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

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History of the document:

Version	Date	Nature of Revisions
01	11 July 2007	First final draft
02	15 July 2008	Second final draft considering changes in PDD format
03	09 October 2008	Revised final draft incorporating clarifications and corrective actions from valifation by on-site assessment

SECTION A. General description of the proposed small-scale A/R CCB project activity:

A.1. Title of the proposed small-scale A/R CCB project activity:

Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative Kirimara-Kithithina Small Scale A/R Project

A.2. Description of the proposed small-scale A/R CCB project activity:

In 2007 and 2008 the **Aberdare Range / Mt. Kenya Small Scale Reforestation Initiative** will reforest 1763 hectares hectares of degraded forest lands in the Aberdare Range and Mt. Kenya Regions. Lands chosen are in the catchment areas of the Tana River within the Aberdare and Mt. Kenya Reserve Forests (gazetted). They will be reforested using a mix of fast, medium and slow growing indigenous species. The project is operated by Green Belt Movement (GBM) on behalf of Community Forest Associations (CFAs) in association with the Ministry of Environment and Natural Resources, Kenya Forest Service (KFS). This PDD is submitted for the Kirimara-Kithithina site (163.32 ha).

The purpose of the proposed activity is to reforest environmentally sensitive lands in the catchment areas of the Tana River within the Aberdare and Mt. Kenya Reserve Forests.

The proposed activity adds to sustainable development because it:

1. requires that communities in the area form CAs (either Constituency Community Association or Community Forest Association) and develop forest management plans with which the CAs are granted exclusive forest user rights to all non-wood forest products including medicinal plant, honey and grass collection and environmental services like carbon rights in the framework of a Community Forest Management Agreement under the Forest Act 2005.
2. offers income generation opportunities for CA members to plant and tend the seedlings during the first two years. This will provide income of approximately 10 Ksh per tree (US$130 / ha) directly to the groups involved in the tree planting. This represents a significant amount of income since the annual income in Kenya is less than a dollar per person in rural areas.
3. additional revenue will be generated from the sale of carbon[1] .CA's assigns the verified emission reductions to the Green Belt Movement (GBM) and in exchange the GBM will cover i) direct project development related costs; ii) the entire charges for the Community Forest Management Agreements; iii) introduces income generating activities and iv) provides financial incentives to sustain community bursaries. The above order indicates revenue utilization priorities.

A.3. Project participants:

For the Kirimara-Kithithina Small Scale A/R Project.

[1] depending on the growth rate of the trees and the contractual agreement for the sale of carbon.

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Indicate if the Party involved wishes to be considered as a project participant (Yes/No)
Kenya (host country)	Green Belt Movement	No
Government of Canada	International Bank for Reconstruction and Development as a Trustee of the World Bank Group for the Biocarbon Fund	Yes
(*) At the time of making the CDM-SSC-AR-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

Note: The Community Association of Upper North Imenti (CFA) has allowed GBM to act on their behalf to quantify, and trade the carbon sequestered in the licensed gazetted forest.

A.4. Description of location and boundary of the small-scale A/R CCB project activity:

Mt. Kenya, Kenya

A.4.1. Location of the proposed small-scale A/R CCB project activity:

A.4.1.1. Host Party(ies):

Kenya

A.4.1.2. Region/State/Province etc.:

North Imenti Constituency

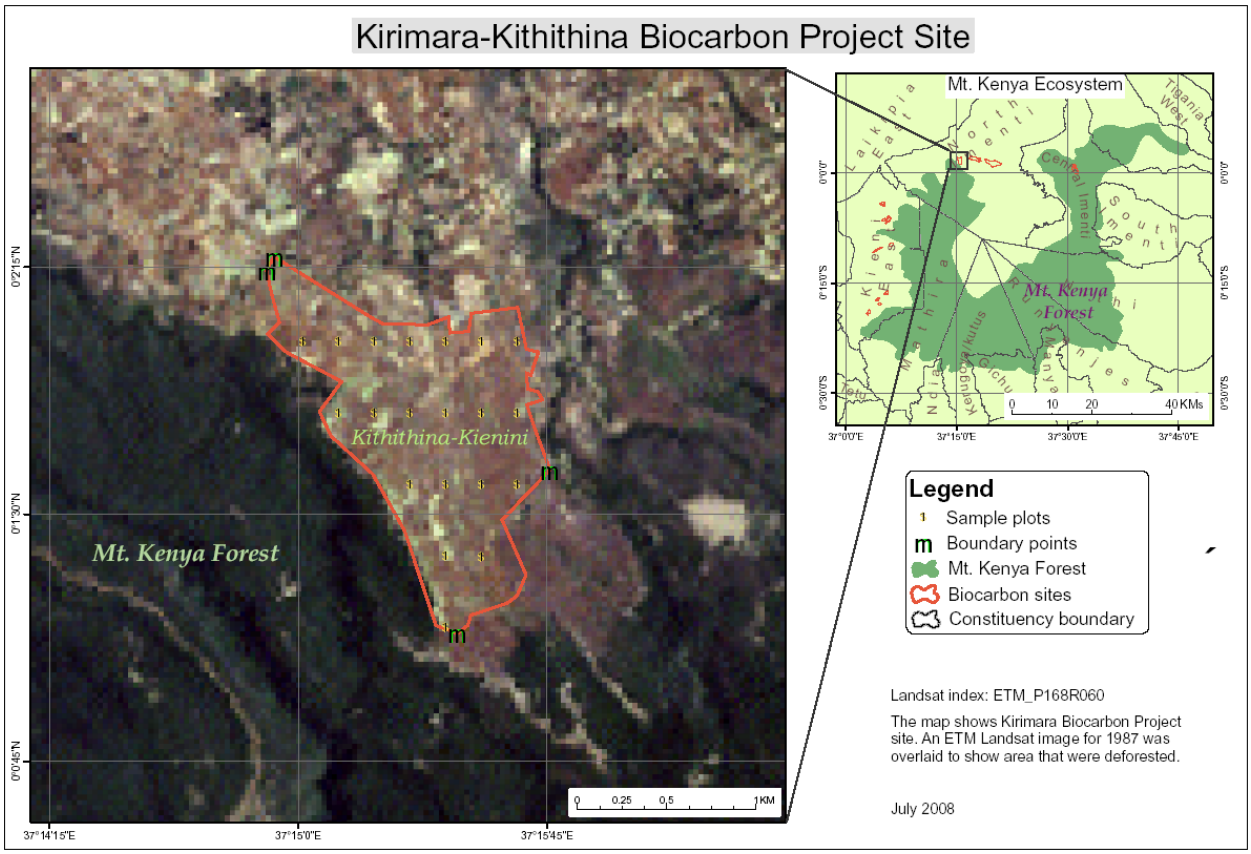
A.4.1.3. City/Town/Community etc:

North Imenti Constituency

A.4.2. Detail of geographical location and project boundary, including information allowing the unique identification(s) of the proposed small-scale A/R CCB project activity:

Figure 1 shows the location of the Kirimara-Kithithina site. Exact coordinates of the project boundary corner points are given in the supporting document.

Figure 1: Kirimara-Kithithina Project Site



A.5. Technical description of the small-scale A/R CCB project activity:

The project will use GBM's existing infrastructure of network, groups and community nurseries to collect and germinate seeds, raise planting stock and plant seedlings. As a part of the process all participating community groups formed Community Associations (CAs). They will participate with the Kenya Forest Service and the GBM in the selection of planting sites, and the development of forest management plans for the duration of the project. Species selected have multiple uses so as to generate income for the CAs.

Seed selection and propagation

The project will use only indigenous tree species that are part of the natural vegetation of the ecosystem. Seeds will be selected following the World Agroforestry Toolkit and Reference "Tree Seeds for Farmers"[2] published in 2006 to select and manage seeds. Green Belt Movement has published its own

[2] Kindt R., Lillesø J.P.B., Mbora A., Muriuki J., Wambugu C., Frost W., Beniest J., Aithal A., Awimbo J., Rao S., Holding-Anyonge C. 2006. *Tree Seeds for Farmers: a Toolkit and Reference Source*. World Agroforestry Centre (ICRAF), Nairobi. http://www.worldagroforestry.org/treesandmarkets/tree%20seeds/Documents%20of%20Toolkit/PDF/Toolkit.pdf

"Forest and Environmental Guide Notes"[3]. which provide guidelines quality assurance and quality control procedures for seed selection.:

- Seed Sourcing
- Seed Collection
- Seed Processing
- Seed Storage
- Seed Dormancy and Pre-sowing Treatments
- Seed Quality – Physiological and Genetic
- Seed Distribution
- Seed Documentation

After an on-the-job training provided by the GBM volunteer and extension officer, CA members will collect the seeds under the supervision of the Kenya Forest Service..Existing tree nurseries will be assessed to analyse if they are in a good condition or have to be upgraded or establish new nurseries to produce the expected number of seedlings. Nursery owners will receive incentives and assurance that GBM is procuring the seedlings. Currently, there is no guideline on germination and propagation periods for all selected tree species. Knowledge will be gathered after the nurseries are established and in use. Seedlings will be raised in polyethylene containers using quality seeds, collected according to the guideline mentioned above. In case wildlings can be collected near by and transport can be ensured in a way that the fine root system is not drying up, wildlings will be used as well. Seedlings will be planted at a height of 30 cm.

The GBM extension officer will assist CAs to collect seeds, develop and up-grade nurseries, raise seedling and plant them. A monitoring system will be established to improve the planning of seedling production and to make sure that enough seedlings are raised. The monthly reports contain information on the status of the nursery (numbers of trees per species, tree height, expected time and numbers when trees are ready to plant, nutrient deficiencies etc.

Once trees begin to grow, they are transplanted into individual containers or plastic bags in anticipation of distribution using the existing GBM network. The GBM "Green Volunteers" (GVs) assist CAs with the submission of monthly reports to headquarters. The reports contain information on the status of the nursery (numbers of trees), the numbers that are ready for distribution and any challenges facing the nursery.

Forest restoration approach - site tree species matching

The main purpose of the reforestation project is to restore a natural forest ecosystem and its biodiversity. Therefore, only tree species that are indigenous to the area and that can be raised successful in the nursery will be planted based on the "framework tree species method"[4]. The approach combines the planting of 8 key tree species, selected for their potential to accelerate natural regeneration and biodiversity recovery.

Planting

[3] Green Belt Movement. 2005. Forest and Environmental Guide Notes. Available upon request.

[4] Forest Restoration Research Unit, 2005. How to Plant a Forest: The Principles and Practice of Restoring Tropical Forests, Biology Department, Science Faculty, Chiang Mai University, Thailand. http://www.forru.org/newsletter&literature.htm

For each seedling, a CA member under supervision by GBM trained staff dig a hole roughly 30 cm in diameter and 30 cm deep with the soil being conserved. The hole is lined with litter and other humous, at which point the seedling and soil is returned to the hole. Manure may be applied where the soil quality is poor. The hole is mulched over with cut grasses taken from the surrounding ground. The 50 cm hole acts as a rain water catchment area and improves the likelihood of survival.

Tending – 1st year

GBM and CA members conduct the first verification of seedling survival at one month and that information is sent to the headquarters. Verification involves inspecting the trees planted and determining that they are well taken care of. A second verification of the same seedlings is conducted at three months. A report is sent to the GBM headquarters. If the reports are acceptable to the monitors, the CA receives the survival bonus from GBM. By so doing, the CA gets a small compensation for the number of trees surviving at the time of the second follow up. The survival of the trees is significantly increased if the seedlings survive the first three months.

During first year, competition from grasses and other vegetation is controlled by hand cutting. Trees will be weeded approximately three times during the first year. No herbicides or pesticides are used. This is used as fodder by the CA.

Management – After the 1st year

After the first year, the trees will be weeded two times in the subsequent years, depending on the growth of the competing grasses and until the trees are tall enough to out-compete the grasses. Harvesting of grasses is permitted at all times but attention has to be paid that no trees are damaged. Grazing is not permitted.

For all non-wood forest products sustainable utilisation arrangements will be developed. Community based monitoring procedures will be developed to ensure that individual products are not over utilised. For example, the trees will be punned to allow some light penetration to the ground. Fire wood can be collected by CAs from the prunnings and natural mortality.

During the fire season, fire breaks will be established between the planted trees and other land-uses. Fire-lines with a width of 4 m will be kept free from high grass and litter. In addition, during high risk periods guards will patrol the area. Community members will be trained on fire prevention and fire fighting. Ten sets of fire fighting equipment will be stored close to the planting site during the fire season. The foresters will put up fire rating signs to increase the awareness of CA members on the fire risk situation.

A.5.1. Type(s) of small-scale A/R CCB project activity:

Grassland converted to forested land

A.5.2. A concise description of present environmental conditions of the area, which include information on climate, soils, main watershed, ecosystems, and the possible presence of rare or endangered species and their habitats:

Mt Kenya[5]

[5] Reprinted from Emerton, L. 1999. Mount Kenya: The Economics Of Community Conservation. Evaluating Eden Series. Discussion Paper No.4.

The project area is in North Imenti constituency on the northern side of Mt. Kenya. The area is characterized by a number of ridges dropping towards the north. It has an altitudinal range of 2100 m - 2200 m a.s.l. The annual average rainfall is about 800-1,200 mm occurring mainly in two rainy seasons (March-May and September-December). Together with a relatively low mean annual temperature of 17.5°C this results in favorable tree growth conditions. The main watershed is the Tana river which flows into the Indian Ocean. The soil in most areas is sandy loam.

Mount Kenya Forest is one of the largest, most ecologically significant and commercially important natural forest areas in Kenya and is considered to be among the highest priority, forests for national conservation (Wass 1995). It is also one of the most threatened forests, in the country because of its commercially valuable reserves of indigenous timber, and due to the large human population living in the vicinity of its boundary, Mount Kenya Forest Reserve covers an area of just over 2 000 km^2 of dry montane and montane rain forest, making it one of Kenya's largest contiguous blocks of indigenous, forest. The Forest Reserve surrounds 71.5 km^2 of Mount Kenya National Park, which also represents the second highest mountain in Africa .

Although originally gazetted to safeguard commercial timber interests, environmental protection has become an important reason for the reservation of Mount, Kenya Forest. The forest has exceptional value in biodiversity and contains diverse, vegetation including several endemic Afro-alpine plant species as well as commercially valuable Juniperus, Ocotea, Olea, Podocarpus and Vitex timber species. It also provides habitat to a wide range of fauna, including four threatened bird species and mammal species (Davies 1993). The forest forms a major water catchment from which two of the country's five river basins − the Tana and Ewaso Nyiro − which together supply water to more than a quarter of Kenya's population and support over half of its irrigated area (Wass 1995), including hydroelectric power sources that account for three-quarters of national electricity requirements.

Soil

Soils in the Mt. Kenya region are generally Lithosols and Histosols (FAO classification) at the highest altitudes with Humic Andosols at slightly lower elevations. Over much of the rest of the basalt foot slopes, deep fragile clays (Eutric Nitosols) predominate[6].

Drought, Flood and other extreme events

The following table gives a rough overview of drought and flood occurrence in southern Africa[7].

[6] Mutua1, B. and A. Klik. 2006. Estimating Spatial Sediment Delivery Ratio on a Large Rural Catchment. Journal of Spatial Hydrology **6**(1) .

[7] Source, State of the environment in Southern Africa, Southern Africa Development Community, 1994. Republished at http://www.ess.co.at/GAIA/CASES/ZIM/drought.html

Table 1: Occurrence of drought and flood in southern Africa

Era	Drought	Flood	Comments
1820-30	√		Severe drought throughout Africa
1844-49	√		Southern Africa experienced five consecutive drought years.
1870-90		√	This period was humid in some areas and former Lake Ngami, in the northwest of Botswana, was full.
1910	√		
1921-30	√		Severe droughts in the region.
1930-50			Southern Africa experienced dry periods alternating with wet ones, and in some years the rains were very good. The 1946-47 season experienced a severe drought.
1967-73			Drought in southern Africa, while the equatorial region experienced above average rainfall
1974-80		√	This period of six years was relatively moist over much of southern Africa. In 1974, the average annual rainfall was 100 percent above normal throughout the region.
1981	√		Southern Africa
1982	√		Drought extends to all sub-tropical Africa
1983			Drought extends to all Africa
1986-87	√		
1991-92	√		Southern Africa, excluding Namibia, experienced the worst drought in living memory.

Fire

Most of Kenya's forests, especially the high productive indigenous forests and plantations are located in the relatively high fire prone areas. The fires continue to be one of the biggest forest health hazards. Most fires have anothropogenic origin. Of these fires, 40% are classified as arson, 20% are caused by negligence and 40% are due to unknown causes. Table 2 lists the occurrence of fires during the 1990s[8].

[8] Wass, P. 2000. Kenya's Forest Resource Assessment. EC-FAO Partnership Programme (1998-2002) – Project GCP/INT/679/EC Data Collection and Analysis for Sustainable Forest Management in ACP Countries – Linking National and International Efforts.

Table 2: Number of fires and area burned: Kenya 1990 – 1999

	AREA BURNT (ha)			
YEAR	**PLANTATION**	**INDIGENOUS**	**BUSH/GRASS**	**NO. OF FIRES**
1990	85	331	12,183	36
1991	1,705	236	6,697	64
1992	6,170	5,494	13,302	180
1993	1,731	515	1,718	48
1994	690	69	1,913	40
1997	4,726	2,961	7,729	121
1999	1,449	317	2,041	59

Biodiversity

The Mt. Kenya forests host a number of threatened fauna species. The Jackson mongoose (Bdeugale jacksoni), endemic to Kenya's montane forests and the rarely seen golden cat (Felix aurata) are two threatened mammals. Other large threatened mammals of international conservation interest that occur in Aberdare forests are bongo (Tragelaphus euryceros), giant forest hog (Hylochoerus meinertzhageni), black rhino (Diceros bicornis), elephant (Loxodonta africana), leopard (Panthera pardus) and African hunting dog (Lycaon pictus). In addition, the forest harbours bushbuck (Tragelaphus scriptus), mountain reedbuck (Redunca fulvorufula), waterbuck (Kobus ellipsi prymnus), cape buffalo (Syncerus caffer), suni (Neotragus moschatus), side-striped jackel (Canis adustus), eland (Taurotragus oryx), and varieties of duikers and bushbabies.

The forests are rich in primates, the common ones include the black-and-white colobus monkey (Colobus guereza), sykes monkey (Cercopithecus mitis), vervet monkey (Cercopithecus aethiops) and baboons (Papio anubis neumanni).

Mt. Kenya is internationally recognized as an Important Bird Area (IBA). The Range holds 52 of Kenya's 67 Afrotropical highland species and six of the eight restricted range species in the Kenyan montane endemic bird areas. Over 270 species of birds have been recorded in the Mt.Kenya/Aberdare complex including the following globally threatened and restricted-range species: Sharpe's Longclaw, Abbott's Starling, Aberdare Cisticola and Jackson's Widowbird. Regionally threatened species found in the Mt. Kenya/Aberdares include Cape Eagle Owl, African Crowned Eagle, and African Green Ibis. Jackson's Francolin, Hartlaub's Turaco and Bar-tailed Trogon are characteristic and spectacular birds of the Aberdare Range.

Mt. Kenya also holds several amphibians that are endemic to the central Kenyan highlands including Hyperolius montanus, Hyperolius cystocandicans, Rana wittei and Phrynobatrachus kinangopensis. latifolius) and Hagenia (Hagenia abyssinica). Other notable plants include the Aberdare/Mt. Kenya endemics Lobelia bambuseti and Senecio keniodendron.

Table 3: Red List Species - Kenya, Tropical Moist Montane

The IUCN Red List of Threatened Species™ Search Resu

Sort results by . . .

Scientific Name Sort

Viewing results **1** to **30** of **30**.

#	[Scientific Name]	Common Name(s)	Red List
1	Afrana ruwenzorica		DD ver 3.1 (2001)
2	Afrana wittei		DD ver 3.1 (2001)
3	Anthreptes pallidigaster	AMANI SUNBIRD (E)	EN B1ab(i,ii,iii,v)+2ab (i,ii,iii,v) ver 3.1 (2001)
4	Apalis chariessa	WHITE-WINGED APALIS (E)	VU B1ab(i,ii,iii,iv,v) ver 3.1 (2001)
5	Apalis fuscigularis	TAITA APALIS (E)	CR B2ab(i,ii,iii,v); C2a(ii) ver 3.1 (2001)
6	Arthroleptides dutoiti	DU TOIT'S TORRENT FROG (E)	CR B2ab(iii) ver 3.1 (2001)
7	Boulengerula changamwensis		DD ver 3.1 (2001)
8	Bufo lonnbergi		NT ver 3.1 (2001)
9	Bufo mocquardi		DD ver 3.1 (2001)
10	Cinnyricinclus femoralis	ABBOTT'S STARLING (E)	VU C2a(ii) ver 3.1 (2001)
11	Crocidura ultima	ULTIMATE SHREW (E)	DD ver 3.1 (2001)
12	Encephalartos kisambo	VOI CYCAD (E)	EN A2cd; B1ab(ii,iii,v)+2 (ii,iii,v) ver 3.1 (2001)
13	Eremomela turneri	TURNER'S EREMOMELA (E)	EN B1ab(i,ii,iii,iv,v) ver 3.1 (2001)
14	Grammomys gigas	GIANT THICKET RAT (E)	EN B1ab(iii) ver 3.1 (2001)
15	Hypsugo eisentrauti	EISENTRAUT'S PIPISTRELLE (E)	DD ver 3.1 (2001)
16	Loxodonta africana	AFRICAN ELEPHANT (E) ÉLÉPHANT AFRICAIN (F) ÉLÉPHANT D'AFRIQUE (F) ELEFANTE AFRICANO (S)	VU A2a ver 3.1 (2001)
17	Lycaon pictus	AFRICAN WILD DOG (E) CAPE HUNTING DOG (E) PAINTED HUNTING DOG (E) WILD DOG (E) CYNHYENE (F) LOUP-PEINT (F) LYCAON (F) LICAON (S)	EN C2a(i) ver 3.1 (2001)
18	Muscicapa lendu	CHAPIN'S ALSEONAX (E) CHAPIN'S FLYCATCHER (E)	VU C2a(i) ver 3.1 (2001)
19	Otomops martiensseni	LARGE-EARED FREE-TAILED BAT (E)	NT ver 3.1 (2001)
20	Phrynobatrachus irangi		EN B1ab(iii) ver 3.1 (2001)
21	Potamonautes raybouldi	EAST AFRICAN TREE HOLE CRAB (E)	VU B1ab(iii); C2a(i) ver 3.1 (2001)
22	Praomys delectorum	DELECTABLE SOFT-FURRED MOUSE (E) EAST AFRICAN PRAOMYS (E)	NT ver 3.1 (2001)
23	Rhinolophus deckenii	DECKEN'S HORSESHOE BAT (E)	DD ver 3.1 (2001)
24	Sheppardia gunningi	EAST COAST AKALAT (E) GUNNING'S AKALAT (E)	VU B2ab(i,ii,iii,v) ver 3.1
25	Sorindeia calantha		CR B1+2d ver 2.3 (1994)
26	Tauraco fischeri	FISCHER'S TURACO (E) TOURACO DE FISCHER (F)	NT ver 3.1 (2001)
27	Turdus helleri	TAITA THRUSH (E)	CR B2ab(i,ii,iii,iv,v) ver 3.1 (2001)
28	Zoothera guttata	NATAL THRUSH (E) SPOTTED FOREST THRUSH (E) SPOTTED GROUND-THRUSH (E)	EN B2ab(i,ii,iii,iv,v); C2a ver 3.1 (2001)
29	Zosterops kulalensis	KULAL WHITE-EYE (E)	VU D2 ver 3.1 (2001)
30	Zosterops silvanus	TAITA WHITE-EYE (E)	EN B1ab(i,ii,iii,v) ver 3.1

A.5.3. Species and varieties selected:

The starting point for matching species is the natural vegetation of an area. Mt Kenya is part of the Afromontane forest located along the African Rift Valley in southern Sudan, Kenya, Uganda and northern Tanzania. Trees species and provenances occurring naturally at a site are integral part of this ecosystem. Considering the goal of the GBM is to restore natural forests, indigenous tree species of Mt. Kenya and the Aberdares will be planted.

Based on reports from UNEP (2003) and KWS (1999), the most common species of trees on Mt. Kenya include Camphor (Ocotea usambarensis), Cedar (Juniperus procera), Wild Olive (Olea europaea), Meru Oak (Vitex keniensis), Podo (Podocarpus latifolius), East African Rosewood (Hagenia abyssinica), Croton (Croton macrostachyus) and Mugumo (Ficus thonningii). Common hardwood tree species at the Aberdares include Camphor (Ocotea usambarensis), Cedar (Juniperus procera) and Podo (Podocarpus). Of these, the following species will be used in the project.

Table 4 Species Planted and Uses

Botanical Name	English Name	Primary Uses	Growth	Shade Tolerance
Croton macrocarpus		Shade, fuel wood	Fast	low
Cordia africana	Large leaved Corida	Timber edible fruits	Fast	low
Markhamia lutea			Fast	low
Juniperus procera	Cedar	Timber, building materials, medicinal	Medium	
Podocarpus *sp*			Medium	high
Prunus africana			Medium	high
Vitex keniensis	Meru oak	Edible fruit, timber	Slow	

A.5.4. Technology to be employed by the proposed small-scale A/R CCB project activity:

The following technology will be used:

1. Propagation of locally collected seeds from indigenous species using nurseries;
2. Hand planting of seedlings by CA members;
3. Hand cutting of vegetation to reduce competition;
4. Hand pruning of branches to allow light to penetrate to the forest floor

A.5.5. Transfer of technology/know-how, if applicable:

The transfer of technology to the communities will be as follows:
GBM as the capacity building organisation will train in the field. GBM Extension workers are giving on site advice and practical training on the technologies to be employed.

A.5.6. Proposed measures to be implemented to minimize potential leakage as applicable:

A.6. A description of legal title to the land, current land tenure and land use and rights to tCERs / lCERs issued:

The lands are within the Kenya Forest Reserve so are owned by the Government of Kenya. The Kenya Forest Service has granted the Upper North Imenti Community Forest Association (CFA) a license to manage the projects lands which includes the rights to the carbon. The Upper North Imenti Community Forest Association (CFA) has granted Green Belt Movement right to act on their behalf as AR project participant.

All legal agreements are included in the supporting document.

A.7. Assessment of the eligibility of land:

To be eligible to the use the Small Scale methodology the project can only occur on lands

1. that were grasslands or croplands in 1990 and
2. that were not subjected to ploughed during plantation establishment and
3. where there is less than 50% displacement of households or pre-project agricultural activities.

Following "Procedures To Demonstrate The Eligibility Of Lands For Afforestation And Reforestation Project Activities (Version 01)"[9]

Step 1(a) i) For the purposes of the Kyoto Protocol, Kenya has defined "forest" as an area with:

- 30% canopy cover;
- 2 m potential tree height; and
- 0.1 hectares area

The project site is greater than 0.5 hectares as measured by GPS. The baseline survey found that the site is dominated with grasses that prevent the return of the natural forest even though there are few woody perennials on site. The site is:

ii) *All young natural stands and all plantations on the land are not expected to reach the minimum crown cover and minimum height chosen by the host country to define forest; and*

iii). *The land is not temporarily unstocked, as a result of human intervention such as harvesting or natural causes.*

The details of the site survey are given in the supporting document.

Step 1 (b) This site has been grassland since 1987 constituting a reforestation activity as proven using LANDSAT images (see **Figure 1**, page 4) and has been grassland at the starting date in 2007 according to ground truthing.

[9] EB 35 repan 18: http://cdm.unfccc.int/EB/026/eb35_repan18.pdf

A.8. Approach for addressing non-permanence:

Non-permanence is being addressed by the issuance of tCERs

A.9. Duration of the proposed small-scale A/R CCB project activity / Crediting period:

20 (year) year crediting period, which may be renewed twice, adding up to a total maximum crediting period of 60 (sixty) years.

A.9.1. Starting date of the proposed small-scale A/R CCB project activity and of the (first) crediting period, including a justification:

October 1, 2007 – with the start of the first planting preparations

A.9.2. Expected operational lifetime of the proposed small-scale A/R CCB project activity:

60 years

A.9.3. Choice of crediting period and related information:

Optional renewable crediting period

A.9.3.1. Duration of the first crediting period (in years and months), if a renewable crediting period is selected:

20 years

A.9.3.2. Duration of the fixed crediting period (in years and months), if selected:

Not applicable

A.10. Estimated amount of net anthropogenic GHG removals by sinks over the chosen crediting period:

Tab A-5 Net anthropogenic GHG removals by sinks over the chosen crediting period

	Annual net a. GHG removals by sinks	Cumulative net a. GHG removals by sinks
Year	tCO2e	tCO2e
2007	4,507	4,507
2008	3,288	7,795
2009	3,524	11,319
2010	4,960	16,280
2011	6,527	22,807
2012	7,704	30,511
2013	8,581	39,092
2014	9,339	48,432
2015	9,198	57,629
2016	9,056	66,686
2017	8,945	75,630
2018	8,208	83,838
2019	7,472	91,310
2020	6,761	98,071
2021	6,051	104,123
2022	5,442	109,565
2023	5,410	114,975
2024	5,282	120,257
2025	4,901	125,159
2026	3,874	129,033
Total estimated net a. GHG removals by sinks	**129,033**	
Total crediting years	**20**	
Annual average over the crediting period	**6,452**	

A.11. Public funding of the proposed small-scale A/R CCB project activity:

The **Kirimara-Kithithina Small Scale A/R Project** is one of seven SSC A/R projects that comprise the **Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative** developed by Green Belt Movement in the Aberdare Range and Mt. Kenya region. The total area of all projects with the initiative is 1763 ha. It has a total budget of $3.7 million. The detailed budget is available upon request.

Project Development and Baseline Studies

For the development of the Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative, Green Belt Movement used public funds and donations from numerous organizations to fund project development, land identification and baseline studies. These are given in the annex.

Sustainable Development Activities

Associated with the Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative are activities that promote sustainable land use management; alternative household income sources, food security, water harvesting and civic education and advocacy. The activities although are not required part of the CDM A/R project activities, but are vital components to ensure the success of the Green Belt Movement Initiative on sustainable development. The cost of these activities is covered from voluntary donations and supplemental funding local public agencies.

There is no official development assistance or other public funding to the Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative. The declarations that the funding is not the diversion of ODA were obtained from all relevant Annex I parties. These are given in the annex II.

A.12. Confirmation that the small-scale A/R CDM project activity is not a debundled component of a larger project activity:

This project is not a debundled of a larger project because there is no other CDM A/R project;

(a) *With the same project participants*;
(b) *Whose project boundary is within 1 km of the project boundary of the proposed small-scale afforestation or reforestation activity under the CDM at the closest point*.[10]

SECTION B. Application of a baseline and monitoring methodology :

B.1. Title and reference of the approved baseline and monitoring methodology applied to the proposed small-scale A/R CCB project activity:

Simplified baseline and monitoring methodologies for small-scale afforestation and reforestation project activities under the clean development mechanism implemented on grasslands or croplands AR-AMS0001 / Version 05

B. 2. Justification of the applicability of the baseline and monitoring methodology to the proposed small-scale A/R CCB project activity:

The choice of methodology is justified because:

1. The proposed project activity is "grasslands to forested lands";
2. There has been no ploughing of lands during plantation establishment;
3. The displacement of activities due to the implementation of the project activity is less than 50%; and
4. Significant changes in the carbon stocks, in particular the living biomass pool of woody perennials and the below-ground biomass of grasslands, are not expected to occur in the absence of the project activity.

B.3. Specification of the greenhouse gases (GHG) whose emissions will be part of the proposed small-scale A/R CCB project activity:

[10] Dec.14 / CP.10 Appendix C

As per the simplified baseline and monitoring methodologies fore selected small-scale afforestation and reforestation project activities under the clean development mechanism, CO_2 is the only GHG included as part of the proposed small-scale A/R CCB project activity.

B.4. Carbon pools selected:

As per the Simplified baseline and monitoring methodologies fore selected small-scale afforestation and reforestation project activities under the clean development mechanism only above ground and below ground biomass are selected.

CARBON POOL	SELECTED
Above ground, tree and woody perennials	Yes, main carbon pool increased through project activity
Below ground, tree, woody and grass	Yes
Dead wood	No, pool likely to increase compared with the baseline but excluded (conservative)
Litter	No
Soil organic carbon	No

The SSC A/R methodology does not include dead wood, litter, and soil pools.

B.5. Description of strata applied for ex ante estimations:

Due to the size of the project area, its location and uniform nature, we will assume one baseline stratum

B.6. Application of baseline methodology to the proposed small-scale A/R CCB project activity:

The baseline is assumed to be the "existing or historical, as applicable, changes in carbon stocks in the carbon pools within the project boundary".

The existing land use is "Grassland with the removal of fodder". These lands have been grasslands since before 1990 as evidenced from satellite images and there has been no encroachment of woody perennials.

Given this information, we have assumed that

Significant changes in the carbon stocks, in particular the living biomass pool of woody perennials and the below-ground biomass of grasslands, are not expected to occur in the absence of the project activity.

As such following the paragraph 10 (a) of the SSC methodology:

Changes in carbon stocks shall assumed to be zero.

Baseline carbon stocks are determined using equation 1:

$$B_{(t)} = \sum_{i=1}^{I} \left(B_{A(t)i} + B_{B(t)i} \right) * A_i \qquad (1)$$

Where:
$B_{(t)}$ = carbon stocks in the living biomass pools within the project boundary at time *t* in the absence of the project activity (t C);
$B_{A(t)i}$ = carbon stocks in above-ground biomass at time *t* in the absence of the project activity (t C/ha)
$B_{B(t)i}$ = carbon stocks in below-ground biomass at time *t* in the absence of the project activity (t C/ha)
A_i = project activity area of stratum *i* (ha)
i = stratum *i* (*I* = total number of strata)

Above-ground biomass

For above-ground biomass $B_{A(t)}$ is determined for the one stratum as follows:
Living biomass carbon pools are expected to be constant

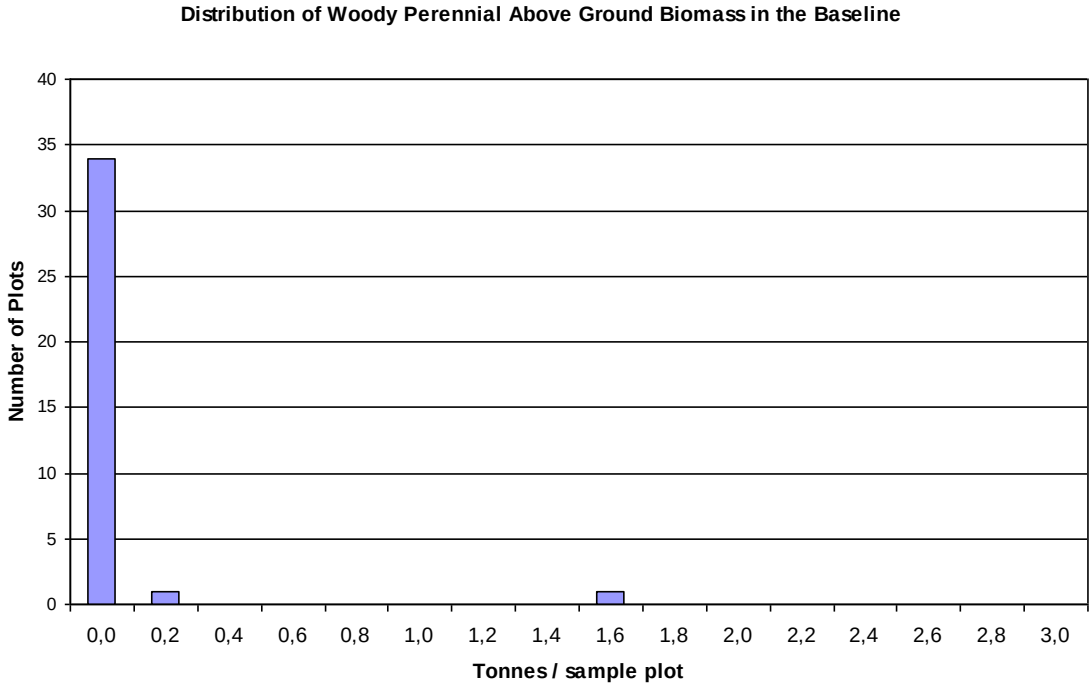
$$B_{A(t)} = M_{(t)} * 0.5 \qquad (2)$$

Where:
$B_{A(t)}$ = carbon stocks in above-ground biomass at time *t* in the absence of the project activity (t C/ha)
$M_{(t)}$ = above-ground biomass at time *t* that would have occurred in the absence of the project activity (t dm/ha)[11]
0.5 = carbon fraction of dry matter (t C/t dm)

According to AR-AMS0001 methodology (version 4.01) $M_{(t)}$ consist of above-ground tree and woody perennials biomass M_{woody}. It has been measured during preliminary baseline surveys. The results of these surveys are shown in Table 5. The survey methodology was identical to the monitoring methodology described below with the exception that the plot radii were 20 m due to the sparseness of the trees.

Figure 2: Distribution of Woody Perennials in the Baseline

[11] dm = dry matter



Below-ground biomass

For below ground-biomass $B_{B(t)}$ is determined for the one stratum as follows:
Living biomass carbon pools are expected to be constant

$$B_{B(t=0)} = B_{B(t)} = 0.5 * (M_{grass} * R_{grass} + M_{woody\,(t=0)} * R_{woody}) \quad (6)$$

Where:
$B_{B(t)}$ = carbon stocks in below-ground biomass at time *t* that would have occurred in the absence of the project activity (t dm/ha)
M_{grass} = above-ground biomass in grass on grassland at time *t* that would have occurred in the absence of the project activity (t dm/ha)
$M_{woody\,(t)}$ = above-ground woody biomass at time *t* that would have occurred in the absence of the project activity (t dm/ha)
R_{woody} = root to shoot ratio of woody perennials (t dm/t dm)
R_{grass} = root to shoot ratio for grassland (t dm/t dm)
We were unable to find documented studies on root-shoot ratio for grasslands on the slopes of the Aberdares Range / Mt. Kenya. Kinyamario (2005) measured a maximum below-ground live biomass in Nairobi Park of 5638 kg / hectare in monthly monitoring between 1984 and 1994[12]. The same study found an aboveground live biomass of 3149 kg / hectare.This corresponds to a root-shoot ratio of 1.65. The inter-annual variability found a maximum root-shoot ratio of 4.48 with an average of 0.93.The IPCC GPG Table 3.4.3 value for tropical grasslands is:

M_{grass}= 6.2 t dm/ ha

[12] Kinyamario, J.I. 2005. NPP Grassland: Nairobi, Kenya, 1984-1994. Distributed Active Archive Center for biogeochemical dynamics. Oak Ridge National Laboratory. http://www.daac.ornl.gov/NPP/guides/nrb_guide.html

To be conservative we will use a root – shoot ratio that corresponds to the highest recorded below-ground biomass from measurements.

R_{grass} = 1.65

From Table 3A.1.8 from the GPG LULUCF we will use the root-shoot ratio for "secondary tropical/subtropical forests".

R_{woodys} = 0.42

Table 5: Baseline Biomass Estimate – Summary

Baseline Survey Results			
	Number		Woody Biomass (t dm)
Plots with woody perennials	2		1.6
Plots without woody perennials	34		0.0
Total	**36**		**1.6**
Average (per ha)			**0.4**
Baseline Biomass (t dm)			
	Perennials	**Grasses**	**Total**
Above ground biomass	59	1,013	1,071
Below ground biomass	25	1,671	1,695
Total	**84**	**2,683**	**2,767**

B.7. Description of how the actual net GHG removals by sinks are increased above those that would have occurred in the absence of the registered small-scale A/R CDM project activity:

The registered small scale A/R CDM project activity provides an organization and technology that allows the re-establishment of native forest.

The demonstration of additionality follows the AR-AMS0001 / Version 05. The project activity would not have occurred without the CDM component due to the following barriers:

Investment barriers, other then the economic barriers, inter alia:

GBM and community groups do not have access to loan facilities. Its interest will be higher than the rate of a fixed government bond which is for a 10 year bond 11,4% p.a. at the moment. (Bank of Kenya, 2008) This is not feasible for a forestry project. Other debt funding is currently not available and international capital markets are reluctant to support forestry projects in Kenya. In addition, guarantees/securities of forestry projects are difficult to sell due to limited market and tradability experiences with this asset class. Finally, the high country specific risk disables the project developer to get financing – Kenya is a class 6 country meaning in the second highest financial risk class (OECD country risk classification valid as of 14.07.2008).

Institutional barriers, *inter alia*:

Legally the project area can be used only for forestry, no alternative land-use is permitted. However, the financial situation of the KFS prevents that Forest Reserve are reforested, considering the financial situation of the KFS and the scale of this task. The KFS has only the capacity to reforest recently harvested plantations. This is more cost efficient because land preparation costs are lower and the revenue from the timber sales can be used to cover the investment costs. Therefore, without the CDM component the project activity would have not occurred.

Technological barriers, *inter alia*:
This pilot project in the Mt. Kenya region faces low technological knowledge on seedling preparation and raising. The project will offset this barrier. Another technological difficulty is the unavailability of transport facilities from the nursery to the planting areas. Without overcoming these barriers no planting would take place.

Barriers relating to local tradition, *inter alia*:
This barrier is not applicable.

Barriers due to prevailing practice, *inter alia:*
The small-scale CDM AR project activity is the "first of its kind" in Kenya. No project activity of this type is currently operational in the country. This means the initial learning curve is steep and transaction costs to get the project on the ground will be very high. This pilot project activity will leverage the playing field for other investors to establish CDM forestry projects.

Barriers due to local ecological conditions, *inter alia*:
This barrier is not applicable.

Barriers due to social conditions, *inter alia*:
There are hardly any income generation opportunities in the area. The communities are relatively far away from the main markets and therefore can not sell agricultural crops at competitive prices. Accordingly, only with the CDM component forestry skills can be developed and people can manage the forest areas for a sustainable livelihood. They are committed to plant quality trees but without the carbon component they have no access to land, quality seedlings and technical advice.

The project activity faces barriers in generating the investment to support the costs of nurseries, planting, tending and protection (fire, human intervention, etc.) after plantation establishment. The revenue from the sale of CERs as a result of registration of the project as the CDM project is expected to support the plantation maintenance.

B.8. Application of monitoring methodology and monitoring plan to the small-scale A/R CCB project activity:

The project will use the monitoring methodology as specified in section IV of Annex II of FCCC/KP/CMP/2005/4/add.1., Pearson et al (2005)[13] and field experience of UNIQUE forestry consultants GmbH.

The monitoring methodology uses a regular grid sampling scheme.

[13] Pearson, T., Walker, S. and Brown, S. 2005. Sourcebook for land use, land-use change and forestry Project. Winrock International. http://www.winrock.org/Ecosystems/files/Winrock-BioCarbon_Fund_Sourcebook-compressed.pdf

Step 1: Grid the project area into a 100 m x 100 m raster. Plot these points on all GIS maps.

Step 2: From the 100 m x 100 m raster, select to sample every 200 m x 400 m (1/8th of the raster). The direction of the long axis of the sampling will be based on operational efficiency and visual heterogeneity (the long axis should be in the direction of most homogeneity).

Step 3: Proceed to each sample grid point. The permanent grid node will be marked using a buried metal nail. This will be located using a metal detector in subsequent monitoring exercises.

Step 4: Tag and measure the diameter at breast height (DBH) and height of all living trees within 14 m of the sample plot center. Record the species of each tree.

Step 5: Calculate the above ground carbon for each tree within the sample plot using allometric equation listed in Appendix C of the revised SSC AR for broad leaf species in tropical humid climates with annual rainfall of 1500 – 4000 m and DBH of 5 – 130 cm. It is assumed that carbon content of above ground biomass is 0.5. Therefore:

$$E_A(kg) = EXP\left(-3.1141 + 0.9719 * LN\left(DBH^2 * HT\right)\right) \quad (3)$$

Where DBH = diameter at breast height in centimetres and HT is the tree height in metres.

Sum the estimates per tree to calculate the total above ground carbon per sample plot.

$$´p_A(tonnes) = 0.001 * \sum_{tree} 0.5 * E_A(kg) \quad \textbf{(4)}$$

Step 6: Calculate the mean and standard deviation of the above-ground carbon (μ_{pA} and σ_{pA} respectively).

Step 7: Calculate the precision of the estimate using the following formula.

$$\text{Precision} = \frac{T_{95\%}\sigma_{pA}}{\mu_{pA}\sqrt{N_{plots}}} \quad (5)$$

Where $T_{95\%}$ is the Student's T statistic and N_{plots} is the number of sample plots.

Step 8: If the precision is greater than 10% then stratify the sample data into strata by species. Recalculate the mean (kg/tree) and standard deviation (kg/tree) for each species ($\mu_{tree,i}$ and $\sigma_{tree,i}$ respectively). Recalculate the precision for the stratified estimate using the following formula:

$$\text{Precision} = \frac{\text{Total Error}}{\text{Estimate}} = \frac{\sum_{i=species} \sqrt{n_i} T_{95\%,i} \sigma_{tree,i}}{\sum_{i=species} n_i \mu_{tree,i}} \quad (6)$$

Where n_i= the number of trees of species, i

Step 9: If the precision is still greater than 10% then one must collect more sample measurements. Use the following formulas to calculate the required number of samples, *N* and the number of samples of each species, n_i'.

$$N = \frac{\left(\sum_{i=species} n_i \sigma_{tree,i}\right)^2}{\frac{0.1 \sum_{i=species} n_i}{T_{95\%}} + \left(\sum_{i=species} n_i \sigma^2_{tree,i}\right)} \tag{7}$$

and

$$n_i^{'} = \text{the optimal number of samples per species} = N * \frac{n_i \sigma_{tree,i}}{\sum_{i=species} n_i \sigma_{tree,i}} \tag{8}$$

Step 10: Repeat steps 3 to 8 with the additionally required samples (in each species).

Step 11: Calculate the above-ground biomass using the formula.

If stratification by species was not required,

$$P_{A(t)} = A * \frac{\mu}{\pi(14)^2} \tag{9}$$

Or if stratification by species was required;

$$P_{A(t)} = \frac{A}{N_{plots}\pi(14)^2} \sum_{i=species} n_i * \mu_{tree,i} \tag{10}$$

Where
A is the total area of the project in square meters;
$\pi(14)^2$ is the area per sample plot in meters;

Step 12: Calculate the below-ground biomass for the site using the formula[14]:

If stratification by species was not required,

$$P_{B(t)} = A * \exp\left[-1.0587 + 0.8836 * \ln\left(\frac{P_{A(t)}}{A}\right)\right] \tag{11}$$

Or if stratification by species was required;

$$P_{B(t)} = A * \sum_{i=species} \exp\left\{-1.0587 + 0.8836 * \ln\left[\frac{A * n_i * \mu_i}{N_{plot}\pi(14)^2} * \frac{N_{orig}}{A * n_{orig,i}}\right]\right\} \tag{12}$$

[14] GPG LULUCF. Table 4.A.4 Equation for tropical forest.

Where N_{orig} is the total number of trees originally planted and $n_{orig,i}$ is the number of trees of species *i* originally planted.

In this formula, the first term within the logarithm is the total above-ground biomass for species, *i*, and the second term is the total area occupied by species, *i*.

Finally the total biomass is given by;

$$P(t) = P_{A(t)} + P_{B(t)} \tag{13}$$

Step 13: Calculate the tCERs generated by the project using the formula:

$$tCER(t) = \frac{44}{12}\left[P(t) - B(t) - L(t)\right] \tag{14}$$

And since L(t) = 0

$$tCER(t) = \left\{ \begin{array}{l} \frac{44}{12}\left[P(t) - B(t)\right] \text{ if } < 16000 * t \\ \text{or} \\ 16000 * t \end{array} \right\} \tag{15}$$

B.8.1. Data to be monitored: Monitoring of the actual net GHG removals by sinks and leakage.

B.8.1.1. Actual net GHG removals by sinks data:

B.8.1.1.1. Data to be collected or used in order to monitor the verifiable changes in carbon stock in the carbon pools within the project boundary resulting from the proposed small-scale A/R CCB project activity, and how this data will be archived:

Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic / paper)	Comment
Location of the project areas	*Forest Management Plan maps with UTMX UTMY tie points measured using a GPS system*	*UTMX, UTMY (meters)*	*Measured*	*2006, 2012 and then every 5 years*	*100%*	*Electronic, and paper*	
Area of project	*Forest Management Plan maps with UTMX UTMY tie points measured using a GPS system*	*Hectares*	*Calculated*	*2006, 2012 and then every 5 years*	*100%*	*Electronic, and paper*	This will be calculated using a GIS system
Grid sample centers (UTMX, UTMY)		*Meters*	*Calculated*	*2006 only*		*electronic*	*The number of sample plots may increase during the project lifetime if needed to fulfill the required level of accuracy*
Number of trees planted	*Monitoring and inventory records*	*Number*	*Measured*	*2007 and 2008*		*Electronic, and paper*	
Number of trees plnated, by species	*Nursery and planting records*	*Number*	*Measured*	*2007 and 2008*		*Electronic, and paper*	
Number of sample plots		*Number*	*calculated*	*2006, 2012 and then every 5 years*	*Depends of variability*	*electronic*	*The number of sample plots my increase during the project lifetime if needed to fulfill the required level of accuracy*

DBH	*Permanent plots*	*centimeters*	*measured*	*2006, 2012 and then every 5 years*	*Each tree within the sample plot*	*Electronic, paper*	
HT per tree	*Permanent plots*	*Meters*	*measured*	*2006, 2012 and then every 5 years*	*Each tree within the sample plot*	*Electronic, paper*	
Number of live trees	*Permanent plots*	*Number*	*measured*	*2006, 2012 and then every 5 years*	*Each tree within the sample plot*	*Electronic, paper*	
Tree species	*Permanent plots*	*Species*	*measured*	*2006, 2012 and then every 5 years*	*Each tree within the sample plot*	*Electronic, paper*	
E_A	*per tree*	*Kilogram C*	*calculated*	*2006, 2012 and then every 5 years*	*Each tree within the sample plot*	*Electronic, paper*	*Equation 7*
p_A	*per sample plot*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*	*Every sample plot*	*Electronic, paper*	*Equation 8*
μ_{pA}	*Sample data*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*	*Project*	*Electronic, paper*	*Step 6*
σ_{pA}	*Sample data*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*	*Project*	*Electronic, paper*	*Step 6*
Precision	*Project*	*%*	*calculated*	*2006, 2012 and*	*Project*	*Electronic, paper*	*Equation 9 or equation 10 as required*

				then every 5 years			
$\mu_{tree,i}$	*Sample data*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*	*Project*	*Electronic, paper*	*If stratification by species is required. Step 8*
$\sigma_{tree,i}$	*Sample data*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*	*Project*	*Electronic, paper*	*If stratification by species is required. Step 8*
$P_{A(t)}$	*Project*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*		*Electronic, paper*	*Equation 13 or 14 as required*
$P_{B(t)}$	*Project*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*		*Electronic, paper*	*Equation 15 or 16 as required*
$P_{(t)}$	*Project*	*Tonnes C*	*calculated*	*2006, 2012 and then every 5 years*		*Electronic, paper*	*Equation 17*
tCER	*Project*	*Tonnes* CO_2e	*calculated*	*2006, 2012 and then every 5 years*		*Electronic, paper*	*Equation 26*

B.8.1.2. Data for monitoring of leakage (if applicable)

Leakage attributable to the project activity is not applicable since:

1. there are no displaced households within the project boundary;
2. displaced agricultural production (fodder collection) from within the project boundary is minimized by allowing this activity to continue between the planted trees;
3. displaced agricultural production (fodder collection) is compensated by promotion of improved grassland management techniques (zero-grazing); and
4. the remaining displaced agricultural production (fodder collection) cannot cause deforestation since all remaining forests are protected by law.

B.8.1.2.1. If applicable, please describe the data and information that will be collected in order to monitor leakage of the proposed small-scale A/R CCB project activity

Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic / paper)	Comment

B.8.2. Describe briefly the proposed quality control (QC) and quality assurance (QA) procedures that will be applied to monitor actual GHG removals by sinks:

The project will follow the recommendations on QC and QA as set out in the CCB-AR-PDD: This will include
1. Training all field-team members on the need and method to collect accurate data. Pearson et al, 2005 will serve as a training manual.
2. A standard operating procedure will be developed and adhered to at all times; and
3. Independently re-measuring the tree diameters and number of trees in every 10th sample plot.

Procedures to verify field data collection

To verify that plots have been installed and the measurements taken correctly, it is good practice to re-measure independently every 10 plots and to compare the measurements. The following quality targets should be achieved for the re-measurements, compared to the original measurements:

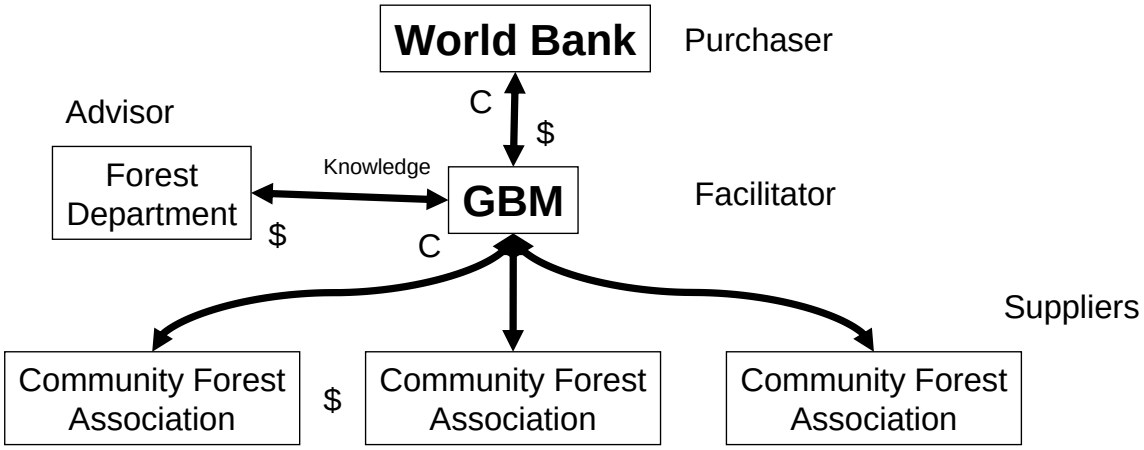
- Missed or extra trees no error within the plot
- Tree species or groups no error
- D.B.H. < ± 0.5 cm or 3 % whichever is greater
- Height < ± 10/ and -20%
- Circular plot radius/sides of rectangular plot < ± 1% of horizontal (angle-adjusted)

Reliable carbon estimates require proper entry of data into the data analyses spreadsheets. Possible errors in this process can be minimized if the entry of both field data and laboratory data are cross-checked and, where necessary, internal tests incorporated into the spreadsheets to ensure that the data are realistic. Communication between all personnel involved in measuring and analyzing data should be used to resolve any apparent anomalies before the final analysis of the monitoring data is completed. If there are any problems with the monitoring plot data that cannot be resolved, the plot should not be used in the analysis.

B.8.3. Please describe briefly the operational and management structure(s) that the project operator will implement in order to monitor actual GHG removals by sinks by the proposed small-scale A/R CCB project activity:

Green Belt Movement (GBM) would act as an intermediary for the Community Associations (CA). GBM would act as both an aggregator of carbon and distributor of finances obtained through the sale of carbon. The legal agreement between the CA and GBM will be provided during validation. The proposed organizational structure is shown below.

Figure 3: Proposed Project Organizational Structure



Organisation	Role
GBM	Aggregator of Credits, Financing of Project Monitoring, Project Monitoring, Capacity Building, Quality Control and Assurance
CFM	Project implementation,
KFS	Project implementation support, Monitoring of legal parameters
WB	UNFCCC registration, reporting and communication

B.9. Date of completion of the baseline study and the name of person(s)/entity(ies) determining the baseline and the monitoring methodology:

Baseline study completed:	5.December 2006		
Baseline study performed by:	David Neil Bird JOANNEUM RESEARCH Elisabethstrasse 5 A-8010, Graz, Austria Tel: +43 316 876 1423 Fax: +43 316 876 91423 Email: neil.bird@joanneum.at	Dr. Timm Tennigkeit UNIQUE forestry consultants GmbH Egonstraße 51-53 D-79106 Freiburg Tel. +49 761 15 60 766 Fax +49 761 15 60 767 Email: unique@unique-forst.de	Fredrick Njau Green Belt Movement Hughes Building, 1st Flr. Muindi Mbingu Street Kenyatta Avenue Wing P.O. Box 67545-00200 Nairobi Tel. +254 211842 Fax: +254 221628 Email: fnjau@greenbeltmovement.org

Monitoring study completed:	28.November 2006		
Monitoring study performed by:	David Neil Bird JOANNEUM RESEARCH Elisabethstrasse 5 A-8010, Graz, Austria Tel: +43 316 876 1423 Fax: +43 316 876 91423 Email: neil.bird@joanneum.at	Dr. Timm Tennigkeit UNIQUE forestry consultants GmbH Egonstraße 51-53 D-79106 Freiburg Tel. +49 761 15 60 766 Fax +49 761 15 60 767 Email: unique@unique-forst.de	Fredrick Njau Green Belt Movement Hughes Building, 1st Floor Muindi Mbingu Street Kenyatta Avenue Wing P.O. Box 67545-00200 Nairobi Tel. +254 211842 Fax: +254 221628 Email: fnjau@greenbeltmovement.org

Mr. Bird is not a project participant as listed in Annex 1.
Dr. Tennigkeit is not a project participant as listed in Annex 1.
Mr. Njau is a project participant as listed in Annex 1.

SECTION C. Estimation of ex ante net anthropogenic GHG removals by sinks:

C. 1. Estimated baseline net GHG removals by sinks:

As discussed previously, it is estimated that there are no baseline net GHG removals by sink

C. 2. Estimate of the actual net GHG removals by sinks:

Project planting area after 20 years: **129,033 tCO_2e**

C. 3. Estimated leakage:

Leakage attributable to the project activity is not applicable since there is no displacement of agricultural production from within the project boundary and there are no displaced households within the project boundary.

a) The project area will be closed for grazing (an illegal activity), fodder from the project site (agricultural production) will continue to be collected.
b) The displacement of cattle will not cause deforestation because that is an illegal activity.

Leakage due to the use of fertilizers is not significant.
Therefore is estimated that there is no leakage.

C. 4. The sum of C. 2. minus C.1. minus C.3. representing the net anthropogenic GHG removals by sinks of the proposed small-scale A/R CCB project activity:

Estimated net anthropogenic GHG removals by sinks of the proposed small-scale A/R CCB project activity: **129,033 tCO_2e**

C. 5. Table providing values obtained when applying equations from the approved methodology:

Tab C-2 Project planting area: Net anthropogenic GHG removals by sinks of the proposed A/R CCB project activity.

	Estimation of baseline net. GHG removals by sinks	Estimation of actual net GHG removals by sinks	Estimation of leakage	Estimation of net anthropogenic GHG removals by sinks
Year	tCO2e	tCO2e	tCO2e	tCO2e
2007	0	4,507	0	4,507
2008	0	3,288	0	3,288
2009	0	3,524	0	3,524
2010	0	4,960	0	4,960
2011	0	6,527	0	6,527
2012	0	7,704	0	7,704
2013	0	8,581	0	8,581
2014	0	9,339	0	9,339
2015	0	9,198	0	9,198
2016	0	9,056	0	9,056
2017	0	8,945	0	8,945
2018	0	8,208	0	8,208
2019	0	7,472	0	7,472
2020	0	6,761	0	6,761
2021	0	6,051	0	6,051
2022	0	5,442	0	5,442
2023	0	5,410	0	5,410
2024	0	5,282	0	5,282
2025	0	4,901	0	4,901
2026	0	3,874	0	3,874
Total	**0**	**129,033**	**0**	**129,033**

SECTION D. Environmental impacts of the proposed small-scale A/R CCB project activity:

D.1. Provide analysis of the environmental impacts, including transboundary impacts (if any):

The BioCarbon Fund required an environmental and social impact assessment (ESIA)[15] of the **Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative**. The significant findings for environmental impacts are listed below. The entire ESIA is available upon request.

In every respect, the project is designed specifically to have a positive environmental impact. If implemented, the project will absorb an estimated 12,000 tonnes of carbon from the atmosphere every year, and restore the natural habitat for indigenous species of plant and animal. It will reduce soil erosion, thereby improving the quality of downstream water supplies and may ameliorate local climate to some limited extent, commensurate with the relatively small areas to be reforested at the different sites. Tree planting will help to break up soil compaction and in the long term help to improve the depleted soil fertility.

[15] Kamweti, D., and Acworth J. 2006. Green Belt Movement BioCarbon Project, Environmental and Social Impact Assessment Study. Prepared by KAMFOR Ltd. for the BioCarbon Fund.

D.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken an environmental impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation:

Few potential negative environmental impacts are envisaged. Risks of very localised soil erosion around tree planting pits are small. The greater risks for the project are that of drought, weeds and foraging game threatening tree survival during the first 5 or so years of the project. Fire and elephants can threaten the forest at any stage.

Trees are known to use more water than grass and scientific evidence from equivalent sites suggests there may be a reduction in total flows of water from the watershed, but in severely compacted sites, better infiltration resulting from tree roots breaking up the compaction, may improve the recharging of ground water. The net effect on water flows is therefore probably zero. The implication is not that there may be a negative impact per se, as water quality will be greatly improved, but that the positive impacts are not as great as anticipated.

From: Kamweti and Acworth (2006)

D.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section D.2. above:

SECTION E. Socio-economic impacts of the proposed small-scale A/R CCB project activity:

E.1. Provide analysis of the socio-economic impacts, including transboundary impacts (if any):

The significant findings for social impacts are listed below.

It is expected that the project will generate a number of benefits for the local communities, including some paid labour, purchase of seedlings from community managed nurseries, increased supply of non-wood forest products in the medium to long term including deadwood, animal fodder, and medicinal plants for local utilisation.

There may be potential to benefit from the sale of other non-wood forest products, such as mushrooms, medicinal bark, vegetable oils from tree seeds, and ecotourism. However, there is a need to make substantial investment in capacity building to develop the necessary skills, technologies and markets for most of these.

Beekeeping represents the greatest opportunity for future revenue generation, given that there is a thriving local market for honey, and profitability is projected to be quite high.

E.2. If any negative impact is considered significant by the project participants or the host Party, a statement that project participants have undertaken a socio-economic impact assessment, in accordance with the procedures required by the host Party, including conclusions and all references to support documentation:

The preliminary budget allocated for tree planting and long term maintenance by GBM in their preliminary costing is insufficient to provide the necessary incentive to communities to complete the reforestation to the standard required, and forego revenues currently derived from free range grazing within the State Forest. Without sufficient benefit from the project, the ESIA

team doubt that the project will take off either due to lack of community enthusiasm to plant, or worse, that trees are planted, and then die due to lack of maintenance – which was observed as a widespread outcome of many previous reforestation efforts in the region visited as part of this assessment.

Periodic payments from the BioCarbon Fund for sequestered carbon (as measured and certified by independent assessment) will contribute a long term incentive to the community as a whole to retain trees, once planted. A risk of the project is that the longer term development benefits are not fairly distributed among the community as a whole, and/or among those who put most effort into the initial tree planting phase. It is often the more literate, powerful and wealthy members of a community that manage to capture the future benefits of projects designed to introduce new income generating activities. This must be avoided to ensure that carbon money continues to be an incentive for forest protection rather than a source of internal conflict within the community.

Without paying directly for work done there is no guarantee that those who invest in tree planting will benefit from longer term developments. Poor people cannot afford to take a gamble that planting trees might pay off in the end.

Finally, there is a risk that GBM field staffs raise expectations that planting trees will solve all the communities' environmental problems - enhancing rainfall, increasing the yields of grass that grows under trees, and increasing low-season flows of streams. The scientific evidence does not support such claims in most circumstances, and there is a risk that communities are mobilised under false pretences, or are disappointed in the future.

In summary, the greatest risks of the project are NOT what would happen if it were implemented, but what would happen if it were not implemented well, or at all.

From: Kamweti and Acworth (2006)

E.3. Description of planned monitoring and remedial measures to address significant impacts referred to in section E.2. above:

SECTION F. Stakeholders' comments:

F. 1. Brief description of how comments by local stakeholders have been invited and compiled:

The ESIA team visited 6 representative sites out of the total 10 sites where the project will be implemented. An assessment was made of each site, and a baseline of environmental characteristics, current land use and values prepared. Many representatives of community groups were met at each site. Their opinions about the project were sought, and detailed information about current revenues and costs relating to the current land use (grazing) was collected, analysed and incorporated into the findings and recommendations of this ESIA.

In each area visited, consultation with the Forest Officials at District and Field Station level was undertaken. The Forester at the site gave the mission the necessary data as well as the history of forestry in their respective stations as well as the main challenges to forestry

development and how they involve the adjacent communities in forestry protection against illegal cutting, fires and overgrazing as well as the development. Also explained was the system of licensing and the fee charge for firewood and for Non Wood Forest Products (no royalty of commercial timber as logging is currently banned). At District level, discussions were also held with the District Forest Officers of Nyeri and Kiambu.

From: Kamweti and Acworth (2006)

The full ESIA is available upon request.

GBM is by vision and definition of the organization inviting local stakeholders in their programs. Minutes of community interactions and sensitization efforts are available on request.

F. 2. Summary of the comments received:

These have been sumarised in the general findings of the ESIA (see above)

F. 3. Report on how due account was taken of any comments received:

The financial model including incentives to the communities was modified to address the issues such a sustainability, and continued community interest that were uncovered by the ESIA (see above).

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROPOSED SMALL-SCALE A/R CCB PROJECT ACTIVITY

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Represented by:	
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Salutation:	Mr.
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

See attached letter from Chris Tuite, Green Belt Movement to Johannes Woelcke, World Bank dated March 12, 2007

THE FOLLOWING COUNTRIES ARE GIVING ASSISTANCE BUT

There is no official development assistance or other public funding to the Aberdares Range / Mt. Kenya Small Scale Reforestation Initiative. Please refer to attached letters from Canadian Government 31.10.05 and Italian government of 28.09.05 as it states "that any participation in the Bio Carbon Fund does not result in a diversion of official development assistance"

Annex 3

DECLARATION ON LOW-INCOME COMMUNITIES

Prior to the request for registration of the project, GBM will prepare a declaration that the project will be implemented by local low-income communities.