green Resources AS[32] equity, as well as, timber and carbon revenues, which will provide financing for future planting, biodiversity and community benefits (e.g.: sharing of 10% carbon revenues with communities). Furthermore, according to the project participant financial model the expected breakeven point would be in 2017 and thus the project is expected to be cash flow positive onwards. See VCS Non-permanence risk report for financial analysis.

G4. Management Capacity and Best Practices

G.4.1 Identify a single project proponent, which is responsible for the project's design and implementation. If multiple organizations or individuals are involved in the project's development and implementation the governance structure, roles and responsibilities of each of the organizations or individuals involved must also be described

Green Resources Limited is responsible for the design and implementation of the proposed project activity. The company has employed a sufficient number of competent and qualified staff,

[32] Green Resources Directors' Report, 2010

including a well tested management structure. The employees` have extensive experience necessary for forest management and certification as well as relevant experience of forest management in the local area.

G.4.2 Document key technical skills that will be required to implement the project successfully, including community engagement, biodiversity assessment and carbon measurement and monitoring skills. Document the management team's expertise and prior experience implementing land management projects at the scale of this project. If relevant experience is lacking, the proponents must either demonstrate how other organizations will be partnered with to support the project or have a recruitment strategy to fill the gaps

GRL has deployed a well trained and experienced management team in plantation management. Each project site is lead by the project manager who is assisted by foresters, surveyors and supervisors. At the GRL headquarters at Sao Hill, there is an interdisciplinary team of approximately 25 professionals who directly serve the project from various professional backgrounds, each with a minimum education qualification of Bachelors degree. The project manager reports at the headquarters at Sao Hill where the Managing Director is based. GRL facilitates and supervises the implementation of the proposed project activity, organizing technical training and consultation, organizing and coordinating all forest management activities including monitoring of biodiversity and communities. The staff is trained, and workshops and courses are provided to extend knowledge. Additionally, there is a technical team in the country headquarter in Dar es Salaam and from other offices visiting and supplying the project with technical resources. The technical team of the company is composed of foresters, surveyors, ecologists, environmentalists, human resource personnel, social workers, engineers, researchers, GIS and mapping specialists, accountants as well as health carers.

G.4.3 Include a plan to provide orientation and training for the project's employees and relevant people from the communities with an objective of building locally useful skills and knowledge to increase local participation in project implementation. These capacity building efforts should target a wide range of people in the communities, including minority and underrepresented groups. Identify how training will be passed on to new workers when there is staff turnover, so that local capacity will not be lost

The employee training[33] plan for GRL and the employee handbook[34] provide guideline for how employee skills will be developed. GRL plans to expand its training plan to include a recruitment and worker advancement programme[35] for local contract and temporary workers in the plantations of Uchindile and Mapanda. This programme is designed in such a way that people working in the project will be asked to apply for the training after which they will be assessed of their competence either to enter into permanent employment or advance into a higher level. In this programme a worker will get promoted to work as an inventory assistant talking up new professional roles in forest management. Furthermore, those who advance into further formal training will be promoted to take on advanced roles based on their field of training. Six people have been employed under this programme at Uchindile and Mapanda, being 3 people from each project.

Where specific skills are lacking, individual experts, institutions and research centres shall be consulted. These will include researchers from Sokoine University of Agriculture, University of Dar es Salaam, Kenya Forest Research Institute, Tanzania Forest Research Institute, Tanzania National Environmental Management Council, Tanzania Tree Seed Agency, Vice President's Office Division of Environment, Wildlife Conservation Society of Tanzania, Rufiji Water Basin in Iringa, Mufindi Environmental Trust (MUET), Sao Hill Forests, Ministry of Natural Resources, Mufindi and Kilombero District Council.

G.4.4 Show that people from the communities will be given an equal opportunity to fill all employment positions (including management) if the job requirements are met. Project proponents must explain how employees will be selected for positions and where relevant, must indicate how local community members, including women and other potentially underrepresented groups, will be given a fair chance to fill positions for which they can be trained

The project offers employment to residents of the project zone. The company procedure for employee selection (SOP 07) will be used. Particular care is taken to ensure that selection criteria

[33] GRL Staff Training Programme for Green Resources Ltd 2008-2012, (Mussami, P., and V.G Nambombe)

[34] Green Resources AS and Subsidiaries Employee Handbook, (Updated August 2011)

[35] GRL Proposed training Plan for Forest inventory Assistants, 2012

are not in any way directly or indirectly discriminatory on grounds of gender, race, disability, religion or belief. Local stakeholders with relevant skills are highly encouraged to fill higher positions; though there are also many job opportunities for less skilled workers. The challenge lies on the fact that, currently the majority of local community members have very low education and particularly forestry skills are lacking. Therefore, if local people have the necessary skills, they will be considered for higher posts.

G.4.5 Submit a list of all relevant laws and regulations covering worker's rights in the host country. Describe how the project will inform workers about their rights. Provide assurance that the project meets or exceeds all applicable laws and/or regulations covering worker rights and, where relevant, demonstrate how compliance is achieved

GRL intends to meet and exceed compliance with local and international laws and regulations in its operations. This is why it applies sustainable forest management Principles and Criteria (P&Cs) of Forest Stewardship Council (FSC); one of whose principles (Principle 1) entirely assesses project's compliance to local, national and regional laws and regulations. The whole of GRL Company is FSC certified, and has undergone three consecutive surveillances successfully. Some of regulations that are relevant and which GRL abides to include Employment and Labour Relations Act amended in 2004.

G.4.6 Comprehensively assess situations and occupations that pose a substantial risk to worker safety. A plan must be in place to inform workers of risks and to explain how to minimize such risks. Where worker safety cannot be guaranteed, project proponents must show how the risks will be minimized using best work practices

Green Resources' occupational health and safety policy is formulated under the auspices of creating and maintaining an environment where management and staff work together to ensure that a safe and healthy workplace is provided for all employees, contractors, visitors and third parties. To overcome substantial risks to worker's safety GRL will ensure that Personal Protection Equipments (PPEs) are in place and in use by staff at all time. Additionally the company undertakes to proactively asses situations that pose risks to workers in order to design training to workers for them to take precation during the operations.

G.4.7 Document the financial health of the implementing organization(s) to demonstrate that financial resources budgeted will be adequate to implement the project

The company's shareholders have provided NOK 120mn (USD 21mn) of capital since the start of 2011, mostly through a rights issue that was completed at the start of 2012. This capital has enabled Green Resources to complete its capital expenditure programmes and continue planting, and has created the basis for the long-term funding of the company. Since the long-term plan was approved by the board, Green Resources has signed a USD 25mn six-year mezzanine loan agreement with Finnfund and Norfund that will secure funding of the new plan. This financing will enable the company to implement the investment phase of its new strategy, moving into a situation of positive cash flow where internal cash generation will determine the level of annual planting.

G5. Legal Status and Property Rights

G.5.1 Submit a list of all relevant national and local laws and regulations in the host country and all applicable international treaties and agreements. Provide assurance that the project will comply with these and, where relevant, demonstrate how compliance is achieved

GRL is registered with the Tanzania Investment Centre (TIC) as a Tanzanian company. All the preliminary processes of land acquisition follow the government legal procedures. The Tanzania Environmental Policy, following a precautionary approach, insists that before any implementation of land-based projects, an environmental impact assessment must be carried out to identify any negative impacts that may be caused and take precautionary measures to the proposed activities. In the case of this project, two external agencies from a government provided list were contracted to carry out the EIA for the two separate areas[38]. GRL accords all the national and international legal requirements including environmental audit regulations from 2005. The project also applies ISO 9001 and 14001 procedures of Environmental Management Systems and the principles of the Forest Stewardship Council (FSC).

[38] Orgut Consultancy and Environmental Association of Tanzania.

G.5.2 Document that the project has approval from the appropriate authorities, including the established formal and/or traditional authorities customarily required by the communities

GRL holds letters of approval for two Environmental Impact Assessments separately for the Uchindile and Mapanda plantations from the National Environmental Management Council of Tanzania (NEMC); Title Deeds for the two parcels of land; approval from Tanzania Investment Centre (TIC); and water use rights from the Ruaha River Basin's headquarters in Iringa renewed regularly for water use activities such as for nursery establishment.

G.5.3 Demonstrate with documented consultations and agreements that the project will not encroach uninvited on private property, community property, or government property and has obtained the free, prior, and informed consent of those whose rights will be affected by the project

GRL only plants within the boundary earmarked during land acquisition. The project boundary has been surveyed with beacons, is mapped and legally leased to the company for reforestation activities. The land title demonstrates that all activities will take place within the surveyed beacons and GRL will abide by this agreement. However, there has been a land dispute to Uchindile project, which was due to erroneous allocation of the land by the government. Negotiations are still going on between the government and the company, and GRL may be given a concession to manage the land. However this land as been excluded from the CCBA and VCS project. Therefore the project does not anticipate encroaching on other land. Farmer settlements who originally owned this land were compensated and moved into nearby villages with their free prior consent. Therefore, uninvited encroachment on private property is not expected.

G.5.4 Demonstrate that the project does not require the involuntary relocation of people or of the activities important for the livelihoods and culture of the communities. If any relocation of habitation or activities is undertaken within the terms of an agreement, the project proponents must demonstrate that the agreement was made with the free, prior, and informed consent of those concerned and includes provisions for just and fair compensation

The project areas were largely abandoned prior to the project inception, with the exception of a very limited number of migratory small scale farmers, who during early stages of negotiations with the company were amicably compensated and moved their activities to other lands close by

their homes in neighbouring villages. The shifting was with free consent of these farmers, and has been documented and arbitrated by district officials along with procedures of land acquisition which requires that compensation must be given. Furthermore, since early stages of project inception, the company established solid partnerships with local communities which are expected to be strengthened during project implementation by supporting the local community projects at the villages.

G.5.5 Identify any illegal activities that could affect the project's climate, community or biodiversity impacts (e.g., logging) taking place in the project zone and describe how the project will help to reduce these activities so that project benefits are not derived from illegal activities

There is no evidence that fires occurring in the project area were intended to extracting any illegal material from the project area. However, interviews indicate that setting fires in the area by the local communities was a common land preparation tool; which at times got out of control and escaped to burn the vast grassland areas before the project started. The project area is grassland at the start of the project with very few pockets of trees of little value to communities. Under such a situation, no illegal activities are expected at the project area.

G.5.6 Demonstrate that the project proponents have clear, uncontested title to the carbon rights, or provide legal documentation demonstrating that the project is undertaken on behalf of the carbon owners with their full consent. Where local or national conditions preclude clear title to the carbon rights at the time of validation against the Standards, the project proponents must provide evidence that their ownership of carbon rights is likely to be established before they enter into any transactions concerning the project's carbon assets

GRL inherited the land titles from Escarpment Forestry Company Ltd (EFC) which was taken over by GRL in 2001 and has a long term lease for the discrete areas of land from the Government for the purpose of long-term reforestation. The legal ownership of land is as given in table G5.6 below.

Table G3: Land area, tenure and legal title

Name	Villages	Area	Tenure	Deed
Uchindile	Uchindile, Kitete	6, 647ha	99yrs from yr. 2000	50742
Mapanda	Chogo	1,606ha	99yrs from yr. 2003	8954 – MBYLR
	Chogo & Mapanda	4,652ha	99yrs from yr. 2003	8955 – MBYLR

There is no provision under the government of the United Republic of Tanzania that provide for sharing of carbon revenue from forestation projects, but since GRL has the right of ownership to the land of the project activity, GRL also has exclusive right of ownership of carbon revenues.

Climate Section

CL1. Net Positive Climate Impacts

The climate impacts of the proposed project activity are presented in sections C6, C7 and D1 of the VCS PDD. However the climate impacts have been updated using new volume equations and default data which have been considered more reliable.

CL1.1. Estimate the net change in carbon stocks due to the project activities using the methods of calculation, formulae and default values of the IPCC 2006 GL for AFOLU or using a more robust and detailed methodology

Estimation of the carbon stock changes is based on the approved methodology applied in line with VCS PDD (section D2), and the net carbon stock changes over the chosen crediting period is given in section A4.6 of the VCS PDD. The actual net GHG removals by sinks (annual and cumulative) in the carbon stock change for above- and below-ground biomass minus the increase in anthropogenic emissions are as presented in the Table CL1.1a&b below. The project tables from years 1997-2100 are included to indicate net positive GHG removals during that time period, so their exclusion from total net project GHG is conservative.

Table CL1a: Estimation of actual net GHG removals by sinks and estimation of actual net anthropogenic GHG removals by sinks (see also general section).

Uchindile and Mapanda ex ante Carbon Model

	Year	Project removals	Baseline	Leakage	Emissions	tCO2e	Cumulative tCO2e
1st crediting period	1997	0	0	0	0	0	0
	1998	0	0	0	0	0	0
	1999	611	0	0	0	611	611
	2000	2,957	0	0	0	2,957	3,568
	2001	6,044	0	0	0	6,044	9,612
	2002	6,460	0	0	0	6,460	16,072
	2003	11,344	0	0	0	11,344	27,416
	2004	16,037	0	0	0	16,037	43,453
	2005	22,108	0	0	0	22,108	65,561
	2006	26,315	0	0	0	26,315	91,877

	2007	30,265	0	0	0	30,265	122,142
	2008	45,701	0	0	0	45,701	167,844
	2009	-57,064	0	0	0	-57,064	110,780
	2010	55,423	0	0	0	55,423	166,203
	2011	70,923	0	0	0	70,923	237,126
	2012	100,490	0	0	0	100,490	337,616
	2013	30,214	0	0	0	30,214	367,830
	2014	155,143	0	0	0	155,143	522,973
	2015	29,110	0	0	0	29,110	552,083
	2016	154,723	0	0	0	154,723	706,806
	2017	214,605	0	0	0	214,605	921,410
	2018	242,383	0	0	0	242,383	1,163,793
	2019	193,980	0	0	0	193,980	1,357,774
	2020	98,064	0	0	0	98,064	1,455,837
	2021	100,807	0	0	0	100,807	1,556,644
	2022	-71,096	0	0	0	-71,096	1,485,548
	2023	12,095	0	0	0	12,095	1,497,643
	2024	-79,686	0	0	0	-79,686	1,417,958
	2025	127,221	0	0	0	127,221	1,545,179
	2026	-69,364	0	0	0	-69,364	1,475,815
	2027	-65,086	0	0	0	-65,086	1,410,729
	2028	-607	0	0	0	-607	1,410,122
	2029	72,266	0	0	0	72,266	1,482,387
	2030	-64,433	0	0	0	-64,433	1,417,954
	2031	-311,903	0	0	0	-311,903	1,106,051
	2032	-313,900	0	0	0	-313,900	792,151
	2033	-196,872	0	0	0	-196,872	595,279
	2034	-81,264	0	0	0	-81,264	514,014
	2035	-67,296	0	0	0	-67,296	446,718
	2036	159,905	0	0	0	159,905	606,623
	2037	48,887	0	0	0	48,887	655,511
	2038	171,525	0	0	0	171,525	827,036
	2039	210,718	0	0	0	210,718	1,037,754
	2040	217,284	0	0	0	217,284	1,255,038
	2041	195,038	0	0	0	195,038	1,450,076
	2042	104,607	0	0	0	104,607	1,554,683
	2043	102,735	0	0	0	102,735	1,657,418
	2044	-73,949	0	0	0	-73,949	1,583,470
	2045	-19,327	0	0	0	-19,327	1,564,142
	2046	-95,218	0	0	0	-95,218	1,468,925
	2047	61,431	0	0	0	61,431	1,530,355

	2048	-170,921	0	0	0	-170,921	1,359,434
	2049	-43,687	0	0	0	-43,687	1,315,747
	2050	40,601	0	0	0	40,601	1,356,348
	2051	-41,129	0	0	0	-41,129	1,315,219
	2052	-214,929	0	0	0	-214,929	1,100,290
	2053	-310,100	0	0	0	-310,100	790,189
	2054	-23,041	0	0	0	-23,041	767,149
	2055	-167,308	0	0	0	-167,308	599,840
	2056	-6,938	0	0	0	-6,938	592,903
	2057	-62,534	0	0	0	-62,534	530,369
	2058	179,682	0	0	0	179,682	710,051
	2059	65,689	0	0	0	65,689	775,741
	2060	167,639	0	0	0	167,639	943,379
	2061	185,620	0	0	0	185,620	1,128,999
	2062	218,341	0	0	0	218,341	1,347,341
	2063	201,581	0	0	0	201,581	1,548,922
	2064	106,535	0	0	0	106,535	1,655,457
	2065	99,883	0	0	0	99,883	1,755,340
	2066	-105,371	0	0	0	-105,371	1,649,968
	2067	-34,859	0	0	0	-34,859	1,615,109
	2068	-161,008	0	0	0	-161,008	1,454,101
	2069	-40,126	0	0	0	-40,126	1,413,975
	2070	-149,523	0	0	0	-149,523	1,264,452
	2071	-2,479	0	0	0	-2,479	1,261,974
	2072	-72,794	0	0	0	-72,794	1,189,180
	2073	-191,626	0	0	0	-191,626	997,554
	2074	-213,126	0	0	0	-213,126	784,428
	2075	-19,241	0	0	0	-19,241	765,187
	2076	6,523	0	0	0	6,523	771,710
	2077	-92,982	0	0	0	-92,982	678,729
	2078	-2,175	0	0	0	-2,175	676,554
	2079	-42,757	0	0	0	-42,757	633,797
	2080	196,484	0	0	0	196,484	830,281
	2081	61,803	0	0	0	61,803	892,085
	2082	142,540	0	0	0	142,540	1,034,625
	2083	186,677	0	0	0	186,677	1,221,302
	2084	224,884	0	0	0	224,884	1,446,186
	2085	203,509	0	0	0	203,509	1,649,695
	2086	103,683	0	0	0	103,683	1,753,378
	2087	68,460	0	0	0	68,460	1,821,838
	2088	-120,903	0	0	0	-120,903	1,700,935

	2089	-100,650	0	0	0	-100,650	1,600,286
	2090	-262,565	0	0	0	-262,565	1,337,720
	2091	-18,728	0	0	0	-18,728	1,318,993
	2092	-108,314	0	0	0	-108,314	1,210,679
	2093	-115,873	0	0	0	-115,873	1,094,805
	2094	-223,290	0	0	0	-223,290	871,515
	2095	-189,822	0	0	0	-189,822	681,693
	2096	77,733	0	0	0	77,733	759,426
	2097	10,323	0	0	0	10,323	769,749
	2098	80,850	0	0	0	80,850	850,599
	2099	-88,219	0	0	0	-88,219	762,380
	2100	17,602	0	0	0	17,602	779,982

The approved methodology is robust enough to guarantee credible and verifiable GHG removals by sinks, and is in line with the IPCC good practice guideline for AFOLU. The baseline scenario in this project is based on estimation of carbon stock changes as a result of unmanaged use of grasslands subject to frequent burning in the absence of the project. The project participant used approach from paragraph 22 (c) of the CDM A/R modalities and procedures: “Changes in carbon stocks in the pools within the project boundary from the most likely land use at the time project starts”. The estimates of the actual net GHG removals by sinks in the project activity are based on the carbon stock change in aboveground and belowground biomass estimated using equations described in section II.7 of the approved methodology. The changes in carbon stocks in the living biomass pool are estimated based on the changes in carbon stocks of the living biomass of trees (gain and losses) minus increase in emissions of GHG within the project activity boundary. As described in section B and section C in the VCS PDD, carbon stock changes in pools of soil organic matter, dead wood and litter are not accounted as part of the net GHG removals by sinks.

Changes in carbon stocks:

Verifiable changes in carbon stocks of living biomass of trees (above ground and below ground) occurring annually is estimated using Equation B.15. For above ground- and below ground biomass, equations B.16 and B.17 are used. The living biomass at any particular time is estimated from the gain and losses in living biomass of trees through equations B.18- B.21. In absence of the project and regional specific parameters during PDD preparation for the biomass expansion factors (BEF), Wood density (D), and Root to shoot ratio (R), the project participants uses default values from the GPG LULUCF 2003 (Table 3A.1.10) and from other relevant regional and peer

reviewed literature. The variables to be used in equation B.18 and B.19 are shown in the table D.1 below:

Table CL.1.1. Parameters used to calculate carbon stocks

Specie	BEF	D	R
Pine	1.30	0.44	0.32
Eucalyptus	2.70	0.46	0.2
	BEF values taken from table 3A.1.10 of the GPG LULUCF 2003; Pine - mean value taken from Tropical Pines; Euc - mean value taken from Tropical Broadleaf D Taken from the book "The Commercial Timbers of Tanzania", J.M. Bryce, revised edition of 1999. R values taken from table 3A.1.8 of the GPG LULUCF 2003; Pine – mean values taken from the conifer forest/ plantation category with aboveground biomass; Euc – mean values taken eucalypt plantation		

During *ex-post* calculations, the growth data (standing volume per hectare) are collected and converted into biomass through wood density and Biomass Expansion Factors (BEF) and root-shoot ratio (R) using equations and steps described in the methodology.

The approved methodology recommends estimating the annual decrease or losses of the carbon in living trees as a result of commercial harvest and fuel wood harvest. There will be no fuel wood harvest during the crediting period. The growth data used follows similar technical guides provided by the government. Any changes due to thinning will be captured during monitoring events in the Permanent Sample plots (PSPs). The impact of disturbances e.g. losses from fire and pests are considered to be small and are a result of natural event. For losses due to commercial harvest which occur during crediting period, these shall be calculated using equations B.20 – B.23 from the approved methodology.

CL1.2. Estimate the net change in emissions of non-CO_2 GHG emissions such as CH_4 and N_2O in the *with* and *without* project scenarios if those gases are likely to account for more than a 5% increase or decrease of the project's overall GHG emissions reductions or removals over each monitoring period

Non-CO2 emissions in the with project scenario are not expected to exceed 5 % of the overall

GHG emissions, however these shall be included in the monitoring plan of the VCS.

CL1.3. Estimate any other GHG emissions resulting from project activities. Emissions sources include, but are not limited to, emissions from biomass burning during site preparation, emissions from fossil fuel combustion, direct emissions from the use of synthetic fertilizers, and emissions from the decomposition of N-fixing species

No other emissions resulting from project activities are expected.

CL.1.4 Demonstrate that the net climate impact of the project is positive. The net climate impact of the project is the net change in carbon stocks plus net change in non-CO2 GHGs where appropriate minus any other GHG emissions resulting from project activities minus any likely project-related unmitigated negative offsite climate impacts (see CL2.3)

The project assumes that no losses of GHGs will happen in the form of leakage because planting will be done manually and no displacement of agricultural activities is occurring. Because grass is subject to annual fires and regeneration while shrubs and trees in the valley bottom have insignificant growth, the baseline GHG emissions were conservatively assumed to be zero. The project therefore anticipates a net GHG emission reduction of 2,439,184 tCO2e, as shown in Table CL1.b over the crediting period. Non- CO2 GHGs are not anticipated to exceed 5% of total emission reductions as all planting will be done manually and fertilizer will not be applied at the plantation.

Therefore, implementation of the project is expected to give positive climatic impacts to the project zone. The forest cover will contribute to a reduction of green house gases emissions by acting as a carbon sink.
Furthermore trees grown by communities in woodlots outside the ARR VCS project boundary will also have a positive climate impact though it will not be included in the quantification of the GHG emission reduction.

Overall the project will have a net positive climate impact, as demonstrated by table CL 1a.

CL.1.5 Specify how double counting of GHG emissions reductions or removals will be avoided, particularly for offsets sold on the voluntary market and generated in a country with an emissions cap

The GHG emission reductions from this project activity will be sold in the voluntary market. However, no double counting is expected. The host country is a non-annex 1 country, and thus, does not have an emissions cap. Furthermore, all VCUs will enter the VCS registry.

CL2. Offsite Climate Impacts ('Leakage')

CL.2.1 Determine the types of leakage that are expected and estimate potential offsite increases in GHGs (increases in emissions or decreases in sequestration) due to project activities. Where relevant, define and justify where leakage is most likely to take place

No leakage is occurring as a result of the project activities in accordance with the leakage rules stipulated in applied methodology. Leakage due to activity shifting is not occurring since the area under the project activity had no activity occurring on it pre-project. See also table D.2.1 of the VCS PDD.

CL.2.2 Document how any leakage will be mitigated and estimate the extent to which such impacts will be reduced by these mitigation activities

As explained above, the project activity is not expected to cause negative offsite impacts. The project shall rather produce positive impacts outside the project boundary by sequestering a large amount of CO_2 as a result of the establishment of community woodlots promoted by the project. Also the fire education campaigns will help to reduce emissions from forest burning.

CL.2.3 Subtract any likely project-related unmitigated negative offsite climate impacts from the climate benefits being claimed by the project and demonstrate that this has been included in the evaluation of net climate impact of the project (as calculated in CL1.4)

No unmitigated impacts are expected. The possible negative offsite climate impacts are considered to be mitigated through project design. In the case that negative impacts arise, these shall be identified with the monitoring programme and mitigated timely.

CL.2.4 Non-CO2 gases must be included if they are likely to account for more than a 5% increase or decrease (in terms of CO2-equivalent) of the net change calculations (above) of the project's overall off-site GHG emissions reductions or removals over each monitoring period

Some non-CO_2 GHG emissions are expected by the project activity as a result of planting activities and during controlled burning for the preparation of firebreaks, but are unlikely to account for more than 5% of the project's overall GHG emissions reductions.

CL3. Climate Impact Monitoring

CL.3.1a Develop an initial plan for selecting carbon pools and non-CO2 GHGs to be monitored, and determine the frequency of monitoring. Potential pools include aboveground biomass, litter, dead wood, belowground biomass, wood products, soil carbon and peat. Pools to monitor must include any pools expected to decrease as a result of project activities, including those in the region outside the project boundaries resulting from all types of leakage identified in CL2

In accordance to the approved methodology only above ground and below ground biomass are accounted for, in the GHG estimation. Litter, deadwood and soil carbon are conservatively neglected as there is no chance that they would decrease below the baseline, in the project scenario. The initial plan for monitoring both CO2 and Non-CO2 GHGs is in place, and follows the VCS monitoring plan elaborated in section E of the VCS PDD; including parameters of selected carbon pools that will be monitored and the frequency of monitoring.

CL.3.1b A plan must be in place to continue leakage monitoring for at least five years after all activity displacement or other leakage causing activity has taken place. Individual GHG sources may be considered 'insignificant' and do not have to be accounted for if together such omitted decreases in carbon pools and increases in GHG emissions amount to less than 5% of the total CO2-equivalent benefits generated by the project. Non-CO2 gases must be included if they are likely to account for more than 5% (in terms of CO2-equivalent) of the project's overall GHG

impact over each monitoring period. Direct field measurements using scientifically robust sampling must be used to measure more significant elements of the project's carbon stocks. Other data must be suitable to the project site and specific forest type

As indicated section above, leakage is not anticipated with this project activity. Similarly, as per provisions of the approved methodology, if measures to prevent leakage are implemented, then leakage would not be accounted for in the VCS project activity. Therefore, leakage will not be monitored.

CL.3.2 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders

Any monitoring of climate benefits will follow the monitoring plan and modalities of the VCS approved methodology indicated in section E of the VCS PDD. At subsequent annual CCB verifications, results from these monitoring will be made publicly available and where possible translated into local language and communicated to local communities and other stakeholders.

Community Section

CM.1.1 Use appropriate methodologies to estimate the impacts on communities, including all constituent socio-economic or cultural groups such as indigenous peoples (defined in G1), resulting from planned project activities. A credible estimate of impacts must include changes in community well-being due to project activities and an evaluation of the impacts by the affected groups. This estimate must be based on clearly defined and defendable assumptions about how project activities will alter social and economic well-being, including potential impacts of changes in natural resources and ecosystem services identified as important by the communities (including water and soil resources), over the duration of the project. The 'with project' scenario must then be compared with the 'without project' scenario of social and economic well-being in the absence of the project (completed in G2). The difference (i.e., the community benefit) must be positive for all community groups.

In 1999 an assessment of the project baseline scenario in terms of socio-economic status was carried out along with an EIA[48]. In the future this data will be compared to socio economic analysis studies by the project participant employing Participatory Rural Appraisal and Participatory Impact Assessment methodologies with bottom up methods using focus groups and interviews with communities.

The without project scenario represents a situation whereby communities would continue to survive a prevalent poverty based in subsistence agriculture due to lack of jobs and other sources of income. Remoteness of the area, that is, over 130 kilometres from a nearest township, the District headquarters at Mafinga, combined with very poor roads, meant that the villages were inaccessible at the start of the project; a situation that would continue. Furthermore, environmental degradation predominated and would continue in the without project scenario. This would have substantial effects on environmental resources such as soil and water, and would deplete land productivity that in return would affect subsistence farming which is the most plausible alternative in the absence of the project.

[48] GRL, Uchindile EIA -Orgut Consult, 1999

In the “with project scenario” the project will create employment opportunities for majority of community members in the project zone. Employment opportunities are expected to contribute directly to poverty reduction in these rural areas with limited sources of incomes. An average of 200 mandays will be created annually for unskilled local work force. Moreover, professional jobs will be created to locals extending outside the area of project influence.

Furthermore GRL will develop and implement a community development programme together with the communities and focusing on their needs.
Community monitoring has been planned and will run throughout project’s lifetime. Activities from which indicators of project impacts will be selected for monitoring are given in Table CM1.1.1. These are project’s socio economic initiatives against which project benefits to the communities will be evaluated over time.

Table CM.1.1.1. Project’s Socio Economic Initiatives/Goals

Project activity	**Impact/ Benefit**
Employment	- Source of income for communities around the project - Poverty reduction - Capacity building - Improved female status - Improved housing - Increase in furniture and other goods (bicycles, solar panels, TVs, etc)
Creation of Tree Growers Associations	- Alternative income generation activity - Sustainable source of wood - Capacity building - Contribute to conservation of biodiversity
Education	- Improved conditions for both students and teachers - Contribute to increase levels of literacy in the region
Infrastructure	- Improved accessibility to health and education services through construction/improvements in bridges and roads - Increase in local trading
Health	- Improved facilities and increased health services

	- Provide medical equipments to hospitals - Increase villagers access to health services - HIV and malaria awareness

Employment

As mentioned before employment opportunities in the project are extremely important to improve living conditions in the project zone due it's remoteness and lack of other alternative sources of income.

Local economy/ household income

It is expected that with income from salaries housing will improve as well as increase in household goods. Overall, increased purchase power would develop local economy, increasing small businesses, shops and other services.

Community Tree Growing Programmes

Green Resources Ltd has put tree growing programme at the centre of long term biodiversity conservation and community development in the project zone. The aim is to inspire local communities to plant trees, own and manage woodlots on their own plots. Initially GRL will provide local villages with free seedlings from its nurseries, and will gradually move from supplying seedlings to formulation of a more organised Tree Growers Associations (TGAs). This programme intends to provide communities with skills in managing trees, starting from nurseries to harvesting. Therefore, through TGAs communities will receive training on various tree management practices including nursery establishment, tending operations, protection against fires and diseases, inventory, mapping as well as harvesting. Building local community's capacity is meant to transfer knowledge which will remain with communities after project's lifetime. In addition to training communities on tree management, they will be trained on biodiversity conservation, food security and human health. Woodlots will bring multiple benefits to communities starting with environmental protection, turning the less valued grassland areas into long term household investments and reliable sources of income. Household incomes will increase through sale of harvested timber whilst wood will provide fuel and construction materials.

Education

GRL education support programme includes construction of classrooms and teachers' houses, and dormitories along with supply of furniture in schools. In addition to the overall goal of

reducing illiteracy in such remote areas, this support in education aims at encouraging teachers to come and teach in these villages, provide adequate studying environments and increase schools' capacities such that they could enrol more students. Although almost all schools would need support, the contribution of GRL will be based on village's priorities on education among other projects. This contribution combined with improved livelihoods, improved access to the villages and other social services is expected to have a major impact in school performance.

Infrastructure Development

Infrastructure development is amongst community development projects at the heart of GRL's operations. These will include roads, bridges and culverts. Whilst some of these are constructed for the purpose of making projects accessible, others are entirely constructed to serve communities and some serve both purposes. Hitherto, GRL has given various infrastructure supports to Uchindile and Mapanda. Already 66.18 km of roads have been built off the project sites to serve access in local villages. There are wider benefits coming with roads and bridges to local communities, although there may also be negative impacts with it. Benefits include easy accessibility to health and educational services and to farms as well as increased local exchange; villages that were isolated will now be accessible by roads/bridges. Negative impacts maybe related to an increased social interaction with the possibility of increased transmission of transmittable diseases such as HIV/AIDS.

Health and Medication

GRL support on health services will include building/improving health facilities, awareness raising on prevalent diseases as well as medical support. Support by GRL may include among other things dispensaries, nurses houses and a maternity ward at Mapanda; this is expected to tackle several problems in the villages like lack of nurses due to poor housing and mortality rate at birth.

GRL has anticipated that increased social interaction will occur in the project scenario, and thus it would result into spread of transmittable diseases. Although, this might not necessarily be the case, the project participant wants to ensure that there are measures in place to overcome this; GRL will therefore engage with NGOs and health care providers in surrounding areas to understand the prevalence of HIV/AIDS in the area and raise awareness amongst its workers and communities surrounding the project.

Water Availability and Quality

Despite adequate availability of streams and springs in the villages surrounding the project, sanitation is a big challenge. There is a problem of water safety due to pollution of water sources with human activities. Main sources of water for domestic uses are local wells, streams and rivers. It is common for communities to use same sources for washing and bathing, right at the river or well. One in three houses does not have a pit latrine; toilets are shared with neighbours. As such, water borne diseases are regularly reported in dispensaries particularly during rainy season when surface runoff by rains collects all dirt down stream.

GRL intends to improve access to safe water in the project zone through construction of borehole, education campaigns and monitoring. At the project workers will be provided with clean water. GRL intends to raise awareness with communities through meetings, along with disseminating monitoring results on water pollution in these villages. As part of water monitoring in the project area, water collection points are also planned where communities collect water for domestic and consumption purposes. The findings will be used to raise awareness to communities, including nature of contamination and effects of such contamination on health.
GRL will also have continuous monitoring of water quantity and quality to ensure the project won't cause negative impacts related with forest plantation management.

Based on communities' development priorities GRL may support other projects.

Capacity Building

Training and capacity building will be part and parcel of project operations at GRL, and community participation in training sessions will be encouraged to ensure that a large part of the community is trained and not limiting this to plantation workers only. Trainings will be conducted through presentations, workshops and seminars, and will cover areas such as human health, biodiversity protection, tree planting and woodlot management.

Comparison of Project and Without Project Scenario

Comparing the situation in the without project scenario to project scenario, the project participant believes that the project scenario will have net positive socio economic impacts.

CM.1.2 Demonstrate that no High Conservation Values identified in G1.8.4-6 will be negatively affected by the project

To ensure that High Conservation Values identified in sections G1.8.4-6 are protected the project will set buffer zones of 60 meter on both sides of rivers so that biodiversity as well as water are not affected. Water quality analysis will be done at least once a year to see effects of the project on water; hazardous chemicals are restricted under the FSC and therefore will not be applied. Plantation workers will be supplied with water guard and communities will be encouraged to use it regularly. Grave yards and ritual sites have been identified with community consultations and will be protected following the company's guidelines for ritual site protection (see section G1.8.6).

CM2. Offsite Stakeholder Impacts

CM.2.1 Identify any potential negative offsite stakeholder impacts that the project activities are likely to cause

The project does not expect any offsite negative socio economic impacts resulting from the project. The EIA/SEIA assessors called attention to different areas where the project could potentially have a negative impact on if not avoided by the project in advance; this is described in section G1 of the VCS PDD. The comments from stakeholders are given in section H.2, of the VCS PDD.

CM.2.2 Describe how the project plans to mitigate these negative offsite social and economic impacts

The resolution/mitigation measures are given in sections G.1 and G.3, of the VCS PDD. To ensure that they are met, a monitoring programme has been designed to check and correct on time.

CM.2.3 Demonstrate that the project is not likely to result in net negative impacts on the well-being of other stakeholder groups

Comparison of the positive and negative community impacts suggest that the project activity is not likely to cause net negative impacts. The project scenario is far above the status quo in terms of community benefits. Furthermore, the project scenario is believed to provide sustainable social and economic benefits that will last beyond the project lifetime. These include technology and knowledge transfer, in many areas like health and nutrition, woodlot management and biodiversity conservation.

CM3. Community Impact Monitoring

CM.3.1 Develop an initial plan for selecting community variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's community development objectives and to anticipated impacts (positive and negative)

The community monitoring plan has been developed[53] and is being submitted along with this PDD for validation. In this plan, the variables selected and monitoring frequency is given.

CM.3.2 Develop an initial plan for how they will assess the effectiveness of measures used to maintain or enhance High Conservation Values related to community well-being (G1.8.4-6) present in the project zone

Only grave site and ritual sites have been identified as values of great importance to communities occurring within the project boundary in the project zone. Management of these values follows views of the communities that are obtained through consultations while identifying and demarcating them for conservation. The grave and ritual sites are therefore undisturbed, protected areas within the projects in which communities have access to visit them for whatever traditional/cultural reasons. Project management will keep workers informed regarding conservation of these sites and will follow up with communities regarding their satisfaction with conservation measures.

[53] GRL Uchindile and Mapanda Biodiversity Monitoring Plan, 2012

CM.3.3 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders

The project proponents have already initiated a full community monitoring plan. This plan will be adhered to and results made publicly available on the internet and to the local communities in the local language.

Biodiversity Section

B1. Net Positive Biodiversity Impacts

B.1.1 Use appropriate methodologies to estimate changes in biodiversity as a result of the project in the project zone and in the project lifetime. This estimate must be based on clearly defined and defendable assumptions. The 'with project' scenario should then be compared with the baseline 'without project' biodiversity scenario completed in G2. The difference (i.e., the net biodiversity benefit) must be positive.

The project has identified HCVFs in the project area that are being conserve and will be regularly monitored to assess biodiversity status. Buffer areas are set aside for all valley bottoms including rivers and riverine vegetation, lakes and swamps, pockets of indigenous species, gullies and landslides; this ensures forest plantations don't have negative impacts on biodiversity in these areas. Furthermore forest plantations establishment follows the management plan and FSC standards for sustainable forest management.

The project will undertake regular biodiversity studies to understand, in order to conserve, and where appropriate enhance biodiversity in the study area. Two Environmental Impact Assessments have been commissioned to analyse the baseline environmental aspects including biodiversity before the project implementation and recommendations were provided. Therefore, the project participants started the project with clear understanding of biodiversity at the project sites, implementing the project while observing EIA recommendations. One critical recommendation was continous biodiverity study through more detailed ecological surveys.

The monitoring methodology to be applied in the ecological surveys includes sample plots and transects to be established in each of selected strata. In each stratum information to be collected includes: identification of all plant species and wildlife encountered, observations of signs that can indicate wildlife presence such as droppings, nests, animal tracks/burrows, carcass or other animal remains and consulted local villagers to gather information on wildlife and tree aspects basing on historical record. Similarly, land eligibility survey by both the District land surveyors and the project participants was done applying GIS techniques with land cover maps for the year 2000 compiled from Landsat TM 30x30m using bands (4, 5 and 3) to produce maps with a scale of 1:50,000. The spatial biodiversity information was collected and stored in GIS for comparison over time.

Also, encouraging the local communities' to plant trees on their land will contribute to supply wood for energy and construction needs of the communities, thus reducing pressure on natural forests.

Table B.1.1.1. Main benefits resulting from the "with project scenario".

Project activity	**Impact/ Benefit**
Conservation of wetlands and natural forests	- Enhance biodiversity - Contribute to conservation of habitats for RTEs
Buffers	- Avoid changes in water quality and quantity - Preserve natural ecosystems
Fire control	- Conservation of RTEs and ecosystems - Avoid soil depletion
Forest plantations	- Contribute to reduce pressure on natural forests
Woodlots	- Contribute to reduce pressure on natural forests
Research and monitoring	- Contribute to conservation of natural ecosystems and RTEs
Capacity building/training	- Ensure that local communities understand and protect natural values

On the other hand, in the absence of the project, it is expected that land use shall continue as unmanaged grassland. This is due to lack of financing for commercial forestry that appears to be the best alternative scenario. Uncontroled fires due to human activities under the without project scenario would continue to reduce biodiversity of the area through loses in soil fertility. This scenario could lead to extinction of RTE species and possibly other native species due to lack of conservation knowledge and high poverty level in the surrounding communities. Significant negative impacts onlocal biodiversity in the project area over time would be expected.

Comparing the "without project" to the "with project" scenarios in terms of impacts on biodiversity, it can be established that, the project will produce net positive biodiversity benefits.

B.1.2 Demonstrate that no High Conservation Values identified in G1.8.1-3 will be negatively affected by the project.

Based on results of the assessment of the project area against the HCVF toolkit, it is established that the areas contain HCVFs resulting from presence of RTE species. As stated in section B.1.1 above the project has identified and is protecting HCVFs in the project area. Measures in place (e.g. buffer zones) are expected to ensure that HCVFs are not affected by plantation establishment and management. In addition, regular monitoring will ensure that any impact that may occur is observed and mitigated. Furthermore the project will promote awareness on conservation of these values both to project workers and communities.

B.1.3 Identify all species to be used by the project and show that no known invasive species will be introduced into any area affected by the project and that the population of any invasive species will not increase as a result of the project.

The species to be planted are shown in Table B1.3 below. These species have been screened against national list of invasive species and proved to be non-invasive. The same species are being planted in the government owned forest near the project area since 1950s and have not show signs of invasive species. Invasive species will not be planted in the project; and when observed in the project zone they will be uprooted.

Table B.1.3.1: Main species for planting in the AAR VCS project:

Genera	Species
Eucalyptus	**Eucalyptus camadulensis**
Eucalyptus	**Eucalyptus cloeziana**
Eucalyptus	**Eucalyptus globulus**
Eucalyptus	**Eucalyptus grandis**
Eucalyptus	**Eucalyptus maidenii**
Eucalyptus	**Eucalyptus saligna**
Eucalyptus	**Eucalyptus tereticornis**
Eucalyptus	**Eucalyptus urograndis**
Eucalyptus	**Eucalyptus urophylla**

Pine	**Pinus caribaea**
Pine	**Pinus elliotti**
Pine	**Pinus oocarpa**
Pine	**Pinus patula**
Pine	**Pinus taeda**

B.1.4 Describe possible adverse effects of non-native species used by the project on the region's environment, including impacts on native species and disease introduction or facilitation. Project proponents must justify any use of non-native species over native species.

The planted exotic species are obtained from high quality stock generated from genetically superior seeds and are well adapted to the prevailing site conditions and broadened within and between species so as to ensure sustainability of the plantations against pests, diseases and climatic fluctuations. The project proponents are planting both pine and eucalyptus species which are exotic in Tanzania.

Possible adverse effects include suppression of the grass and shrub as a result of canopy closure. This will, however, provide suitable habitats for shade tolerant plant species as well as other taxa not facilitated by fire. Tree species planted are not invasive and therefore do not pose a threat to indigenous eco-systems in and around the project site. No disease introduction is expected as a result of exotic tree planting as those species have been in use in the region for decades now without any serious disease or pest incidences.

There are recent controversies and critiques from public against planting of exotic species especially of eucalyptus claiming that it would deplete biodiversity, water and soil resources. Professor Munishi from Sokoine University of Agriculture undertook a research in 2007[60], focusing on the adverse effects of eucalyptus on these resources. Similarliy, Nshubemuki[61] from

[60] The Eucalyptus Controversy in Tanzania. Munishi, PKT., 2007. Available online at: http://www.taftz.org/

[61] Nshubemuki L., 2007. Antithetical views on Eucalyptus: Prejudicial disposition versus untapped prospects. Available online at: http://www.taftz.org/

Tanzania Forest Research Institute carried out a research on anti-ethical views of eucalyptus on water depletion in the sites that they been planted for over a century in Kagera and Lushoto, Tanzania. The two studies have not found any proof to justify that eucalyptus may cause depletion of water, soil or biodiversity resources. This is because out of over 600 known species of eucalyptus, the only four species planted in Tanzania since colonial times have not depleted water where they were planted in trials or in plantations. Instead Nshubemuki proposes that the reduction in water resources may also have been contributed by climate change that has affected precipitation and evapotransipartion in many parts of Tanzania.

Even in Ethiopia, a study carried out to assess negative against positive effects of eucalyptus[62] revealed that, besides a few negative impacts, the species provided more environmental benefits and had substantial socio economic impacts such as lumber gains. This is supported by FAO[63] (Davidson 1993), which compares the Eucalyptus with a range of crops. From this study, it is evident that eucalyptus can achieve a high biomass production on a low nutrient uptake (as little as one-half to one-tenth that of most agricultural and estate tree crops). The same study also reveals that Eucalyptus appears to use less water per unit weight of biomass produced than other kinds of trees and many agricultural crops. Water consumption by eucalyptus is reduced by planting trees further apart or by thinning existing plantations, thus lowering water consumption per unit area of land. With these studies in mind, and own experience the project proponents believe that planting eucalyptus and pine will not result into water and soil degradation in the area.

The justification for why exotic species must be used resides in the growing demand for timber and electrical poles due to higher harvesting rates and slow growth of native species, making exotic plantation the only feasible solution to it. But also the project sites lack fertility and seeds to support native species. Despite this, some trial planting with native species at Uchindile and Mapanda was done but has shown poor results, justifying that the area is not suitable for planting native species for commercial purposes.

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[62] Senbeta, F., 2010. Is Eucalyptus Farming Blessing or Curse in the Central Highlands of Ethiopia? Analysis from Farmers' Perspective

[63] Ecological Aspects of Eucalyptus Plantations. Davidson (1993) FAO http://www.fao.org/docrep/005/ac777e/ac777e06.htm

B.1.5 Guarantee that no GMOs will be used to generate GHG emissions reductions or removals.

The forestry policy of Tanzania discourages the use of Genetically Modified Organisms in plantations. No genetically modified organisms (GMOs) are to be planted in this project and hence no carbon credits shall be claimed from these species. The seedlings production shall not involve seed culture, but direct sowing on the ground and the project shall ensure seeds for planting are to be obtained from known seed sources.

B2. Offsite Biodiversity Impacts

B.2.1 Identify potential negative offsite biodiversity impacts that the project is likely to cause.

The project is not expected to have negative offsite biodiversity impacts as a result of project activity. Nevertheless since RTEs (table G1.8.1) were identified in the project area, monitoring and mitigation measures will be put in place to reduce/avoid negative impacts.
The EIA/SEIA covers potential negative impacts of the project which are described in section F1 of the VCS PDD.

B.2.2 Document how the project plans to mitigate these negative offsite biodiversity impacts.

To respond to these potential adverse effects on the RTEs as stated in section B.2.1 above, recommendations of the EIA and ecological studies will be followed (see section F1 and F3 of the VCS PDD).
Regular monitoring means that any negative impacts will be identified timely and remedial measures implemented by the project. Furthermore, tree planting and education campaigns are some of the long term measures undertaken to reduce biodiversity degradation in the project zone.

B.2.3 Evaluate likely unmitigated negative offsite biodiversity impacts against the biodiversity benefits of the project within the project boundaries. Justify and demonstrate that the net effect of the project on biodiversity is positive.

All likely negative biodiversity impacts will be mitigated. Therefore unmitigated negative biodiversity impacts are not expected. From what has been stated in sections B1 to B2.2. the

project is expected to have net positive effects on biodiversity.

B3 Biodiversity Impact Monitoring

B.3.1 Develop an initial plan for selecting biodiversity variables to be monitored and the frequency of monitoring and reporting to ensure that monitoring variables are directly linked to the project's biodiversity objectives and to anticipated impacts (positive and negative).

The biodiversity monitoring plan has been developed[64] and is being submitted along with this PDD for validation. In this plan, the variables selected and monitoring frequency is given.

B.3.2 Develop an initial plan for assessing the effectiveness of measures used to maintain or enhance High Conservation Values related to globally, regionally or nationally significant biodiversity (G1.8.1-3) present in the project zone.

The selection of the HCVFs adopted a conservative approach in which all areas that contain native vegetation (pockets of natural forest and riverine vegetation) and a blue swallow grassland area will be conserved as HCVF. Furthermore in addition to internal biodiversity monitoring GRL will consult external expertise when needed and external ecological and biodiversity studies will be carried out in the project area.
The project will also use satellite images to monitor major changes over time and confirm that conservation measures like buffer zones are maintained.

B.3.3 Commit to developing a full monitoring plan within six months of the project start date or within twelve months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders.

The biodiversity monitoring plan has been developed, will be implemented and results will be made publicly available locally an on the internet.

[64] GRL Uchindile and Mapanda CCBA Biodiversity Monitoring Plan, 2012

Gold Level Section

GL1. Climate Change Adaptation Benefits

GL.1.1. Identify likely regional climate change and climate variability scenarios and impacts, using available studies, and identify potential changes in the local land-use scenario due to these climate change scenarios in the absence of the project

GL.1.2. Identify any risks to the project's climate, community and biodiversity benefits resulting from likely climate change and climate variability impacts and explain how these risks will be mitigated

N/A

GL.1.3. Demonstrate that current or anticipated climate changes are having or are likely to have an impact on the well-being of communities and/or the conservation status of biodiversity in the project zone and surrounding regions

N/A

GL.1.4. Demonstrate that the project activities will assist communities and/or biodiversity to adapt to the probable impacts of climate change

N/A

GL2. Exceptional Community Benefits

GL.2.1. Demonstrate that the project zone is in a low human development country *or* in an administrative area of a medium or high human development country in which at least 50% of the population of that area is below the national poverty line

N/A

GL.2.2. Demonstrate that at least 50% of households within the lowest category of well-being (e.g. poorest quartile) of the community are likely to benefit substantially from the project

N/A

GL.2.3. Demonstrate that any barriers or risks that might prevent benefits going to poorer households have been identified and addressed in order to increase the probable flow of benefits to poorer households

N/A

GL.2.4. Demonstrate that measures have been taken to identify any poorer and more vulnerable households and individuals whose well-being or poverty may be negatively affected by the project, and that the project design includes measures to avoid any such impacts. Where negative impacts are unavoidable, demonstrate that they will be effectively mitigated

N/A

GL.2.5. Demonstrate that community impact monitoring will be able to identify positive and negative impacts on poorer and more vulnerable groups. The social impact monitoring must take a differentiated approach that can identify positive and negative impacts on poorer households and individuals and other disadvantaged groups, including women

N/A

GL3. Exceptional Biodiversity Benefits

N/A