

THE GOLA REDD PROJECT



Project description following the Climate, Community and Biodiversity Alliance Standards (Second addition)

Prepared by: the RSPB on behalf of the Gola Rainforest Conservation LG (the project proponent)

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Project Title	The Gola REDD project
Project Location	Gola Rainforest National Park, Kailahun & Kenema Districts in Eastern Province and Pujehun District in Southern Province, Sierra Leone
Project Proponent	Gola Rainforest Conservation LG. Contact person: Alusine Fofanah, tel: 00 232 78661027, asfofi@yahoo.co.uk / alusine.fofanah@golarainforest.org
Auditor	Rainforest Alliance, contact: Campbell Moore cmoore@ra.org ; (443) 975 8351
Project Start Date	Start date 1 st of August 2012, ends on the 31 st of July 2042, totalling a project lifetime of 30 years.
Full validation	Yes
History of CCB status	Undergoing validation. Validation field audit completed in 2014
CCB Standards being used for this validation	CCB Standards 2 nd Edition
Brief summary of the CCB benefits generated since start data to current monitoring period	Conservation actions expected as a direct result of the Gola REDD project: 1) protection of 60 threatened species, 8 endangered and 1 critically endangered species, 2) preserving 68,515 ha of tropical forest with a net GHG emission reduction (not including the 10% buffer account) of 1,197,521t CO ₂ e between August 1st 2012 and the first Monitoring event at the end of 2014 (to conserve 5,028,197 tonnes of CO ₂ -e during the first 10 years of the project), 3) providing livelihood support to the 122 impoverished communities that surround the GRNP through, for example, (i) cocoa farmer groups will be established, (ii) farmer field schools will be established to improve productivity on existing crop fallow land, (iii) savings and internal lending committees and (iv) awarding scholarships for secondary education.
Gold level criteria being used and summary	Gold levels for Climate Change Adaptation: it enhances resilience to climate change stresses amongst 122 Forest Edge Communities whilst maintaining critical ecosystem services such as water, land and soil resources. Gold level for Biodiversity: the project protects 1 Critically endangered species and 8 endangered species.
Schedule for Verification	1 st Verification expected to take place at the same time as validation.
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Abbreviations and Acronyms

AFOLU	Agriculture, Forestry and Other Land Use
ARTP	Across the River Trans-boundary Peace Park Project
BCP	Biodiversity Conservation Project
BSA	Benefit Sharing Agreement
CCBA	Climate, Community and Biodiversity Alliance
CD	Community Development
CLG	Company Limited by Guarantee
CSSL	Conservation Society of Sierra Leone
EPA	Environmental Protection Agency
FD	Forestry Division
FEC	Forest Edge Community
FG	Focal Group
FIC	Forest Industries
GCDC	Gola Community Development Committee
GFR	Gola Forest Reserve
GHG	Green House Gas
GoSL	Government of Sierra Leone
GRCLG	Gola Rainforest Conservation LG
GRNP	Gola Rainforest National Park
HCV	High Conservation Value
HH	Household
IVS	Inland Valley Swamp
LG	Limited by Guarantee
MAFFS	Ministry of Agriculture, Forestry and Food Security
METT	Management Effectiveness Tracking Tool
NBSAP	National Biodiversity Strategy and Action Plan
NPAA	National Protected Areas Authority
NTFP	Non-Timber Forest Product
O-KNP	Outamba-Kilimi National Park

PAM	Protected Area Manager
PC	Paramount Chiefs
PPP	Public-Private Partnership
REDD	Reducing Emissions from Deforestation and Degradation
RSPB	Royal Society for the Protection of Birds
SBIA	Social and Biodiversity Impact Assessment
SILETI	Sierra Leone Timber Industry and Plantation Company
SLIEPA	Sierra Leone Investment and Export Promotion Agency
TSC	Timed Species Counts
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
WHH	WeltHungerHilfe

Executive Summary

Gola REDD Project Vision

The Gola REDD project is a catalyst for peace, prosperity and national pride in Sierra Leone, ensuring that the globally important habitats, biodiversity and environmental services of the GRNP and wider Gola landscape are conserved and that neighbouring communities are active environmental stewards of the natural resource base that underpins and enhances their livelihoods

The Gola REDD project aims to conserve the forested areas of the Gola Rainforest National Park (GRNP). The GRNP and adjacent forests are Sierra Leone's largest remaining area of Upper Guinea Tropical Forest, a forest type recognised as a global biodiversity hotspot (Myers et al 2000). The area contains 60 threatened species, including 8 endangered and 1 critically endangered species (Klop et al. 2008). Conservation actions as a direct result of the Gola REDD project will protect these species, preserve 68,515 ha of tropical forest and conserve 4,986,671 tonnes of CO₂-e during the first 10 years of the project, as well as provide livelihood support to the 122 impoverished communities that surround the GRNP.

Although the Forestry Division within the Government of Sierra Leone's Ministry of Agriculture, Forestry and Food Security (MAFFS) is responsible for the management of the nation's forests, including GNRP, current funding levels results in a lack of capacity and finances to effectively manage forest areas protected by legislation. For example, in 2011, \$115,814 was allocated to the Forestry Division (GoSL budget 2009-2013;49) to manage all 48 Forest Reserves and National Parks.

Gola Rainforest Conservation LG, a not-for-profit company is being established to manage the Gola REDD project and act as the project proponent. The Company is founded by three partners: The Government of Sierra Leone represented by the Ministry of Agriculture, Forests and Food Security (MAFFS), The Royal Society for the Protection of Birds (RSPB) and The Conservation Society of Sierra Leone (CSSL). These three partners, under the banner of the Gola Forest Programme, have been working with the local communities of the 7 Chiefdoms surrounding the GRNP since 2002. The Gola REDD project seeks to sell credits validated by the Verified Carbon Standards (VCS) and the Climate, Community and Biodiversity Alliance (CCBA) to provide a stream of sustainable revenue sufficient to significantly reduce emissions from unplanned deforestation activities. Revenues from the sale of credits will be used to;

- i) improve the conservation strategy and enhance the management effectiveness of the GRNP
- ii) enable sustainable resource management throughout the project zone by engaging in a suite of livelihood improvement activities with local communities

iii) develop a monitoring program that provides robust information to underpin management decisions and a research program that allows GRNP to become recognized as an international centre of excellence and

iv) build a conservation trust fund that will provide a means of ensuring conservation actions last beyond the lifetime of the project.

The Gola REDD project recognizes both the moral and pragmatic necessity of actively involving local communities in all aspects of project development and implementation. Local stakeholders have been identified and involved in project development including Paramount Chiefs, section and village Chiefs, landowning families and Forest Edge Communities – communities in the leakage belt bordering the project area. These stakeholders and others will continue to be directly involved with the implementation of activities throughout the lifetime of the project. A comprehensive package of benefits to ensure the integrity of the project area and leakage belt has been agreed with local stakeholders. The package includes direct payments to landowning families and Paramount Chiefs, sustainable livelihood projects focused on land use planning and co-management, sustainable agriculture, saving and lending schemes, and a community development fund for villages beyond the project zone in each of the 7 Chiefdoms, as well as ecotourism opportunities, jobs within the Gola REDD project, and education scholarships.

The Gola REDD project is the first REDD project to be developed in Sierra Leone and aims to demonstrate that protecting forest resources can be both socially and environmentally beneficial. It is envisioned that it will pave the way for future projects of a similar nature that will provide Sierra Leone with a viable sustainable alternative to forest conversion and biodiversity loss.

General Section

G1. Original conditions in the project area

General Information

G1.1. Project location and basic physical parameters

The location of the project and basic physical parameters (e.g., soil, geology, climate)

Location

The Gola REDD project is located in the south east of Sierra Leone. The nearest entry point to the project area is 30km south-east of the district headquarter town of Kenema and 260 km east of Freetown, the nation's capital. The eastern area of the project lies adjacent to the Moro and Mano Rivers and the international border with Liberia. To the south, the area is bisected by the Kenema-Zimmi highway. The project lies within three districts: Kailahun and Kenema in Eastern Province and Pujehun in Southern Province (see Figure 1).

The forests within the project zone (the Gola Forests) are the largest area of lowland tropical forest remaining in Sierra Leone and form part of the Upper Guinea forest ecosystem which is classified as one of the 25 most important biodiversity hotspots in the world (Myers et al. 2000). The Gola forests are a key stronghold for a large number of endangered and threatened bird and mammal species and are also politically important as they form part of a larger 'trans-boundary peace park' envisioned by the Government of Sierra Leone and Liberia to assist in establishing permanent peace in a previously troubled cross-border region¹.

The project area is divided into 3 blocks; Gola North, Gola Central and Gola South.

¹ In 2009 the Presidents of Sierra Leone and Liberia made a joint declaration of their intention to create a transboundary peace park to conserve the Gola forests in Sierra Leone and Liberia



Figure 1. Location of the Gola REDD project within Sierra Leone

Hydrology

The Gola REDD project covers important catchment areas for the Moro, Mano, Mahoi and Moa Rivers which are the main water supplies for local villages and towns (see Figure 2).

The north eastern area of the project zone is drained by the Moro River which runs along the eastern boundary. The region is fairly well drained with elevated hilly terrain; only 8-9% of its area is under streams, swamps or poorly drained terraces.

The central area of the project zone is also drained by the Moro River running along the eastern boundary. This part of the project zone is intersected by a series of water courses and seasonally dry valleys. The most important water course to originate in this part of the project zone is the Mogbai River which flows east into the River Moro and has a catchment of approximately 52 km² and an area of swampy terrain.

As the Moro River flows south, it flows into the Mano River which runs along the eastern boundary of the southern area of the project zone. The eastern section of this area feeds the Mano River via a series of small rivers and streams that are no longer than 15 km, for example the Watuma, Wemango and Weadia, and as a result is fairly well drained. The central area in the south is drained by a network of small streams which feed into the Mahoi River. The western part of the southern area is poorly drained with up to 18% of the area classed as waterway, swamp or poorly drained land. Streams in this area feed into the adjoining Moa River.

The watershed services provided by the project zone are vital to local and regional economies which are based on subsistence and cash crops.

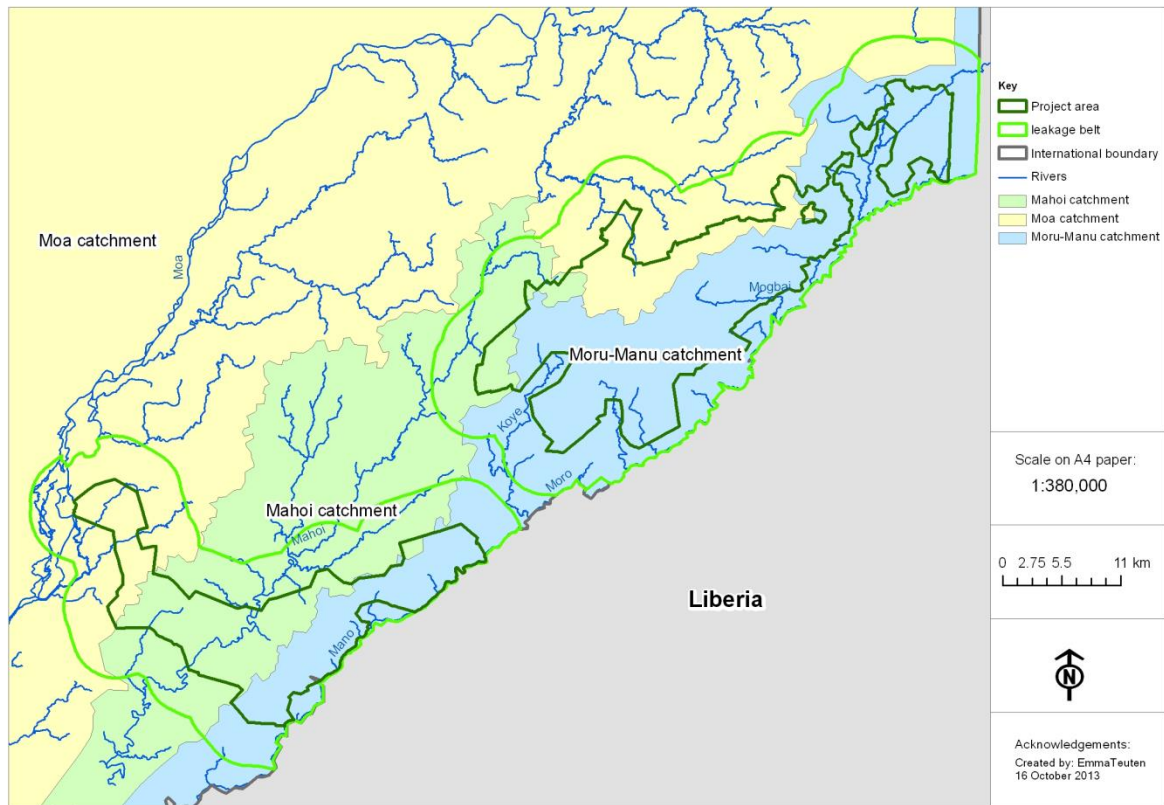


Figure 2. Watersheds of the project zone

Geology and Soils

The Gola REDD project zone is characterized by ancient crystalline rocks of the Archaean subdivision of the Precambrian period (Wilson, 1965). The granite greenstone complex, common in this area, contains iron and magnesium rich metamorphic rocks overlying a quartz-rich granite basement. Metamorphism gave rise to local occurrences of granulitic materials which are characteristic in parts of the project area. Most of the ores of chromium, gold and iron are located in the strips of metamorphic rocks that permeate the dominating granite (see Figure 3).

The soils in the project zone are mostly derived from granite. They are usually freely draining sands and gravels, with varying proportions of lateritic gravel. Four types of soil are recognized in the project area (Iles et al 1993):

1. Kulufaga. Rocky hill complex of moderate to high relief on Precambrian granite complex and local amphibolites; shallow sandy clay loams with locally deeper reddish clay loams;
2. Kailahun. Strongly dissected high level plains of low to very low relief and scattered isolated hills, on Precambrian granite complex and local granulites; moderately shallow to deep, sandy clay loams to clays often containing much gravel;

3. Blama. Dissected plains of extremely low relief with scattered small hills and terraces, on Precambrian granite complex and local granulites; moderately deep, very gravelly reddish clay loams to clays;

4. Sandaru. Variable dissected complex of plains and rocky hills of low to moderate relief, on Precambrian granite complex; moderately shallow to deep, sandy clay loams, gravelly on hilly terrain.

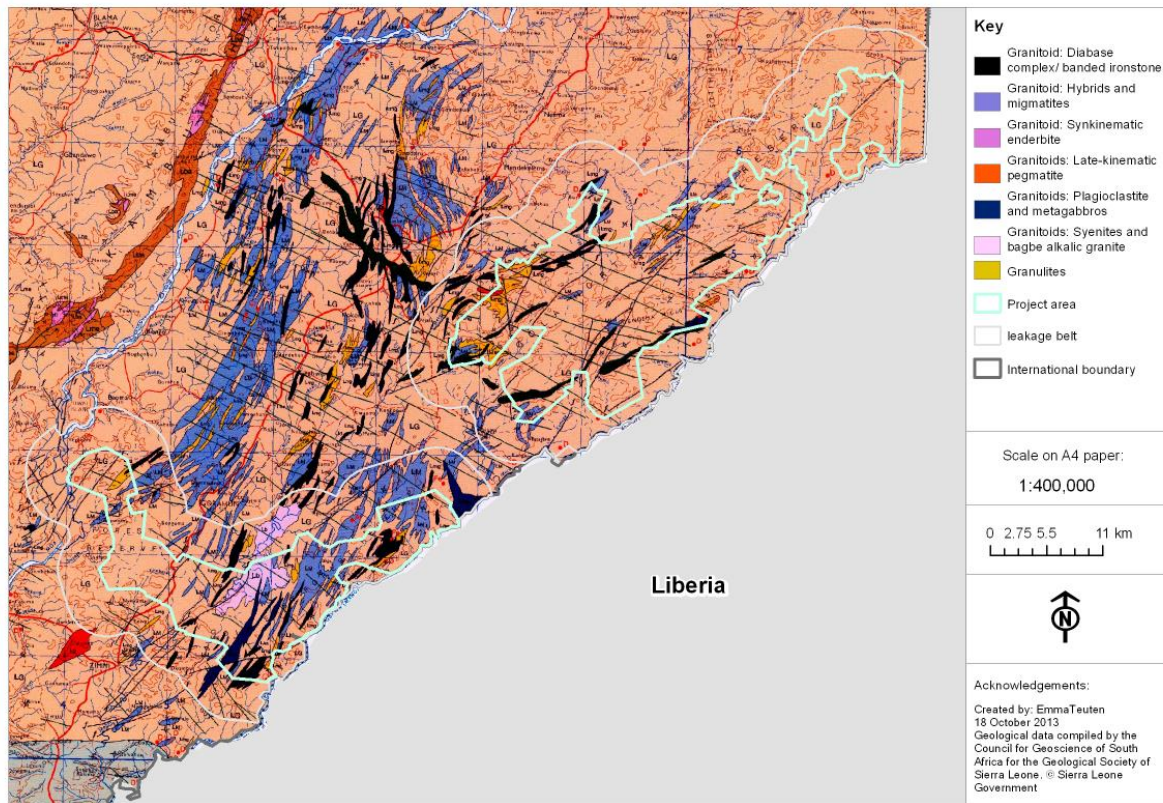


Figure 3. Geology of the project zone

Geomorphology

The central area of the project zone contains the most varied geomorphologic features (see Figure 4). Extensive rolling hills in this area give rise to form more rugged terrain and isolated rocky outcrops, some of which exceed 130m in length and 22% are over 330m in elevation. Over 9% of this area consists of steep slopes. The highest point, which reaches 427m, is known as Sangie Mountain. Slopes exceeding 27 degrees are common, and slopes of upto 45 degrees occur in the North and Eastern parts of this area.

The southern part of the project zone is lower than the central and northern area and becomes progressively lower and more uniform in slope from east to west. The highest point in this area is Bagla Hills at 330m in the east. The hilly terrain in this area is crossed by numerous watercourses which form steep sided water valleys.

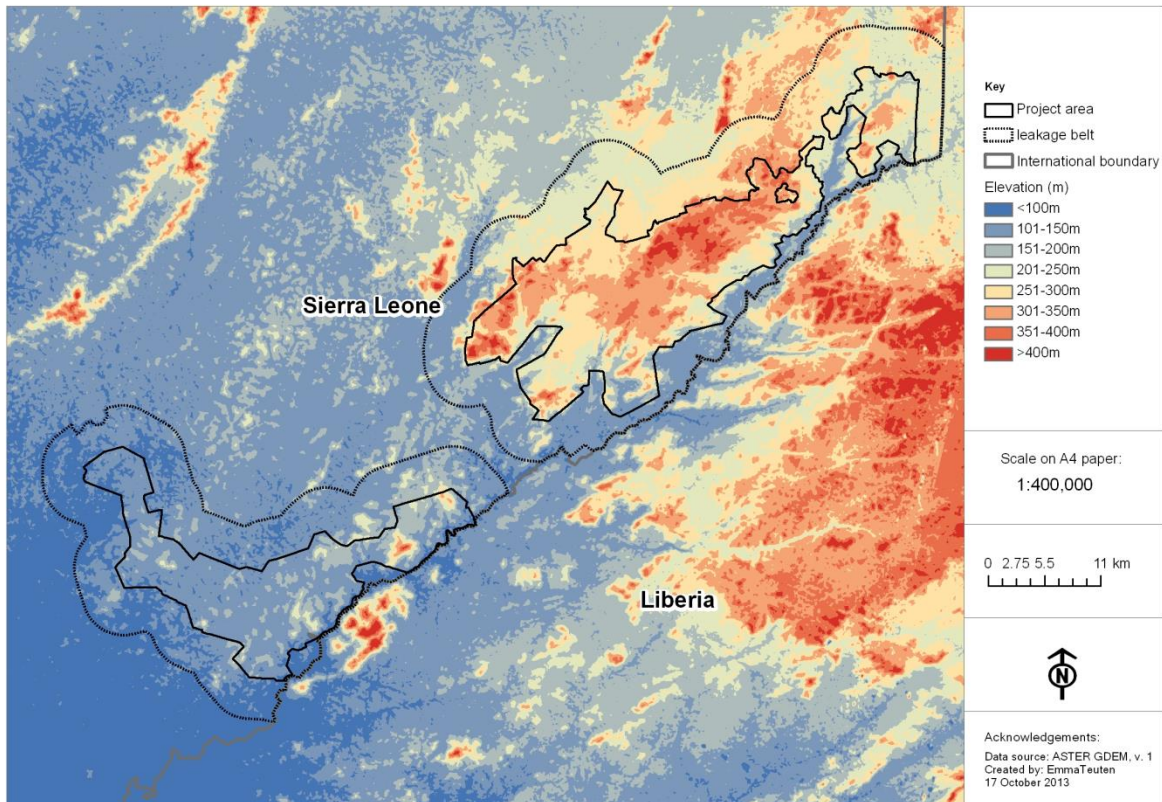


Figure 4. Geomorphology of the project zone

Climate

The project zone lies within the wet tropical climatic zone. Historical and recent precipitation data is available from towns and villages in the project and offsite zone. White (1972) reports mean annual rainfall values of 2576 mm at Daru, 2605 mm at Pendembu and 2770 mm at Kenema. Based on this data, mean annual rainfall is likely to be 2500-3000mm. In 2006 the total annual rainfall for Kenema was 2188 mm, which is lower than the historical average. During 2007 rainfall was measured within the forest of the project zone at 3 sites each month (Figure 5) and the mean annual total for the 3 sites was 3117mm (Klop et al 2008), slightly higher than the historical average. Rainfall was recorded in every month; there is a pronounced dry season from December to March during which rainfall was less than 50 mm per month. The wettest months are July and August when rainfall was over 550mm per month.

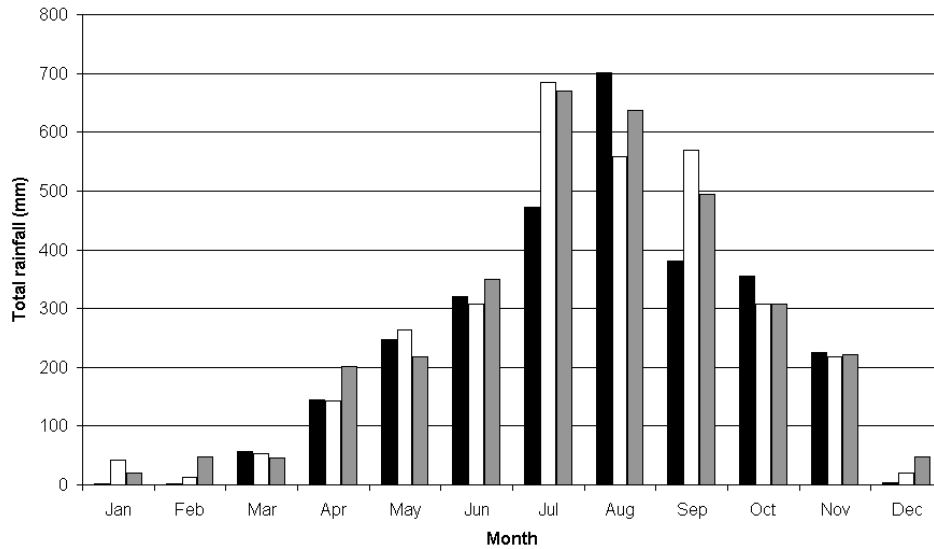


Figure 5. Annual rainfall data for the project zone

(based on 2007 data, from 3 stations in the project zone: Source Klop et al. 2008)

G1.2. Types and condition of project area vegetation

The types and condition of vegetation within the project area

All the forest of the project zone is part of a single forest type – the Western Guinean Forest. Extensive botanical surveys and ecological research characterises the project area into evergreen and moist semi-deciduous forest types but there is considerable overlap between these two classifications and they should be considered a continuum over a gradient (Klop et al 2008). This is also corresponds with Hall & Swaine (1976) who argued that the West African rainforest showed too much continuity of structure to define associations at this level of detail. Like species composition, the biomass (i.e. carbon) between these two forest types are similar, with no statistical difference (Lindsell and Klop 2012).

Vegetation Diversity

The Upper Guinean Forests are species diverse, with some 2800 species of vascular plants known to occur in these forests (Jongkind 2004), of which about 650 (23%) are endemic to the region. So far a total of 899 plant species have been identified in the project zone, mainly in the project area and of these plant species 232 species are trees (Klop et al. 2008).

Vegetation Condition

Prior to the initiation of conservation work, the project area was classified as a Production Forest Reserve and until the late 1980's two large scale timber companies conducted commercial logging in the Gola REDD project area: the Forest Industries Corporation (FIC) and The Sierra Leone Timber Industry and Plantation Company (SILETI). FIC worked in the accessible areas of the western section of Gola Central in 1961, 1978 and during the period 1984-1986. Some 19% of Gola Central was exploited during this period (Klop et al. 2008).

Gola South was more extensively logged by both FIC and SILETI during the 1960's, 70's and 80's; operations finished in 1989. Some 43% of Gola South has been exploited, particularly the western and central sections (Iles et al. 1993), see Figure 10 for reference.

As a result of past management practices the southern block of the project area in particular is still regenerating and has not reached yet an equilibrium state, the central area was less impacted by logging and contains greater carbon stocks (Lindsell and Klop 2012) (see G1.4).

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

The boundaries of the project area and project zone

The Gola REDD project consists of a project area covering 69,714 hectares of which 68,515 hectares is forested and a leakage belt containing 62,932 hectares of forest. Together the project area and leakage belt make up the project zone.

The project uses the following definitions to describe the different areas of the project (see Figure 6);

Project area – the area within the demarcated boundary of the GRNP, over which the Gola Rainforest Conservation LG, the project proponent, has management control. There are no communities living in this area. The project area consists of 3 separate blocks; a northern, central and southern block (see Figure 6). On the ground the boundaries have been cleared following protocols for demarcation (Marris et al. 2013), in coordination with the Forest Edge Communities living adjacent to the area. Boundaries are currently being planted with Yamane saplings to facilitate the detection of the boundary; 105km have been planted so far. The current landcover show that within the GRNP boundaries in 2011 there was 68,515ha of forest and 1,199ha of non-forest. The forested area is the carbon accounting area as per the VCS methodologies. The non-forest areas consist primarily of rivers and a number of rocky outcrops known as inselbergs. The 1,199ha of non-forest are physically part of the project area and will therefore be included in conservation management actions (i.e. biodiversity in these areas will be protected) but they areas are not included in carbon accounting as per the VCS methodologies.

Leakage belt – the forested and non-forested area that immediately surrounds the project area, extending for 4km around each block of the project area except on the eastern side where it is truncated by the Sierra Leone-Liberian border. The leakage belt was defined to meet the requirements of the VCS methodology VMD0007., The leakage belt contains 122 inhabited Forest Edge Communities² (see Figure 6).

Project zone – the area covered by both the project area and the leakage belt (see Figure 6).

² A Forest Edge Community is defined as a community lying adjacent to the project area and within the leakage belt of the project zone. Many Forest Edge Communities (86 out of 122) also share a direct boundary with the project area. These are the communities that were identified as being potentially affected by the project through PRA.

Offsite zone – the area beyond the project zone and extending to the boundaries of the 7 Chiefdoms. It contains approximately 373 communities and 130,478 people (based on the population census of 2004) (see Figure 6).

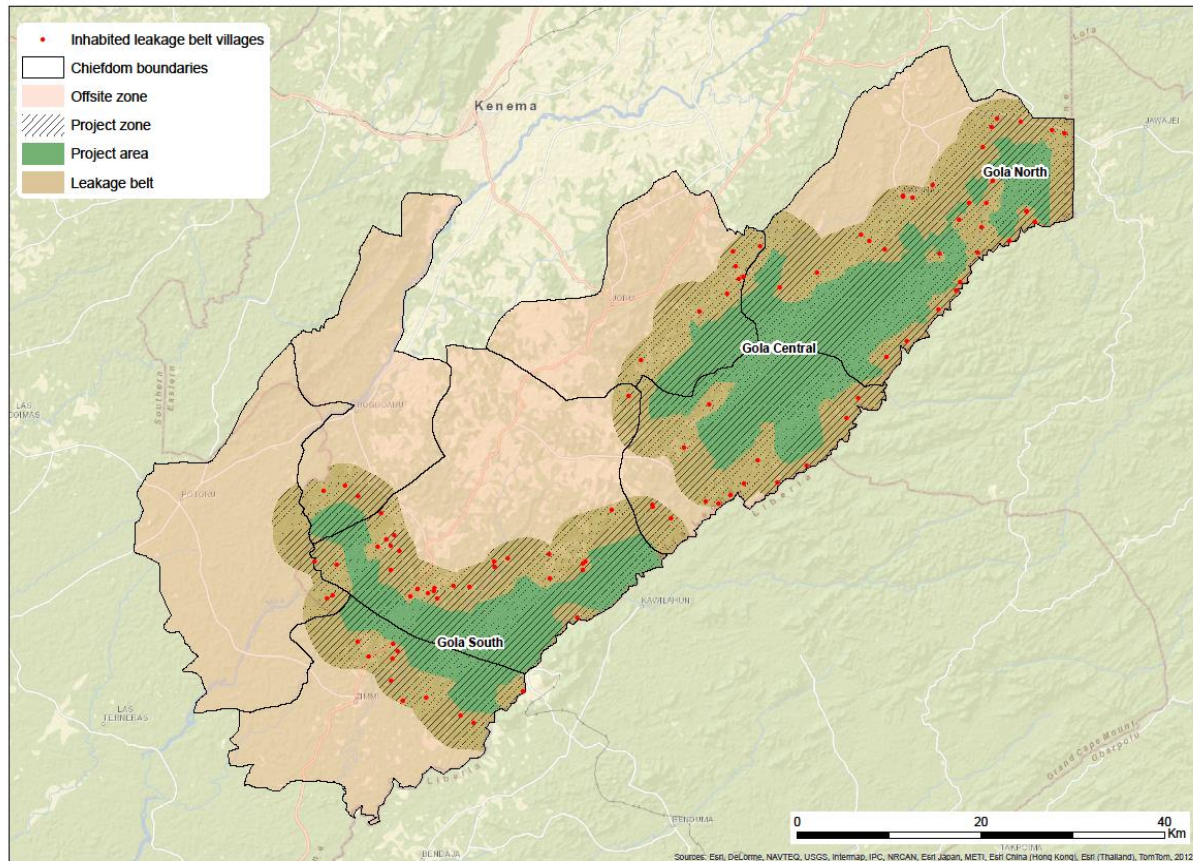


Figure 6. A map of the project area (with the 3 blocks named), the project zone (including leakage belt) and the offsite zone

CLIMATE INFORMATION

G1.4. Current carbon stocks in the project area

Current carbon stocks within the project area(s), using stratification by land-use or vegetation type and methods of carbon calculation (such as biomass plots, formulae, default values) from the Intergovernmental Panel on Climate Change’s 2006 Guidelines for National GHG Inventories for Agriculture, Forestry and Other Land Use5 (IPCC 2006 GL for AFOLU) or a more robust and detailed methodology.

Carbon stocks in Gola comprise of above ground biomass, below ground biomass and soil carbon. In order to calculate carbon stocks in the Gola Forest, in 2006 trees were surveyed in 609 fixed area circular plots located throughout the entire project area, the methodologies used comply with the VCS REDD modules methodologies (VM0007), and specifically with VMD0001 (option 1, fixed area plots with allometric equation method) (Tatum-Hume et al

2013b). The data collected in 2006 is used for the baseline carbon stocks in the Gola North and Gola Central blocks. For the Gola South block, the trees were surveyed in fixed plots in 2012, following the VCS REDD modules methodologies (VM0007), and specifically with VMD0001 (option 1, fixed area plots with allometric equation method) (Tatum-Hume et al 2013b).

Biomass survey

Sample plots were positioned at 200m intervals along line transects that followed a systematic segmented grid design (Buckland et al. 2004), which ensured an even coverage of the entire forest (see Figure 7).

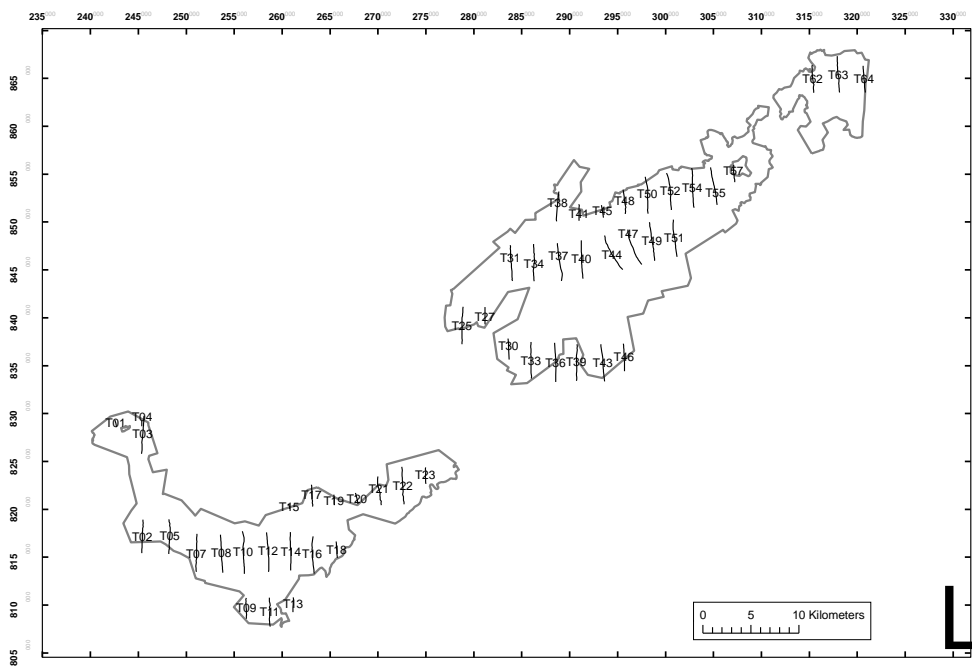


Figure 7. Transect locations throughout the project area

The tree measurements were carried out by trained teams consisting of experienced field staff and according to the 2006 and 2012 standard operating procedures on diameter measurements, tree labeling, tree height measurements, data recording and habitat measurements (Klop 2006, Winrock 2012). Soil carbon data was collected in 2012 from 47 randomly selected plots through out the project area (Tatum-Hume et al 2013b).

Stratification

The results of this extensive survey work showed that the forests across the project area were relatively homogenous in species composition (same forest type), however there were differences in carbon stocks between Gola South, and Gola Central/North. It was hypothesized that the difference between the stocks in the 2 areas was due to past management histories, the southern block having been more extensively logged than the central or northern blocks, thus resulting in a forest with lower carbon stocks but with potential for significant re-growth (Lindsell and Klop 2012). Because of the potential for re-growth enhancement of carbon in Gola South will be measured throughout the projects

lifetime (Tatum-Hume et al 2013b), this is why a more recent baseline of carbon stocks was established in 2012 for Gola South.

Based on these results the Project Area was stratified into:

- 1) Gola Central & North, and
- 2) Gola South (where enhancements (forest growth) will be monitored).

Block	area (ha)
Gola Central/North	43,059
Gola South	25,455
Total	68,515

Table 1. Area of Gola REDD project strata.

Carbon stock calculations

Carbon stocks were estimated in the forest areas following the VCS, VM0007 Modules CP-AB and CP-S. Non-tree, litter and deadwood were excluded (Tatum-Hume et al 2013b). Above and below ground tree biomass and soil organic carbon was calculated for both forest strata (ibid). Carbon stocks were estimated for Strata 1 (GRNP Central/North) and Strata 2 (GRNP South). Uncertainty was calculated as a percentage of the mean at 95% confidence intervals following the VCS methodology VMD0017 (X-UNC).

Carbon Pool	Strata 1 (GRNP North Block)				Strata 2 (GRNP South Block)			
	Number of Plots	Mean Stock t CO ₂ e ha ⁻¹	95% CI	95% CI as % of mean	Number of Plots	Mean Stock t CO ₂ e ha ⁻¹	95% CI	95% CI as % of mean
C _{AB_Tree,i}	353	629	41.5	6.6%	49	578	74.9	13.0%
C _{BB_Tree,i}		151.0	10.0	6.6%		138.7	18.0	13.0%
C _{AB_nontree,i}								
C _{BB_nontree,i}								
C _{LL,i}								
C _{SOC,i}	18	253.9	30.6	12.1%	29	192.3	24.4	12.7%
C _{BSL}		1,034.26	26.4	8.4%		909.05	48.0	12.9%

Table 2. Project area carbon stocks

COMMUNITY INFORMATION

G1.5. Description of project zone communities

A description of communities located in the project zone, including basic socio-economic and cultural information that describes the social, economic and cultural diversity within communities (wealth, gender, age, ethnicity etc.), identifies specific groups such as Indigenous Peoples and describes any community characteristics.

In its fifty-two years of independence, gained from the United Kingdom in 1961, Sierra Leone has struggled to develop despite being rich in natural resources such as fish, timber, oil, and minerals. The country has had over a dozen military coups and a brutal 11 year civil war; the legacies from which “dominate Sierra Leone’s prospects for a new beginning” (National Long Term Perspective Studies: 2000). More than 50,000 people died and almost half the population was displaced, (Internal Displacement Monitoring Center 2004) with the east and south of the country, where the Gola REDD project is located, most impacted. Sierra Leone is a low income country with a population of 5,997,486 (World Bank 2011) and a per capita GDP of \$734. The country’s Human Development Index places it 177 out of 187 countries (UNDP 2013) and with a poverty rate of 63% (UNDP 2011).

Seventy-three percent of all poverty in Sierra Leone is found in rural areas and 2 of the 3 districts where the project is based are recognised as the poorest districts in Sierra Leone (PSRP 2005:34). Life expectancy is 47 years, and under-5 mortality is 174 out of every 1000 children, the fourth worst rate in the world (UNICEF 2010). The adult literacy rate is estimated at 41% (UNICEF 2010). Sierra Leone had an “alarming” Global Hunger Index score³ of 25.2 and was ranked 71 out of 81 countries (IFPRI 2011); it qualifies as a Low Income Food Deficit Country per FAO criteria. Only 49% of the population uses improved drinking water sources (26% in rural areas) and only 13% use improved sanitation facilities (6% in rural areas) (UNICEF 2010). The underlying causes of poverty are attributed to wide-ranging factors including the lack of availability of social services (health, education, safe water and sanitation); lack of agricultural inputs, market access and low incomes from the sale of produce; weak infrastructure (bad road networks, lack of storage facilities); lack of economic and employment opportunities; devastation by the war; and social barriers such as large family size within the rural communities (PSRP 2005:38).

From baseline surveys and other consultation and information gathering exercises (Bulte et al 2013, Tatum-Hume et al 2013a), the findings of national surveys are a reflection of conditions in forest edge communities in the project zone. All forest edge communities described themselves as poor and the vast majority lack basic amenities and services such as latrines, clean water supply, healthcare and education. The war had a devastating impact on infrastructure (housing in particular) that remains widely apparent to date. The majority of forest edge communities are quite remote and located at some distance from motorable roads making market access difficult and restricting economic opportunity. For 90% of the

³ Designed to track global hunger, the index combines undernourishment, child mortality and children underweight.

population in forest edge communities, subsistence agriculture forms the basis for their livelihoods (Bulte et al. 2013).

Village size: The size of forest edge communities varies from small hamlets of as few as 10 individuals to large towns of up to 1200 people. 75% of villages have a larger proportion of women than men due to the impacts of the civil war on able-bodied men and greater male out-migration after the war (Bulte et al. 2013). In spite of this, the majority of households have male heads (85%) due to the widespread practice of polygyny.⁴ Despite the civil war, populations have grown by an average of 2% between 1990 and 2000 (Bulte et al. 2013). The current population of the project zone is estimated to be 23,500 individuals (Bulte et al. 2013), spread across 122 villages. It is estimated that over half the population is below the age of 18 (Bulte et al. 2013).

The majority (86%) of people residing in forest edge communities describe themselves as being 'Mende'; other ethnic groups are Gola, Fula, Mandingo, Vai, Kissi, Limba, Gbandi, and Temne. There are no obvious ethnic tensions between these groups. The primary religion found in the area is Islam (93.1% of people); the remaining inhabitants are largely Christian and religious groups in the region live in harmony. Within a village people are seen as either citizens (*tali*) or strangers (*hota*). Citizens belong to land owning families which can recognize a common founding ancestor and trace patrilineal descent (Bulte et al. 2013:10). Strangers are people that were not born in the Chiefdom; some may marry a citizen or be accepted as a community member by way of their profession.

Governance: Villages are led by a village chief, who is the traditional authority in a village. Chiefs can be men or women and play a key role in regulating daily activities and resolving any disputes. Other villagers that hold a degree of power and influence include the village speaker, the elders, members of secret societies and religious authorities. Whilst the village chief is the key representative of a forest edge community, day to day life in a village is organized in households. A household can be defined as the 'production unit' that makes a household farm which is used to feed the members of the household for the year. Usually the household activities are coordinated by a head, who is most often male (in approximately 85% of households; Bulte et al. 2013).

Villages are grouped into sections and then chiefdoms, governed by Section and Paramount Chiefs respectively. There are 7 Chiefdoms in the project zone: Malema, Gaura, Nomo, Tunkia, Koya, Barri and Makpele (see Figure 8). A dual system of local and traditional governance operates in the provinces of Sierra Leone further detail on both local and traditional governance systems can be found in the Gola REDD Project Context Report (Witkowski et al 2012c).

⁴ Polygyny is widely practised in Sierra Leone whereby a man is married concurrently to more than one woman.

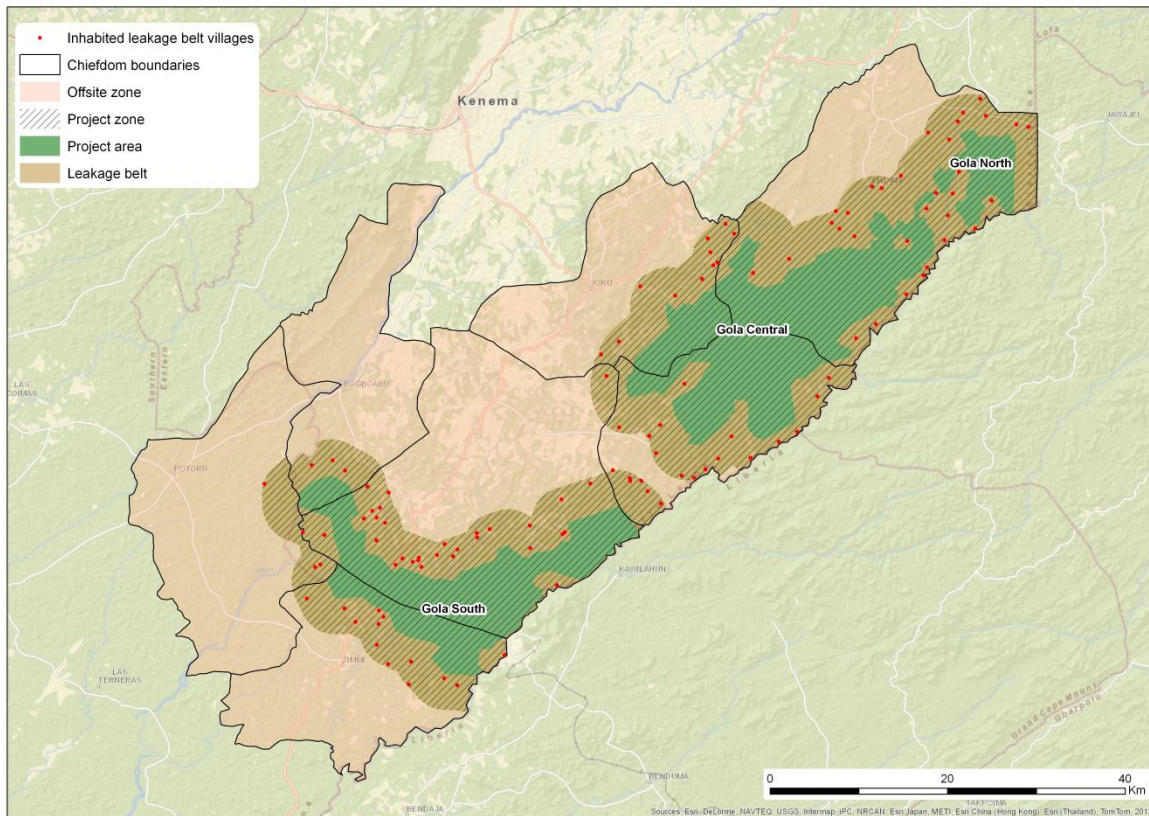


Figure 8. The 7 Chiefdoms of the offsite and project zone and the Forest Edge Communities

Wealth: All forest edge communities suffer from severe poverty and face many constraints to development. The majority of communities are located far from a motorable road (up to 8 hours walk) making access to key services such as markets, health centres and schools very difficult. Few villages contain even the most basic amenities such as public toilets, radios, cement drying floors or electricity (Bulte et al.2013). The majority of houses are made from local materials consisting of mud walls and a thatch roof. At the household level, it is likely that households with lower socio-economic status are stranger headed households or female-headed households as they generally have less land and civic rights. When villagers were asked directly who was the poorest, they all considered themselves to be poor and only upon further probing identified people that could not provide for themselves – namely the elderly, disabled, single mothers and widows - as being among the poorest (Witkowski et al. 2012a).

Education and Health: Across forest edge communities literacy levels are low, with approximately 29% of the adult population (over 18 years old) able to read and write, though this is unequal across the genders, with about 43% of males and only 13% of females being literate. Over half the forest edge community population has received no education at all (Bulte et al. 2013). The majority of forest edge communities do not have any educational facilities within the village so children either do not attend school, have to walk long distances to attend school or lodge with a relative in larger towns. The costs associated with attending school (books, uniforms, supplies and lodging) also create a barrier to attendance.

There is a lack of access to basic health services across forest edge communities leading to high disease rates and mortality. Malaria and dysentery are the primary causes of mortality amongst children (Bulte et al. 2013). Most villages lack public latrines and sanitation facilities, the majority of villages do not have access to a clean water supply and lack knowledge of good health practices. Even in the schools and health care facilities that do exist, there are frequently shortages of staff, equipment and supplies.

Livelihoods: Agricultural production is the main source of income for households (approximately 90% of households in forest edge communities, Bulte et al. 2013). The main farming activity is rice cultivation, the majority of which is carried out in upland areas. Approximately half of land holdings are dedicated to upland farms. Rice production in inland valley swamp (IVS) areas and plantations (largely coffee and cocoa) each cover 25% of the remaining agricultural land.

Most villagers directly engage in rice farming, and on average 77% of households make a new farm each year; the average household upland farm size is about 3 acres (ranging from 0.5 to 15 acres) (Bulte et al. 2013).⁵ In upland areas, forest or “farm-bush” is cleared and farmed for one or two years. Rice is intercropped with yams, cassava, corn, beans and a variety of vegetables; these intercrops are worth approximately 25-50% of the total food value of the upland farm (Bulte et al. 2013). Intercrops in upland areas are largely the remit of women, as are the backyard gardens that supplement food supplies. Land is then left to fallow for an average period of 7 years in forest edge community villages but fallow periods vary depending on many factors from soil fertility to labour availability (Witkowski et al 2012a).

The heavy work of clearing and planting the upland farm is, where possible, undertaken by the members of a rotational labour-sharing group (Richards 1986, Bulte et al. 2013). Agriculture groups are the most common form of community institution found in about 61% of Forest edge communities (Bulte et al. 2013). Once the upland farm is planted the work of weeding and scaring animals falls to the female members of the households. Labour constraints are a challenge in many of the forest edge communities (Bulte et al. 2013).

On average, 70% of villagers farm swamps and average farm sizes are 2 acres (ranging 0.5 to 15 acres⁶) (Bulte et al. 2013). Women, strangers and young men are the main cultivators of swamp rice, as male heads of households focus on the cultivation of tree crops from which they receive better returns. Swamp farms, especially when properly developed, tend to yield more rice, but are more labour intensive to develop, do not allow for the production of inter-crops and the variety of rice grown is less favoured for household consumption. The net return on swamp rice is thus “probably comparable to that from upland cultivation” (Bulte et al. 2013).

Forest edge communities report that the majority if not all of their residents experience a ‘hungry season’ during the wet season sometime between May and October when there are

⁵ Sierra Leonean rice farmers estimate the size of upland rice farms in terms of the bushels of rice seed the area will require. One bu. is c. 25 kg of husk rice, and this amount of seed will plant about one acre. 2.5 acres = 1.0 ha, but it is convenient to refer to farm sizes in terms of acres or bushels.

⁶ 2.5 acres = 1.0 ha

shortages of upland rice, their staple food (Witkowski et al, 2012b). This typically occurs from July to September when the prior year's rice supplies have been exhausted (sold or eaten) and the current years are not yet ready to harvest. The actual length and severity of this period varies greatly depending on a variety of factors such as weather conditions, labour availability, crop damage, disposable income to buy rice, etc (Witkowski et al, 2012b).

Many (usually male) household heads also invest in small plantations, typically producing coffee, cocoa, bananas, palm oil, pineapple and kola nuts. Women are less likely to develop plantations due to their typically lower levels of capital and land rights which do not provide enough security to invest in such permanent crops (Bulte et al. 2013). Even so, some women do own plantation crops, often that they have inherited or been given by their spouses or parents. On average 86% of household heads cultivate a plantation. The average plantation size is 8 acres (ranging 0.5 to 282 acres) (Bulte et al. 2013). Plantations are still an important source of income, but production levels have declined over time as many areas have become overgrown for a variety of reasons including shortage of labour, the advancing age of some trees, use of poor varieties and techniques (Witkowski et al 2012b; pers. comm. Hans-Peter Mueller, WHH).

Natural resources are the basis for the livelihood activities communities conduct to complement agricultural activities. Complementary activities for both subsistence use and cash generation include logging, mining, gathering, hunting, fishing, and petty trade. Communities rely on numerous forest products in their everyday lives; this includes both timber and non-timber forest products such as honey, fruits, seeds, thatch, and rattan (Leach 1994). Wild plant foods add variety to diets and are critical supplement to food supplies during the hungry season (Leach 1994). Forest products serve as medicines, foods, construction and tying materials, as well as to make household items like mortars, utensils, and baskets; all of which can be used in the home or sold to generate income (Davies and Richards 1991). These natural resources are gathered primarily in bush-fallow areas and plantations but also in forests (Leach 1994, Davies and Richards 1991). High forests were reported to account for 57.9% of all medicinal plants used by villagers around the GRNP before the civil war (Davies and Richards 1991) and these plants remain central to Mende medicinal practices despite the availability of Western medicine (Leach 1994). 'Bush' areas are also important to the creation and maintenance of local society's traditional structures particularly local governance and secret societies (Leach 1994).

G1.6. Current land use, property rights and conflicts

A 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 and identifying and describing any disputes over land tenure that were resolved during the last ten years (see also G5).

The project area

The Government of Sierra Leone obtained the legal right to manage the GRNP (the project area) upon the creation of the Gola forest Reserve, a process which began in the late 1920's. In late 2010, the Government upgraded the protection status of the project area from a Production Forest Reserve to a National Park. The legislation limiting land use in national parks and protected areas in Sierra Leone are the Forestry Act 1988, the Forest Regulations 1990 and the Wildlife Act 1992 (see G5 for further detail). The Government

followed due process in the creation of the National Park, no disputes were raised over land tenure or land conflict in the creation of the National Park (Fofanah 2012). The boundaries of the National Park (project area) were demarcated on the ground in coordination with the Forest Edge Communities that share a boundary with the Park during 2012 and 2013, several discrepancies were encountered during this process which are documented in the boundary demarcation report (Marris et al 2013) and in the grievance folder (available in the project office). All disputes over the project area were resolved and agreements have been made over the placement of the boundary with each community (ibid).

Whilst the Government has the legal authority to manage the project area, the 7 Chiefdoms and landowning families that surround what is now the national park are still recognized as the traditional owners of the land, though they no longer have any control rights and use rights are limited by the national laws mentioned above. This has been the case since the Gola Forest Reserves were created (Witkowski et al 2012c). The Paramount Chiefs facilitated by the Government and project staff have gone to great lengths to identify the heads of family of all the heirs of the traditional land owners of the project area within the 7 Chiefdoms and ensure that they were consulted in the project development process and receive a direct benefit from the project (Forestry Division 2013). All heads of land holding families have signed an agreement with the Government which acknowledges their support of the project and the transfer of any outstanding carbon rights to the Government in exchange for direct payments via the Benefit Sharing Agreement (ibid, Tatum-Hume et al 2013a, appendix E).

As is the case in all Forest Reserves in Sierra Leone, local people have the right to access the forest and collect non-timber forest products, other specific permitted activities vary for each protected area in Sierra Leone and are outlined in each areas published gazette, in the GRNP local communities retain the right to fish using legal and non-destructive methods for subsistence purposes (see 'laws and regulations for the GRNP' a reference to Fofanah 2012) All other land and resource uses, including agriculture, mining, logging, settlements, and hunting, are prohibited in National Parks, (as a Forest Reserve such activities were permitted only if a license was obtained from the Forestry Division) (Fofanah 2012).

There are no communities living inside the project area but as discussed later in section G1.8.5, prior to conservation activities, it was customary for the communities living nearby to the project area to periodically enter the reserves to carry out a variety of activities (both legally and illegally) to compliment farming activities and other livelihood activities occurring outside the reserve. This included farming in upland areas and inland valley swamps, logging, mining, hunting, fishing and collection of non-timber forest products (Witkowski et al 2012b).

The leakage belt

Land in the leakage belt of the project zone is under a different form of management to the project area. Here, similar to all provincial areas in Sierra Leone, land is governed primarily by customary law and is subject to family tenure under the Mende tribal system (Climate Focus 2011). Land is held by family lineages and administered by a family head whilst Paramount chiefs and chiefdom councils retain the right to regulate the way in which land is used in their Chiefdoms. The family head can trace their land rights in terms of patrilineal descent from those who first cleared the forest for farming. The traditional system is clear

amongst local people; each family respects another's property rights and there are few disagreements as land boundaries are known and the knowledge passed down through the generations (Bulte et al. 2013). However, family tenure is not formally documented which can lead to problems if outsiders come to the area to make agreements to lease large areas of land for agriculture projects (Green Scenery 2011). Many villages have bylaws, but these most often relate to social norms such as abusive language, sexual misconduct and obeying elders rather than land use (Bulte et al. 2013).

The leakage belt has a matrix of land uses depending on resource availability and other factors. There are 122 inhabited communities in this area with a total population of approximately 23,500 people. As described in G1.5, subsistence farming is the main livelihood activity of 90% of the villagers in the leakage belt and land dedicated to agriculture is divided between upland farming areas (usually making up around half of a village's agricultural land) where rice is intercropped with vegetables over a 1-2 year period before being left fallow for an average of 7 years (Witkowski et al 2012b), swamp farming (where only swamp rice varieties are grown) and plantations where cash crops such as cocoa, coffee and palm oil are grown. Other land uses include selective logging for valuable timber to be sold in national markets and artisanal mining for both gold and diamonds, both of which are legal activities if a license is obtained first from the relevant local authority. Other important livelihood activities in the leakage belt are hunting and fishing (using nets, baskets, and sometimes poison) which provide protein for local families as well as to sell in markets for income generation. Gathering of non-timber forest products such as rattan, poles, palm thatch, fibers, and traditional medicines also occurs.

Land disputes are not widely reported (Bulte et al. 2013) but when disputes do occur, they often involve encroachment when land is being brushed for farming, or a dispute over the timing of bush burning (e.g. when the wind changes and carries fire into a neighbouring farm). Sometimes a villager may be fined for clearing land for farming and then not using it (*lobai* – waste). Most conflicts are between co-villagers rather than inter-village disputes (Bulte et al. 2013). Where inter-village disputes arise it is purported to be where farmers clear bush on either side of a poorly-marked inter-communal boundary; this is most likely where land has not been used for many years and the local boundary markers have been neglected.

BIODIVERSITY INFORMATION

G1.7. Description of project zone biodiversity

Description of current biodiversity within the project zone and threats to biodiversity, using appropriate methodologies, sustained where possible with appropriate reference material

The project zone is extremely rich in biodiversity and harbours many species that are threatened or endemic to the Upper Guinea Forests. The flora and fauna of the project zone have been thoroughly surveyed, both before and after the civil war. The results of these surveys have been published in the scientific literature and in various unpublished reports (see GRNP 2013 for a list of published and unpublished reports); so far 60 threatened

species have been found within the project zone. A brief description of the biodiversity in the project zone and the factors threatening it is given below.

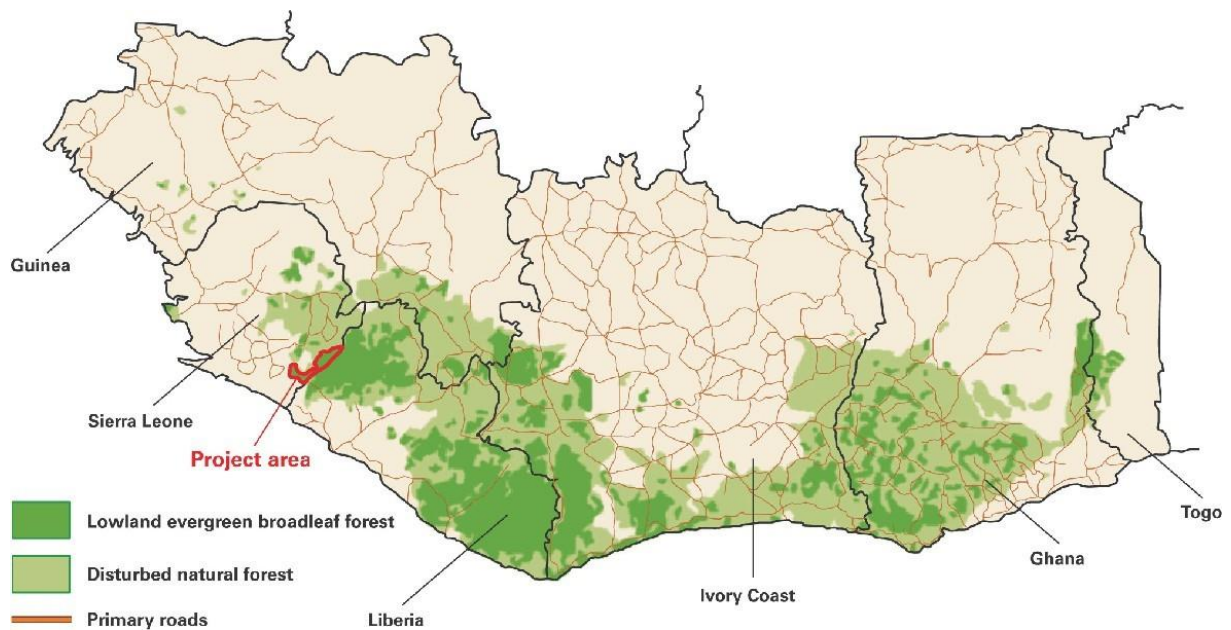


Figure 9. Location of the project area within the Upper Guinea Forest zone.

(source; Conservation International 1999)

Plants

Information on the vegetation types is described in section G1.2. 899 species of plant are known to occur in the project zone of which 232 are tree species; the most common family is identified as Leguminosae, with common species such as *Cynometra leonensis* and *Brachystegia leonensis*. However, the most dominant tree species is *Heritiera utilis* (Sterculiaceae) (Klop et al 2008).

IUCN classification for plants is incomplete. Nonetheless, at least 33 threatened species listed by IUCN have been recorded recently including two, *Tieghemella heckelii* and *Placodiscus pseudostipularis*, that are classified as Endangered and 31 classified as Vulnerable (IUCN 2012). Poorter et al. (2004) classified 278 woody plants in the Upper Guinea forests as rare or threatened based on extent of distribution and threats from human exploitation. Of these, 67 have been recorded in the project zone. There are 599 forest species which are endemic to the Upper Guinea forests, of which 120 have been found in the project zone during surveys.

Of the 71 species of orchids identified in the project zone, seven are thought to be endemic to the Upper Guinea Forest (Klop et al 2008). According to Jongkind (2004), there are about 25 species of Orchidaceae endemic to the Upper Guinea Forest. Therefore, it can already be stated that the project zone contains almost 1/3 of the Upper Guinea endemics in this particular family.

Birds

The project area is listed as an Important Bird Area (Fishpool & Evans 2001) and holds a high proportion of the threatened and endemic species of the region and a good representation of Guinea-Congolian forest biome species. Many of these species are also present in the community forests of the project zone (Demey 2011). Recent bird surveys (Klop et al 2010, Demey 2011) recorded 294 species in the project zone bringing the total to 327, which is amongst the highest of the Upper Guinean Forests. The birds that occur in the project zone include flagship species such as White-necked *Picathartes*, Rufous Fishing-Owl, White-breasted Guinea fowl and Gola Malimbe. Besides the high species diversity, several threatened species occur in good numbers. The threatened species of birds that occur in the project zone are listed in

Table 3.

English name	Scientific name	IUCN status
White-breasted Guineafowl	<i>Agelastes meleagrides</i>	Vulnerable
Timneh Parrot	<i>Psittacus timneh</i>	Vulnerable
Rufous Fishing-owl	<i>Scotopelia ussheri</i>	Vulnerable
Brown-cheeked Hornbill	<i>Bycanistes cylindricus</i>	Vulnerable
Yellow-casqued Hornbill	<i>Ceratogymna elata</i>	Vulnerable
Western Wattled Cuckooshrike	<i>Campephaga lobata</i>	Vulnerable
Yellow-bearded Greenbul	<i>Criniger olivaceus</i>	Vulnerable
Nimba Flycatcher	<i>Melaenornis annamarulae</i>	Vulnerable
White-necked Picathartes	<i>Picathartes gymnocephalus</i>	Vulnerable
Gola Malimbe	<i>Malimbus ballmanni</i>	Endangered
Hooded Vulture	<i>Necrosyrtes monachus</i>	Endangered

Table 3. Threatened species of birds recorded in the project zone.

Status refers to the 2012 IUCN Red List Category; data available at <http://www.iucnredlist.org/search>).

Nearly 80 of the bird species in the project zone are mostly restricted to forest habitats, although some may occasionally occur at the ecotone of forest and more open habitats. Another approximately 100 species occur in forest but are also frequently found in other habitats such as forest edges or clearings inside the forest. Nine species appear to be restricted to primary forest: Lemon Dove, Black-collared Lovebird, Shelley's Eagle-owl, Brown-chested Alethe, Nimba Flycatcher, Dusky Crested Flycatcher, Yellow-bellied Wattle-eye, Lagden's Bush-shrike and Gola Malimbe. In addition, the Lyre-tailed Honeyguide was nearly restricted to primary forest, with only a few records from tall secondary forest. Most of these species are rare or uncommon; only the honeyguide and the wattle-eye were more common. Evidently the conservation of these species depends entirely on the preservation of large tracts of undisturbed closed-canopy forest, and the project area can be considered essential to the survival of these species in Sierra Leone.

Although some of the true forest specialists are missing from the community lands in the buffer area of the project zone, the areas surrounding the project area hold good numbers and diversity of birds (Demey 2011). Many of these species are restricted to forest edges, open country and farmbush. Around 80 species of the project zone do not normally occur inside forest, although some were found in large clearings inside the forest. The species in the community lands comprise a gradient from ‘forest-oriented’ to ‘farmbush-oriented’ species. Species that are normally found close to, or sometimes in, forest are e.g. Violet-backed Hylia, Dusky-blue Flycatcher, Capuchin Babbler and Splendid Starling. A number of species did not enter forest and were restricted to open farmbush. These species included Double-spurred Francolin, Common Bulbul and Pied Crow. Around 25 species were regularly recorded in all habitats. These habitat generalists include Palmnut vulture, Western nicator and Velvet-mantled drongo. Most of the farmbush species and habitat generalists are common and widespread throughout (West) Africa, and not currently threatened or likely to become so in the near future (information available at <http://www.iucnredlist.org/search>). The exception was Hooded Vulture which has recently been uplisted to Endangered.

Mammals

An overview of the mammals in the project zone is given by Lindsell et al (2011). 49 species of large mammal are known to occur, of which 9 species are currently considered to be threatened (

Table 4). Four species are listed as Endangered and five species as Vulnerable. Several species of ungulates that are known to occur in the project zone are endemic to the Upper Guinea forests. These include Jentink’s Duiker and Zebra Duiker, and Brooke’s Duiker if this subspecies of Ogilby’s Duiker is raised to full species status. Pygmy Hippopotamus is also endemic, (if the isolated population in Nigeria is extinct, as it is thought to be (IUCN 2011)). Black Duiker and Maxwell’s Duiker are both near-endemic to the Upper Guinea forests.

Despite 11 years of civil war in Sierra Leone, it appears that the mammal fauna of the project zone has survived relatively intact and that the project zone continues to be an important site for the conservation of threatened Upper Guinea forest wildlife, and the most important site for these species in Sierra Leone. No large mammal species was extirpated during the war and previously unrecorded species have been discovered in recent years. Some of the most threatened species continue to have healthy populations in the forest, especially primates, and showed little or no sign of reduced abundance. However, the population of African forest elephants has collapsed during the war, with only a few individuals remaining from approximately 110 in the mid-1980s (Lindsell et al 2011).

Species	Scientific name	Status	Endemic
Cercopithecidae			
Western pied colobus	<i>Colobus polykomos</i>	VU	Upper Guinea
Western red colobus	<i>Procolobus badius</i>	EN	Upper Guinea

Sooty mangabey	<i>Cercocebus atys</i>	VU	Upper Guinea
Diana monkey	<i>Cercopithecus Diana</i>	VU	Upper Guinea
Hominidae			
Western Chimpanzee	<i>Pan troglodytes verus</i>	EN	
Hippopotamidae			
Pygmy hippopotamus	<i>Choeropsis liberiensis</i>	EN	Upper Guinea
Bovidae			
Zebra duiker	<i>Cephalophus zebra</i>	VU	Upper Guinea
Jentink's duiker	<i>Cephalophus jentinki</i>	EN	Upper Guinea
Elephantidae			
African forest elephant	<i>Loxodonta cyclotis</i>	VU	

Table 4. Threatened mammal species recorded in the project zone.

(Based on Lindsell et al 2011. Status refers to the 2011 IUCN Red List Category, VU: Vulnerable, EN: Endangered, updated from www.iucnredlist.org).

Eleven primates are known to occur in the project zone, including one ape and three prosimians. The Endangered Western red colobus is common but is mostly restricted to the less disturbed areas of the central and northern parts of the project area. The Vulnerable Diana monkey, Sooty mangabey and Western pied colobus are abundant and widespread but the only Near-threatened primate, Olive colobus seems to be rare (Klop et al, 2008).

The Endangered Chimpanzee is relatively widespread throughout the project zone. Based on transect sampling of nest counts in 2009, an average population density of 0.27 chimps per km² was estimated (Ganas 2009), with highest densities occurring in the northern part of the project area. These figures compare favourably to other West African forests. When extrapolated over the entire forest this density gives a total population of 303 in the project zone (Ganas 2009).

The Endangered Pygmy hippopotamus occurs in a many areas, most notably along the Mano/ Moro River. This area consists of a mix of floodplains dominated by herbaceous vegetation and patches of riverine forest. There is very little information on the ecology of this species so it is hard to make inferences about likely population sizes. Most of the

riverine forest is in the leakage belt of the project zone and so floodplain areas in the community forest may be essential for the conservation of this species in Sierra Leone (Hillers and Muana 2011).

Small mammals

A rapid assessment of small terrestrial mammals in Gola identified 26 species of shrews and rodents (Anadu 2008). Three of these species, *Crocidura juvenetae*, *Crocidura obscurior* and *Malacomys cansdalei*, are Upper Guinea endemics. Two species, Large-headed Forest Shrew (*Crocidura grandiceps*) and Buettikofer's Shrew (*C. buettikoferi*), are restricted to the Gulf of Guinea and are classified as Near-threatened (Mondajem 2011).

The project zone is also an important stronghold for bats; 34 species have been identified so far, 1 of which is Vulnerable (*Hipposideros marisae*) (Weber and Fahr 2009).

Reptiles and amphibians

Survey work by Hillers (2009) identified a total of 43 amphibian and 13 reptile species in the project zone. Most of the recorded frogs and reptiles were typical forest species that are restricted to the Upper Guinea Forest zone. One third of the encountered amphibians are listed as threatened or near threatened on the IUCN Red List, (Table 5; 1 CR, 2 EN, 2 VU). The majority of species were closely related to forest habitats (19 frog species, 44%; 9 reptile species, 69%). Additionally, 13 amphibian (30%) and one reptile (8%) species were also related to forests, but they are tolerant of farmbrush habitats. The remaining 11 amphibians and three reptiles comprised of purely savanna, grassland and farmbrush species. None of these species is currently considered to be threatened, although IUCN classification is incomplete.

Genetic analyses identified two specimens of the genus *Phrynobatrachus* as a cryptic species new to science. This species probably is endemic to the area and therefore is likely to be threatened based on its small distribution range. The spectacular finding of the Critically Endangered forest Tai toad *Amietophrynus taiensis*, that so far was thought to be endemic to the Tai National Park in Côte d'Ivoire, furthermore highlights the extremely high potential of the project zone for conservation (Hillers 2009). More research is likely to discover further surprises, including more species new to Sierra Leone or to science in general. Very high species richness, similar to the most diverse forests in south-western Côte d'Ivoire and south-eastern Guinea is not unlikely. The project area is therefore crucial in protecting its important forest habitat diversity and for guaranteeing the persistence of the regional biodiversity of the Upper Guinean forests.

The five reptile and amphibian species that are currently considered threatened are listed in Table 5.

Table 5. Threatened reptile and amphibians recorded in Gola Forest by Hillers (2009).

Status refers to the 2011 IUCN Red List Category, updated from www.iucnredlist.org.

Species	IUCN status
<i>Amietophrynus taiensis</i>	Critically Endangered
<i>Conraua alleni</i>	Vulnerable
<i>Phrynobatrachus annulatus</i>	Endangered
<i>Hylarana occidentalis</i>	Endangered
<i>Osteolmaemus tetraspis</i>	Vulnerable

Freshwater fish

The rivers of the project zone largely comprise the tributaries of the Moro, Mano, Mahoi and Moa Rivers within the Moro-Mano, Mahoi and Moa River basins. The waters of these basins are relatively demineralised, poorly buffered and hence vulnerable to change. Sampling in the Mahoi and Koye Rivers (Payne 2009) produced 31 fish species. With 35% of these species being regional endemics confined to the Sierra Leone/Liberia Upper Guinean ecoregion, the distinctiveness of the fish communities is remarkable. This further emphasises, in global terms, the distinctive nature of the Upper Guinean region of which the project zone is part. Many of the fish species found are scarcely known to science and must be regarded as data deficient or unevaluated in IUCN conservation terms. Of particular note are the headwater swamps and streams which have distinctive communities of smaller species.

Butterflies

The importance of the project zone in the overall butterfly biodiversity of Sierra Leone can hardly be overestimated. Recent surveys have indicated that the project zone holds an extremely high diversity of butterflies, probably well in excess of 600 species or 80% of all the 750 species known from Sierra Leone. A significant proportion of the rarest and most interesting species in Sierra Leone are almost limited to the project zone, the great majority of which are forest-dependent (Safian 2009), two recently encountered butterflies are new to science (Safian 2011). Because of the incomplete IUCN assessment of invertebrates, the conservation status of many of these species is not clear. An overview of noteworthy species is given by Larsen & Belcastro (2008) and Safian (2011). Four recent descriptions of species new to science are based, at least in part, on material collected in the project zone.

Dragonflies

One hundred and forty species of dragonflies and damselflies (Odonata) are known to occur in the project zone (Dijkstra 2011), representing 80% of the species found in all of Sierra Leone. Odonate species can be used as indicators of the quality of freshwater ecosystems and forest habitats (e.g. Catling 2005). This dependency can contribute to raising public awareness of the importance of conserving forests and aquatic habitats. Twenty-two species are considered regionally endemic or threatened, rare and insufficiently known (and thus potentially threatened) (Dijkstra 2011), *Agriocnemis angustirami* is listed as a vulnerable species by the IUCN. Six species found in the project zone in 2011 are new to science.

Threats

Biodiversity in the project zone is threatened by a number of activities that result in deforestation, degradation or disturbance of the forest or by hunting activities.

Deforestation and degradation

The primary driver of deforestation in the project zone is the conversion of forest into the bush-fallow cycle for subsistence agriculture. Forest degradation occurs in the leakage belt of the project zone via selective logging activities and artisanal mining (Witkowski 2012), but degradation from such activities in the project area has been successfully prevented since forest rangers began patrolling there in 2004. Deforestation in the project zone would reduce the size of the forest blocks and increase their isolation from one another (see **Error! eference source not found.**). This would have a direct impact on plant biodiversity and an adverse impact on other taxa as many species are restricted to forest habitats and so are dependent on the availability of forest cover. Many threatened species have small ranges or are mostly restricted to undisturbed primary forest (e.g. the Endangered Gola Malimbe and Western red colobus and the Critically Endangered Tai toad) and so are highly vulnerable to deforestation (Davies 1987, Klop et al 2010). Established metapopulation theory (e.g. Hanski 1999, Akcakaya et al. 2007) predicts that reducing connectivity between forest areas would have a long term impact on the viability of isolated populations. Artisanal mining activities can contribute to forest degradation because small areas are cleared of vegetation to access the minerals found in the soils. Areas chosen for mining often coincide with river courses or swampy areas and as a result there can be a negative impact on water quality and aquatic organisms (Hilson and Nyame 2006).

Disturbance

Disturbance is defined here as increased human presence that may impact the behaviour of animals, leading to e.g. reduced population sizes or the abandonment of suitable sites. Disturbance represents a threat to biodiversity as many species are susceptible to even small levels of disturbance. The Vulnerable White-necked Picathartes, for example, a flagship bird species for the project zone, nests in colonies on large boulders in forest areas. Surveys of nest colonies inside the project area and in communal forests have indicated that colonies in the communal forests have a higher risk of abandonment because of human disturbance (Monticelli et al 2011). Forest elephants are a further example of a species prone to the threat of disturbance; their numbers crashed during the civil war period when people used the forest as a refuge from war atrocities. Only a few individuals remain in the central parts of the project area and the crash in the project zone population brings the elimination of the forest elephant from Sierra Leone closer; it was known from only two other sites in the country, Outamba-Kilimi and the Loma Mountains area, where these populations were small even in the 1980s and under heavy pressure from hunting (Blanc et al 2007). Another species, the Endangered pygmy hippopotamus is mostly found in floodplain areas in the leakage belt of the project zone. It is probably rare inside the forest in the project area (Hillers and Muana 2011). Disturbance and habitat conversion threaten what is probably the largest remaining population of this species in the country.

Bush meat hunting

In West and Central Africa, bushmeat hunting is known to be one of the most important threats to primate and duiker populations (Bowen-Jones et al 1999, Kümpel et al 2008,

Greengrass 2011). Many of the primates and duikers in the project zone are targeted by hunters. In a recent survey on bushmeat markets in the wider Gola area, six species of high conservation concern were found including three Endangered species; Western red colobus, western Chimpanzee and the Pygmy hippo and three vulnerable species; the Sooty Mangabey, Diana Monkey and the Black and White Colobus monkey (Koroma 2012). Some of the bird species are also susceptible to hunting; the Vulnerable White-breasted guineafowl is a terrestrial species and is sometimes caught in snares. Some species are also kept as pets, for example Timneh (Grey) parrot.

G1.8. Project zone High Conservation Value evaluation

High conservation values in the project zone

As is clear from the biodiversity information described in the previous section, the project zone is extremely important for the conservation of threatened Upper Guinea flora and fauna. The project zone harbours several High Conservation Values (HCVs), including several endemic and threatened species and significant tracts of primary Upper Guinea rainforest. The project area has been nominated as a World Heritage site and is awaiting evaluation. An overview of the HCVs present in the project zone is given in below, following classification of HCVs in the CCB project standards.

G1.8.1. Significant concentrations of biodiversity values

Globally, regionally or nationally significant concentrations of biodiversity (HCV1)

The project zone constitutes the westernmost part of the Upper Guinea forest belt, which has been classified as one of the 25 most important biodiversity hotspots in the world (Myers et al 2000). The project zone is home to many species of plants and animals that do not occur anywhere outside of the Upper Guinea forests. For example, a total number of 2,800 species of vascular plants are known to occur in these forests, of which about 650 species (23%) are endemic to the region (Poorter et al. 2004). In addition, many species of mammals, birds and other taxa that are in the Upper Guinea forests occur nowhere else (see section G1.7). The populations of these species in the project zone are thus of global significance as local extinction may be detrimental to the survival of the entire species.

On the national level, the project zone contains the largest remaining tract of tropical lowland forest in Sierra Leone. For many species of regional and national significance the project zone has thus become the final habitat in Sierra Leone. An overview of the species found in the project zone that are threatened is given in

.

Species	Scientific name	IUCN status	Endemic
Mammals:			
Western pied colobus	<i>Colobus polykomos</i>	Vulnerable	Upper Guinea
Western red colobus	<i>Procolobus badius</i>	Endangered	Upper Guinea
Sooty mangabey	<i>Cercocebus atys</i>	Vulnerable	Upper Guinea
Diana monkey	<i>Cercopithecus diana</i>	Vulnerable	Upper Guinea
Western Chimpanzee	<i>Pan troglodytes verus</i>	Endangered	-
Pygmy hippopotamus	<i>Choeropsis liberiensis</i>	Endangered	Upper Guinea
Jentink's Duiker	<i>Cephalophus jentinki</i>	Endangered	Upper Guinea
Zebra duiker	<i>Cephalophus zebra</i>	Vulnerable	Upper Guinea
African forest elephant	<i>Loxodonta cyclotis</i>	Vulnerable	-
Birds:			
White-breasted Guineafowl	<i>Agelastes meleagrides</i>	Vulnerable	Upper Guinea
Rufous Fishing-Owl	<i>Scotopelia ussheri</i>	Vulnerable	Upper Guinea
Brown-cheeked Hornbill	<i>Bycanistes cylindricus</i>	Vulnerable	Upper Guinea
Yellow-casqued Hornbill	<i>Ceratogymna elata</i>	Vulnerable	
Timneh Parrot	<i>Psittacus timneh</i>	Vulnerable	Upper Guinea
Western Wattled Cuckoo-shrike	<i>Lobotos lobatus</i>	Vulnerable	Upper Guinea
Yellow-bearded Greenbul	<i>Criniger olivaceus</i>	Vulnerable	Upper Guinea
Nimba Flycatcher	<i>Melaenornis annamarulae</i>	Vulnerable	Upper Guinea
White-necked Picathartes	<i>Picathartes gymnocephalus</i>	Vulnerable	Upper Guinea
Gola Malimbe	<i>Malimbus ballmanni</i>	Endangered	Upper Guinea
Reptiles and amphibians:			
African dwarf crocodile	<i>Osteolaemus tetraspis</i>	Vulnerable	-
Tai toad,	<i>Amietophrynus taiensis</i>	Critically endangered	Upper Guinea
Allen's slippery frog,	<i>Conraua alleni</i>	Vulnerable	Upper Guinea

Ringed common frog,	<i>Phrynobatrachus annulatus</i>	Endangered	Upper Guinea
	<i>Hylarana occidentalis</i>	Endangered	Upper Guinea

Table 6. Threatened species recorded in the project zone.

Status refers to the 2011 IUCN Red List Category, updated from www.iucnredlist.org.

G1.8.2. Significant large landscape areas

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 (HCV2)

The project zone is part of the Upper Guinea forests, which is a globally, regionally and nationally significant area of forest. Although it is not the only forest block on the African continent, the Upper Guinea forests are home to several species that are found nowhere else on the planet (Poorter et al 2004, Penner et al 2011, Brooks et al 2001). For many species of regional and national significance the project zone has become the last refuge in Sierra Leone. Nearly all lowland forest species found in Sierra Leone have their major stronghold in the project zone. This includes several species that are globally threatened. These endemics include:

- The frog *Phrynobatrachus* nov. sp. It is likely that the entire world population is restricted to the project zone and neighbouring forest in Liberia.
- The Critically Endangered Tai toad *Amietophrynus taiensis* (only known from Gola and Tai NP)
- The Endangered species pygmy hippopotamus, Western red colobus, Jentink's duiker and Gola Malimbe have their main (or sole in the case of Gola Malimbe) Sierra Leone strongholds in the project zone. Although the colobus is relatively common in the project area, both the hippo and the malimbe are very rare. The conservation of the project zone is essential to the survival of these species in the country and to the species as a whole.

Many species that are listed as threatened occur in the project zone (see

-).
- In addition to the threatened species, there are several non-threatened species that are restricted to primary forest and the project zone is of major importance for these species in the country. These include Green-tailed Bristlebill, Rufous-winged Illadopsis and Lagden's Bush-shrike.

The project zone is also important for other reasons. Firstly, for many taxa the IUCN lists are incomplete and the conservation status of many lesser-known taxa such as amphibians, fish and invertebrates has not been adequately assessed⁷. However, many of these species may

⁷ see <http://www.iucnredlist.org/initiatives/amphibians/description/limitations>

be threatened, especially in sensitive groups such as amphibians. In addition, several species that are new to science have been recently discovered in the project zone (e.g. the *Phrynobatrachus* frog and four species of butterflies and six species of dragonfly). There may be many species waiting for discovery in these forests and it is likely that many of these will be endemic to this region. All these species occur naturally in this ecosystem type and exist in natural patterns of distribution and abundance.

G.1.8.3. Threatened or rare ecosystems

Threatened or rare ecosystems (HCV3)

The Upper Guinea forests are distributed in West Africa from Guinea in the west to Togo in the east and are separated from the main Guinea-Congolian forests of central Africa by the unforested 'Dahomey Gap' in Togo and Benin. They have been classified as one of the 25 most important biodiversity hotspots in the world (Myers et al. 2000) and have experienced severe loss of forest cover. Chatelain et al. (2004) estimate that between 20% and 50% of the forest cover that existed at the turn of the 19th century remains. Given the climatic conditions, more than half of Sierra Leone could be covered with rainforest, but actual forest cover is approximately 5% (NBSAP 2010). It is clear that the conservation of the project zone is crucial for the survival of this highly threatened ecosystem and its species in the country.

G1.8.4. Areas providing critical ecosystem services

Areas that provide critical ecosystem services (e.g., hydrological services, erosion control, fire control) (HCV4)

The project zone provides some critical ecosystem services and the forest acts as a natural resource base serves to underpin many of the livelihood options of the communities. The most important services are carbon sequestration and watershed protection but in addition, the forest also plays a role in erosion prevention, climate regulation and the supply of wild pollinators for growing coffee and other crops important for livelihoods. The importance of the project zone in terms of carbon sequestration is discussed in section CL1. The other critical ecosystem services provided by the project zone are discussed in more detail below.

Watershed protection

Forests provide hydrological control of both water supply and water quality. In general, stream flow from forested catchments is more consistent through the year, less likely to run dry, peaks at lower levels and is cleaner than stream flow from areas where the forest has been cleared. Both reduced flow and dirtier water can contribute to health problems.

Most streams from the project zone drain into the Moro/Mano River on the eastern border. Many settlements around the forest depend on streams that originate in the project area and local communities have commented on the importance of the forest for their water supplies (Witkowski et al 2012b). Very few Forest Edge Communities have piped or borehole supplies, and stream water is still used for a number of domestic activities as well as being important for agriculture (Bulte et al. 2013).

Other ecosystem services

Forest cover provides effective protection from erosion by rainfall and runoff (Morgan 2005, Bao & Laituri 2011). Soil loss, particularly on steep slopes, can be a leading cause of land degradation and can lead to danger from landslides in certain circumstances. The delivery of excess sediment downstream can be detrimental for aquatic ecosystems, for agriculture as well as problematic for domestic water supplies (e.g. Birkinshaw et al 2010).

A number of crops grown in the project zone depend on wild pollinators, notably coffee. Elsewhere, wild pollinators have been shown to make a substantial economic contribution to coffee and other agricultural yields (Klein et al 2003, Chaplin-Kramer et al 2011).

Forests are also a source of non-timber forest products (NTFPs) such as honey, fruits, seeds, thatch, and rattan which are collected in farm bush and forest areas (Leach 1994). Wild plant foods add variety to diets and are a supplement to food supplies during the hungry season (Leach 1994). Forest products serve as medicines, foods, construction and tying materials, as well as to make household items like mortars, utensils, and baskets; all of which can be used in the home or sold to generate income (Davies and Richards 1991).

Finally, any large block of forest is believed to play a role in stabilizing climate and hydrology. In particular, forests near the coast in West Africa are believed to be important in recycling moisture so as to maintain humidity levels and contribute to reliable rainfall in drier areas further inland, where water is often a limiting factor in terms of human survival (Popoola 2011). The maintenance of humidity levels is also important for the production of cocoa, an important cash crop for farmers in the project zone (per comm.. WHH).

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

Areas that are fundamental for meeting the basic needs of local communities (e.g., for essential food, fuel, fodder, medicines or building materials without readily available alternatives) HCV5

People living in Forest Edge Communities were identified as those who periodically entered the project area primarily to farm, hunt and gather NTFPs (See G3.8). Of the raw materials communities gather for household use building materials are the most important and in particular poles required for construction (Davies and Richards 1991). The vast majority of building materials used are accounted for by 10 species of tree all of which grow primarily in farm bush areas rather than forest and so are gathered primarily in the leakage belt areas not the forests of the project area (ibid). The most important forest foods are plant products particularly vegetables (e.g. leaves) but also fungi and roots and tubers. Like the building materials many of the species used grow in areas of farm bush and plantations (ibid). Of foods sourced from animals, fish and crustaceans are the most important category for consumption (ibid). As alternatives are available in the community managed areas of the leakage belt closer to dwelling areas, it is understood that the project area served as an additional source for meeting basic needs rather than a fundamental source, the project therefore does not meet HCV5. In addition the project has been designed to involve forest edge communities in the development of co-management zones in the project area (GRNP) and therefore have access to areas to sustainably extract NTFPs and fish to meet any additional requirements for basic needs as they have likely done in the past (see G3.1).

G1.8.6. Areas critical for traditional cultural identity

Areas that are critical for the traditional cultural identity of communities (e.g., areas of cultural, ecological, economic or religious significance identified in collaboration with the communities)

Secret society (*Sande* and *Poro*) is a central part of the Mende culture, as a person is not fully gendered until they have reached puberty and passed through an initiation process. As part of the initiation process, children are required to spend time in a special part of the bush isolated from members of the opposite sex (Leach 1996); the locations of these areas are only known to members of the societies and not to outsiders but they are understood to be largely within the bush areas of the leakage belt in the project zone rather than in the project area (Personal communication, GRNP Community Development staff and Green Africa staff).

Burial grounds are considered sacred areas and there are strict rules about respecting such areas (Bulte et al. 2013). Such sites have been encountered within the project area but these are found as biodiversity survey work is carried out rather than as a result of a deliberate effort to identify such areas. From interviews and discussions with Forest Edge Communities burial grounds and other sacred areas within the project area are not frequently visited (in key informant interviews less than 5% of people said that such sites were known about (Witkowski et al 2012a) and if they were visited the frequency of visit was once per year). Burial grounds are also present in the leakage belt. Such areas are not currently mapped but the location of sites will become clearer as the project develops Co-Management within the project area (see G3.1). It is therefore not considered that critical areas for the traditional cultural identity of communities exist within the project area. It should be noted that communities retain the right to access any sacred areas within the project area.

G2. Baseline Projections

G2.1. Most likely 'without project' land-use scenario

Describe the 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 most likely alternative land-use scenario in the absence of the project, the range of potential land use scenarios and associated driver of emissions were identified and selected following the Verified Carbon Standards (VCS) tool 'VT0001 Tool for the Demonstration and Assessment of Additionality in Agriculture, Forestry and Other Land Use (AFOLU) project activities' and the baseline estimation of carbon stock changes followed VM0007 and the BL-UP (Baseline-Unplanned) methodology module, Version 3.0. The tool uses a step-wise approach to identify the most likely alternatively land use scenario, as is described below.

STEP 1 – IDENTIFICATION OF ALTERNATIVE SCENARIOS

Step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity Scenarios

The following 8 alternative scenarios were identified for the project;

1. Continuation of Forest Reserve designation and issuance and implementation of selective logging concessions

Historically the project area (GRNP) was designated by the government as a timber production area. Gola East and West reserves were gazetted as Forest Reserves in 1926 (now known as Gola South), Gola North in 1930 (now known as Gola Central) and extensions added in 1956 and 1963 (now known as Gola North) (See Figure 10). Two large scale timber companies worked in the Gola project area, the Forest Industries Corporation (FIC) and The Sierra Leone Timber Industry and Plantation Company (SILETI) (Illes et al 1993). FIC worked in the accessible areas in the western section of Gola Central in 1961, 1978 and during the period 1984-1986. Some 19% of Gola Central was exploited during this period (Illes et al 1993). Gola South was more extensively logged by both FIC and SILETI during the 1960's, 70's and 80's, operations finishing in 1989 (Illes et al 1993).

Although the most accessible timber has been removed, Illes et al. (1993), estimated that 28,000 m³/year could be sustainably extracted. Currently there is ban on timber exports; only timber products with added value can currently be exported from Sierra Leone but a high tax levy on each container acts as a disincentive to commercial operators (Sheku Mansaray, Forestry Division pers. comm.). Currently any small scale logging or larger scale commercial logging operations are therefore selling wood to the National market. Although there are limitations, the project area still has the potential to be commercially logged as an alternative land use scenario.

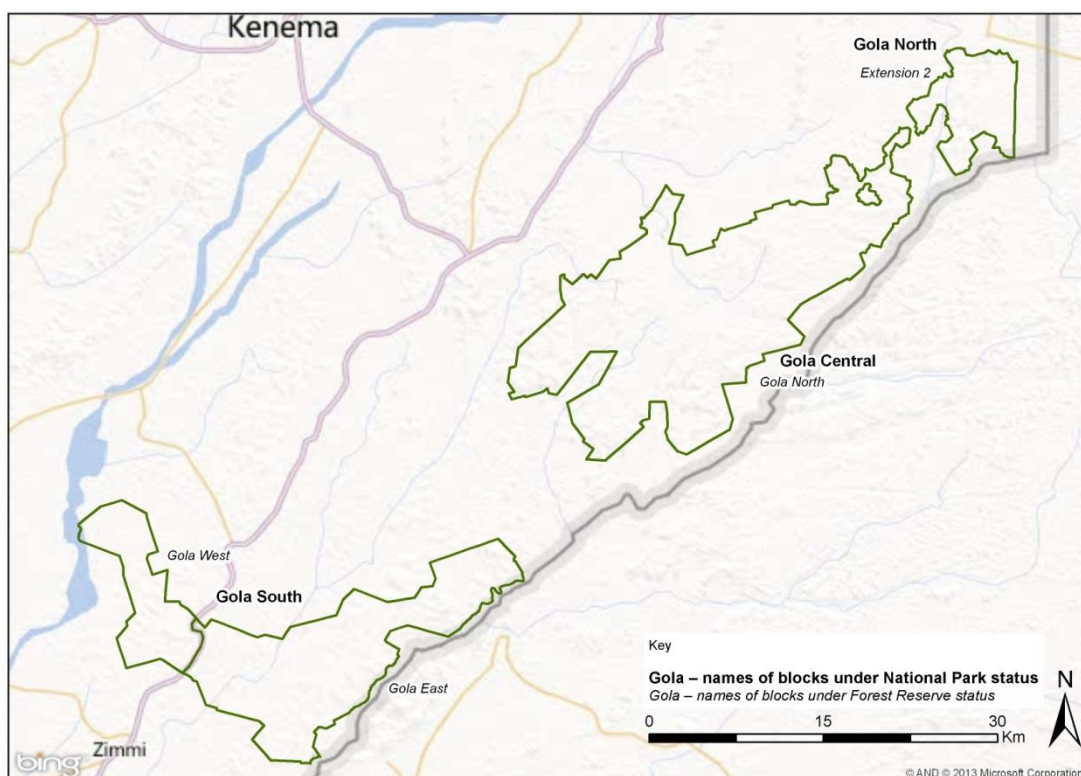


Figure 10. The GRNP with current and historical block names as a Forest Reserve and as a National Park

2. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of small-scale logging operations

Small scale logging operations remove selected trees from within the project area, causing localised degradation. Timber prices on the local market offer an attractive incentive for small-scale logging activities in a country where unemployment, especially among male youths is high (Peters et al 2010:6,7). Without the project small scale illegal timber extraction would take place, it is thought that such activities would be highest in areas where no community forests remain and areas which are most accessible and have good timber stocks (Witkowski 2012). Small scale logging operations therefore represent an alternative land use scenario and such activities would result in degradation, paving the way for further degradation and deforestation processes.

3. Continuation of Forest Reserve designation with issuance and implementation of industrial mining concession operations in parts of the reserve

Before the civil war during the 1960's and 70's the mineral sector provided Sierra Leone with 70% of its foreign exchange earnings and of 20% of the GDP (National Recovery Strategy 2002:7). Minerals continue to be of key importance to the economy of Sierra Leone, as highlighted by the priority given to the sustainable development of the country's mineral wealth in the National Recovery Strategy (2002:55) and the Poverty Reduction Strategy Paper (2005:93). Mineral exports contributed to 54.3% of Sierra Leone's total exports in 2010 (ICMM 2012).

Mining concessions overlies the boundaries of other Forest Reserves; the Kangari Hills Forest Reserve for example is partly overlain by the Baomahun licence for Gold Mining where operations are owned and run by Cluff Gold (Cluff Gold report 2010: 8). Licenses for prospecting minerals have also been issued by the Ministry of Mines within the project zone in the past (see Figure 11). Subsequent investigations into the companies purporting to own the licences reveal that many are no longer operating and the Ministry of Mines reports that there are no active mining licences in the Gola Forests (pers. comm. Director of Mines Jonathan Sharkah on 22 January 2013). The only possible threat is therefore over known deposits of iron ore contained in the Bagla Hills in the Southern block of the project area. The Bagla Hills contain a viable large scale deposit of iron ore (SRK Consulting 2007) which would be extracted by open cast mining methods (SRK consulting 2007), if a licence was issued and would cause multiple direct and indirect impacts on the environment (MINEO 2000; 5, <http://www.african-minerals.com/operations/tonkolili-project-videos>).

Only the southern block of the project area therefore has the potential to be industrially mined as an alternative land use scenario.

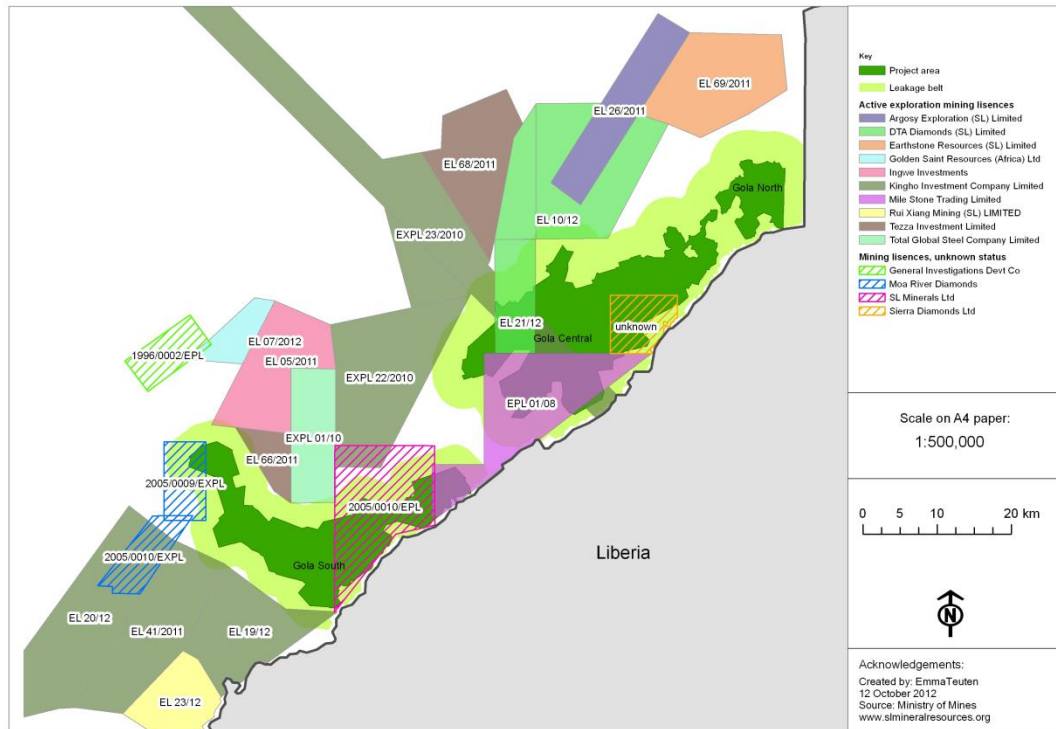


Figure 11. Mining licenses previously issued in the project zone

(source: Ministry of Mines website; www.slmineralresources.org)

4. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of artisanal miners

Mining activities carried out locally by artisanal miners looking for gold and diamonds have been reported from within and around the borders of the project area, (Witkowski 2012). In particular, the Chiefdom of Nomo experienced high levels of artisanal mining during 2011 when 70 miners were arrested from within the project area by the patrol teams (Witkowski 2012). There has been military involvement in these illegal activities and the Forest rangers have received threats from organised groups of artisanal miners. Artisanal mining is carried out in small, shallow pits (approximately 1m deep), using rudimentary tools and results in forest degradation rather than large scale deforestation (Witkowski 2012). Such activities represent a potential alternative land use scenario for small parts of the project area, where there are believed to be small accessible deposits of minerals.

5. Continuation of the Forest reserve lacking operational budget resulting in unplanned deforestation: small scale degradation and deforestation resulting in shifting cultivation by small holder agriculturalists

Smallholder agriculture is widely cited in the literature as a primary driver of deforestation in Sub-Saharan Africa (EC 2010, Union of Concerned Scientists 2011, Gibbs et al 2010). Although in some countries this may be an over-generalization (Ickowitz 2006), in Sierra Leone there is a strong case that the conversion of forest into the farm fallow cycle is one of the primary drivers of forest loss. Climatic conditions would allow Sierra Leone to support

forest cover in approximately 60% of its land area but current forest cover is estimated at only 5% (NBSAP 2010). Extensive loss of national forest has been driven primarily by the conversion of forest land into the bush fallow cycle; subsistence agriculture being the principal livelihood of 80% of the labour force in Sierra Leone (USAID 2007). The Ministry of Agriculture, Forestry and Food Security (MAFFS) also highlights the conversion of forest to agriculture as one of the key drivers of deforestation (MAFFS 2004, PRSP II 2008:144). Estimates that 600,000 hectares of forests have been cleared for shifting cultivation (National long term perspective studies 2004; 29); Sierra Leone received the world's lowest Environmental Performance Index rank in 2010 (163/163).⁸

A high proportion of the labour force in Sierra Leone is dependent on land for agricultural subsistence activities; 75% according to the National Poverty Reduction Paper (2005:33) and 90% of the farming population are small holder farmers according to the National Rice Development Strategy (National Rice Development Strategy 2009: 5). However, subsistence activities are highly inefficient (Goodman 2008), and fewer than 5% of farmers have access to fertilizers, insecticides and herbicides which could help boost productivity (National Rice Development Strategy 2009:7). Both biotic and abiotic factors such as disease, pests, low soil fertility and poor extension services limit farmers yields and factors such as poor crop management, inappropriate storage facilities and poor market access limit farmers' ability to sell produce (National Rice Development Strategy 2009:7). In the region of the project area agricultural yields were calculated to have a value of \$70 per hectare (Goodman 2008), which is very low compared to other West African countries such as Ghana at \$180 per hectare (Grieg-Gran 2008). Low productivity combined with an increasing population's demand for food - an average 2.8% pa growth rate was recorded for Sierra Leone by the World Bank between 2004 and 2010 (World Bank 2010), and 2% average growth rate in Forest Edge Communities around the project area (Bulte et al. 2013) - results in a need for more land to farm as cash poor rural households struggle to afford imported rice prices (National Rice Development Strategy 2009).

Deforestation as a result of farming activities has occurred in the past in the project area before conservation management activities began in 2004 (Witkowski 2012). Farming encroachment into the project area (then a forest reserve) occurred in many areas for various reasons. In some cases it occurred as farmers wanted to expand their farming activities and project boundaries were not clear. As there was no management presence on the ground there were little consequences felt by farmers for encroaching (Witkowski 2012). In other cases families wished to re-exert their historical right to farm inside the reserves (Davies and Richards 1991:29) and so created small plantations or farms inside the Forest Reserves, and in other cases new villages and farms were created within reserve boundaries either during the war when people were seeking a safe place to go, or pre-war by families looking for a new place to live and farm (Musa Swaray, town Chief and Forest ranger, pers. comm., Witkowski 2012). The soils found in newly cleared areas of forest are

⁸ The EPI "ranks 25 performance indicators tracked across ten policy categories covering both environmental public health and ecosystem vitality. These indicators provide a gauge at a national government scale of how close countries are to established environmental policy goals." Emerson, J., D. C. Esty, M.A. Levy, C.H. Kim, V. Mara, A. de Sherbinin, and T. Srebotnjak. 2010. *2010 Environmental Performance Index*. New Haven: Yale Center for Environmental Law and Policy.

widely perceived to have much higher fertility and therefore produce better yields which has driven the conversion of forest areas (Witkowski 2012:12, Davies and Richards 1991:27, 29), and whilst areas of primary forest are harder to clear without labour and equipment, without the project the degradation caused by small scale logging and mining activities would open up the area and more readily allow access for small holder agriculturalists. A similar pattern of agricultural encroachment is seen in the other Forest Reserves selected as the Reference Region for the project (Netzer and Walker 2013).

Without the project activities gradual encroachment into the project area is likely as well as the appearance of new communities inside the project area; smallholder agriculture is therefore an alternative land use scenario.

6. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of plantation agriculture

The GoSL is actively promoting agricultural investment opportunities for national and international investors. Cash crops such as rice and cocoa as well as the production of agrofuels such as sugar cane and palm oil are targeted as investment opportunities in rural areas. A newly created government agency, the Sierra Leone Investment and Promotion Agency (SLIEPA), assists investors and offers generous incentives (SLIEPA presentation). Large scale plantations (above 16,000 hectares) are in the process of being established in the Kailahun and Pujehun districts (two of the three districts in the project area). Socofin S.L. for example is making an investment of \$100 million for 12,000 hectare rubber and oil palm plantation in the Pujehun District (Green Scenery report 2011) and smaller scale investments are being made within the project zone (e.g. tropical farms who purportedly have a 1200ha concession for cocoa production per comm., tropical farms). Without the project, plantations would be a credible alternative land use scenario for the project area.

7. Continuation of the Forest Reserve designation lacking operation budget resulting in degradation due to charcoal and fuel wood collection

The majority of the population uses firewood and charcoal for cooking; over 80% of energy is derived from biomass and it is estimated that 4 million cubic meters of wood biomass is extracted annually to meet domestic energy requirements in Sierra Leone (UNDP 2007). According to the Assistant Director of Forestry, firewood collection and charcoal production are two of the drivers of forest degradation in Forest Reserves in Sierra Leone (Garnett 2012), though such activities are illegal unless the trees are already downed or dead. Species such as *Parinari excelsa* (Chrysobalanaceae) are used to make charcoal and this species is one of 10 most common trees found in the project area (Klop et al 2008). Neither fuel wood collection nor charcoal production were revealed as primary drivers of deforestation or degradation in the project area as there is ample farmbrush closer to the communities for collection and wood collected in the forest is considered too wet (Witkowski et al 2012b). Small areas of forest may become degraded without the project in the project area but charcoal and fuel wood collection are not likely alternative land use of the project area.

8. Designation of area as National Park and committed long term financial resources allowing for protection of forest resources

In recognition of the importance of biodiversity, Sierra Leone has signed and ratified the Convention on Biodiversity and on numerous occasions the current President, Dr Ernest Bai Koroma, has publically committed to conserving the country's natural forest resources for the ecosystem services they provide (Koroma 2009, 2011). The GoSL could therefore have upgraded the project area into a National Park in the absence of the project. As discussed later in G2.2, steps two and three, the GoSL does not have the financial resources to protect the project area or the other gazetted areas of forest in Sierra Leone. The strategic priorities for investment of the Government of Sierra Leone revolve around consolidating peace and rebuilding the economy after the debilitating civil conflict (Poverty Reduction Strategy Paper II, 2008.); conservation is a low priority. The protection of Forest Reserves in Sierra Leone is not part of the Forestry Division's strategic plan (FD strategic Plan 2012-2014, Showers 2012:12), and therefore no budget is available from Central Government for activities relating to the management or protection of Forest Reserves or National Parks in Sierra Leone. In 2011, \$115,814 was allocated to the Forestry Division in the Government of Sierra Leone's budget to manage 48 Forest Reserves and National Parks covering over 300,000 hectares of forest. It is therefore highly unlikely that the Government would have proclaimed the area as a National Park, had the finances from a REDD project not been highlighted as the future source of funding (Eco-securities 2008) for the Park management (per comm.. Sheku Mansaray, McClanahan 2011).

The designation of the area as a National Park with committed financial resources cannot therefore be considered as a viable alternative scenario.

As a result of the above analysis, the credible land use scenarios are therefore;

- 1. Continuation of the Forest Reserve designation and issuance and implementation of selective logging concessions**
- 2. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of small scale logging activities**
- 3. Continuation of Forest Reserve and issuance and implementation of industrial mining concession and operations**
- 4. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of artisanal miners**
- 5. Continuation of Forest Reserve designation lacking operation budget resulting in influx of small holder agriculture**
- 6. Continuation of Forest Reserve designation lacking operation budget resulting in influx of Plantation agriculture**

Step 1b. – Consistency of land use with mandatory laws and regulations

The principal laws that legislate the Forest Reserves and protected areas of Sierra Leone are the Forestry Act 1988, the Forest Regulations 1990 and the Wildlife Act 1992.

1. Continuation of Forest Reserve designation and issuance and implementation of selective logging concessions

Without the project, the forests would be controlled by Forestry Act No.7 of 1988 and administered under the Forestry Regulations published as part of the Act in December 1990. The forests would be managed by the Forestry Division of the Ministry of Agriculture, Forestry and Food Security (MAFFS). Commercial logging would be consistent with the mandatory laws and regulations from the 1988 Forestry Act which grant the Forestry Division the power to issue commercial timber licences and concessions in Forest Reserves (Fofanah 2012:6,7). Even as a National Park, concessions can be authorized by the Chief Conservator of Forests (Fofanah 2012:5). Provided the company has a licence or concession, this land use would be consistent with laws and regulations for either a Forest Reserve or a National Park.

2. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of small scale logging activities

Although small scale logging is illegal unless licences are granted (Fofanah 2012), there is currently no enforcement of the existing laws and legislation in other Forest Reserves, nor would there be in the GRNP without the project (Showers 2012). A reserve without active management due to low capacity and lack of finances within the Forestry Division (Showers 2012) is therefore readily subject to degradation by small scale logging activities. Degradation resulting from small scale logging activities is widely reported as a land use occurring in other Forest Reserves in Sierra Leone (Cuni-Sanchez 2012b: 9, Showers 2012). Although it's not consistent with legislation unless loggers have a licence, it is common practice and therefore an alternative land use scenario.

3. Continuation of Forest Reserve and issuance and implementation of industrial mining concession and operations

Without the project the forests would be controlled by Forestry Act No.7 of 1988 and administered under the Forestry Regulations published as part of the Act in December 1990. According to section 3(a) and (b) of the Forestry Act, the Chief Conservator, under the direction of the Minister of MAFFS, is responsible for the efficient management and rational utilisation of the country's forest resources and their preservation. According to Section 28 (1) of the Forestry Act, no prospecting, exploration or mining may be carried out in national or community forest. Section 9 of the Forestry Act also states that in a national or community forest no one can "cut, burn, uproot, destroy...clear any land, remove any timber... take any earth, clay, sand, gravel or stone except pursuant to a concession agreement or licence confirmed usage right or other authority under this act" (Forestry Act 1988: 5, 20, 8). Furthermore, Section 21 of the 1994 Mines and Mineral Decree, which was in force when the licences outlined in step 1a were allocated, states that where an act is prohibited in

another law, nothing in the Mines Decree will be interpreted as authorising that action (Global Witness 2010).

However, the fact that mining licences have been allocated over several Forest Reserves (Annex 4) and are currently operational, as is the case in Kangari Hills Forest Reserve (Cluff Gold report 2010: 8) and in Farangbaia where a railway to extract mineral ore has divided the Forest Reserve in two (Showers 2012:10), demonstrates that legislation is not the only factor that should be considered in assessing alternative scenarios. Political will, development opportunities and finance must also be considered. Even as a National Park, a provision currently exists in the legislation allowing the President or the Chief Conservator of Forests to permit prohibited activities within National Parks if they are within National interests (Fofanah 2012: 5). Commercial mining could be granted within a Forest Reserve or within a National Park in Sierra Leone if approved by the Chief Conservator or by the President. This land use would therefore be consistent with laws and regulations.

4. Continuation of the Forest Reserve designation lacking operation budget resulting in an influx of artisanal miners

Although as described above, artisanal mining is illegal unless licences are granted, there is currently little enforcement of the existing laws and legislation due to the Ministry of Mine's lack of human and financial resources (Fofanah 2012). The price obtained for gold and diamonds offers an attractive incentive for artisanal activities. In a country where unemployment, especially amongst male youths, is high (Peters et al 2010:6,7), other Forest Reserves in Sierra Leone are experiencing degradation as a result of artisanal mining activities (Showers 2012 and Cuni-Sanchez 2012b). Although not necessarily consistent with legislation, artisanal mining has become common practice in reserves with no active management.

5. Continuation of Forest Reserve designation lacking operation budget resulting in influx of small holder agriculture

Whilst farming activities inside Forest Reserves would be considered illegal without any formal permission, farming inside other Forest Reserves where management is minimal or non-existent has become common practice, (Cuni-Sanchez 2012b and Showers 2012). Without additional external funding the Government of Sierra Leone does not have the resources to protect its forest estates, and protection is not seen as a strategic priority when there are many other more pressing development issues on the agenda (Showers 2012:12). Farming inside the project area was occurred before conservation management and law enforcement began in 2004 (Witkowski 2012). Encroachment by local communities for farming is therefore a commonplace activity inside Forest Reserves in Sierra Leone and consequently an alternative land use scenario that is consistent with common practice.

6. Continuation of Forest Reserve designation lacking operation budget resulting in influx of plantation agriculture

As with the issuance of logging and mining concessions described above, the Chief Conservator has the authority to issue a licence or a concession for a plantation within a Forest Reserve or a National Park, making this land use consistent with legislation.

Plausible alternative land use scenarios;

- 1. Continuation of Production Forest designation and issuance and implementation of selective logging concessions**
- 2. Continuation of the forest reserve designation lacking operation budget resulting in an influx of small scale logging activities**
- 3. Continuation of Forest Reserve and issuance and implementation of industrial mining concession and operations**
- 4. Continuation of the forest reserve designation lacking operation budget resulting in an influx of artisanal miners**
- 5. Continuation of Forest Reserve designation lacking operation budget resulting in influx of small holder agriculture**
- 6. Continuation of Forest Reserve designation lacking operation budget resulting in influx of Plantation agriculture**

Step 1c. Selection of the baseline scenario

The REDD project activity is identified using the following decision tree, as delineated in VM0007. The result of this decision tree demonstrates that the REDD project activity is Avoided Unplanned Deforestation. Thus it is concluded that the baseline scenario is avoided unplanned deforestation.

Is the Forest land expected to be converted to non-forest in the baseline case?			
Yes		No	
Is the land legally authorized and documented to be converted to non-forest?		Is the forest expected to degrade by fuelwood extraction or charcoal production, in the baseline case	
Yes	No	Yes	No
Avoided planned deforestation	Avoided unplanned deforestation	Avoided forest degradation	Proposed project is not VCS REDD activity currently covered by the

			module framework
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The below potential land uses are deemed not the most likely land use due to the following characteristics:

1. Planned deforestation due to selective logging concessions

Selective logging concessions are **not** considered a land use in the baseline scenario for the project area as despite being consistent with legislation for a Forest Reserve, no concession licences have been granted within the project area in the last 10 years and are therefore an unlikely alternative land use.

2. Unplanned degradation due to small scale logging activities

Small scale logging activities result in localised degradation as typically only a few trees are removed from an area (Witkowski 2012). Commercial activities in the 1960s to the 1980's removed the most valuable and accessible timber (Illes et al 1993: 10, 29), but small scale activities involving local gangs and people to transport the wood are likely to feature in a baseline scenario as occurred pre conservation activities (Illes et al 1993: 34, Witkowski 2012). Degradation from small scale logging activities is **not** included in the baseline scenario as it would not result in deforestation, it will be monitored through the projects lifetime.

3. Planned deforestation due to Industrial mining concessions

Although industrial mining concessions for exploration have been issued within the project area in the last 10 years, no mining activities have ever been initiated and most of the companies that purportedly own the licences no longer operate. The only possible threat for industrial mining to occur is in the Southern block of the project area where there is a commercially viable deposit of iron ore in the Bagla Hills. It is a potential threat as several claims have recently been made by individuals and companies interested in mining there (Daily Mail 2012). However, the Government has repeatedly stated that mining will not be allowed to occur in the GRNP (e.g. State House Communications Unit 2011) and therefore planned deforestation from mining concessions is not an alternative baseline scenario.

4. Unplanned degradation due to artisanal mining

Artisanal mining results in forest degradation and small areas of deforestation as mining pits are made with rudimentary tools and are small and shallow (Witkowski 2012). Artisanal mining was seen as an activity to supplement agricultural incomes by Forest Edge Communities and not the primary livelihood activity (90% of communities in the project zone reported that agriculture was the main livelihood activity (Bulte et al. 2013). Although artisanal mining is expected to take place in some small areas within the project area without the presence of forest rangers, it is not the dominant driver of deforestation and is therefore **not** considered in the baseline scenario. It will be monitored throughout the lifetime of the project.

5. Unplanned deforestation: degradation and deforestation resulting in land use change from smallholder agriculture

Historical trends regarding land use in Sierra Leone in and around Forest Reserves indicate that the primary driver of deforestation in Forest Reserves which are not actively managed is from encroachment by small holder agriculturalists converting forests into the bush fallow cycle. This is the most widespread driver of deforestation in Sierra Leone and would result in a mosaic landscape containing fields at various stages along the crop-fallow cycle, from active cropland to fallow areas (See Netzer and Walker 2013).

6. Planned deforestation due to commercial plantations

Planned deforestation due to commercial plantations is not considered a likely alternative land use as currently there is no evidence of agriculture concessions being granted within the boundaries of the project area or other Forest Reserves in Sierra Leone.

As a result of step 1c, only one plausible land use scenario emerges, that of unplanned deforestation due to smallholder agriculture practices.

G2.2. Documentation of project ‘additionality’

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.

In order to prove the project is additional, and that the benefits to the climate, biodiversity and communities would not have occurred without the project, the VCS tool, (VT0001 Tool for the Demonstration and assessment of additionality in Agriculture, Forestry and Other Land Use (AFOLU) project activities), uses investment analysis to demonstrate that project activities are financially less attractive than at least one of the other scenarios.

Step 2 – INVESTMENT ANALYSIS

Here we apply a simple cost analysis to demonstrate the costs associated with the project and that the Gola project generates no financial benefit other than VCS related income.

Sub-step 2b

Detailed accounts of the costs incurred by the GRNP forest program to develop and operate the conservation management during the pilot phase of activities have been kept since 2008. The average yearly costs from the 4 years of activities plus the costs of implementing new activities in the Forest Edge Communities around the project area to mitigate leakage and provide net positive benefits have been summarized in the table below (more detailed records will be made available to the auditor upon request).

Budget Item	TOTAL
Management	80,902
Research & Monitoring	58,298
Administration & Finance & HR services	134,957
Park Operations	232,622
Travel & Transport	9,548
Equipment, Consumables & Running costs	169,965
Other services & fees (incl communication, finances & verification event)	43,845
Visibility & Outreach	28,693
Community Benefit Sharing Development & Implementation	268,965
Infrastructure (maintenance & development)	28,432
Total GRNP Core Operations Annual Budget (£)	1,056,226
<i>Core Ops Annual Budget USD (@1,59)</i>	1,686,117

Table 7. Annual costs for the REDD project; averaged into a yearly amount calculated over a 5 year period (2013-2018)

The only income over this period has been from visitors to the park, the revenue from which is summarized in the table below:

Year	Total Revenue	Revenue for Forestry Division	Revenue for Communities
2009	\$357	\$233	\$124
2010	\$1999	\$1258	\$741
2011	\$1427	\$757	\$670
2012	\$2791	\$1640	\$1151

Table 8. Income from ecotourism activities

The income generated by project tourism activities is given to the Forestry Division and to local communities involved in the tourism activities and is not kept by the project. The project activities therefore do not generate any income to offset the costs of the project.

Budget available from the Government of Sierra Leone

The strategic priorities of the Government of Sierra Leone revolve around consolidating peace and rebuilding the economy after the debilitating civil conflict (Poverty Reduction Strategy Paper II, 2008.), conservation is a low priority for the allocation of funds.

The protection of Forest Reserves in Sierra Leone are not part of the Forestry Division's strategic plan (Forestry Division strategic Plan 2012-2014 and Showers 2012), and therefore no budget is available from the Central Government for activities relating to the management

or protection of Forest Reserves in Sierra Leone. Instead, the Forestry Division's strategy focuses on reforestation, the promotion of commercial activities and the legislative framework for forestry. The staff required in the districts to fulfil the requirements of the Forestry Divisions strategic plan are paid directly by the Central Human Resources Department. In the 2012-2014 budget, a total of Le272,638 (\$63) was available per month for 3 FD staff in Pujehun District, Le1,311,924 (\$305) was available per month for 16 staff in the Kenema District and Le792,411 (\$18) per month for 1 staff in the Kailahun District. This amounts to an average of \$22 per person per month (below the widely accepted \$1 per day international poverty line). These 3 districts are responsible for 13 Forest Reserves, not just the project area (GRNP). Without the project, it is assumed that these amounts would still be available to pay Forestry Division staff in the 3 districts where the project is located⁹. However, there would be no budget available for them to implement any forest management or protection activities.

The project activities and budget available from Central Government clearly do not generate any significant income to offset the necessary conservation management costs. The project would therefore be entirely reliant on VCS income to create financial benefit.

Having demonstrated that the project does not generate any financial benefits other than VCS related income, the project is then required to show that the project activities are not common practice. In the interest of transparency and best practice, the project, in addition to common practice analysis, also presents a barrier analysis to highlight some of the difficulties in implementing conservation projects in Sierra Leone

STEP 3 - BARRIER ANALYSIS

Step 3a. Identify barriers that would prevent the implementation of a type of the proposed activity:

Investment barriers

Creating and implementing conservation projects and protected areas in developing countries is costly; in a post-conflict country such as Sierra Leone which lacks basic infrastructure and has multiple development needs, protecting forest resources is not seen as a priority area for expenditure especially when resources are so limited. The Forestry Division's strategic plan 2012-2014 does not include the protection of any Forest Reserves beyond the Western Area Peninsular Forest (FD strategic plan) and so no budget to implement any management actions on the ground is available from central sources beyond what the government allocates to salaries, which is part of its core costs (see sub-step 2b).

Finances to manage the conservation of the project area since 2004 have been raised from several donors:

⁹ The Gola REDD project employs 150 staff to manage the protected area and work with the local communities so even if all 20 FD staff were employed to work solely in protecting the GRNP without the project, management of the area would be severely understaffed.

Year	Donor Source	Total Amount
2003	GCF	\$25,000
2004-2006	GCF grant and Darwin grant	\$450,000 and £100,000
2007-2012	EU and FFEM	Euro 4.2 million

The RSPB, a member of Gola Rainforest Conservation LG, (the project proponent) took the lead in sourcing donor financing for the Gola forest program and as reported by the lead fundraiser, Alex Hipkiss, (Hipkiss 2012) the potential to find donor funding for the project has dried up; without REDD funding, the project will fall into the traditional boom and bust project cycle that has been experienced by many conservation projects around the world (IUCN 2006). The problem for accessing donor funds is that the focus for the funds is constantly changing as the priorities of governments and international development shift (IUCN 2006). Typical donor funding is available for 3-5 year periods which makes it extremely difficult for a project to develop long term programs and management strategies. This difficulty was identified very early during the early development of the Gola Forest Program and after a review of funding options in 2006 (Davies 2006), carbon markets were identified as a potential source of funding for the project and a feasibility study was undertaken by the Eco-Securities consultancy to investigate this possibility in 2008 (Eco-Securities report 2008). Once confirmed as a potential source of funding for the then Gola Forest Reserve, fundraising was initiated to develop the necessary documents to create carbon project documentation (ARTP 2010). Donor funds from the EU ended in July 2012 and despite extensive investigation and proposals the GRNP team has been unable to secure further funding via donor routes (Hipkiss 2012). For example the partners failed to secure funding from the German International Climate Initiative in 2011; funds from other large donors do not prioritize Sierra Leone; and those from smaller grant-making bodies would be insufficient to protect the project area (Hipkiss 2012).

Institutional barriers

Within the Government of Sierra Leone the most significant institutional barrier to implementing forest conservation projects is the lack of capacity within the Forestry Division, which is directly related to issues of under-funding and causes a multitude of subsidiary effects. The Forestry Division is significantly understaffed; no new staff have been recruited into the FD in the last 10 years and capacity is very low; only 10% of staff have a university degree or equivalent (FAO 2010).

Understaffing and low capacity result in a lack of coordination with District Councils¹⁰, leading to District Forestry Staff lacking credibility at the local level (Sierra Leone Forest

¹⁰ District Councils meet monthly and address a number of devolved functions from central government including the mobilization of finances and resources

Policy draft 2010). There have also been reports of ground staff actively deviating from their stated duties. Recent investigations in the 7 Gola chiefdoms found that forest officers, police officers, and other government officials have, rather than enforcing existing laws, been granting authorisations to logging operators to extract timber, despite no clear authority to do so (ENFORAC 2010) or had been selling confiscated timber on for personal profit. For example, in 2011 the District Forest Officer for Kenema, one of the districts in the project area, was indefinitely suspended for selling illegally cut timber (Sheku Mansaray, Acting Director of the Forestry Division pers. comm.). Furthermore there is a severe lack of coordination and conflicting mandates between the Forestry Division and other Ministries within the Government of Sierra Leone. For example, the Ministry of Mines and Mineral Resources is responsible for issuing licences for prospecting and mining, yet no formal procedures are in place for consultation with the Forestry Division before a licence is issued in a Forestry Reserve (Draft Forest Policy 2010). As a result between 2005 and 2007, the Ministry of Mines issued two licences for prospecting diamonds and iron ore in the project area, then a Forest Reserve (Global Witness 2010, Witkowski 2012).

Such institutional barriers contribute to the on going problem of deforestation in Sierra Leone and demonstrate that low capacity within Government offices is a significant barrier to the implementation of effective forest conservation activities. Significant external support is therefore currently a pre-requisite to the successful implementation of forest projects.

Step 3b. Show that the identified barriers would not prevent the implementation of at least one of the alternative land use scenarios (except the proposed project activity).

The identified barriers do not affect the alternative land use scenario (deforestation for smallholder agriculture) negatively; in fact they aid its occurrence. If the Forestry Division had adequate funding and capacity and were able to manage the country's Forest Reserves then smallholders would not have the opportunity to practice agriculture within the reserves. It is due to the barriers facing the project scenario that the alternative scenario is able to occur. Investment and institutional barriers to conservation aid the conversion of forest to farm land, as the Forestry Division does not have the capacity or funding to implement the laws governing Forest Reserves and few alternatives to agriculture exist for local communities to earn a living.

Step 4 – COMMON PRACTICE ANALYSIS

The Sierra Leonean Government is highly dependent on external financing. Since 2005 between 19 and 46% of Sierra Leones yearly revenue has come from foreign aid (EU report 2007;9, DFID 2012). As demonstrated in Step 2, the Government does not have internal funding to manage the country's Forest Reserves. In 2003 the National Biodiversity Strategy and Action Plan (NBSAP) reported a 95% dependency of the forestry sector on donor funding (NBSAP 2003). Financial dependency on short term and insecure donor funding sources creates a cycle of short term projects and does not allow for long term strategic planning and management or secure sharing of benefits with local stakeholders (IUCN 2006 Chapter 2 and 3). This is demonstrated in the only other National Park gazetted in 1995; Outamba-Kilimi, in the far north of the country. A 5-year World Bank project, the Biodiversity Conservation Project began in 2010 to improve the management of 3 protected areas in

Sierra Leone, one of which is the Outamba-Kilimi National Park. In a METT analysis (Management Effectiveness Tracking Tool) carried out by the Biodiversity Conservation Project team in 2011 on Outamba-Kilimi National Park, one of the principal issues identified was that no current budget was available for the protected area and that management was wholly reliant on outside or year by year funding (Koker 2011). This has resulted in a lack of effective management of the National Park and associated problems of encroachment, deforestation and hunting (Koker 2011). There is no strategy to secure funds for Outamba-Kilimi National Park beyond the lifetime of the Biodiversity Conservation Project which ends in 2015. The possibility of future funding from REDD or PES schemes is mentioned as a possible future finance mechanism in project documents but there is no project funding to develop the necessary documents to secure this finance (BCP project proposal 2009). As demonstrated, it is common practice for outside donors to periodically finance short-term conservation work in Sierra Leone but this does not secure the long term finances necessary to reduce deforestation.

The Forest Reserve closest to the capital city – the Western Area Peninsular Forest Reserve which in 2013 was upgraded to a National Park, is another Park experiencing high levels of deforestation. As the Government does not have the finances or capacity to manage this Park, an international NGO (WHH – WeltHungerHilfe) is working with the Forestry Division to investigate alternative financing mechanisms including PES and REDD (e.g. OBF WAPFOR REDD scoping study 2011). Again, since the Government does not have the finances to stop deforestation within Forest Reserves and Parks, other NGOs are therefore beginning to investigate new sources of financing to reduce deforestation, but this is far from common practice. The Western Area Peninsular National Park and the Gola project are separate projects in different geographical areas with very different alternative land-use scenarios.

Within the project area, the RSPB has taken the lead in sourcing funding from donors for the initiation of conservation management activities in the GRNP, but as can be seen from the 'Review of Gola Funding Potential' (Hipkiss 2012), securing financing from a limited pool of donors results in a boom and bust project cycle as reported above. The GRNP team has failed to secure funding from donor sources beyond July 2012, despite extensive research and investment into proposals (Hipkiss 2012). It has therefore been common practice since 2004 for the project area to be protected using short-term donor funding, but donor funding is no longer available as explained Step 3a (investment barriers) and without funding, the project area will become like any other Forest Reserve or National Park in Sierra Leone and suffer from significant deforestation and degradation.

Clearly it is not common practice in Sierra Leone for the State to be able to fund the management of its forest estates. Requests to donors have been the only alternative tried in Sierra Leone to fund the management of Forest Reserves, but these funding streams are subject to the priorities of external governments and donor objectives, and therefore do not enable effective long term management. Developing REDD projects in Sierra Leone is not currently common practice. The Government has clearly stated that it intends to seek financing via REDD to provide the income to manage the State's forests (NSADP 2009, NPAA Act 2012) and it is intended that the long term nature of such revenues will overcome the boom and bust project cycle commonly found in other Forest Reserves in Sierra Leone

financed by donors and thus result in a significant reduction to deforestation in the project area.

Step 5 – IMPACT OF VCS REGISTRATION

A resource-strapped Government would not have upgraded a Production Forest Reserve with the potential for revenues from timber or other sources such as minerals into a National Park without the expectation of receiving financing from other sources (pers comm. Sheku Mansaray, Acting Director of the Forestry Division). In Sierra Leone, upgrading reserves to National Parks has proved an ineffective option to protecting reserves e.g. the upgrading of Outamba-Kilimi National Park – See step 4. Since the sustainable financing report (Davies 2006) and the first carbon feasibility report carried out in 2008 for the Gola Forest Reserves, the expectation has been for emerging markets such as the carbon market to fund the management and benefit sharing mechanisms that were set up in the initial stages of conservation work. With this in mind the RSPB together with Birdlife International applied for funding from the EU to develop carbon projects, amongst other objectives, for work in the Gola Forest Reserves in Sierra Leone and Liberia (ARTP 2010). Some of the funding to develop a REDD project for the GRNP has therefore come from this project, other funding has come from the Critical Ecosystem Partnership Fund and from the RSPB.

G2.3. Estimated carbon stock changes ‘without project’ reference scenario

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.19 The timeframe for this analysis can be either the project lifetime (see G3) or the project GHG accounting period, whichever is more appropriate. 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. Projects whose activities are designed to avoid GHG emissions (such as those reducing emissions from deforestation and forest degradation (REDD), avoiding conversion of non-forest land, or certain improved forest management projects) must include an analysis of the relevant drivers and rates of deforestation and/or degradation and a description and justification of the approaches

The Gola REDD project has followed a Verified Carbon Standards (VCS) methodology in calculating the carbon stock changes in the without project scenario. The figures presented in G2.3 are for the lifetime of the project (i.e. 30 years).

The Gola REDD project followed VM0007 REDD Methodology Modules (REDD-MF) (v1.3) in estimating emissions from unplanned deforestation activities. This justification for the applicability of this methodology can be found in

Table 9.

Table 9. Applicability of the methodology

Applicability Conditions	Demonstration and justification for the project to meet the conditions
a. All Activity types	
Land in the project area has qualified as forest at least 10 years before the project start date	In Sierra Leone, forest is defined as land areas of at least 1ha, 30% crown cover and 5m tree height (FAO 2010). Analysis of satellite imagery from 2001 based on data collected in ground truthing surveys shows that the project area has been forest from at least 2001 (i.e over 10 years (see Netzer and Walker 2013). Historical information indicates that the area has been forested for a much longer period; a report by Unwin in 1909 describes the region as a mosaic of forest and farmland and recommends the establishment of a forest reserve in the remaining areas of forest (Unwin 1909).
The project area can include forested wetlands (such as bottomland forests, floodplain forests, mangrove forests) as long as they do not grow on peat. Peat shall be defined as organic soils with at least 65% organic matter and a minimum thickness of 50 cm ³ . If the project area includes a forested wetlands growing on peat (e.g. peat swamp forests), this methodology is not applicable	The VCS defines peat as an area with a layer of naturally accumulated organic material that meets an internationally accepted threshold for the depth of the peat layer and the percentage of organic material composition. The project adopted the FAOs definition of depth as; 1. 10 cm or more thick starting at the soil surface and immediately overlying ice, continuous rock, or fragmental materials, the interstices of which are filled with organic material; or 2. cumulatively within 100 cm of the soil surface either 60 cm or more thick if 75 percent (by volume) or more of the material consists of moss fibres or 40 cm or more thick in other materials and starting within 40 cm of the soil surface. The project adopted the FAOs definition of organic material composition as organic material that has one or both of the following; 1. 20 percent or more organic carbon in the fine earth (by mass); or 2. if saturated with water for 30 consecutive days or more in most years (unless drained), one or both of the following: a. (12 + [clay percentage of the mineral fraction × 0.1]) percent or more organic carbon in the

	<p>fine earth (by mass); or b.18 percent or more organic carbon in the fine earth (by mass).</p> <p>Soils surveys sampled soils in Inland valley swamps – these are areas of poor drainage that were identified as the only areas that have the potential to contain organic or peat soils, defined by the FAO (2006/7). No peat was found in any soil samples (Cuni-Sanchez 2012c) and interviews with a leading soil scientist in Sierra Leone confirmed that peat has not been discovered in Sierra Leone (per comm.. Dr Alie Kamara).</p>
Project proponents must be able to show control over the project area and ownership of carbon rights for the project area at the time of verification	The Ministry of Agriculture Forests and Food Security is mandated with the management of all forest areas in Sierra Leone, including the project area. This has been the case since the Gola forest reserves were created in 1926 (Fofanah 2012). As a National Park, the Ministry remains the institution responsible for the management of the project area (Fofanah 2012). Agreements between the project proponent (the Gola Rainforest Conservation LG) and the Government of Sierra Leone represented by the Ministry transfer both management and carbon rights from the Government to the project proponent (also see section 1.12.1) for the lifetime of the project.
Baseline deforestation and baseline forest degradation in the project area fall within one or more of the following categories: 1.Unplanned deforestation (VCS category AUDD) 2. Planned deforestation (VCS category APD); 3.Degradation through extraction of wood for fuel (fuelwood and charcoal production) (VCS category AUDD).	The project falls into ‘unplanned deforestation’ (VCS category AUDD).

Applicability Conditions	Demonstration and justification for the project to meet the conditions
b. Unplanned Deforestation	
Baselines shall be renewed every 10 years from the project start date	The project will revise and update the baseline following VCS procedures and methodologies every 10 years from the project start date

	(August 2012). Baselines will therefore need to be renewed in 2022 and 2032 to comply with VCS guidelines
All land areas registered under the CDM or under any other carbon trading scheme (both voluntary and compliance-orientated) must be transparently reported and excluded from the project area. The exclusion of land in the project area from any other carbon trading scheme shall be monitored over time and reported in the monitoring reports.	The project is not registering any other land areas for a carbon trading scheme. Meetings have been held with land holders and other stakeholders involved in land use schemes in the area and no other organizations are developing CDM or other carbon trading schemes that need to be excluded from the project area or leakage belt.
If land is not being converted to an alternative use but will be allowed to naturally regrow (i.e. temporarily unstocked), this framework shall not be used.	In the area surrounding the project, forested land is converted into the traditional crop-fallow cycle land use. The dominant crops are rice, maize, cassava, sorghum and millet. The landscape includes a mosaic of plots at different stages in this cycle. The average fallow period was found to be 7 years in areas close to the project boundary (Witkowski et al 2012a, Cuni-Sanchez 2012b). Since some locations deforested in the reference region used to estimate baseline deforestation rates may not be managed as the baseline scenario of a traditional crop-fallow cycle, the estimated deforestation rate excluded all areas that transitioned from forest to non-forest and back to forest within the historical reference period. This ensures a highly conservative rate of deforestation and eliminates that proportion of the landscape that is not under the baseline crop-fallow cycle.

Baseline emissions

(Please note this section is taken from the VCS project document, section 3.1)

The quantification of baseline emissions followed the VM0007 methodology modules BL-UP (part 4 estimation of carbon stock changes and GHG emissions), X-STR, C-AB, E-BB. Following the module BL-UP the baseline deforestation rate was calculated from the Reference Region for Deforestation (RRD). The rate of deforestation was applied to the Project Area and Leakage Belt using spatial modelling. **The population driver approach was not used.** The following section is a summary of the analysis and equations. The complete baseline report following BL-UP is found in Netzer and Walker (2013), found in the appendix folder.

1. Estimation of Annual Areas of Unplanned Deforestation (Part 2 in BL-UP)

1.1. Estimation of annual area of unplanned baseline deforestation (step 2.2 in BL-UP)

Annual area of unplanned baseline deforestation in the RRD

Following BL-UP the annual area of unplanned deforestation is determined from the RRD and then applied to the RRL which includes the Project Area and Leakage Belt.

Within the RRD, locations that are classified as transitioning from forest to non-forest to forest within the historical period are conservatively assumed to not be under the baseline scenario of a 7 year average crop-fallow cycle and therefore are excluded from the calculation of deforestation rate. This results in a lower, and thus more conservative, estimate of deforestation.

Following the methodology deviation presented in Section 2.6 of the PD, two deforestation rates were applied 1) within forest reserves (FR-RRD) applied to the PA, and 2) buffer area around forest reserves (BUFF-RRD) applied to the LB. All other methodology requirements were followed.

To calculate the annual area of deforestation in the RRD (both the FR-RRD and BUFF-RRD) ($A_{BSL,RRD,unplanned,t}$) the methodology provides three approaches: 1) historic average, 2) linear regression and 3) non-linear regression that can be used if there are more than 5 points in time. If the regression is significant ($p \leq 0.05$, $r^2 \geq 0.75$, and demonstrated free from bias based on selection of fit with the lowest residuals) than it must be used.

A significant regression was not able to be established and therefore a historic average was taken and the following equations were applied to estimate the projected annual area of unplanned baseline deforestation:

$$A_{BSL,FR-RRD,unplanned,t} = A_{FR-RRD,unplanned,hrp} / T_{hrp}$$
$$A_{BSL,BUFF-RRD,unplanned,t} = A_{FR-BUFF-RRD,unplanned,hrp} / T_{hrp}$$

Where:

$A_{BSL,FR-RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in the Forest Reserve RRD in year t; ha

$A_{FR-RRD,unplanned,t}$ Total area deforested during the historical reference period in the Forest Reserve RRD; ha

$A_{BSL,BUFF-RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in the buffer area RRD in year t; ha

$A_{BUFF-RRD,unplanned,t}$ Total area deforested during the historical reference period in the buffer area RRD; ha

T_{hrp} Duration of the historical reference period in years; yr

t 1,23, ... t^* years elapsed since the projected start of the REDD project activity

Table 10. Deforestation during the historic reference period in the RRD

	Total area deforested during the historical reference period in the RRD $Area_{RRD,unplanned,t}$ Hectares	Duration of the historical reference period T_{hrp} Years	Annual deforestation during the historic period in the RRD $Area_{BSL,RRD,unplanned,t}$ Hectares
Total RRD area	31,150	10	3,115
FR-RRD	14,244	10	1,424
BUFF-RRD	16,907	10	1,691

1.2 Estimation of annual areas of unplanned baseline deforestation in the RRL (BL-UP step 2.3)

Following the methodological guidelines and the Methodology deviation the projected unplanned deforestation in the FR-RRD and BUFF-RRD is described below. Where P_{rri} is the proportion of forest area in the RRL's LB and PA at the start of the baseline period (2011) to the total area of the RRD's forest reserves and buffer areas, and $A_{BSL,RR,unplanned,t}$ is the area of unplanned baseline deforestation in the RRD in year t in the forest reserves and buffer areas. The projected area of unplanned deforestation is estimated using the following equation:

$$A_{BSL,RR,unplanned,t} = A_{BSL,RRD,unplanned,t} * P_{RRL}$$

Where:

$A_{BSL,RR,unplanned,t}$ Projected area of unplanned baseline deforestation in the reference region for location (RRL) in year t ; ha

$A_{BSL,RRD,unplanned,t}$ Projected area of unplanned baseline deforestation in RRD in year t ; ha
 P_{RRL} Ratio of forest area in the RRL at the start of the baseline period to the total area of the RRD ; dimensionless

t 1, 2, 3, ... t^* years elapsed since the projected start of the REDD project activity

Table 11. Estimation of annual areas of unplanned baseline deforestation in the RRL

	Annual deforestation during the historic period $Area_{BSL,RRD,unplanned,t}$ Hectares	Ratio of forest area in the RRL at the start of the baseline period to the total area of the RRD P_{RRL} %	Projected area of unplanned baseline deforestation in the reference region for location $ABSL,RR,unplanned,t$ Hectares
Total RRD area	3,115	0.81	2,517
FR-RRD	1,424	0.73	1,041
BUFF-RRD	1,692	0.91	1,544

This method of estimating the annual area of unplanned baseline deforestation was used because spatial modelling will be applied. Because the Gola REDD project is using a simple historic approach there is no analysis of any of the “alternate population driver” approach.

As per VMD0007, the Gola REDD project is identified as having a “Frontier Configuration” and therefore location analysis is required (i.e. modelling). Frontier deforestation is forest destruction that occurs along a discernible frontier, such as a new road cut into a forest. Mosaic deforestation, in contrast, occurs in patches across a forested area. The land surrounding the Gola REDD Project is a frontier configuration because, although patchy, deforestation is slowly progressing towards the frontier of the National Park.

The software used to model deforestation in the RRL is IDRISI Selva¹¹. Within IDRISI there are 2 models that are appropriate under VM0007 BL-UP for projecting deforestation, Land Change Modeller (LCM) and GEOMOD. Both of these models have similar setup and dataset requirements and therefore can be used interchangeably. Both of these models met all of the requirements set out in BL-UP (Netzer and Walker 2013). The modelling was run from 2011 to 2041. The area of deforestation in the Project Area (*FR- ABSL,RR,unplanned,t*) and the Leakage Belt (*BUFF- ABSL,RR,unplanned,t*) was deforested based on the final deforestation risk map (Netzer and Walker 2013). The resulting deforestation in the Project Area is shown in

¹¹ <http://www.clarklabs.org/products/idrisi.cfm>

Table 12, and Leakage belt in

Table 13.

Table 12. Projected area of deforestation in each stratum in the Project Area

		Gola Central & North ($A_{unplanned,2,PA,t}$)	Gola South ($A_{unplanned,1,PA,t}$)	Cumulative
t	year	Ha	ha	ha
1	2012	337	704	1,041
2	2013	413	628	2,082
3	2014	353	688	3,123
4	2015	446	595	4,164
5	2016	435	606	5,205
6	2017	487	554	6,246
7	2018	518	522	7,287
8	2019	534	507	8,328
9	2020	543	498	9,369
10	2021	552	489	10,410
11	2022	560	481	11,451
12	2023	558	483	12,492
13	2024	508	533	13,533
14	2025	514	527	14,574
15	2026	540	501	15,615
16	2027	553	488	16,656
17	2028	542	499	17,697
18	2029	528	513	18,738

Gola Central & North ($A_{unplanned,2,PA,t}$)					Gola ($A_{unplanned,1,PA,t}$)	South	Cumulative
t	year	Ha	ha	ha	ha	ha	ha
19	2030	533	508				19,779
20	2031	529	512				20,820
21	2032	534	507				21,861
22	2033	548	493				22,902
23	2034	527	514				23,943
24	2035	543	498				24,984
25	2036	554	487				26,025
26	2037	579	462				27,066
27	2038	579	462				28,107
28	2039	581	460				29,148
29	2040	591	450				30,189
30	2041	629	412				31,230

Table 13. Projected area of deforestation in the Leakage belt

Leakage belt ($A_{unplanned,1,PA,t}$)				Cumulative
t	Year	ha	ha	ha
1	2012	1,544		1,544
2	2013	1,544		3,087
3	2014	1,544		4,631
4	2015	1,544		6,175
5	2016	1,544		7,718
6	2017	1,544		9,262
7	2018	1,544		10,806
8	2019	1,544		12,350
9	2020	1,544		13,893
10	2021	1,544		15,437
11	2022	1,544		16,981

Leakage belt ($A_{unplanned,1,PA,t}$) Cumulative			
t	Year	ha	ha
12	2023	1,544	18,524
13	2024	1,544	20,068
14	2025	1,544	21,612
15	2026	1,544	23,155
16	2027	1,544	24,699
17	2028	1,544	26,243
18	2029	1,544	27,787
19	2030	1,544	29,330
20	2031	1,544	30,874
21	2032	1,544	32,418
22	2033	1,544	33,961
23	2034	1,544	35,505
24	2035	1,544	37,049
25	2036	1,544	38,593
26	2037	1,544	40,136
27	2038	1,544	41,680
28	2039	1,544	43,224
29	2040	1,544	44,767
30	2041	1,544	46,311

As per VMD0007, the Gola REDD project is identified as “Frontier Configuration” and therefore location analysis is required (i.e. modeling). The software used to model deforestation in the RRL is IDRISI Selva¹². Within IDRISI there are 2 models that are appropriate under VM0007 BL-UP for projecting deforestation, Land Change Modeler (LCM) and GEOMOD. Both of these models were used to estimate the location of deforestation in the RRL (See Netzer and Walker (2013) Gola REDD baseline report).

2. Estimation of Carbon stock changes and greenhouse gas emissions

2.1 Stratification (Step 4.1 in BL-UP)

Pre-deforestation strata (forest strata)

Stratification for carbon stocks consists of grouping forest areas in homogeneous groups in terms of carbon stocks, using stratification factors (such as type of forest/vegetation, type of soil/geology, management). The project area and Leakage belt were stratified using VM0007 Module X-STR.

Prior to the development of this REDD project extensive ground measurements had established the forest carbon stock for the project area. The data was collected in 2006

¹² <http://www.clarklabs.org/products/idrisi.cfm>

and 2007 from 609 permanent plots (Klop 2012). The results of this extensive survey work showed that the forests across the project area were relatively homogenous in species composition (same forest type), however there were significant differences in carbon stocks between Gola South, and Central/North. It was hypothesized that the difference between the stocks in the 2 areas was due to past management histories, the southern block having been more extensively logged than the central or northern blocks, thus resulting in a forest with lower carbon stocks but with potential for significant re-growth (Lindsell and Klop 2012). Because of the potential for re-growth enhancement of carbon in Gola South will be measured throughout the projects lifetime (Tatum-Hume 2013b).

Based on these results the Project Area was stratified into:

- 1) Gola Central & North, and
- 2) Gola South (where enhancements (forest growth) will be monitored).

Table 14. Area of Gola REDD project strata.

Stratum	area (ha)
Gola Central/North	43,059
Gola South	25,455
Total	68,515

The Leakage Belt is the same forest type as the GRNP. Due to limited information on carbon stocks in the Leakage Belt forests it is conservatively assumed that the leakage belt forests have the same carbon stocks as Gola Central/North. This is conservative because Gola Central/North has the highest carbon stocks and is undoubtedly the least disturbed forest in the Reference Region.

Table 15. Area of Leakage belt

Block	area (ha)
Leakage belt	62,932

Post deforestation strata (non-forest strata)

Farming is the primary livelihood activity for the vast majority of communities in the region around the project area (Witkowski et al 2012a, Bulte et al 2013). These communities engage in shifting cultivation converting natural forests in the farm-fallow cycle (Witkowski et al 2012a, Bulte et al 2013). Every person interviewed described using similar farming techniques. The farming process begins with brushing early in the year. Then the trees are felled, and the land is burned in March or April. (Witkowski et al 2012a, Bulte et al 2013). Traditional practices involve the clearing of forests to make way for 1-2 years of crop plantations followed by an average of 7.5 years fallow time in the reference region (Cuni-Sanchez 2012b), in the Leakage Belt the fallow period is also on average is 7 years (Witkowski et al. 2012a). Therefore the post deforestation strata is considered crop-fallow.

2.2 Carbon stocks and carbon stock changes per stratum (BL-UP step 4.2)

Pre deforestation carbon stocks (forest strata)

Carbon stocks were estimated in the forest areas following VM0007 Modules CP-AB and CP-S.

Non-tree, litter and deadwood were excluded (Tatum-Hume et al 2013b). Above and below ground tree biomass and soil organic carbon was calculated for both forest strata (Table). Carbon stocks were estimated for Strata 1 (GRNP Central/North) and Strata 2 (GRNP South). Uncertainty was calculated as a percentage of the mean at 95% confidence intervals following X-UNC.

Table 16. Pre deforestation carbon stocks

Carbon Pool	Strata 1 (GRNP North Block)				Strata 2 (GRNP South Block)			
	Number of Plots	Mean Stock	95% CI	95% CI as % of mean	Number of Plots	Mean Stock	95% CI	95% CI as % of mean
			t CO ₂ e ha ⁻¹				t CO ₂ e ha ⁻¹	
C _{AB_Tree,i}	353	629	41.5	6.6%	49	578	74.9	13.0%
C _{BB_Tree,i}		151.0	10.0	6.6%		138.7	18.0	13.0%
C _{AB_nontree,i}								
C _{BB_nontree,i}								
C _{LI,i}								
C _{SOC,i}	18	253.9	30.6	12.1%	29	192.3	24.4	12.7%
C _{BSL}		1,034.2 6	26.4	8.4%		909.05	48.0	12.9%

Post deforestation carbon stocks

Post-deforestation field measurements are the long term average carbon stocks of agricultural land from 0-10 years. This included the 1-2 year of planted crops through the 10 year fallow. As delineated in VMD0007, Section 4.2.2, Option 1- Simple approach was chosen and a time-weighted average was used to estimate the above ground biomass of post-deforestation carbon stocks (Tatum-Hume et al 2013b) (Table 16).

Modules CP-AB and CP-S were used to estimate carbon stocks (Tatum-Hume et al 2013b). Non-tree, litter and deadwood were excluded because they are less than 5% of the net carbon stocks and are therefore considered insignificant¹³ following T-SIG (Tatum-

¹³ <http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf>

Hume et al 2013b). Total post-deforestation carbon stocks in all pools are hence calculated using Equation 17 of VMD0007 based on the above and below ground tree biomass and soil organic carbon (Tatum-Hume et al 2013b) (Table 17).

Table 17. Post-deforestation carbon stocks

Carbon Pool	Post Deforestation			
	Number of Plots	Mean Stock	95% CI	95% CI as % of mean
			t CO ₂ ha ⁻¹	
$C_{AB_TreePost,i}$	99	127.0	19.8	12.8%
$C_{BB_TreePost,i}$		34.3		
$C_{SOCPost,i}$		172.7		
$C_{BSL,post,i}$		334.0	19.8	12.8%

Estimation of carbon stocks in wood products per stratum

Wood products were calculated following CP-WP. Based on surveys around the project area 69% of respondents said they would do nothing with the wood as it was too far away from the village to carry, 20% of people reported using felled wood for construction (Witkowski et al 2012a). Based on these surveys the amount of wood products extracted during deforestation was estimated to be 20% (representing 20% of the farmers) and conservatively estimated that those farmers harvest 50% of the total above ground biomass. This resulted in a mean stock extraction shown in Table 18.

Table 18. Wood products extracted during deforestation

	Strata 1: GRNP North	Strata 2: GRNP South
AG Biomass	654.7	582.5
mean stock of extracted biomass carbon (CXB,i)	50.36	44.81

Following CP-WP, the remaining long lived wood products from the total biomass extracted is shown in Table 19.

Table 19. Carbon stocks entering the wood products pool

		Strata 1: GRNP North	Strata 2: GRNP South
	Description	t CO ₂ ha ⁻¹	t CO ₂ ha ⁻¹
CWP,i	Carbon stock entering the wood products pool from stratum i	5.47	4.86
$CWP100,i$	Carbon stock entering the wood products pool at the	0.04	0.03

	time of deforestation that is expected to be emitted over 100-years from stratum <i>i</i>		
--	---	--	--

$$C_{XB,ty,i} = \frac{1}{A_i} * \sum_{j=1}^S (V_{ex,ty,j,i} * D_j * CF_j * \frac{44}{12}) \quad (1)$$

Where:

$C_{XB,ty,i}$	Mean stock of extracted biomass carbon by class of wood product <i>ty</i> from stratum <i>i</i> ; t CO ₂ -e ha ⁻¹
A_i	Total area of stratum <i>i</i> ; ha
$V_{ex,ty,j}$	Volume of timber extracted from within stratum <i>i</i> (does not include slash left onsite) by species <i>j</i> and wood product class <i>ty</i> ; m ³
D_j	Mean wood density of species <i>j</i> ; t d.m.m ⁻³
CF_j	Carbon fraction of biomass for tree species <i>j</i> ; t C t ⁻¹ d.m.
<i>j</i>	1, 2, 3, ... <i>S</i> tree species
<i>ty</i>	Wood product class – defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
44/12	Ratio of molecular weight of CO ₂ to carbon, t CO ₂ -e t C ⁻¹

$$C_{WP,i} = \sum_{ty=s,w,oir,p,o} C_{XB,ty,i} * (1 - WW_{ty}) * (1 - SLF_{ty}) * (1 - OF_{ty}) \quad (2)$$

Where:

$C_{WP,i}$	Carbon stock in wood products pool (stock remaining in wood products after 100 years) from stratum <i>i</i> ; t CO ₂ -e ha ⁻¹
$C_{XB,ty,i}$	Mean stock of extracted biomass carbon by class of wood product <i>ty</i> from stratum <i>i</i> ; t CO ₂ -e ha ⁻¹
WW_{ty}	Wood waste. The fraction immediately emitted through mill inefficiency by class of wood product <i>ty</i> ; dimensionless
SLF_{ty}	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest by class of wood product <i>ty</i> ; dimensionless
OF_{ty}	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product <i>ty</i> ; dimensionless
<i>ty</i>	Wood product class – defined here as sawnwood (s), wood-based panels (w), other industrial roundwood (oir), paper and paper board (p), and other (o)
<i>i</i>	1, 2, 3, ... <i>M</i> strata

2.3 Estimation of carbon stock changes per stratum (BL-UP step 4.3)

As delineated in section 4.2.3 of VMD0007 and equations 16-22, stock changes in each pool are calculated by subtracting post-deforestation carbon stocks from forest carbon stocks (Table 20). Non-tree, litter and deadwood were excluded because they are less than 5% of the net carbon stocks and are therefore considered insignificant¹⁴ following T-SIG (Tatum-Hume et al 2013b).

Table 20. Carbon stock changes per stratum

Carbon Pool	Strata 1	Strata 2	Post deforestation	Wood product CWP, strata1	Wood product CWP, strata2	$\Delta C, \text{Strata 1}$	$\Delta C, \text{Strata 2}$
	Mean Stock t CO ₂						
$C_{AB_Tree,i}$	629.3	127.0	127.0	5.3	4.8	497.1	446.2
$C_{BB_Tree,i}$	151.0	34.3	34.3			116.7	104.4
$C_{AB_nontree,i}$	X	X	X			X	X
$C_{BB_nontree,i}$	X	X	X			X	X
$C_{LI,i}$	X	X	X			X	X
$C_{SOC,i}$	253.9	172.7	172.7			81.2	19.6
C_{BSL}	1034.3	334.0	334.0			695.0	570.2

¹⁴ <http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf>

Forest strata:

$$C_{BSL,i} = C_{AB_tree,i} + C_{BB_tree,i} + C_{AB_non-tree,i} + C_{BB_non-tree,i} + C_{DW,i} + C_{LI,i} + C_{SOC,i} \quad (11)$$

Where:

$C_{BSL,i}$	Carbon stock in all carbon pools in forest stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_tree,i}$	Carbon stock in aboveground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_tree,i}$	Carbon stock in belowground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_non-tree, i}$	Carbon stock in aboveground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_nontree,i}$	Carbon stock in belowground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{DW,i}$	Carbon stock in dead wood in stratum i ; t CO ₂ -e ha ⁻¹
$C_{LI,i}$	Carbon stock in litter in the forest stratum i ; t CO ₂ -e ha ⁻¹
$C_{SOC,i}$	Carbon stock in soil organic carbon in the forest stratum i ; t CO ₂ -e ha ⁻¹
i	1, 2, 3, ... M strata

2.4 Estimation of the sum of baseline greenhouse gas emissions (BL-UP step 4.4)

Emissions of CO₂ by combustion of fossil fuel

Fossil fuel combustion in all situations is an optional emission source. The Methodology Module E-FFC, states that project proponents may elect to include fossil fuel combustion if emissions are higher in the baseline than in the project case thus generating emission reductions through project activities. Where emissions from fossil fuel combustion are estimated in the baseline, monitoring and estimation must also occur in the with-project scenario.

As an option emission the Gola REDD project has elected **not** to estimate emissions from fossil fuel combustion.

Emissions of N₂O due to nitrogen application

The estimation of emission from nitrous oxide is required if leakage prevention activities include the increases in the use of fertilizers (See Module REDD-MF).

The Gola REDD Project will not use fertilizers as a leakage prevention activity, and therefore emissions from nitrous oxide are excluded

Emissions of other GHG by biomass burning

Subsistence crop-fallow farming is the vast majority of the reason for deforestation in the project area (Witkowski et al 2012a). Crop-fallow involves clearing and burning the vegetation (Witkowski 2012; USAID 2007b; Nasi et al. 2006). Therefore GHG emissions from biomass burning are expected to occur on all land deforested during site preparation. Biomass assumed to be extracted for wood products is excluded from the estimation of biomass emission estimation. The emission from biomass burning was estimated following Module E-BB (**Error! Reference source not found.**Table 21).

Table 21. Non-CO₂ emissions from biomass burning (for equations see Netzer and Walker 2013)

	Strata 1: GRNP North/Central	Strata 2: GRNP South	Description
AG Biomass	654.7	582.5	Ave aboveground biomass stock before deforestation t d.m./ha
B _{i,t}	604.3	537.7	Ave aboveground biomass stock, after logs removed, before burning, t d.m./ha
Emissions per hectare, CH ₄	39	35	CH ₄ Emission from biomass burning per hectare, t CO ₂ e/ha
Emissions per hectare, N ₂ O	17	15	N ₂ O Emission from biomass burning per hectare, t CO ₂ e/ha

2.5 Calculation of net emissions (BL-UP Step 4.5)

Stock changes in above ground biomass were emitted at the time of deforestation. Emissions from below ground biomass were emitted at a rate of 1/10 the stock for 10 years. Emissions from soil were emitted at 1/20 the stock for 20 years.

The sum of baseline carbon stock changes is estimated as follows:

$$\Delta C_{TOT} = C_{BSL} - C_{post} - C_{wp} \quad (13)$$

$$C_{BSL} = \sum_{t=1}^{t^*} \sum_{i=1}^M ((C_{BSL,i}) * A_{unplanned,i,t}) \quad (14)$$

$$C_{post} = \sum_{t=1}^t \sum_{i=1}^M (C_{post,i} * A_{unplanned,i,t}) \quad (15)$$

$$C_{wp} = \sum_{t=1}^t \sum_{i=1}^M (C_{WP,i} * A_{unplanned,i,t}) \quad (16)$$

Where:

ΔC_{TOT} Sum of the baseline carbon stock change in all pools up to time t^* ; t CO₂-e (calculated separately for the project area [PA] and the leakage belt [LB])

C_{BSL}	Total forest carbon stock in areas deforested; t CO ₂ -e
C_{post}	Total post-deforestation carbon stock in areas deforested; t CO ₂ -e
C_{wp}	Total carbon stock in harvested wood products; t CO ₂ -e
$C_{BSL,i}$	Carbon stock in all carbon pools in the forest stratum i ; t CO ₂ -e ha ⁻¹
$A_{unplanned,i,t}$	Area of unplanned deforestation in forest stratum i at time t ; ha
$C_{post,i}$	Carbon stock in all carbon pools in the post-deforestation stratum i ; t CO ₂ -e ha ⁻¹
$A_{unplanned,i,t}$	Area of unplanned deforestation in post deforestation stratum i at time t ; ha
$C_{WP,i}$	Mean carbon stock in wood products pool (stock remaining in wood products after 100 years) from stratum i ; t CO ₂ -e ha ⁻¹
t	1, 2, 3, ... t years elapsed since the projected start of the REDD project activity
i	1, 2, 3, ... M strata

For calculation of carbon stock sequestered in wood products, see **CP-W**.

Total GHG emission were estimated for biomass burning. Nitrous oxide and emissions from fossil fuel combustion were excluded.

The GHG emissions in the baseline within the project boundary can be estimated as:

$$GHG_{BSL,E} = \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t}) \quad (17)$$

Where:

$GHG_{BSL,E}$	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline; t CO ₂ -e
$E_{FC,i,t}$	CO ₂ emission from fossil fuel combustion in stratum i in year t ; t CO ₂ -e
$E_{BiomassBurn,i,t}$	Non-CO ₂ emissions due to biomass burning as part of deforestation activities in stratum i in year t ; t CO ₂ -e
$N_2O_{direct-N,i,t}$	Direct N ₂ O emission as a result of nitrogen application on the alternative land use within the project boundary in stratum i in year t ; t CO ₂ -e
t	1, 2, 3, ... t^* years elapsed since the projected start of the REDD project activity

For detailed information regarding the calculation of $E_{FC,i,t}$, $E_{BiomassBurn,i,t}$ and $N_2O_{direct-N,i,t}$ see **E-FFC**, **E-BB** and **E-NA**.

GHG emission sources excluded from the project boundary can be neglected, i.e. accounted as zero. For the determination which sources of emissions must be included in the calculations as a minimum use Table 1 in **REDD-MF** and tool **T-SIG**.

Following BL-UP net emissions were calculated for each strata in the project area and leakage belt (Table 22).

Table 22. Calculation of net emissions

t	y	BSLunplanned - Strata 1			BSLunplanned - Strata 2			BSLunplanned - Leakage belt			Δ CBSL,PA	Δ CBSL,LB
		ha	t CO2e	t non-CO2e (EBiomass Burn,i,t)	ha	t CO2	t non-CO2 (EBiomass Burn,i,t)	ha	t CO2e	t non-CO2 (EBiomass Burn,i,t)	t CO2e (cumulative)	t CO2e (cumulative)
1	2012	337	172,744	18,035	704	322,179	34,620	1,544	791,586	82,643	547,578	874,229
2	2013	413	216,950	22,097	628	295,545	30,894	1,544	815,873	82,643	1,113,063	1,772,745
3	2014	353	192,799	18,897	688	330,026	33,828	1,544	840,207	82,648	1,688,614	2,695,600
4	2015	446	245,888	23,860	595	295,507	29,274	1,544	864,449	82,643	2,283,143	3,642,692
5	2016	435	247,408	23,287	606	307,167	29,796	1,544	888,737	82,643	2,890,802	4,614,072
6	2017	487	281,158	26,096	554	290,120	27,221	1,544	913,024	82,643	3,515,397	5,609,740
7	2018	518	304,749	27,758	522	282,194	25,690	1,544	937,358	82,648	4,155,789	6,629,746
8	2019	534	320,799	28,582	507	281,161	24,937	1,544	961,600	82,643	4,811,268	7,673,989
9	2020	543	333,998	29,083	498	282,630	24,473	1,544	985,888	82,643	5,481,452	8,742,520
10	2021	552	346,930	29,541	489	284,444	24,057	1,544	1,010,175	82,643	6,166,423	9,835,338
11	2022	560	355,878	29,979	481	278,891	23,649	1,544	1,016,441	82,643	6,854,821	10,934,423
12	2023	558	358,855	29,873	483	278,771	23,751	1,544	1,022,753	82,648	7,546,071	12,039,824
13	2024	508	337,946	27,204	533	299,878	26,198	1,544	1,028,973	82,643	8,237,298	13,151,440

14	2025	514	343,645	27,508	527	297,194	25,924	1,544	1,035,238	82,643	8,931,568	14,269,321
15	2026	540	359,850	28,886	501	285,069	24,654	1,544	1,041,504	82,643	9,630,027	15,393,469
16	2027	553	369,386	29,589	488	279,043	24,012	1,544	1,047,816	82,648	10,332,058	16,523,933
17	2028	542	366,537	29,016	499	284,025	24,535	1,544	1,054,036	82,643	11,036,170	17,660,613
18	2029	528	361,447	28,245	513	291,059	25,247	1,544	1,060,302	82,643	11,742,168	18,803,558
19	2030	533	366,129	28,529	508	289,256	24,981	1,544	1,066,568	82,643	12,451,064	19,952,769
20	2031	529	366,271	28,341	512	291,597	25,158	1,544	1,072,880	82,648	13,162,432	21,108,297
21	2032	534	369,003	28,582	507	289,629	24,933	1,544	1,072,835	82,643	13,874,579	22,263,775
22	2033	548	376,320	29,324	493	283,460	24,256	1,544	1,072,834	82,643	14,587,939	23,419,252
23	2034	527	366,774	28,197	514	292,452	25,287	1,544	1,072,833	82,643	15,300,648	24,574,729
24	2035	543	375,745	29,083	498	284,701	24,477	1,544	1,072,833	82,643	16,014,654	25,730,205
25	2036	554	381,535	29,637	487	279,780	23,964	1,544	1,072,880	82,648	16,729,570	26,885,733
26	2037	579	394,690	30,982	462	268,256	22,733	1,544	1,072,834	82,643	17,446,231	28,041,210
27	2038	579	395,548	31,001	462	267,608	22,711	1,544	1,072,833	82,643	18,163,099	29,196,687
28	2039	581	397,393	31,112	460	266,119	22,614	1,544	1,072,833	82,643	18,880,337	30,352,164
29	2040	591	403,002	31,622	450	261,173	22,140	1,544	1,072,880	82,648	19,598,275	31,507,692
30	2041	629	423,352	33,656	412	243,155	20,277	1,544	1,072,834	82,643	20,318,715	32,663,169

G2.4. 'Without project' scenario effects on project zone communities

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.

Without the REDD project there would be no funding for the protection of the project area, the governance structures required to manage the project area would not exist, and none of the project activities described in the later sections G3 and CM1.1 would be carried out with any forest edge communities or offsite communities. Community members said that even though it would be illegal, without enforcement they would re-engage in the activities they had conducted in the area prior to 2004; firstly farming, but also hunting, logging, mining, fishing and gathering (Witkowski et al 2012a and b).

The number of settlements close to or within the project area would most likely increase as would the number of inhabitants within each village due to the lack of forest protection and the 'open access' potential to exploit the area. Whilst this may bring benefit to individuals e.g. Chiefs who have the resources to take advantage of the lack of forest management the wider community would not benefit and the end result would be a depletion of the natural resource base which underpins many livelihood options and a decline in ecosystem service provision such as clean water supplies and climate regulation to all communities in the area.

In consultations with forest edge communities and local district councils, the forest edge communities stated that in large part, the GRNP management team is the only organization with a sustained presence in the forest edge area, due to remoteness, difficulty of access to FECs and scarce resources (Kenema District Council 2012; Focal group report; Witkowski et al 2012b; Gola REDD project context report; Witkowski et al 2012c). Without livelihood activities supported by the REDD project, forest edge communities would continue to utilize the same farming practices and continue to depend on unreliable, ad hoc income generating opportunities such as logging and mining.

Lack of knowledge of sustainable farming practices and continued overreliance on subsistence farming with poor inputs and low access to capital implies that communities would remain food insecure with a yearly hunger season as is found throughout Sierra Leone. Productivity of farms, cited to be a key challenge in the area (Kenema District Council 2012) would continue to be low and challenges such as decreases in fertility and declining fallow periods that are linked to shifting cultivation "are likely to get worse in future" (WHH strategy: 9). In areas where farm bush is over-utilized, grass incursions would occur which would have an adverse effect on subsistence agriculture (Davies and Richards 1991).

Some communities noted that the stocks of valuable timbers in their areas are already gone while others noted that communities extensively involved in logging do not seem to be any better off. Others reported that there are already shortages of resources such as rattan and fish in some areas (Focal Group report; Witkowski et al 2012b), some communities therefore already recognize that there would be negative livelihood impacts should forest resources not be protected. Conflicts over land for farming and resources are also likely to increase both between and within villages as village numbers and inhabitants increase. Conflicts

would increase due to the problem of insecure land tenure and only verbally known boundaries.

In the longer term, therefore deforestation would affect the important ecosystem services and livelihood options that underpin the communities agricultural and livelihood activities, including clean freshwater supplies, erosion control, soil fertility, carbon storage, NTFPs and supplies of animal protein. As Welthungerhilfe reports, “most authorities and regular citizens in Sierra Leone are not really aware of the connections between the environment and agricultural practices in their country. In many places, stocks of trees are being burnt, the cleared areas are being tilled, and conservation areas are being inhabited illegally and often because people are not aware of the borders or the importance of the conservation areas they are destroying” (Welthungerhilfe strategy 2010;23). This lack of knowledge poses a threat to the stability of natural resources in the area. The area around the GRNP has a specific micro-climate that is particularly suitable for coffee and cocoa production (pers. comm., Franz Moestel, Welthungerhilfe). In the absence of the project, increased deforestation would alter this micro-climate and have negative impacts on the cash-crop plantations on which communities depend for income generation.

Without the project forest edge communities would remain marginalized and unable to harness external support and lack the capacity and organization to help themselves. Any benefits would likely to accrue to a few individuals rather than the wider community. Constraints to development would therefore largely remain but with a depleted natural resource base on which to develop livelihoods. In the absence of the project, it is likely that natural capital will be reduced and this will have an increasingly detrimental effect on communities over time.

G2.5. ‘Without project’ scenario effects on project zone biodiversity

Describe how the ‘without project’ reference scenario would affect biodiversity in the project zone (e.g., habitat availability, landscape connectivity and threatened species).

The baseline projection of deforestation as described in G2.1 would have significant negative effects on the biodiversity of the project zone. These effects can be classified into habitat loss and fragmentation, disturbance and species loss.

Habitat loss and fragmentation resulting in loss of connectivity

In the absence of the Gola project, smallholder agriculturalists would be free to convert areas of forest into the farming cycle. This would likely begin with encroachment over the boundaries of the project area but small communities would also become established within the forest and trails would be opened up as has occurred in the past (Witkowski 2012) (see G2.1) and has occurred in other Forest Reserves in Sierra Leone (Showers 2012). This would result in habitat loss and fragmentation which would mean that connectivity (which is vital for the maintenance of viable populations of wildlife) within and between the forest blocks of the project area and the project area and forests in Liberia is lost. According to the baseline scenario, 1041 ha of forest would be lost per year from the project area. Forest loss is higher outside the project area (1544 ha/year in the leakage belt) and without the activities of the REDD project in the project zone this forest will eventually be converted into the farm bush cycle. One particularly important tract of fragmented forest lies between the southern

and central parts of the project area. It is likely that this provides an important connection between the two largest blocks of the project area, especially for larger mammals; larger mammals such as chimpanzees, duiker species and other primates have been recorded in this area (Hillers 2013). A forested floodplain area that is possibly the main site in Sierra Leone for the Endangered pygmy hippopotamus is also located in this area (Hillers and Muana 2011). Without project and leakage mitigation activities in these key areas, the distribution of forest dependent species and population numbers of will decline as has been in the case for pygmy hippos (Hillers and Muana 2011). Although secondary forests may provide habitat to several species, populations of specialists and endemic or localized species are often missing from regenerating forests (De Walt et al. 2003).

Disturbance

In the absence of the project increased human presence in the project area as people enter to carry out farming and other activities will negatively impact on biodiversity. As described in section G1.7, the Vulnerable White-necked picathartes nests in colonies on large boulders in forest areas. This species is endemic to the Upper Guinea forests, and the population in the project zone is the largest in Sierra Leone and one of the largest in its global range (Monticelli et al. 2011). The picathartes is the symbol of the National Park and draws international birdwatchers to the area, thereby generating income to local communities. Many of the known colonies from the project zone are located in community land. Past studies have shown these colonies are highly susceptible to disturbance from logging and farming (Wotton and Morris 2006) and without the project the range and numbers of this species are likely to decline. Some communities in the leakage belt of the project zone have begun to protect nesting sites due to the potential for visits from tourists and the revenue that this brings.

Disturbance will also affect other shy and sensitive species like the endangered pygmy hippo, chimpanzees (Hillers and Muana 2011) and other large mammals such as the Forest Elephant whose numbers significantly declined during the period of civil conflict when the project area was used by both rebels and local people as a refuge (pers. Comm. GRNP research team). For such species the project zone is one of the last strongholds in the country. Increased disturbance levels in the absence of the project may bring the extinction of both species from the country.

Species loss

In the absence of the project there would be no funding for conservation activities to prevent hunting in the project area, which is carried out with shot guns, snares and traps. Species loss would occur due to increased hunting pressure, as well as the disturbance and loss of habitat outlined above.

Species that are especially targeted by local hunters are the duikers and primates (Koroma 2012). In West and Central Africa, bushmeat hunting is known to be one of the most important threats to primate populations (Bowen-Jones et al. 1999, Kümpel et al. 2008, Greengrass 2011). Sooty Mangabeys, Chimpanzees and the Endangered Western red colobus are suffering from the bushmeat trade, because their large size and conspicuous habits make these species a main target to local hunters (Koroma 2012). In addition to the primates, duikers are among the most heavily trapped species in the forests of West Africa

and indeed the project zone (Greengrass 2011, Koroma 2012). While Maxwell's duiker appears to be common in the project zone, the Upper Guinea endemic Zebra duiker is listed by the IUCN as Vulnerable and Jentiks duiker is endangered. Their population sizes in the project zone are unknown. However, any increases in hunting pressure needs to be avoided. Terrestrial birds also get caught using snares, including the Vulnerable White-breasted guinea fowl.

Increasing forest loss in the absence of the project is expected to have a negative impact on several species, in particular those species that are restricted to primary forest. These species include the Endangered Gola malimbe, the Endangered Jentink's duiker, the Critically Endangered Tai toad and, again, Western red colobus and Western pied colobus.

Although the exact effects of the 'without-project' scenario are hard to quantify, it is clear that negative effects on forest cover, ecosystem integrity and the viability of threatened species are to be expected. Several studies have shown that especially taxa that are of conservation concern such as regional endemics are suffering most from habitat disturbance in tropical forests (e.g. Posa & Sodhi 2006, Scales & Marsden 2008). Larger mammals are likely to be the first to experience negative effects from the absence of conservation activities. This would include Forest elephant, Pygmy hippo and the threatened and endemic duiker and primates, including Chimpanzees that are very susceptible to hunting and are dependent on large tracts of undisturbed primary forest.

G3. Project design and goals

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

Provide a summary of the project's major climate, community and biodiversity objectives.

Project vision

The Gola REDD project is a catalyst for peace, prosperity and national pride in Sierra Leone, ensuring that the globally important habitats, biodiversity and environmental services of the GRNP and wider Gola landscape are conserved and that neighbouring communities are active environmental stewards of the natural resource base that underpins and enhances their livelihoods

Project purpose

To conserve the forests, biodiversity, ecological processes and services of the GRNP and wider landscape for the benefit of nature and people.

Goals

To facilitate the achievement of the project's vision and ensure that the project achieves net positive benefits for climate, communities and biodiversity, project activities will focus around three goals:

1. Conservation strategy and effective management for the GRNP

Goal: To strengthen the conservation strategy and effective management of the GRNP and enable the project to be a stimulus for building National policies and regulations as well as informing relevant regional and international platforms of conservation best practice.

2. Sustainable natural resource management

Goal: To enable local people to become environmental stewards of the natural resource base that underpins their livelihoods through education, capacity building, land use planning and activities that enhance the socio-economic benefits derived from the sustainable use of the project zone's forests and agricultural land.

3. Research and monitoring

Goal: To develop and maintain a comprehensive social and biodiversity database and monitoring system to ensure the availability of accurate, relevant and timely information to inform and enhance project management and the effective protection of the forest and delivery of anticipated social and biodiversity goals.

A further goal of the project is to build capital in a trust fund that can be used after the end of the carbon project to continue conservation management. This goal falls outside of the implementing team's management goals which are described above and instead is part of the strategy of the Gola Rainforest Conservation LG. A dedicated trust fund for GRNP post-project management will be established which will be capitalized during the project's lifetime by a percentage of 'excess' revenues from the sale of credits that remain after the costs of project implementation.

G3.2. Description of project activities

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

The three main project goals have been broken down in the following tables into objectives and activities. The rationale and relevance to achieving the project's purpose and vision is described. The management plan which is currently under development will breakdown each activity into actions. The management plan will be reviewed and revised every five years during the 30 year project cycle in consultation with project partners, staff and key community stakeholders.

Each year project management staff will develop an annual operations plan based on the five-year management plan and the results of the previous year's activities. In this way the project will continually evaluate its progress and risks and adapt its activities accordingly to ensure that the project is on target to meet its goals and objectives.

1. Conservation strategy and effective management for the GRNP

Goal: To strengthen the conservation strategy and effective management of the GRNP and enable the project to be a stimulus for building National policies and regulations as well as informing relevant regional and international platforms of best conservation practice

Objectives	Activities	Rationale and Relevance
1. Protect the integrity of the GRNP	<p>1.1 Forest ranger teams to carry out regular forest patrols to deter, prevent and control illegal activities</p> <p>1.2 Strategic patrol planning to optimise coverage of the protected area while targeting areas of high conservation value and ensuring a timely response to known and potential threats</p> <p>1.3 Maintain clear and permanent boundary demarcation</p> <p>1.4 Maintain and where necessary establish infrastructure such as forest ranger stations, road access and park headquarters</p> <p>1.5 Develop robust communication channels with neighbouring communities and local authorities that enable threats and grievances to be efficiently and effectively addressed</p>	<p>National Park status on its own does not guarantee the long term survival of key species and habitats and the integrity of carbon stocks; many species require active management or protection measures and these must be based on sound information and enforcement of legislation through the control of illegal and damaging activities. These activities will need to be implemented through out the lifetime of the project and by preventing illegal activities that result in deforestation GHG emissions will be reduced.</p>
2. Enable effective management through implementation of best practice administrative and financial systems and the provision of necessary staff	<p>2.1 Maintain robust procurement and accounting policies and procedures</p> <p>2.2 Ensure financial planning and reporting is in compliance with company requirements</p> <p>2.3 Ensure that recruitment follows Human Resource policy</p>	<p>Effective project management must have all the mechanisms in place to assist and guide staff in carrying out their work and enable them to demonstrate that resources are being used in a cost-effective legal and transparent manner. Without such 'behind the scenes' management processes the project would be</p>

<p>training and equipment</p>	<p>of equal opportunities and best practice</p> <p>2.4 Provide staff with training and professional development opportunities to ensure the project's capacity needs are met and that staff are able to progress in their careers.</p> <p>2.5 Develop, implement, evaluate and report on annual operational plans</p> <p>2.6 Provide a secure work environment for staff and visitors</p>	<p>unable to efficiently function and reduce GHG emissions, such activities will be implemented through out the lifetime of the project.</p>
<p>3. Strengthen communications and actively promote the project with local, regional and national stakeholders (and wherever possible in international arenas)</p>	<p>3.1 Document and disseminate best management practices (through meetings, publications, workshops and the project website)</p> <p>3.2 Advocate for the replication of the project to support wider conservation initiatives nationally and in the sub region</p> <p>3.3 Establish and maintain strong links, dialogue and collaboration between the project and key local, provincial and national stakeholders</p> <p>3.4 Establish the necessary legal framework for the implementation of co-management and other activities required by the project</p>	<p>Promoting the project's best practices and developing institutional coherence amongst Government and Non-Government agencies will create a positive environment for natural resource governance and the demonstration of effective REDD activities are essential for the development and implementation of national mechanisms and effective protected area management elsewhere in the country thus reducing GHG emissions for the project and wider landscape. These activities are to be implemented through out the lifetime of the project.</p>

2. Sustainable natural resource management

Goal: To create an enabling environment for neighbouring communities to act as committed environmental stewards of the natural resource base that underpins their livelihoods through activities that enhance, generate value from and materialize the benefits derived from the project zone's forests and sustainable land use practices.

Objective	Activities	Rationale and relevance
1. To improve productivity on existing crop fallow land	1.1 Assess current land use systems and design intervention strategies that are inclusive of the most vulnerable 1.2 Develop and implement training workshops for farmer field schools and provide inputs to establish and maintain farmer capacity for best practices in sustainable agriculture 1.3 Pilot innovations to increase productivity in demonstration plots 1.4 Research human-wildlife conflict (HWC) and pilot awareness mechanisms and measures to reduce impact (to link in with objective 2) 1.5 Provide comprehensive ongoing training and supervision of agriculture officers 1.6 Implement the monitoring plan and adapt activities according to results of evaluations	Improving the productivity on land that is already part of the traditional bush fallow cycle will reduce deforestation and benefit household food security and income, this is part of the project strategy to achieve a net positive impact for project zone communities. This activity will be implemented in all 122 villages of the leakage belt in the first 6 years of the project, after which time progress will be assessed and a new activity plan developed (see Tatum-Hume and Witkowski 2013 for further descriptions of the activity and the implementation plan).
2. To improve productivity and farmer income from cocoa production and other diversified sustainable income	2.1 Assess existing agricultural commodity value chains and identify gaps for agricultural products, Non-timber forest products, sustainable forest products and constraints for Forest edge communities 2.2 Provide training and inputs for the production/collection, post-harvest	Rehabilitating cocoa plantations will have the benefit of both increasing farmer income and maintaining forest cover thus ensuring that GHG are not emitted

<p>generating activities</p>	<p>processing and marketing needs of the identified crop</p> <p>2.3 Increase organization and capacity of small holders to enable increased trade and income e.g. through certification, and or cooperatives</p> <p>2.4 Develop and promote the Gola area as an eco-tourism destination that benefits and involves local communities</p> <p>2.5 Implement the monitoring plan and adapt activities according to results of evaluations</p>	<p>through the conversion of old plantations into other land uses. This activity will be implemented in all 122 villages of the leakage belt in the first 6 years of the project, after which time progress will be assessed and a new activity plan developed. (see Tatum-Hume and Witkowski 2013 for further descriptions of the activity and the implementation plan).</p>
<p>3. To enable forest edge communities to achieve financial independence</p>	<p>3.1 Establish savings and internal lending group(s) within participating villages</p> <p>3.2 Provide training, guidance and monitoring of each groups committee and activities</p> <p>3.3 Train Private Service Providers within each group to establish further groups within each village</p> <p>3.4 Implement the monitoring plan to monitor outputs, outcomes and impacts of activities as compared to the baseline scenario on livelihoods and wellbeing in accordance with the specific indicators detailed in the social monitoring plan and longitudinal and activity monitoring procedures documents. Adapt activity if barriers or issues are uncovered through monitoring (e.g. additional training)</p>	<p>Enabling villagers to have access to a pot of funds that can be used to finance alternative livelihoods or used in times of emergency will provide improved and diversified incomes thus reducing pressure on forest resources (and thereby reducing GHG emissions) whilst providing net positive benefits to forest edge communities. This activity will be implemented in all 122 villages of the leakage belt in the first 6 years of the project, after which time progress will be assessed and a new activity plan developed. (See Tatum-Hume and Witkowski 2013 for further descriptions of the activity and the</p>

		implementation plan).
4. To provide an enabling environment and capacity for forest edge communities to sustainably manage forest areas	<p>4.1 Capacity building and awareness raising of importance of Natural Resource Management in villages in the project zone (to link in with objective 5)</p> <p>4.2 Identification, prioritization and engagement of cluster forest edge communities for CBNRM work</p> <p>4.3 Review and update in a participatory manner existing by-laws on traditional land use practices</p> <p>4.4 Establish co-management areas inside project area (GRNP) with resource use agreements and at community request, in the leakage belt (to link in with objective 2, activity 1)</p> <p>4.5 Identify and promote the strengthening of traditional governance systems to enable communities to participate more effectively in the protection and of the GRNP and enforcement of its laws and regulations.</p>	Effective CBNRM will mitigate leakage in the project zone and preserve habitat connectivity between the forest blocks and forests in Liberia thus contributing to both climate and biodiversity objectives. From a community perspective land use planning will ensure that natural resources which underpin many livelihood activities are available in perpetuity. Tenure security in the form of use rights and access will be enhanced inside the park through the designation of community use zones and co-management agreements. This activity will be developed over the lifetime of the project with the forest edge communities in the leakage belt.
5. To enhance environmental awareness and promote community participation in the management of the GRNP	<p>5.1 Develop and implement an education strategy with modules dedicated to targeted topics and audiences</p> <p>5.2 Establish and maintain a network of school nature clubs</p> <p>5.3 Develop a GRNP volunteer program in forest edge communities for unemployed youth</p>	Promoting understanding and knowledge of the values of the GRNP and forests is a necessary pre-requisite for enabling the emergence of environmental stewardship in local communities. If communities value and preserve

	<p>5.4 Identify and support environmental stewards in neighbouring communities</p> <p>5.5 Conduct annual awareness raising and educational roadshows and other events to reach remote forest edge communities</p> <p>5.6 Monitor the success of the educational programme following the monitoring plan and selected indicators, adapt as required</p>	<p>forests this will reduce emissions of GHG, educational activities will be implemented through out the lifetime of the project.</p>
<p>6. Implement and monitor mechanisms that equitably compensate stakeholders and promote incentives for conservation practices in the project zone and offsite zone</p>	<p>6.1 Implement the distribution of funds and activities outlined in the Benefit Sharing Agreement (BSA)</p> <p>6.2 Develop structures and monitoring procedures to ensure effective and transparent distribution of funds and in-kind benefits</p> <p>6.3 Support Gola Community Development Committees (GCDC) in develop procedures and criteria to select development projects for funding</p> <p>6.4 Provide advice and capacity building to GCDCs</p> <p>6.5 Oversee the fair election of GCDCs</p> <p>6.6 Support the Government in updating the GRNP landowner register</p> <p>6.7 Assess pupil access and participation in secondary schools. Develop criteria for scholarship selection and provide scholarship package to community selected students</p> <p>6.8 Assess and implement where possible other strategies for providing educational support to remote forest edge communities which fall outside the current school coverage</p>	<p>The development and maintenance of an agreement and mechanisms that reward and incentivise stakeholders to reduce deforestation and compensate others for foregone rights in an equitable, effective and transparent manner is essential to prevent elite capture and to foster support for the project. The Benefit sharing agreement will be periodically renewed through out the project.</p>

3. Research and monitoring

Goal: To develop and maintain a comprehensive social and biodiversity database and monitoring system to ensure the availability of accurate, relevant and timely information to inform and enhance project management and the effective protection of the forest and delivery of anticipated social and biodiversity goals.

Objectives	Activities	Rationale and relevance
1. To carry out specific studies to fill critical gaps in information on biodiversity, ecological processes and social-ecological systems	1.1 Carry out ecological research into key species and recommend management interventions if required 1.2 Develop conservation action plans for key species and habitats 1.3 Carry out socio-economic research to understand community dynamics 1.4 Promote national and international research involvement in the project zone	This objective will provide the necessary scientific information to guide the project's management and protection measures
2. Establish and maintain a biophysical and socio-economic database	2.1 Design, implement and maintain a database to capture all data collected 2.2 Analyse and report on data	Ensure that the project maintains a robust dataset upon which management can rely to make informed decisions
3. To carry out monitoring of key species, habitats, ecological processes and socio-economics to determine and evaluate the project's progress and impacts	3.1 Carry out regular monitoring of pre-identified and agreed sets of indicators for climate change, forest cover, biodiversity and community development 3.2 Carry out regular analysis and report on available data 3.3 Disseminate reports and results to stakeholders and the scientific community	This objective will ensure that the implemented management actions are creating the predicted and desired changes and enables the project to adapt the management strategy accordingly

<p>4. To promote GRNP as a centre for national and international research on tropical rainforest ecosystems and integrated conservation and development approaches to protected area management</p>	<p>4.1 Set up the required infrastructure for national and international research to be held in the project zone</p> <p>4.2 Develop and implement an education program for schools and visitors to the centre to build environmental awareness</p> <p>4.3 Establish collaborative partnerships on agreed research questions</p> <p>4.4 Facilitate independent research projects within the project zone , the results of which must be shared with local communities through the CDRO-FEC meetings, workshops and be published on the project website</p> <p>4.5 Promote and advocate research results</p>	<p>This objective will secure and enhance the recognition of GRNP's high Conservation values, fill gaps in scientific knowledge and understanding, as well as build the capacity and reputation for national research thus creating the impetus to protect Gola during and beyond the project cycle at a national and international level.</p>
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G3.3. Project boundaries and location of project activities

G3.3. Provide a map identifying the 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 (e.g. through leakage).

Project activities relating to conserving and strengthening the management of the project area (goal 1, described in G3.2), will occur within the project area (the three forest blocks of the GRNP). Project activities involving the forest edge communities that are directed towards sustainable natural resource management (goal 2, objectives 1 to 6, described in G3.2) will take place in the 122 communities of the leakage belt of the project zone, goal 2, objective 6 will occur in both the project zone and offsite zone. Project activities relating to research and monitoring (goal 3, described in G3.2), will take place throughout the project zone and in some parts of the offsite zone.

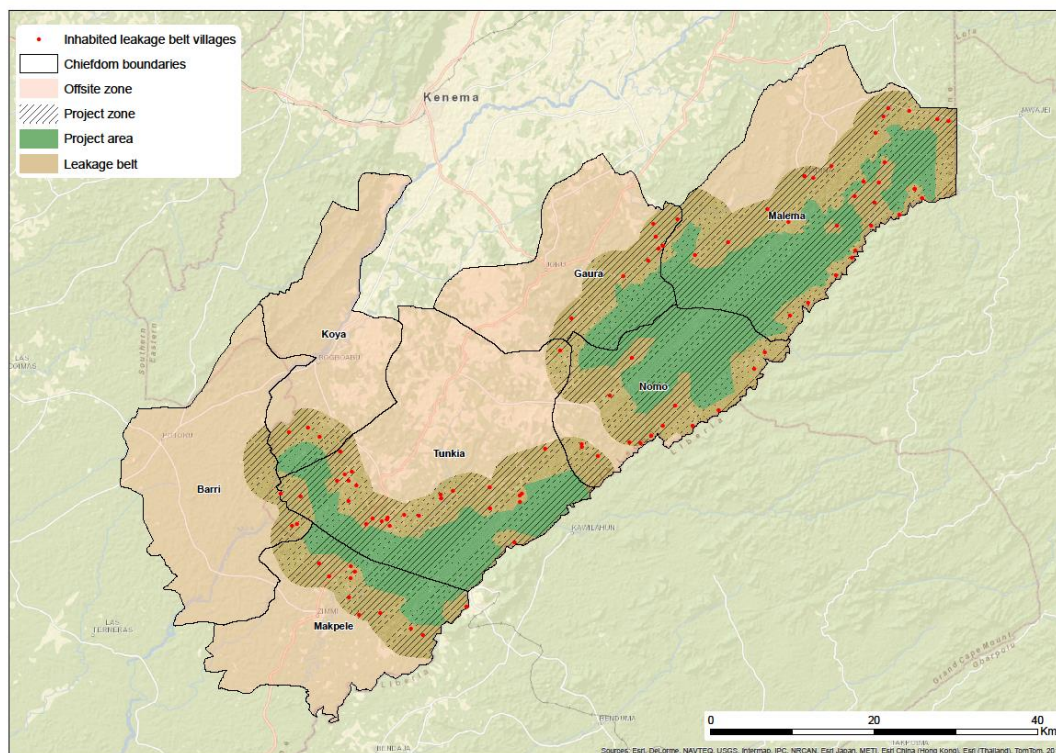


Figure 12. Map of the location of project activities

G3.4. Project lifetime, accounting period and implementation schedule

Define the project lifetime and GHG accounting period and explain and justify any differences between them. Define an implementation schedule, indicating key dates and milestones in the project's development.

Project lifetime and GHG accounting period

The Gola REDD project lifetime is 30 years, starting on 1st August 2012 when donor funding ended and so would all conservation work had the RSPB not provided temporary bridging finance and ending on 31st July 2042. This is the same as the GHG accounting period.

As per G3.1 the project proponents propose to use a trust fund to accumulate a percentage of any excess finances from the sale of carbon credits to be used after the project ends to continue conservation work.

Table 23: Implementation schedule of key dates in project development

Date	Milestone
2008	Conclusion of 1 st feasibility study; a REDD project is the most viable funding option for Gola
2009	Dissemination of results study to stakeholders; Meetings with partners, Chiefs and civil society to discuss the way forward
2011	Launch of National Park by President Ernest Bai Koroma; Due process followed to upgrade the Gola Production forest reserves to a National Park (see Fofanah 2012)
2012 – 2103	Project start date (August 2012) Beginning of community consultation process for project design and development; Meetings with Paramount Chiefs to launch the process (see G3.8 for details on stakeholder engagement) Collection and analysis and report writing of all baseline data
2013	Project validation to VCS and CCB standards
2014	VCS Monitoring event and report generated Project verification to VCS standards Dissemination of verified monitoring report
2017	Social, Biodiversity and Climate/VCS monitoring events and reports generated Project verification to VCS and CCB standards Dissemination of verified monitoring report

2018	Management Plan update
2020	Social, Biodiversity and Climate/VCS monitoring events and reports generated Project verification to VCS and CCB standards Dissemination of verified monitoring report
2022	Social, Biodiversity and Climate/VCS monitoring events and reports generated Project verification to VCS and CCB standards Dissemination of verified monitoring report Baseline revision process for VCS Management Plan update

G3.5. Risks to expected climate, community and biodiversity benefits

Identify 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 Gola project has used the risk assessment tool created by the VCS to assess the risk and determine the appropriate risk rating for the project. Through applying the tool, the project scored a risk rating of 9. However, following the guidelines the minimum risk rating a project can have is 10, the Gola REDD project has therefore applied a risk rating of 10 in determining the number of VCS credits that will be deposited into the AFOLU pooled buffer account (VCS non-permanence risk report).

Risks were assessed by type and included both internal risks; project management, financial viability, opportunity cost, project longevity and external risks; land ownership, community engagement and natural risks. Mitigation measures are in place for any identified risks as explained below.

Internal Risks

Project Management;

The project will be overseen by a company (the Gola Rainforest Conservation LG) established by 3 partners who have been working together to conserve the integrity of the project area for wildlife and for people since agreements were signed in 2001. The 3 partners are the Ministry of Agriculture, Forestry and Food Security, represented by the Forestry Division of the Government of Sierra Leone, the Conservation Society of Sierra Leone (CSSL) and the Royal Society for the Protection of Birds (RSPB). The RSPB has taken the technical lead in developing the Gola REDD project on behalf of the partners.

The RSPB is a UK based conservation organization which currently oversees a portfolio of hundreds of conservation projects in 52 countries in Africa, Asia and Europe in partnership with local birdlife partners, national governments, universities, other non-governmental organizations and committed individuals to promote wildlife conservation based on scientific research. The RSPB considers human induced climate change to be the biggest long term threat to biodiversity and supports policies and measures that reduce anthropogenic emissions. The RSPB has a long history of involvement in the international climate change debate and works with BirdLife International Partners to pilot projects, which aim to reduce emissions from deforestation in developing countries.

The day to day management of the project is carried out by a team of 150 local and international RSPB staff (the vast majority being local staff) with a wealth of conservation and development education, training and experience within Sierra Leone and elsewhere. The project will follow a 5 year management plan that is developed through consultation with local communities and Chiefs. An annual operations plan based on the Management Plan is developed by the project staff and outlines the yearly activities, project risks and monitoring strategies. Progress will be evaluated every quarter to ensure any problems are detected at an early stage and activities adapted together with project staff.

The implementation of leakage mitigation activities (livelihood projects) will be carried out by a combination of project staff and Welt-Hunger Hilfe staff depending on the activity and timing of its implementation (Tatum-Hume and Witkowski 2013). Agricultural interventions have been designed by Welt-Hunger Hilfe, an organization with significant experience in developing farmer capacity and increasing agricultural productivity in Sierra Leone. There is a risk that communities may fail to benefit from the designed activities if there are any human induced barriers that prevent the activity being adopted that were not anticipated during the design phase of the activity or if the sustainable farming practices that are introduced do not result in an anticipated increase in yield and income. Thus the satisfaction and the uptake of new techniques and changes in productivity by community members are included in monitoring plans of the project activities (outputs and outcome monitoring procedures document). Potential barriers considered and mitigated for during the design phase included for example; elite capture (the activities are open to everyone in the community to avoid this issue); landless households may not be involved in earlier rounds of agricultural activities as they were found to be poorer households and risk adverse to trialing new agricultural techniques (landless households are provided with improved varieties of seed if they are unable to take part in the first round of activities to try to help increase productivity), female headed households and farmers may not be able to join farmer field school groups (female farmers are actively sort to join the groups and field schools aim for a minimum of 20% female participants¹⁵). Where any agricultural interventions or other activities are seen to be at risk to community benefits the activities will be adapted accordingly. The technical capacity of the project staff and adaptive management process put in place for the project justify a low risk category associated with the management of the project (VCS non-permanence risk report and appendices).

Financial Viability

¹⁵ A higher percentage was not targeted as women do not traditionally farm all crops types or cocoa

The project partners and staff have successfully managed private and donor funds during pearly conservation work and in the development of the REDD project. Revenues from the sale of carbon credits are expected to be sufficient to cover the costs of implementing the project and any excess revenues will be held in trust funds to be used to manage the GRNP beyond the lifetime of the project. One of the project partners, the RSPB, has provided bridging finance until carbon revenues are available resulting in a minimal financial viability risk to the project (financial analysis available to auditor).

Opportunity cost

The most profitable alternative land use is identified as the mining of the Bagla Hills area in the southern block of the project area for iron ore. This activity is likely to be 100% more profitable for any commercial mining company than conservation activities, although the impact on neighbouring communities is hard to assess. The risk of mining occurring however is very low as: 1. the project area is a National Park and legislation does not readily permit such activities to take place inside a National Park, 2. the Ministry of Mines has publically declared that no mining will take place in the project area 3. the project proponent (the Gola Rainforest Conservation LG) has entered into a public-private partnership agreement with the Government of Sierra Leone further securing the management of the project area for conservation purposes.

Project longevity

A legal agreement is in place for the project proponent to manage the project area for the lifetime of the carbon project i.e. the next 30 years. As a National Park the regulations are in place to protect the area beyond the lifetime of the project, but regulations alone are not enough to prevent deforestation. The partners will therefore create a trust fund to build capital over the lifetime of the project that will then be used to continue the conservation management once carbon financing ends. The risk of project activities not being maintained is therefore low (legal agreements available to auditor).

External risks

Land ownership and resource rights

The Government of Sierra Leone represented by the Ministry of Agriculture, Forestry and Food Security owns the carbon rights and management rights to the project area. These rights will be legally transferred to the project proponent by way of a public-private partnership agreement to enable the sale of credits. Families within the 7 Chiefdoms are recognized as traditional landowners to the project area and have been consulted to secure outstanding carbon rights and will be paid compensation via the REDD benefit sharing agreement. There are therefore no risks associated with land ownership or management for the project.

Community Engagement

The VCS considers the project to be at risk if it has not adequately consulted with households reliant on the resources of the project area. Within the leakage belt of the project zone there are 122 communities. Consultations with communities in both the project zone and the offsite zone revealed that households in these communities were not reliant on

the project area but used it periodically for farming, hunting, logging, mining, fishing and gathering NTFPs. Consultations to develop the project activities were undertaken with the project zone communities and project staff have visited all the Forest Edge Communities in the leakage belt to describe the project and gain consent for the project and for the activities that will be implemented with them over the projects lifetime. Household and focal group surveys to inform the development of project and leakage mitigation activities have been carried out with 30% of villages within the project zone. All communities visited have endorsed the REDD project (MoUs available to auditor).

Any negative impacts of conservation activities on local communities will be mitigated via compensation mechanisms set up by the project that include a range of direct payments and livelihood activities with both project zone and offsite communities. These are described in section CM1.1.

Political risk

The VCS rates political risk by the governance scores determined by the World Bank indicators. Sierra Leone achieves a high political risk rating. The project considers that this risk is mitigated by the fact that the Government is an active partner in the project and has demonstrated its long term commitment towards reducing anthropogenic GHG emissions through participation in international climate change negotiations, public declarations made by the President Dr Ernest Bai Koroma and the recent steps towards developing a National REDD mechanism. The Forestry Division has recently been awarded an EU grant to develop REDD technical capacity within the division and is committed to updating policy and building institutional capacity to meet UNFCCC requirements.

Natural Risks

Analysis of natural risks including fire, extreme weather, pests and disease and geological activity revealed that the project zone is under very low risk from natural disasters. To mitigate any possible risk the project will actively monitor fire outbreaks using the MODIS satellite early warning system, patrol teams will be sent out to investigate any outbreak and react accordingly. In Sierra Leone wild fires are a more common occurrence in the North of the country where there are areas of extensive grassland. Natural risks that may affect the leakage mitigation activities (livelihood projects) introduced to the Forest Edge Communities include the impacts of climate change and crop raiding by wild animals. Agricultural techniques that are being introduced to communities to increase productivity are designed to be 'climate proof' and to increase the resilience of communities and households to climate change for example short-duration rice varieties and agro-forestry systems both enhance the resilience of the farming system (see GL1). Through land use planning the project will encourage the protection of water catchments and inland valley swamps which will contribute to reforestation and improved water availability in the swamps. Protection of the project area itself and the maintenance of connectivity between the forest blocks will also help community resilience by ensuring the long term availability of ecosystem-services including provisional services (food stuff and materials) and regulating services (water quality and availability and micro-climatic conditions). Human wildlife conflict mitigation measures will be trialed with communities based on the results of wildlife conflict research before the most effective measures are scaled up and introduced to all forest edge communities. Both natural risks to leakage mitigation activities will be monitoring during the

lifetime of the project and further mitigation measures introduced should any further risks be identified.

The project therefore has a low natural risk for conservation and livelihood activities.

G3.6. Project design and High Conservation Values

Demonstrate that the project design includes specific measures to ensure the maintenance or enhancement of the high conservation value attributes identified in G1 consistent with the precautionary principle.

The project zone harbours a number of HCV attributes as described in G1; many of the HCV attributes described are dependent on large areas of contiguous forest. The project vision is to protect and enhance natural resources within the project zone and all project goals and objectives are channeled towards achieving the vision. If the forest is protected the forest dependent HCVs will be maintained and in many cases enhanced (see section B1.1 and B1.2).

The first major step to ensuring that the HCVs are maintained was achieved at the end of 2011 when the status of the Gola Production Forest Reserve was upgraded to a National Park. Although this occurred before the official project start date it was part of the process to align management practice with policy to enable a REDD project (see G3.4 for timeline of key events). As a production forest reserve the primary objective for the area was timber production. By upgrading the status of the reserves into a National Park, the highest level of legal protection possible in Sierra Leone was given to the project area. Strengthening the protection strategy and effective management of the Park is one of the three main goals of the project. This will be partly achieved through regular patrolling the project area but also through involving neighbouring communities in the co-management of areas of the Park and developing sustainable land use plans and practices for the leakage belt, which is part of the second goal of the project - sustainable natural resource management throughout the project zone.

The integration of conservation and development goals as described in section 3.2 will ensure that HCVs are maintained and enhanced in the project zone which consists of the GRNP and the wider landscape of the Forest Edge Communities in the leakage belt (also see section B1.1 and B1.2). As HCV areas have been identified by past research work, the project will prioritize these areas for patrolling efforts within the GRNP and for community activities in the leakage belt, ensuring communities are aware of and feel pride for the HCV attributes in their area.

G3.7. Project benefits beyond the project lifetime

Describe the measures that will be taken to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime.

As explained in section G3.6, the establishment of the National Park early in the project planning process created the necessary legal framework for maintaining and enhancing the benefits of the project beyond its lifetime and the Government of Sierra Leone is committed

to the long term vision of the project, as evidenced by Presidential declarations for example at the launch of the GRNP in 2011 (Koroma 2011). Further to this, the project has a number of related strategies to ensure that climate, biodiversity and community benefits extend far beyond the 30 year life of the project. Firstly the partners are setting up a dedicated trust fund which will be capitalized during the project lifetime and be used to continue conservation management in the project zone after the project ends (Project agreements are available to the auditor upon request). Secondly, the project will work with the Forestry Division of Sierra Leone, one of the project partners, and other government agencies (e.g. the Environmental Protection Agency and the NPAA) to ensure that the project is grandfathered into any future national mechanism and that social and biodiversity safeguards are incorporated. Thirdly, the project will work to empower local communities to become active environmental stewards of the project zone through environmental awareness raising, co-management and enhancing their ability to obtain both financial and in-kind benefits from the forest. As a result, natural resource governance will become embedded into community values and sustainable management will extend beyond the lifetime of the project.

G3.8. Stakeholder identification and involvement

Document and defend how communities and other stakeholders potentially affected by the project activities have been identified and have been involved 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. Project developers must document stakeholder dialogues and indicate if and how the project proposal was revised based on such input. A plan must be developed to continue communication and consultation between project managers and all community groups about the project and its impacts to facilitate adaptive management throughout the life of the project.

To identify the stakeholders around the project area that can potentially be affected by REDD project activities a stakeholder analysis profile matrix was completed. This was complemented by a rainbow stakeholder analysis which clarified not only which stakeholders can potentially be affected by project activities, but also which stakeholders might affect project activities, as recommended by Reed et al (2009) (see Figure 13). The aim of the rainbow analysis was to highlight the nature of each group's impact to and from the project so that plans can be included in the project design to mitigate negative impacts and pinpoint with whom the project must engage to ensure long term protection of the project area. Information was used from the stakeholder analysis profile matrix, the Gola Project Context Report (Witkowski et al 2012c), the threats Report (Witkowski 2012) as well as the perspectives of various stakeholders (NGO, government and community actors) to determine who and/or what has the ability to affect the success of the project. In addition, a rights holder analysis was carried out to identify all those stakeholders with rights to the land and resources in the project area (See Gola Project Context Report; Witkowski et al 2012c). All of these analyses were validated through consultation (see Table 24).

Table 24. Stakeholder analysis, carried out at the beginning of the project design process 2012

Stakeholder Analysis Profile Matrix
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Stakeholder or Stakeholder sub-group	Interest in the project	Effect of project on their interests	Capacity/ Motivation to Participate
GoSL - regional representatives	Political leaders of region where project is being implemented - This includes MPs (constituency level) and Permanent Secretary (regional level), and District Council and Councilors (district level)	Project will impact their constituencies and provide positive benefits for constituents.	Low
National and International Development organizations (both non and for profit)	Some are already working in the Gola area and may be engaged to help with livelihood activities designed as part of the REDD project. These organizations include CRS, PAGE, WHH, GOAL, and Tropical Forest Farms, among others	Positive - some of project's community development activities may be implemented by them	Medium
Regional Traditional Leaders	This includes Paramount Chiefs, Chiefdom speakers, Section chiefs and Town chiefs. The Paramount Chief is the highest traditional leader and head of chiefdom. There are 7 Chiefdoms around GRNP, and some of each Paramount Chief's villages are forest edge communities, others are offsite; buy in is critical.	Project will affect people in their constituency, which includes both the project zone and offsite communities	High
Traditional Landowning families of the Gola Forest	Families recognized by customary law as the land owners of the Gola Forest before the existence of the Reserve or National Park. The head of the family receives annual payments under the benefit sharing agreement to compensate them for loss of use and royalty payments	Positive; the project will ensure that their traditional rights are recognized and provide direct financial benefits	Medium
Gola Community Development Committees	Responsible for implementation of the Community Development Fund. One exists in each chiefdom - members are elected and include a teacher, farmer, women's leader, youth, hunter, logger, and forest edge community representative. There are also several permanent members, including representatives for the Paramount Chief, MP, and District Councilor	Project will provide the funds for the chiefdom development fund that all communities can apply to for support for development projects	High
Offsite communities	Communities within the 7 Chiefdoms around the project zone; potential agents of deforestation within the leakage belt	Positive - these communities will receive benefits under the benefit sharing agreement in the form of the community development fund, scholarships etc.	Medium
Forest edge communities	Communities living closest around the edge of GRNP; most likely agents of deforestation	Project will affect them and the activities they can do in the GRNP, project will need to engage with these communities to develop project activities	High

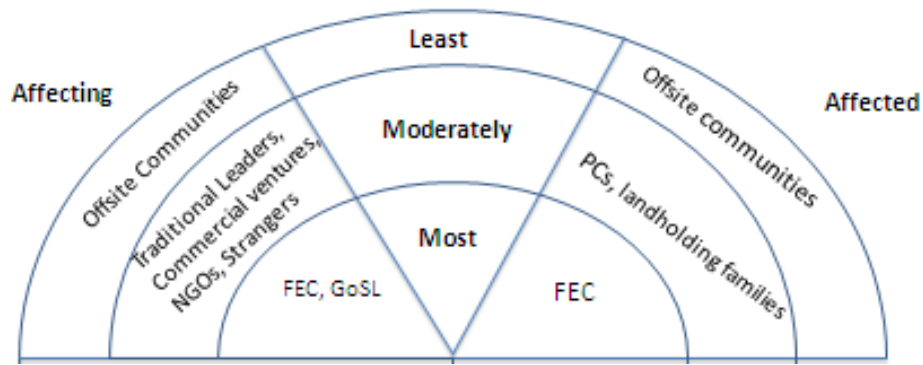


Figure 13. Rainbow stakeholder diagram of Gola project stakeholders who may affect and be affected by project activities

The analysis showed that in order to mitigate the potential threats the project will need to engage with a broader range of stakeholders than just the affected rights holders and most impacted group to gain political support at both local and national levels. There is a need to address wider natural resource governance issues in the region and within the Government to ensure the long term success and sustainability of the Gola project.

The critical groups of legal, customary and ethical local rights-holders to engage with for the purposes of the development of the REDD project, as they can both affect it and be affected by it, are therefore the:

1. **Paramount Chiefs** - The seven paramount chiefs are the traditional custodians of the land and leaders of the people. They therefore have great influence over land use patterns in their respective Chiefdoms and under legislation would have been entitled to receive logging royalties had the project area remained a production forest reserve.
2. **Heirs of the original landowners of GRNP** (project area) – The members of this group consist of the families represented by the family heads registered in the GRNP landowner register (2013). The family heads represent their respective family units and are recognised as the traditional land owners of the area within the National Park by the project, the Government and by other local stakeholders. The traditional landowning families, whilst important stakeholders in the project are not seen as the primary threat to the project or as most impacted by project activities as they passed their management rights to the Government in the 1920's when the majority of the reserve was first created and have therefore not had user rights or customary rights to the land in nearly 100 years. Like the Paramount Chiefs they were entitled to royalties had the project area remained a production forest reserve (although they did not receive any royalties from the timber companies that had concessions in Gola when it was a production forest reserve).
3. **Forest Edge Communities** – These communities either have a direct physical boundary to the GRNP or are within the leakage belt. Because of customary resource use and permission patterns, the current and potential impacts of the project on their livelihoods and the threats they pose to the project zone, these stakeholders are considered to be the key group with whom to engage. Some of the family units associated with landowning families of the project area are living in the forest edge communities.

Identification of and engagement with rights holders

Paramount Chiefs: These seven individuals are clearly identified in the seven chiefdoms. At present however, two chiefdoms – Makpele and Gaura - are without Paramount Chiefs as they recently passed away and the chiefdoms are being led by Regent (temporary) Chiefs. Elections for new permanent paramount chiefs are anticipated to occur sometime during 2013.

To ensure adequate consultation was held with the paramount chiefs to seek their input into the carbon project and achieve their consent to move forward, a series of meetings were held with the group of Paramount Chiefs in Kenema. These meetings started in February 2012 (see Table 25), meetings are the traditional method of consultation with and between Paramount Chiefs, predating any conservation work, which is why this method has been adopted by the project as the best form for REDD project discussions. This was followed up by a series of three additional Paramount Chief meetings, (see Table 25). In order to ensure a community perspective in high level decision making about the project, the Paramount Chiefs created a GRNP Paramount Chief Council to facilitate meetings with project staff and to enable better discussions between Paramount Chiefs on land management issues within their chiefdoms and to foster a necessary sense of collective ownership and cooperation among the 7 chiefdoms with the project. A representative of this council was officially elected by all paramount chiefs to attend meetings of the project partners (the Forestry Division of the Government, CSSL, RSPB) as well as other additional meetings which require the presence of the Paramount Chiefs. Additional meetings attended by the Paramount Chief representative are not reported here but include four partner meetings held during 2012 and 2 in early 2013 which discussed carbon project development and management arrangements.

Landowners: An effort was made by the Forestry Division and the Eastern and Southern Provincial Secretaries with support from the GRNP management team to identify all the landowners in 2008 to enable landowner payments to be made under a benefit sharing agreement made in 2008.

During the carbon sensitization meetings in the seven Gola chiefdom headquarter towns with the Paramount, Section and Town Chiefs in 2012, it was requested that the existing landowner register be updated due to omissions and changes since 2008 when the first landowners registration took place. This updating process has helped ensure that the right landowning families are being compensated for loss of usage and royalty rights to the land in the GRNP, to present the Gola REDD project and concepts of REDD and to arrange the transfer of any residual carbon rights in return for compensation. A series of two meetings with landowners were held in each chiefdom during August and September 2012. In addition, many of the family units of the landowning families are still residing in forest edge communities and are therefore also engaged in project development and implementation through forest edge community outreach activities described below.

Forest edge communities: As discussions with stakeholders took place during 2012, it was determined that the most accurate criterion for forest edge communities is those lying adjacent to the park with a direct boundary with GRNP. A small number of villages that lie

within the leakage belt but do not share a direct boundary with the project will also be classified as forest edge communities due to their proximity to the project area¹⁶. During community sensitization meetings about the carbon project held by the project in March/April 2012 initial lists of forest edge communities were drawn up. Input on these lists was then sought from project staff who spend substantial amounts of time on the ground, many of whom grew up in the chiefdoms. This was followed by confirmation of the lists with the Paramount Chiefs at a meeting in late June 2012. The lists were further triangulated through ground-truthing during household surveys and focus group exercises (described below). They were also verified at every opportunity possible during June-October 2012 by members of GRNP's community development team during visits to the project zone and with as many stakeholders as possible during meetings or at GRNP's office (i.e.: section chiefs, town chiefs, ward development committee representatives, FMC members, etc.). To finalize the list, two processes were used. One was the signing of a boundary agreement between forest edge communities and the GRNP as the boundary was demarcated. The second validation occurred in October 2012 when the lists were presented at chiefdom level meetings in which the Paramount Chief, Gola Community Development Committees, Section Chiefs, and forest edge community chiefs participated.

Communication about the Gola REDD project started with meetings that included forest edge community village and section chiefs in March and April 2012. Subsequently, visits to 13 randomly selected known forest edge communities in June and July 2012 were made to discuss the ideas of climate change and a carbon project and conduct household surveys. The surveys were to collect information on what activities the forest edge communities were doing in the reserve area before the regulations were more stringently enforced, the impact of conservation enforcement, challenges the communities face, and what ideas people had about what might be done to reduce deforestation pressures and support livelihoods. Information into village organizations, governance, and resource use was also solicited.

Next, 11 focus groups which included 22 different villages were held. Both small and large communities were included in meetings which were carried out during August and September 2012 to discuss the carbon project, seek insight into the 'with' and 'without' project scenarios, focal issues, and desired activities to support livelihoods whilst reducing deforestation pressure.

The GRNP community development team also took advantage of the boundary demarcation process and other outreach activities to ensure that all communities bordering the reserve were informed of the project and had the opportunity to provide feedback and ask questions. Forest edge communities which had not been part of any other REDD development activities (i.e. the HH surveys and focus groups) were visited later in 2012 to introduce the concepts of climate change and carbon projects, discuss the potential impacts, and seek community consent to move forward with the design of the REDD project.

After information and feedback from communities was compiled and project design progressed, a meeting was held in each chiefdom headquarters during October 2012 with the Paramount chiefs, section chiefs, and all forest edge community chiefs. During these

¹⁶ There are 122 forest edge communities, 86 of them share a direct boundary with the park, 28 lie within the leakage belt of the project zone but do not share a direct boundary.

meetings, an update on progress of the carbon project was given as was an overview of findings from the consultations and how the project plans to work with the forest edge communities. Participants were asked to validate the information summarized and provide input to the project goals and the benefit sharing agreement.

In 2013 a 'roadshow' involving various activities from drama and dance to videos and presentations was developed as part of the process of cementing an understanding of the Gola project and key conservation and sustainable development messages. It was then trialed in May and June 2013 in 10 forest edge communities. Between 150 and 300 villagers attended each roadshow which were very well received. In late 2013 and 2014 presentations of the project will be given in all forest edge communities as part of the public comment period and the implementation plan for the first 6 years of activities will be discussed and the community and the GRNP management team will enter into an informal agreement to define their roles in the Gola REDD project.

Further socio-economic surveys will be carried out in early 2014 to gather any missing baseline data from forest edge communities that will be required as baseline information, against which the impacts of REDD livelihood projects can in part be measured. This work will be led by the University of Cambridge and Wageningen University. A Community Development Relations Officer for each chiefdom who works in the chiefdom they hail from is tasked with continual visits to the communities there to open communication channels, raise awareness, and monitor project implementation (activities and impact), with a particular focus on the forest edge communities in collaboration with Gola Community Development Committees.¹⁷

Offsite Communities: All villages in the seven chiefdoms that are not classified as forest edge communities will be considered as part of the offsite zone. There are approximately 380 villages in this zone. As representatives of offsite communities, all section chiefs were invited to sensitization meetings on the carbon project in March and April 2012 and asked to pass on the information to the communities in their sections. These offsite communities are also represented by the Gola Community Development Committees, who are in continual contact with the GRNP. In May-July of 2012 elections were held to elect new Gola community development committee representatives as the previous representatives had been in place for almost four years. The newly elected representatives received training on climate change and the carbon project, and also accompanied the GRNP community development relation officers during their sensitization visits to villages when possible. Communication with these communities will be maintained through discussions with the Gola community development committees and the traditional governance system (town, section, and paramount chiefs). In addition, these communities will continue to be

¹⁷One Gola Community development committee exists in each of the 7 Chiefdoms, and its members have multiple responsibilities, including serving as a liaison between the communities and the GRNP, and assisting with the implementation of the community development fund which is part of the Benefit Sharing Agreement. Members are elected every three years and include a teacher, farmer, women's leader, youth leader, hunter, logger, and a forest edge community representative. There are also seats for the local MP, District Council Representative and paramount chief representative. Each village nominated representatives, who were then voted on at the section level, and finally the chiefdom level.

compensated through the community development fund in the new Benefit Sharing Agreement, which will be improved to ensure greater impact, transparency, and more equitable distribution of benefits. The distribution of funds from the community development fund for example will now be carried out in accordance with the Gola community development fund guidance manual that sets out criteria for the selection of projects and for monitoring the dispersal of funds and the implementation of the projects (GRNP GCDC 2012). Section chiefs and Gola community development committee representatives attended meetings in October 2012 regarding the carbon project and the benefit sharing agreement, and members of the community development team conducted small sensitizations when they were in offsite communities. Finally, surveys were carried out in October 2012 with 40 of these villages to understand the impacts of conservation measures on offsite communities.

NGOs and Local Government: Several steps were taken to ensure that the broader set of stakeholders is informed and has the opportunity to participate in or provide feedback on the design and implementation of the Gola REDD project. These stakeholders include local government officials and other NGOs. Several stakeholders were invited to a workshop and training in January 2012 to kick-off the carbon project design stage. Additionally a GRNP Forum is held at least once per year which includes private sector and NGO stakeholders working in the seven Gola Chiefdoms. This enables the project to keep other stakeholders up to date on project progress and seek their feedback. Informal consultations and communication with these stakeholders also took place through meetings, workshops and joint participation in other events, and this will continue during the lifetime of the project.

Table 25. Consultation and stakeholder engagement activities that took place over 2012 and 2013 with local stakeholders.

A more detailed description can be found in the Gola Stakeholder Engagement 2013 Report (Tatum-Hume et al 2013a).

Date	Consultation Format	Stakeholders Present	Topics discussed	Outcome
21-Feb 2012	Meeting	Paramount chiefs, paramount chief representatives and Chiefdoms Councilors of the 7 Gola Chiefdoms	Overview of climate change and carbon projects, idea of carbon project in GRNP, steps needed to make it happen (including assigning carbon rights to government), BSA, landholder register, development of grievance procedure, thoughts on what would happen without the GRNP, ideas for how to consult communities	Obtained endorsement of traditional leaders to pursue carbon project development and move ahead with consultation and participation process in the seven chiefdoms.
March – April 2012	Meetings in each Chiefdom	Section Chiefs, village chiefs, Paramount Chiefs, Chiefdom Councilors, forest edge community representatives, Gola Community Development Committee members	Overview of climate change and carbon projects, idea of carbon project in GRNP, steps needed to make it happen (including assigning carbon rights to government), Gola community development committee elections, Benefit sharing agreement, update of landholder register, development of grievance procedure, importance of community participation in project design, using focus groups for consultation concentrating on forest edge communities, grievance mechanism, development of preliminary list of forest edge communities	Sought and received consent to pursue consultations and project development, preliminary list of forest edge communities developed
June-July 2012	HH surveys in FECs	Forest edge community members from 13 villages in 6 chiefdoms (excluding Nomo due to insecurity over mining issues at the time)	All present and interested were invited to listen to an overview of climate change, carbon project, grievance mechanism, and to ask any questions they had. Afterwards, 10 members of each community were targeted for a survey to collect data for the Social Impact Assessment.	All communities agreed to participate and gave support for development of project; they expressed concern over the impacts of animal conflict and a lack of engagement in the past. Animal conflict was therefore noted as a potential future activity to be researched and mitigation options to be

				tested. (See Witkowski et al 2012a)
June-August 2012	Meetings/ elections in section towns	All communities in the 7 chiefdoms	Gola Community Development Committee elections to elect new members (see stakeholder engagement report for more detail)	7 new Gola Community Development Committee members elected in every chiefdom who will be responsible for coordinating the funds from the benefit sharing agreement and serving as a liaison between the project and the communities. Feedback was obtained on the past benefit sharing agreement to inform the development of the new one
28-Jun	Meeting	Paramount chiefs, Local government and police/ military representatives	Benefit sharing agreement, climate change, carbon project, forest edge community definition, grievance mechanism	Continued approval to move forward; establishment of paramount chief council, agreement on definition of forest edge communities
July – March 2012-2013	Consultation and negotiations	Forest edge community chiefs, landowner representatives, project staff – Community and boundary team	Boundary demarcation process; as part of process have a small meeting to explain the carbon project and discuss the boundary issues and forest protection	Clarification and finalization of boundary for GRNP; there was disagreement in some areas – these were carefully documented and a thorough process was used to resolve issues.
10-Aug 2012	Meeting	MAFFS, section chiefs, paramount chiefs, MPs, journalists, Gola community development committee, NGOs	Brief discussion of carbon project, memo on carbon project update given to the Minister; threats to Protected areas in Sierra Leone discussed	Answered questions; no dissent to moving forward

August – Sept 2012	Focus groups in forest edge communities	9 community members from each of 22 communities in all 7 chiefdoms	Climate change, carbon project, grievance mechanism, participatory collection of information on with and without project scenarios for social impact assessment, current challenges in communities, potential livelihood support options	All communities indicated support for development of carbon project; information for social impact assessment and development of strategy for sustainably improving livelihoods in forest edge communities (see Witkowski et al 2012b)
July – August 2012	Meetings in forest edge communities	numerous community members from 34 forest edge communities	Sensitizations by the community development team in forest edge communities; discussion of climate change and carbon project, free prior and informed consent and consultation, grievance mechanism, ground truthing of abandoned villages	Received feedback from communities and consent to move forward with carbon project; some expressed discontent with not having previously received direct benefits from the GRNP but were happy that they were now being consulted and that there would be activities introduced in their villages
August 2012	Meetings (one meeting in each chiefdom HQ town)	old and new Gola community development committee members	1st Quarterly meeting of Gola Community development committee; induction training on roles and responsibilities; overview of carbon project + consultation to date, presented grievance mechanism; scholarship criteria	Received feedback from the Gola Community development committee members, answered many questions, all agreed for the project to move forward and that they would communicate the carbon project and sensitize their chiefdoms
26-Aug - 5 Sept 2012	one full-day meeting in each chiefdom HQ	landholders, Forestry Division, Provincial Secretary, District Officers, Paramount Chiefs, Section chiefs, GRNP	Landowner re-registration, concepts of climate change, carbon projects and their potential impacts, and carbon rights, grievance mechanism, ideas on how best to consult with the heirs of landowners since some may have moved to new areas, if the landowners consent to move forward with the REDD project; description of agreement to transfer any carbon rights to the government	Agreement on process, preliminary list of landholder families developed; approval obtained on process; Landowners agreed to speak to family members about the carbon project and the carbon rights agreement before the next meeting. In each of the meetings the landowners were asked how payments should be structured (based on the size of land owned by each Chiefdom within the GRNP, equal payments per chiefdom, equal payments to all landowning families, etc). As there was no consensus, landowners recommended that this decision be made by the Paramount Chiefs.

Sept 2012	2 meetings in each Chiefdom	landholders, Forestry Division, Provincial Secretary, District Officers, Paramount Chiefs, Section chiefs, GRNP staff	Landowner re-registration, carbon project, carbon rights	Landholder register finalized, payments distributed. There were a number of disagreements over the register which were resolved by the Paramount Chiefs in coordination with the Provincial Secretary (see Forestry Division 2013).
Sept-Oct 2012	planning meetings in each Chiefdom	New Gola Community Development Committee members	Guidelines for selection of projects, how to identify and monitor projects; how to organize meetings and write reports, scholarship policy, carbon project update, review of grievance mechanism	Committee members briefed on improved guidelines for various aspects of the benefit sharing agreement (scholarships and community development funds) and their feedback obtained. Members brought up to date on the carbon project so they can continue to help sensitize all communities in their chiefdoms.
20-Sep 2012	Meeting	Paramount chiefs, Permanent secretary, District officer, paramount chiefs, District forest officer	Review of current benefit sharing agreement, carbon project update, summary of data collected from consultations, target groups for benefit provision, feedback and input on information presented; discussion of next steps to be taken	As agreement was not reached in the landowner meetings on how landowner payments should be structured, the paramount chiefs present were asked to discuss. The paramount chiefs agreed that payments should continue to be equal between landowners as they thought this was fairest. They requested for the section chiefs to be included for payments and for a further meeting to be held so that absent paramount chiefs could be involved. The paramount chiefs present validated the consultation information and agreed the next steps
1-Oct 2012	Meeting	Paramount chiefs, Permanent secretary, District officer, paramount chiefs, District forest officer	Current benefit sharing agreement and potential changes, carbon project update, summary of data collected from consultations, target groups for benefit provision, feedback and input on information presented; discussion of next steps to be taken	All agreed that section chiefs should receive \$500 per chiefdom to support the selection and identification of the community development projects as part of the benefit sharing agreement and that payments to the landowners should be equal between Chiefdoms and not based on the size of

				land a Chiefdom has inside the GRNP or by the number of landowner families
Oct 2012	Surveys	members of 40 offsite communities	Historical usage of reserve; impact of conservation efforts	Improved understanding of offsite community usage of project area and impact of conservation efforts on offsite communities
Oct-Nov 2012	Meetings in section towns	Gola Community Development Committee chairperson + secretary, principals of secondary schools and community reps	Scholarship selection process	Pupils to receive scholarships identified
-various dates	radio shows	Radio Wanjuh - (Barri, Makpele), Radio Moa - (Makpele, Koya, Gaura, Malema, Nomo), SLBC - (Malema, Koya, Gaura) Gola Radio – Kenema	Project objectives, benefits, legal + illegal activities, climate change and global warming, who will buy credits, benefits to communities). Open session for callers to ask questions	Receive feedback from callers; discussion and publicization of carbon project and grievance mechanism
Oct 16 – 25 2012	Meetings - one in each Chiefdom headquarters	Paramount chief, section chief, forest edge community chiefs, District officer, Gola Community Development Committee members,	Benefit sharing agreement, definition of forest edge community, discussion of rights, proposed compensation, summary of forest edge community consultation results, boundary demarcation, grievance mechanism, confirmation of forest edge community lists and what support community receives, next steps	Validation of information from consultations, agreement on benefit sharing agreement, confirmation of forest edge community list, list of support received by communities (government and NGO) continued approval to move forward with carbon project. The most frequent recommendation was to increase the amounts of all support.
Dec-Jan 2012 - 2013	Informal Consultations Interviews and discussions	EFA, Green Africa, WHH, GOAL, PAGE, CRS, District Councils, local government officials, etc.	Different aspects of the carbon project, particularly the project goals and community development components were continually discussed with others working in the area; other NGO work in forest edge communities, perception of priorities, and if/how they might be involved in implementation of the proposed project	Feedback and input from a variety of interested stakeholders.

4 th -5 th March 2013	Teacher training for nature clubs	34 school teachers that lead the schools nature club	Importance of conservation, Climate change, environment and habitat of animals.	Functioning nature clubs spreading information of the value of nature and the environment to school children in the project zone.
21 st May 2013	Meeting and presentation	GRNP local Government forum (Permanent secretary, senior district officers, MAFFS, district forest officers, Paramount Chiefs, Chiefdom Councillors, MPs.	Update on GRNP activities (Partners, landowners registration, formation of PC councils, Roles and responsibilities of the Gola Community Development Committee and Carbon presentation)	Increased awareness of GRNP activities and REDD+ carbon projects. Better coordination and links between local government and the projects activities.
May-Oct 2013	Gola REDD project roadshows in Forest edge communities	Members of 11 forest edge communities, Nature clubs and teachers (upto 300 people in each event)	Dissemination of information on climate change, carbon trade, the grievance mechanism and the project objectives and plans with the forest edge communities through video, picture presentations, drama, songs and competitions.	Communities better informed of the importance of the project from a local and global perspective and thus more supportive of the activities.
August, 4-10 Sept, 13 th -19 th Sept, 23-27 th Sept, 16-17 th Oct, 18 th -22 nd Nov 2013	Gola REDD project presentations and MoU presentation to FECs	Village Chiefs, community elders, women leaders, youth leaders and community members from all FECs	Overview of the Gola REDD project provide through a presentation to all FECs to elicit there comments and feedback. MoU outlining roles and responsibilities of the GRNP and FECs in implementing the project	Forest edge communities broadly in agreement with the project and the activities to be implement. Some concerns raised about human wildlife conflict which the project will try to address through research and livelihood activities. Queries also raised on how the project will improve market access for isolated communities on the eastern side of the project zone, this will be addressed as the livelihood activities develop.
13-19 th Sept 2013	Presentations and meetings in each of the 3 District council offices	3-District council chairmen, ward Councillors, Chief Administrators	Gola REDD project presentation, discussion on community development fund and guideline and on consultations and work with the forest edge communities and how this fits in to district development strategies	District councils are in agreement for the project to move forwards and approve of the livelihood activities planned with the forest edge communities.

G3.9. CCB public comment period

Describe what specific steps have been taken, and communications methods used, to publicize the CCBA public comment period to communities and other stakeholders and to facilitate their submission of comments to CCBA. Project proponents must play an active role in distributing key project documents to affected communities and stakeholders and hold widely publicized information meetings in relevant local or regional languages.

Community roadshows played an innovative and key role in communicating the project to Forest Edge Communities. As the majority of forest edge community members are illiterate, roadshows were conducted in Mende, the local language and disseminated information on climate change, carbon trade, the grievance mechanism and the project objectives and livelihood activities with the forest edge communities through video, picture presentations, drama, songs and competitions. Between May and December 2013, the 122 forest edge communities were visited by the community development team to explain the project using some of the roadshow techniques and to elicit any comments as part of the outreach for the public comment period.

Community notice boards located in each of the 39 section towns have a summary of the Gola project and a diagram of the grievance mechanism to orientate community members on the project and methods of providing comments. As the local language Mende is not a written language, all notices are in English which is the official language of Sierra Leone.

Meetings will be held during the public comment period in each Chiefdom with the Paramount Chiefs, Section Chiefs and village Chiefs to communicate the project goals, objectives and activities and the plan for implementation, comments and feedback are noted in the grievance log.

Radio shows on various local radio stations have already and will during the public comment period communicate the projects goals, objectives and activities and an open session for questions and comments will be held after each show.

The project documents are available in the project office for review and comments and a member of staff is always available to answer questions.

G3.10. Grievances and conflict resolution

Formalize a clear process for handling unresolved conflicts and grievances that arise during project planning and implementation. The project design must include a process for hearing, responding to and resolving community and other stakeholder grievances within a reasonable time period. This grievance process must be publicized to communities and other stakeholders and must be managed by a third party or mediator to prevent any conflict of interest. Project management must attempt to resolve all reasonable grievances raised, and provide a written response to grievances within 30 days. Grievances and project responses must be documented.

At the start of the REDD project design process (2012), a comprehensive grievance mechanism was developed and put in place to ensure that a clear, standardized process for addressing major unresolved conflicts and grievances existed during project development and it will continue to function throughout the lifetime of the project. This process has an independent third party option (managed by the Network for Movement for Justice and

Development – NMJD), ensures responses are provided in appropriate time frames, and guarantees that all grievances are adequately addressed and documented. The proposed process was discussed and revised with local government officials, Paramount, section, and town chiefs, and forest edge communities to ensure its suitability and adequacy before being implemented. Once amended as per feedback received, it was well publicized amongst the communities and other stakeholders through all the meetings and events described in G3.8. In order to ensure that all Forest Edge Communities are fully aware of how to use the mechanism, the Grievance mechanism is one of the key messages of the FEC communication strategy delivered by the Community Development Relations Officers to the Forest Edge Communities. A formal meeting is held with each FEC at least every 6 months by the FECs designated CDRO. The meetings include 4 areas of discussion¹⁸, one of which is the grievance mechanism. Discussions about the grievance mechanism include how the mechanism works and who community members can make a grievance to (highlighting the third party option) and a cross check of what grievances have been made by any community members both via the traditional mechanism or Gola Community Development Fund member (option 1) and via Gola or NMJD staff (option 2 or 3). Regular formal meetings along with other communications media (via the radio, other staff members etc will help establish the grievance mechanism and other key project messages. NMJD is a suitable third party mediator as they are a respected local development organization that is independent of the Gola REDD project. They have extensive experience in conflict mediation and core to their work is the provision of community support to strengthen governance through their community integrity program with a focus on women and youth..

Additionally the GRNP office in Kenema holds an open door policy, and information on the REDD project and climate change is available to any visitors. All GRNP staff have attended trainings in climate change and REDD project development given by the Carbon Coordinator throughout 2012 (see G4.3) and a staff project reference manual has been created for orientation. Also many of the GRNP staff, particularly the community development team and Forest rangers are in continual contact with local communities and so are key conduits of information to and from the GRNP office. They respond to the questions they are able to in the field, and more serious issues are brought back to headquarters to be resolved. Finally, the seven Gola Community Development Committees were trained in carbon project concepts by the community development team and serve as additional communication conduits and liaisons between the communities and the GRNP.

A notebook with all grievances received, responses offered and actions taken is publicly available in the GRNP office. (see Tatum-Hume et al 2013a for the mechanism and further details). The technical advisor for Park Operations is responsible for overseeing the implementation of the mechanism.

G3.11. Project financing

Demonstrate that financial mechanisms adopted, including projected revenues from emissions reductions and other sources, are likely to provide an adequate flow of

¹⁸ See the CDRO communication strategy with FECs document in the Ongoing FEC communications folder which is an annex to Tatum-Hume et al 2013a

funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits.

Financing was secured from the EU to develop the Gola REDD project and the additional funds required to develop the project and sustain conservation work until carbon revenues are available is provided by one of the project partners (the RSPB). The partners are currently in negotiations to sell the credits that will be generated by the project and are confident that sales will cover the required core annual budget (\$1,686,117 (see G2.2)) with excess revenues being placed in a trust fund to ensure that the project area is protected beyond the lifetime of the project. (A financial model is available to the auditor upon request).

G4. Management capacity and best practices

G4.1. Project proponents and governance structure

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.

The project proponent is the 'Gola Rainforest Conservation LG', a not-for-profit company limited by guarantee being set up by the 3 project partners (the GoSL, CSSL, RSPB) to effectively and transparently manage the Gola REDD project. An overview of the structure of the company and agreements is in Figure 14. The RSPB (one of the project partners) is designated as the technical lead for developing the project. During project development a number of organizations have partnered with the project and will continue to do so during implementation; a summary of these organizations and individuals can be found in Table 26 along with a description of the roles and responsibilities of the members of the Gola Rainforest Conservation LG.

The project will be implemented by the 'GRNP management' department of Gola Rainforest Conservation LG. An organogram for GRNP management and the roles and responsibilities of key staff members is outlined in G4.2.

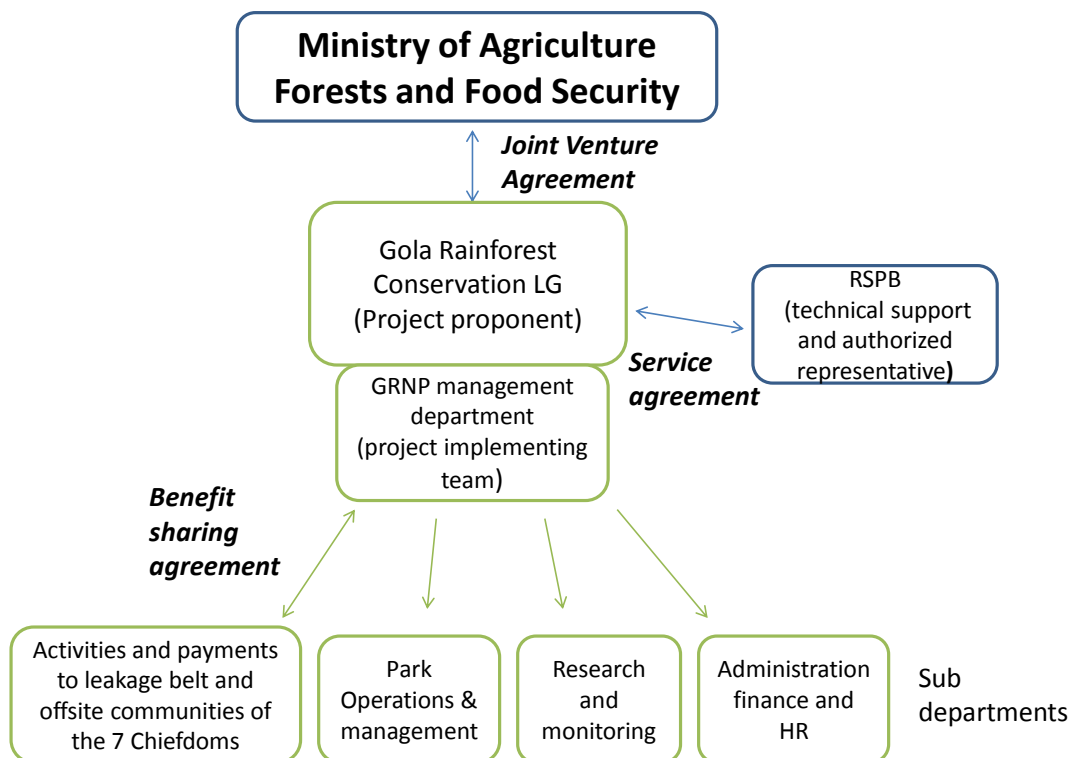


Figure 14. Structure of Gola Rainforest Conservation LG

Table 26. Summary of the organizations and individuals involved in project development and implementation

Members and Directors of the Gola Rainforest Conservation LG	Description	Role and Responsibilities
<p>The Forestry Division of the Ministry of Agriculture, Forestry and Food Security of the Government of Sierra Leone (GoSL)</p> <p>Contact; Kate Garnett, Assistant Director, Biodiversity and Wildlife</p> <p>Ministry of Agriculture, Forestry and Food Security, Ground Floor, Youyi Building, Brookfields, Freetown</p> <p>Telephone; 00 32 076627320 Email; majelarnett@yahoo.co.uk</p>	<p>The Ministry of Agriculture, Forests and Food Security is the Government of Sierra Leone's lead institution in the management and protection of the country's forest resources. Under the professional wing of the Ministry, there are three technical divisions; Crops, Livestock and Forestry.</p> <p>The Forestry Division is responsible for the management of the forests and is led by the Director of Forestry, a Deputy Director and an Assistant Director support the Director. The Forestry Division is divided into three areas of work; commercial forestry, conservation and wildlife management and community forestry. District Forest Officers (DFOs) represent the FD within each of the 13 districts of Sierra Leone.</p>	<ul style="list-style-type: none"> - Member of the Gola Rainforest Conservation LG and representative sits on the board of directors - Advocate the project with Government stakeholders - Take measures to ensure that the Government does not take any actions that are likely to compromise the project - Undertake periodic reviews of the landowners registry - Support any enforcement activities (shared role)
<p>The Royal Society for the Protection of Birds (RSPB)</p> <p>Contact; Tropical Forest Unit, Emma Tatum-Hume</p> <p>The Lodge, Sandy, Bedfordshire, SG19 2DL</p> <p>Telephone; 00 44 (0)1767 680551 Email; emma.tatum-hume@rspb.org.uk</p>	<p>The RSPB is a UK based conservation organization which currently oversees a portfolio of hundreds of conservation projects in 52 countries in Africa, Asia and Europe in partnership with local birdlife partners, national governments, universities, other non-governmental organizations and committed individuals to promote wildlife conservation based on scientific research.</p>	<ul style="list-style-type: none"> - Member of the Gola Rainforest Conservation LG and representative sits and on the board of directors - Act as authorized representative on behalf of the Gola Rainforest Conservation LG - Lead in the development of the documentation required to validate and verify the project under VCS and CCB standards - Market and negotiate the sale of any project credits - Provide technical and management assistance to the project implementers

<p>Conservation Society of Sierra Leone (CSSL)</p> <p>Contact; Director, Dr Sama Monde</p> <p>4C Main Motor Road, Tengbeh town, Freetown, Sierra Leone</p> <p>Telephone; 00 232-30 522 579</p>	<p>CSSL is a Sierra Leone's foremost national conservation NGO and was founded in 1986. Their mission is to promote the wise use and management of Sierra Leone's Natural Resources through Education, Advocacy, Research and Site Action. CSSL is a birdlife partner and was a founding partner to conservation work in Gola.</p>	<ul style="list-style-type: none"> - Member of the Gola Rainforest Conservation LG and representative sits and on the board of directors - Support the implementation of community environmental awareness program and other areas to be defined
<p>Paramount Chief Representative (Traditional Authorities)</p> <p>Contact; Chief Alameen Kanneh</p> <p>Email; PCKanneh05@yahoo.com</p>	<p>The paramount chiefs are the traditional authorities in the provinces, and serve a governance and administrative role over their subjects within a Chiefdom. Whilst the project works with more stakeholder groups than just the paramount chiefs, a representative from this group, elected by the 7 paramount chiefs of the project area represents the interests of the communities in all high level decision making and management relating to the project.</p>	<ul style="list-style-type: none"> - One of the board of directors - Provide an enabling environment for the project amongst villages - Disseminate project information in a transparent and timely fashion (shared role) - Enforcement activities (shared role) - Monitoring activities (shared role)
<p>Partners during project development and implementation (entities either contracted or with a Memorandum of Understanding to work with the project)</p>		
<p>Organization</p>	<p>Description</p>	<p>Role and Responsibilities</p>
<p>Winrock International</p> <p>Contact; Program Associate, Michael Netzer</p> <p>2121 Crystal Drive, Suite 500 Arlington Virginia 22202-3706 USA</p> <p>Telephone; 001 8056167903</p>	<p>WI is a leading voice and active participant in the global environment and climate change arena. For over a decade, Winrock has been the organization trusted worldwide to bring the most cutting edge, proven information and services for greenhouse gas assessment in agriculture, forestry, and other land uses.</p>	<ul style="list-style-type: none"> - Provide technical support during project development, particularly in the development of the mapping and modeling components of the project

<p>Email; mnetzer@winrock.org</p> <p>Cambridge-Wageningen Research Group</p> <p>Contact; Dr Maarten Voors</p> <p>University of Cambridge, Department of Land Economy, 19 Silver Street, Cambridge, CB3 9EP UK</p> <p>Email; marten.voors@wur.nl</p>	<p>Members of the research group have over 40 years of experience working on social science research in Sierra Leone and thus have a thorough understanding of the socio-economic context that exists in the project area. The research group has been working in the project region since 2010, carrying out extensive household and village surveys to inform a variety of socio-economic questions.</p>	<ul style="list-style-type: none"> - Provide support in developing the community consultations phase of project development - Provide support in developing the surveys and standard operating procedures for monitoring of the impacts on communities in the project zone
<p>Climate Focus</p> <p>Contact; Legal Counsel, Darragh Conway</p> <p>Sarphatikade 13, 1017 WV, Amsterdam, The Netherlands</p> <p>Telephone; 0031 207601261</p> <p>Email; d.conway@climatefocus.com</p>	<p>Climate Focus is an independent expert in international and national climate law, policies, project design and finance. They have been pioneering carbon markets ever since their inception. They aim to find a creative and unique solution for every single client, ranging from the development of policies to protect the rainforest to structuring greenhouse gas mitigation projects in the energy sector. Their advice is rooted in a profound knowledge of climate change policies, emission trading schemes and project development.</p> <p>Local Sierra Leonean council was sort for the development of all legal agreements from a former Chief Justice of Sierra Leone, Ade Renner-Thomas.</p>	<ul style="list-style-type: none"> - Provide support in analyzing the legal context of the project -Provide support developing the legal structure for the project
<p>Green Africa</p> <p>Contact; Moses Zombo</p> <p>1 Show field Road Kenema</p>	<p>Green Africa is a local development NGO, its mission is to defeat poverty and hunger in a sustainable manner. They engage with environmental, agriculture and education issues with rural populations, especially women and youth.</p>	<ul style="list-style-type: none"> - Provide support during the community consultations for the project -

<p>Email; greenafrika.kenema@yahoo.com</p>		
<p>Network for movement for justice and development (NMJD)</p> <p>Contact; Dennis Lansana</p> <p>Bo Highway, Kenema, Sierra Leone</p> <p>Phone; 00232 76 76 51 69</p>	<p>NMJD is a Sierra Leone National NGO originating from the Eastern Part of the country with roots in Kenema. Their core business is advocacy and supporting communities to build their strength for better governance through their community integrity program.</p>	<p>- Act as third party for the project grievance mechanism</p>
<p>Welthungerhilfe (WHH)</p> <p>Contact; Project Manager, Dr Hans-Peter Mueller</p> <p>137 Bo-Kenema Highway, Bo, Sierra Leone</p> <p>Phone; 00232 78 77 56 66</p> <p>Email; hans-peter.mueller@welthungerhilfe.de</p>	<p>WeltHungerHilfe works to promote human rights, sustainable development, food security and the preservation of the environment. In Sierra Leone they are particularly active in rural development and in promoting alternative livelihood strategies such as cocoa.</p>	<p>- Support in developing and implementing livelihood projects in forest edge communities, particularly covering objective 1 and 2 of goal 2 (agriculture and cocoa work)</p>

G4.2. Key technical skills for project implementation

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.

The Gola Rainforest Conservation LG will oversee the overall management of the project and the 3 partners of the company bring a variety of technical skills to the project that will provide support to the 'GRNP management' department which is responsible for the day to day management and implementation of the project. The Forestry Division will provide the technical knowledge of policy and legislation required to implement project, for example the co-management activity, CSSL will provide support in developing the environmental awareness raising required to empower local communities to become effective environmental stewards and the RSPB will provide the technical backstopping for a range of activities from research to financial management.

The GRNP management team is divided in five sub-departments: Finance, Administration, Park Operations, Research & Monitoring and Community Development. Each department is headed by a Superintendent who all report to the protected area manager. The protected area manager is supported by an international chief technical advisor and other international specialist advisors who have specific fields of expertise and support, assist and enhance each department's capacity, working side by side with the relevant Superintendent(s). The GRNP management team oversees the work of 150 employees who are spread across the five departments (100+ of which come from communities in the 7 Gola Chiefdoms). The protected area manager oversees the development and implementation of the annual operations plan developed by senior staff in coordination with the directors of Gola Rainforest Conservation LG and community stakeholders, as well as for transparently and effectively managing the project's budget. The roles and responsibilities of key positions are shown in Table 27.

Many GRNP management team staff have extensive experience in their respective areas as they have been involved in conservation and development activities within the Gola Forest Reserves since conservation initiatives began on the ground in 2004/05. Individuals in post have grown into their current respective roles with many climbing their way up in the GRNP management structure thanks to their experience, dedication and leadership skills. The capacity of the management team is further justified in appendix 1 of the VCS non-permanence risk report which is an appendix to the project document.

A wide range of technical skills will be required to implement the project successfully, covering aspects of financial management, natural resources management and agricultural practices so the list below is not exhaustive and the project's management will need to be receptive and responsive to any further technical skills that are identified during the lifetime of the project.

Community Development

The community development team has established a long working relationship with the local communities in the seven Gola chiefdoms surrounding the project area. One community development staff is assigned to cover each chiefdom, and that staff member is from that same chiefdom. As a result the team has an extensive understanding of the community context and the individuals have developed a wide range of skills to engage local

stakeholders. This team will oversee the implementation of activities with communities in the project zone and offsite zone.

Since 2007, the community development team has been responsible for a wide range of livelihood interventions, ranging from infrastructure development, to seed provision and agricultural processing improvements. Some of the activities that will be introduced in the forest edge communities require specialist knowledge and experience, particularly in agriculture and finance and whilst some of the community development team have agricultural degrees, strategic partnerships have been sought with organizations with more extensive local experience.

An agreement has been signed with WeltHungerHilfe, (WHH) a German agricultural development organization, to secure their involvement and the resourcing of interventions. Additionally an intern programme has been developed with WHH so the team's staff can build its own capacity and benefit from the partners' expertise. The team has also strongly benefited from close collaboration with a wide range of partners in addition to WHH, including Green Africa, who supported the team with community survey work, and the Cambridge-Wageningen team of social scientists. The Cambridge team carried out extensive baseline surveys of the forest edge communities (in 2010) and collaborated with the community development team in developing the community engagement plans and methodologies and in the development of future monitoring activities (see G4.1), as well as training the community development team in survey work and monitoring and evaluation.

Land use mapping with forest edge communities in the leakage belt and co-management areas represent significant pieces of work for the project and whilst the team has the skills to engage with the communities, additional technical skills are required for land use mapping and co-management. As such an international technical advisor will be recruited to provide and transfer these additional skills and the team will work with WHH to trial methodologies.

Carbon and Biodiversity research and monitoring

The research team has developed considerable expertise in biodiversity assessments, carbon measurement and monitoring. The team is provided with technical guidance from an international Technical Advisor based in country and with support from the Conservation Science Department of the RSPB. Together the team has a long track record of publishing in peer reviewed journals, see GRNP (2013) for a full list. The interpretation of satellite images required for monitoring deforestation in the project zone will be carried out by the RSPB's data unit.

Table 27. Roles and responsibilities of key GRNP management staff

Title	Number of staff	Role & Responsibilities
Protected Area Manager	1	Planning, implementation, coordination and supervision of the project. Ensures that each sub-department delivers activities and meet specific objectives on time and within budget. Represents the project with stakeholders and actively engages with government at regional and national levels. With the Chief Technical Advisor, staff and stakeholders the protected area manager develops the annual operating plans and budget and the 5 year management plan
Chief Technical Advisor	1	Provides technical advice and support to the protected area manager on a range of issues to ensure that all activities are in line with objectives and targets and to assist in the development of monitoring and reporting activities and outcomes to the Gola Rainforest Conservation LG Directors. The CTA has financial responsibility to the Directors for the appropriate use of funds for the implementation of activities and ensures that all technical advisors to the project deliver activities on time and within budget.
Technical Advisor Co-management, Livelihoods & Agriculture	1	Provides technical advice and support on co-management, land use planning and community work including agriculture and environmental education to the community development team, working closely with the Community Development Superintendent. Gives particular attention to the monitoring and evaluation of all livelihood activities as per objectives time lines and budget set and oversees the implementation of partners activities
Technical Advisor Research (Conservation Scientist)	1	Provides technical advice and support to the Research and Monitoring team on biodiversity and carbon research and monitoring, working closely with the Superintendent of this department. Responsible for ensuring that the biodiversity monitoring plan is implemented and the data collected and stored in a timely and accurate manner.
Technical Advisor Protected Areas	1	Provides technical advice and support on co-management inside the project area, ranger deployments, boundary demarcation and maintenance as well as the related data management with a

		particular focus on remote sensing. Works closely with Park Operations and Administration to provide support to the superintendents of each sub-department.
Finance Superintendent	1	Establishes, implements and ensures that the project complies with and delivers on internal and external financial requirements. Provides monthly as well as more extensive quarterly expense reports to project management. Responsible for the financial report to be provided annually to the Directors of the Gola Rainforest Conservation LG and to Government authorities.
Administration Superintendent	1	Establishes, implements and ensures that the project complies with and delivers on all internal procedures, processes and policies for the effective implementation and monitoring of the project. Responsible for the purchase and maintenance of project assets, ranging from the project's fleet of vehicles to office running costs.
Park Operations Superintendent	1	Establish, implement and supervise the patrolling of the national park, assuring it is effective and complies with all procedures and policies. Works with the technical advisor of park operations to ensure the NP's boundary is maintained/demarcated and to deliver activities in an efficient and timely manner within the designated budget.
Research & Monitoring Superintendent (biodiversity)	1	Establish, implement and supervise the biological research and monitoring activities of the research and monitoring team. Ensuring that activities are aligned with the annual operating plans and objectives of the project and are delivered effectively and efficiently within the allocated budget.
Community Development Superintendent	1	Establish, coordinate, implement and supervise the community development activities, assuring they deliver all project requirements on time and within budget. This ranges from the management of the Community Development Fund to the improvement of agricultural practices.
GIS and database manager	1	Mapping, data processing and management. Reports to the Park Operations Superintendent.
Human resource manager	1	Oversees all human resource issues and ensures the project complies with legislation, policies and welfare

		as outlined in the Gola staff manual. Reports to the Administration Superintendent. Focuses on project staff's welfare as well as health and safety.
Communications Officer	1	Coordination and implementation of communication activities, ranging from writing press releases to delivering radio shows. Responsible for maintaining a coherent and targeted message to all stakeholders related to the project. Responsible for maintaining a database of all related inputs, with a particular focus on photo imagery and footage.
Tourism Officer	1	Development of community ecotourism activities to ensure consistent packages are offered to visitors. Guide and assist visitors but also promote the project zone as an ecotourism destination at a national level. Ensure that all funds generated from visitors are effectively distributed to the communities and Government.
Community Development Relations Officer	8	Implement and monitor community/livelihood activities. Allocated a specific Chiefdom where based permanently. Serve as a permanent and first point of contact between local communities and the project. Reports to the Community Development Superintendent.
Research Technicians	6	Implement research & monitoring activities inside the NP as well as in the leakage belt. Reports to the Research & Monitoring Superintendent.
Forest Rangers	50	Patrol the National Park and monitor illegal activities. If required, arrest perpetrators of any illegal activities inside the NP. The team is divided into units that patrols, units that carry out monitoring activities and units that maintain the boundary.

G4.3. Capacity building and project training

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.

New employees partake in an induction period during which they are provided the necessary orientation and training for their new role (see documents in HR folder). Annually the Human Resources manager compiles capacity assessments of project staff to ascertain the training

requirements. Training is provided in-house, by project partners or by external organizations. Last financial year (2011-2012) for example, staff and key community stakeholders were involved in the following training activities;

i) Community training

Date	Duration	Type of Training	Trainer	No of Trainees
2011	10 days	Conflict Resolution - GCDC members	Eastern Polytech	28
2011	6 days	Conflict Sensitive Conservation workshop (community leaders, local government stakeholders)	UNEP	27
2012	3 Days	Livestock husbandry training	MAFFS	75

ii) Staff training

Date	Duration	Type of Training	Trainer/Institution	Number of trainees
2011	2 weeks	Biodiversity conservation, wildlife management and ecotourism (short course) - research technicians and CD staff	Njala University SL	10
2011	3 days	Methodology training for research technicians e.g. radio Telemetry and research methodologies	ARTP / University of Georgia USA/GRNP	7
2011	3 days	First aid Training	Sierra Leone Red cross society	23
2011	5days	Practical Financial Management	Mango	1
2011	5 days	Conflict & security Management (Staff)	Institute of Public Admin and Management (IPAM)	2
2011	2 days	Reducing Emissions from Deforestation & Degradation	WINROCK / RSPB	22
2011	6 days	Conflict Sensitive Conservation	UNEP	15
2011	1 year	Higher National Diploma in Procurement	Freetown College of Management and Accountancy (FCMA)	1
2011	1 year	Higher National Diploma in Human Resources Development	FCMA	1
2011	3 days	First Aid	SL Red Cross (SLRC)	all staff
2011	1 day	HIV	Gov't Hosp,	all staff

			SLRC,HIV/AIDS SEC	
2011	1 day	Human Rights	Human Rights Commission /UNHCR	50
2011	3 days	Methodology training for research technicians e.g. radio Telemetry and dung sampling	ARTP / University of Georgia USA, Chester University and St Andrews UK/GRNP	7
2011	10 days	Radio telemetry for research	ARTP / University of Georgia USA	1
2011	1 week	Quick Books	Institute of Public Admin and Management (IPAM)	1
2011	1 yr	Secretarial studies	Catholic Centre for Computer Studies	1
2011	1 yr	Diploma, Office Mgt	Freetown College of Management and Accountancy (FCMA)	1
2011	1 yr	Dip, Purchasing ,marketing and supplies	Freetown College of Management and Accountancy (FCMA)	2
2011	4-6 weeks	Butterfly and bat survey techniques for research technicians	ARTP / international experts	2
2012	2 weeks	Reducing Emissions from Deforestation & Degradation (project design, data collection, methodologies, baseline scenarios etc.)	WINROCK / RSPB	22
2012	3 months	Computer Training	Eastern Polytech	25
2012	4 months	Ongoing informal training to research team in field survey techniques for biomass inventories	RSPB	4
2012	3 days	Security Guard Refresher Training	SL Police / Human Rights Commission/GRNP	24
2012	7 days	Forest Guard Recharge Training	SL Police / GRNP	53
2012	3 weeks	Biodiversity conservation and natural resource management (short course) - research technicians and CD staff	Njala University / US Fish and Wildlife Service	8
2012	3 months	Cambridge Conservation Initiative training of FGs in ranger based data collection and navigation	CCI volunteers	20

2012	½ day (3 times)	Climate change and REDD project development, grievance mechanism	RSPB	115
2012	5 months	Ongoing informal training to the Community Development Team on the carbon project, climate change, communication with communities, consultation strategy, methods, and techniques	RSPB	6
2012	2 weeks	International Seminar on Protected Area Management – USA	University of Montana / Conservation International / RSPB	2

In addition, lectures are given from project staff to local universities and internships are provided by the project on a wide range of topics including research methodologies, species identification, survey and monitoring techniques. This involves 5-12 students each year.

An environmental awareness roadshow to be shown in forest edge communities was developed in early 2013 which aims to cement an understanding of the Gola project and key conservation and sustainable development messages with project zone communities. Capacity building on a range of issues will be provided to communities through project activities including training in improved farming techniques (production and post-production), land use mapping and co-management (see section CM1).

The Gola management team have developed a project reference guide to provide a basic overview of the project to new employees (Gola Rainforest National Park reference guide) and an induction process is in place to ensure that there is a handover of knowledge between old and new employees and that new staff receive necessary training which is identified through 3 month and 6 month reviews (see Gola Employee Handbook 2013).

Local Community capacity building

Capacity building with local communities to increase local participation in the implementation of the project takes place in a number of ways outlined in Table 28 and below;

1. Through livelihood activities which aim to build the capacity of farmers living in Forest Edge Communities to engage in sustainable agricultural practices and financial management that will address the key focal issues (poverty and food security) whilst maintaining the natural resource base. Training in improved agricultural practices is introduced via Farmer Field schools in both cocoa production and crop production. Training in financial management is introduced via savings and lending schemes (see Table 28). Cocoa farmer field schools for example include 4 areas of training during the first year of activity implementation a. in nursery training which includes seed selection and growing seedlings, b. in farm management which includes rehabilitation of land and how to prune properly, c. in out-planting and tree husbandry and d. production/ processing, marketing and certification. Follow on trainings will be provided to Master farmers and to farmers interested in achieving certification for the cocoa farm (see Tatum-Hume and Witkowski 2013). Livelihood activity

trainings will be introduced in all 122 forest edge communities during the first 6 years of the project. Livelihood projects are aimed primarily at farmers as this is the group affected most by conservation management activities. Farmers from non-landowning families who have time constraints and are not able to participate in the initial round of capacity building will be involved through seed sharing schemes, and once there are proven benefits within the community will be involved through follow on livelihood activity training. Training is provided by WHH during the first 2 years of the project and will then be provided in house.

2. Through the training of Gola Community Development Committees. For the wider population living in the 7 Gola Chiefdoms (the offsite zone), the Community Development Funds are the primary way that they can access benefits from the Gola REDD project. The Gola Community Development Committees are responsible for equitably distributing these funds to projects that meet the set criteria. Building the capacity of these committees so that they can transparently distribute the funds and communicate with the wider population about the fund is therefore important for the project and regular training and evaluation of the committees is part of the in-house training provided to communities.

Table 28. Examples of community training that will be introduced via the Gola REDD project to build capacity and involvement with the project

Project activity	Training provided	Link with the Gola REDD project
With Forest Edge Communities (Leakage belt of the project zone)		
Cocoa rehabilitation	Nursery training, farm management, out-planting, processing, marketing and certification	Capacity building amongst cocoa farmers will help rehabilitate cocoa farms that were abandoned during the civil war thereby increasing cocoa productivity and farmer income whilst maintaining forest cover and biodiversity.
Crop production	Seed selection and vegetable establishment, field preparation and planting out, crop and pest management and weed control, processing, marketing and storage	Building the capacity of farmers to produce and store food crops will improve the key focal issues (food security and poverty) and decrease the amount of forest converted into farm bush
Savings and Lending schemes	Financial management; numeracy skills, book keeping, policies and	Lack of finances were identified by communities as a barrier to more sustainable activities. This activity will build financial assets, particularly amongst women and enable greater

	procedures	involvement other project activities.
Environmental roadshows	Carbon, climate change, the Gola REDD project, the role of forests in the provision of ecosystem services, project activities	This activity aims to promote a collective understanding of the ethos of the project and share the idea that protecting the forest provides local as well as global benefits in order to gain a united effort to prevent deforestation.
With Communities in the Offsite and Project Zone		
The 7 Gola Community Development Committees	Proposal development, financial management, monitoring and evaluation	The committees are responsible for the equitable disbursement of the Gola Community Development funds which comprise of a proportion of revenues from the sale of carbon credits to provide finances for sustainable development projects in the 7 Chiefdoms

G4.4. Recruitment policy

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 Gola REDD project is committed to providing equal opportunities for community members and in ensuring that no employee, or applicant for a job, receives less favourable treatment on the grounds of age, colour, disability, ethnic origin, gender, illness, marital status, political opinion, race, religion or belief” (Gola employment policy). This commitment is demonstrated through our employee handbook and through practice which both ensure that, for example, recruitment, access to training, promotion opportunities, pay, benefits, terms and conditions of employment, disciplinary and redundancy procedures all reflect the equal opportunities policy. Preferences for employment are given to applicants from the seven Gola chiefdoms, for example if applicants score equally in the interview process and one applicant is from the communities and one is not, the employment preference is given to the applicant from the communities. If a man and woman are ranked equally in the interview process and both come from the 7 chiefdoms, the woman will be given employment preference. (Gola Employees Handbook 2013 p9). All community development relations officers are from the 7 Chiefdoms and all forest rangers are from forest edge communities. Sub-station caretakers are also always from the local community.

There are currently 150 Gola staff employed from the 7 Gola Chiefdoms, mainly comprising the Community Development team and forest rangers. The project also utilizes a significant

amount of casual labour for various small projects and activities from local communities, in 2011 to 2012, this amounted to over 9,000 casual labour man days.

G4.5. Laws and regulations governing workers rights

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.

The Regulation of Wages and Industrial Relations Act 1971 sets out the basic framework of employment regulation in Sierra Leone. This is supported by collective agreements between trades unions and certain industrial sectors. The Gola REDD project is subject to the regulations agreed by the Agriculture Trade Union Group Negotiating Council on 11 April 1985 and published in the Sierra Leone Gazette on 13 June 1986. The industry groups covered by this agreement include Agriculture, Plantation and Forestry workers. The regulations are updated and published in the Sierra Leone Gazette approximately every three years, the most recent being 2011. The 1985 Regulations, with the 2011 update, cover all aspects of employment including:

- Contracts of Employment
- Working hours
- Pay, overtime and time off in lieu
- Annual leave and public holidays, compassionate leave
- Sick leave
- Maternity leave
- Medical facilities & allowances
- Redundancy, Disciplinary and Grievance procedures
- Health & safety, protective clothing etc.
- Casual & temporary workers

In addition The Workers Compensation Act 1971, which specifies levels of compensation for workers injured at work, The Anti-corruption Act 2008, The Minimum Wages Act 1971, the current Tax and safety regulations, the 1991 Constitution of Sierra Leone and the National Social Security and Insurance trust Act, No. 5. also apply.

A summary of how the project meets all applicable laws is found in Table 29.

The Gola project complies with all of the above legislation and workers are informed of the legislation and their rights by the Gola Employees Handbook. The handbook is available in a written format but also in audio format for any employees that are illiterate. The legislation is due to be updated in 2013/2014 at which time the project will review the new legislation and update its employees handbook as appropriate.

Table 29. Legislation, requirements and project compliance

Legislation	Article/ Section	Requirement	Gola Compliance	Evidence of Compliance
<p>The Regulation of Wages and Industrial Relations Act 1971 is the primary legislation affecting employment in Sierra Leone. The detailed requirements are set out in the 'Notice of Terms and Conditions of Employment agreed by the Agriculture Trade Group Negotiating Council 1986', and subsequent amendments. The most recent amendment was in 2011. The Agriculture Trade Group specifically applies to Plantation and Forest workers.</p>	<p>1 (5 in 2011 revision)</p>	<p>Working Hours: Maximum working week to be 40 hours Monday to Friday 7.5 hours per day, Sat 4.5, max Variable by written agreement</p>	<p>Implemented. Maximum working week is 40 hours, Monday – Friday 8 – 4.30 with 30 minutes for lunch</p>	<p>Staff Handbook Section 2 & Contract of Employment</p>
<p>Ditto</p>	<p>1 (5d in 2011 revision)</p>	<p>Working hours for Security Guards – maximum is 12 hrs per day, 5 days per week</p>	<p>Implemented. Maximum working week for Security Guards is 12 hours per day, 5 days pw</p>	<p>Staff Handbook, Section 2 & Contract of Employment</p>
<p>Ditto</p>		<p>Temporary & Casual Workers must be automatically absorbed into permanent staff after</p>	<p>Will be implemented Q4 2013</p>	<p>Staff Handbook, section 2</p>

		12 months service. Are eligible for redundancy after 6 months continuous service.		
Ditto	6	Public Holidays (usually 9) & gazetted holidays must be paid	Implemented. All 9 public holidays and additional gazetted holidays are paid	Staff Handbook, section 4 & Contract of Employment
Ditto	7	Overtime. Any period of time worked in excess of normal working hours , and work on Sundays & Public holidays to be treated as overtime when work authorised by employer	Will be Implemented Q4 2013.	Staff Handbook, section 3
Ditto	8 (6 in 2011 revision)	Probationary period. All workers serve a 6-month probationary period on appointment, which may be extended for not more than another 3 months. Employment may be terminated by either party. If satisfactory, must be incorporated into permanent staff & confirmed in writing.	Implemented. All workers serve a 6 month probationary period which can be extended for another 3 months if necessary.	Staff Handbook section 2
Ditto	9 & 10 (18 in 2011 revision)	Urgent Private Affairs leave staff Up to 7 days additional paid 'family' leave, deducted from next year's allowance, after 12 months service. If less than 12 month's service, 48 hours emergency leave, of	Implemented. 7 days paid additional leave or 1 paid & 1 unpaid is less than 12 month's service	Staff Handbook section 4, & Contract of Employment

		which 24 paid		
Ditto	11 (10 in 2011 revision)	<p>Annual Leave Allowances</p> <p>1-3 years' service = 21 days</p> <p>3-5 years' service = 26 days</p> <p>5+ years' service = 32 working days</p>	Implemented. Annual leave allowance as per regulations	Staff Handbook, section 4 & Contract of Employment
Ditto	11	<p>Payment of outstanding annual leave on termination.</p> <p>Entitled to proportionate leave if leaving through no fault of their own</p>	Implemented, Outstanding leave paid pro rata on termination	Staff Handbook section 4 & Contract of Employment
Ditto	13	<p>Entitlement to Paid Sick leave</p> <p>1-5 years service – 6 weeks full pay, followed by 6 weeks half pay</p> <p>5-10 years service - 7 weeks full pay, 7 weeks half pay</p> <p>Over 10 years' service 8 weeks full pay 8 weeks half pay</p> <p>Subject to medical certificate</p>	Implemented, as per regulations	Staff Handbook section 4 & Contract of Employment
Ditto	14	<p>Paid Maternity leave</p> <p>After 1 year of service, entitled to 10 weeks paid maternity leave, which may be extended on recommendation of a doctor or deducted from annual leave</p>	Implemented. 10 weeks paid maternity leave, extendable on recommendation of doctor or deducted from following year leave allowance	Staff Handbook section 4 & Contract of Employment

		allowance		
Ditto	16	Medical Allowance. Staff accrue medical allowance for every day they work, which can be used for medical expenses for themselves & immediate family.	Implemented, medical allowance introduced in 2012 for medical expenses for employee, partners, offspring, parents and siblings.	Staff Handbook section 5 & Contract of Employment
Ditto	53	HIV/AIDs Discrimination forbidden. Awareness training provided in keeping with National Policy	Implemented Awareness training provided in 2011, to be repeated in 2014	Staff Handbook section 13
Ditto	17 (30 in 2011 Revision)	Protective clothing Employer to provide protective clothing as required by Risk assessment	Implemented. Uniforms, waterproofs and other protected clothing provided as necessary.	Staff Handbook section 6
Ditto	22 (34 in 2011 revision)	Disabled employees Employer to try to find alternative employment if employee disabled at work	Implemented. GRNP undertake to continue to employ disabled employees if at all possible.	Staff Handbook section 6
Ditto	23 (27in 2011 Revision)	Technical training. Training to be encouraged and aided by employer	Partially Implemented. Full implementation Q4 2013	Staff Handbook section 8
Ditto	24	Redundancy. Staff to be redeployed whenever possible, must use fair system for selection for	Implemented Redundancy arrangement meet all the requirements of	Staff Handbook section 10

		<p>redundancy. Redundancy compensation to be calculated as follows:</p> <p>1-5 years service – 16 days pay for each complete year</p> <p>5-10 years service – 20 days pay</p> <p>over 10 years service – 25 days pay</p> <p>plus outstanding annual leave & medical allowance, + End of Service Gratuity</p>	the regulations	
Ditto	26	<p>End of Service Gratuity.</p> <p>On leaving GRNP, staff receive a gratuity as follows:</p> <p>2-5 years - 18 working days pay for each complete year of service</p> <p>5-10 years service - 20 working days</p> <p>Over 10 years service - 25 working day</p>	Implemented. Staff who leave GRNP receive end of service gratuity as set out in the regulations.	Staff Handbook section 10
Ditto	52 in 2011 revision	<p>Death in Service. If a staff member dies while in service all their outstanding benefits shall be paid to their next of kin</p>	Implemented. Next of kin receive all outstanding benefits	Staff Handbook section 10
Ditto	30	<p>Disciplinary procedure</p> <p>Disciplinary procedures to follow</p>	Implemented. GRNP Disciplinary procedure meets &	Staff Handbook section 11 & Contract of

		set process	exceeds requirements	Employment
Ditto	33	Grievance Procedure Grievance procedures to follow set process	Implemented. GRNP grievance procedure meets requirements of regulations	Staff Handbook section 12 & contract of employment
Ditto	38	Acting appointments. Staff who temporarily act up into more senior positions are to be paid the rate for the senior post	Full implementation Q4 2013	Staff Handbook section 3
Ditto	45	Certificate of service. Staff who leave to be provided with certificate giving basic details of employment	Implemented. Certificate of service includes name position date of birth and period of employment.	Staff Handbook section 11
Ditto	29 of 2011 Revision	Personal Safety & Health Hazards. Employers to provide suitable protective clothing	GRNP has developed a system of Hazard identification, risk reduction and risk assessment which exceeds the legal requirements. Full implementation Q4 2013	Health & safety policy, Hazard Register, Risk Assessments & Staff Handbook section 6
Ditto	41	Pay Increase. Legislation specifies increase, when revised – but this may not keep up with inflation. GRNP's policy is to give annual	Implemented. GRNP's pay policy implemented in 2012	Staff Handbook section 3

		cost of living increases unless there is a shortage of funding. there is also an objective fair pay system based using a Job Evaluation system		
Ditto	57 in 2011 revision	Advance of salary Up to 4 months advance to be repaid over 12 months, provided total amount is less than end service benefit	Implemented. GRNP has well established staff loan policy.	Staff Handbook section 3
Ditto/Workman's Compensation Act 1971		Industrial Accident compensation	Implementation. In case of death or injury to an employee, compensation will be paid according to the detailed arrangements in the Act	Staff Handbook section 6
Anti-Corruption Act 2008		GRNP fits the definition of a 'Public Body' under the act.	GRNP employment and financial procedures help to prevent corruption by its staff and by those in positions of responsibility for the organisation.	Staff Handbook (all sections)
UK Employment Law, including Employment Rights Act 1996, Employment Act 2010, Health & Safety at Work Act 1974, Bribery Act 2010,		All expatriate workers are employed by RSPB on UK-compliant contracts of employment. All employees receive a copy of the 'Employee Handbook' on appointment and	Fully Implemented	Contract of Employment and RSPB Employee Handbook

Equality Act 2010, Immigration, Asylum & Nationality Act 2006, etc		amendments are posted on the intranet, which can be accessed in Gola.		
1991 Constitution of Sierra Leone and the National Social Security and Insurance trust Act, No. 5.	Section 8, Subsection 3(f)	Retirement benefit The project contributes 10% of each staff member wages into NASSIT every month (5% is contributed by the staff member). Payment is stopped if the staff member leaves.	Fully implemented	Contract of employment, staff handbook and GRNP financial report (in confidential financial analysis folder)

G4.6. Occupational risk and worker safety

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.

The Gola Employee Handbook includes a dedicated section on ‘Health and Safety’ which covers ‘Protective clothing and equipment’ and ‘Accidents at work’. It explicitly states “GRNP’s safety procedures are based on risk assessments for particular tasks, and in some cases, jobs. Risk assessments are currently carried out for the following positions which involve field work and are therefore the occupations within the implementation team that pose the greatest risk: Forest Rangers and Research & Monitoring Technicians, as these positions involve field work (see Gola risk assessment templates). Field teams are required to take safety equipment into the field including first aid kits, communications equipment (phones, radios, etc.). Whilst in the field employees are required to take appropriate precautions such as not travelling at night, filling out detailed work and travel plans before field work commences, using seat belts in all vehicles and protective clothing on bikes or when using machinery.

The Gola Employee Handbook states: “GRNP is committed to ensuring, as far as is reasonably practical, the health, safety and welfare of its employees, volunteers and visitors by working positively to prevent work-related injury and ill-health, and promoting healthy and safe working practices. The nature of the projects work means it is not possible to eliminate all risk and we aim to reach a reasonable balance between safety, conservation, education and access” (Gola staff handbook p23).

Additionally the project provides each member of staff with a health & safety card which provides all emergency contact details and an emergency plan is in place should a serious

incident arise. All information concerning risk and risk mitigation measures are available in audio format as well as written format for any illiterate staff members.

Staff that work as park rangers under take a week long refresher training every year which includes sessions on engagement and health and safety to ensure front line staff are following project guidelines and minimizing risks especially when engaging with armed encroachers (see Sinclair, 2014, Ranger refresher training handbook).

G4.7. Financial health of implementing organization

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

The project will be implemented by the GRNP Management department of the Gola Rainforest Conservation LG. The financial staff have a robust track record in financial management (audit reports from earlier conservation work available to audit team upon request). Though the experience of meeting specific requirements for donors, when operating as the Gola Forest Programme, the team has ample experience of managing, implementing and reporting the finances for a large conservation project. A financial analysis of project viability is available to the auditor.

G5. Legal status and property rights

G5.1. Laws and regulations governing property rights

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.

National and local laws relevant to project implementation are:

National Forest Laws

The Forestry Division within the Ministry of Agriculture, Forestry and Food Security (MAFFS) is responsible for the management of forest areas in Sierra Leone including forest reserves and national parks. The principal policies and laws relevant to the management of forest areas are the Wildlife Conservation Act of 1972, the Forestry Act of 1988 and the Forestry Act Regulations in 1990 and the recently passed National Protected Areas Authority Act 2013.

The Wildlife Conservation Act of 1972 established significant provisions for the conservation of wildlife ranging from the constitution of strict nature reserves, game reserves, and national parks, to prohibition of hunting of animals generally except with license and permit. It also contains enforcement and penalty provisions. The Wildlife Conservation Act of 1972 stipulates in Part 2 Section 5 the constitution of national parks. The purpose of a National Park in Sierra Leone is 'propagating conserving and managing wild animal life and wild vegetation, and protecting sites, landscapes or geological formations of scientific or aesthetic value for the benefit and enjoyment of the public'. The first goal of the project (see G3.1 and G3.2) is to implement effective protection measures of the National Park to ensure that the forest is conserved and that biodiversity is protected, thus demonstrating that the project is aligned with the Wildlife Conservation Act.

The Forestry Act of 1988 and its Regulations for 1990 established provisions for the administration and management of the Forest Reserves, Community forests and National Parks. It also established fees for licenses and law enforcement provisions. The project has established a register of landowning families of the National Park and has entered into a benefit sharing agreement with the families and other local stakeholders to provide compensation for lost royalties and rights in the project area and is therefore aligned to the Forestry Act of 1988.

As a National Park, the objective is *inter alia* to conserve wildlife and vegetation, and activities such as farming, logging and mining are prohibited. Since the project intends to conserve the forest and wildlife, and all Management Plans will be reviewed by the National Protected Areas Authority (NPAA)¹⁹ the project is aligned with National Forest Laws. The

¹⁹ The National Protected Areas Authority Act (2013), establishes an authority to exercise control over National Parks and protected areas designated for conservation purposes, to coordinate wildlife management and biodiversity conservation, research and education

Forestry Division followed regulations in upgrading the forest reserves to National Park status (Fofanah 2012)

REDD regulations

The Government currently does not have any guidelines or regulations in place for REDD projects. A legal analysis carried out by Climate Focus (see G4.1 for details on Climate Focus) which reviewed the legal regulations surrounding the implementation of carbon projects in the Gola area concluded that specific legislation was not required to develop a REDD project in the project area.

The project works directly with the Government of Sierra Leone and the Ministries and agencies that will be involved in the development of any national framework and will comply with any future REDD regulations.

Environmental Protection Agency Act

This act established the Environmental Protection Agency (EPA) to 'provide for the effective protection of the Environment and for other related matters'.

Under the act, projects that make 'substantial changes in renewable resource use (e.g. conversion of land to agricultural production, forestry or to pasture land, rural development, timber production)' are required to carry out an Environmental Impact Assessment (EIA). As the project has not made any substantial changes to the renewable resources of the area, and will not have any negative impacts on renewable resources an EIA was not required.

National Protected Area Authority Act

A recent act enacted in 2012, provided for the establishment of a National Protected Area Authority (NPAA) and Conservation trust fund to 'promote biodiversity conservation, wildlife management, research, to provide the sale of ecosystem services in National Protected Areas and to provide for other related matters. Although the NPAA has yet to be constituted, in the future the project will work closely with this body to ensure that project activities are aligned with Government policy as the authority's main function will be to 'exercise oversight authority over National Parks and Protected Areas designated for conservation purposes' (part III, 12 (1)) and has responsibility to 'promote REDD projects in Sierra Leone' (part III, 12 (2)f), and evaluate and approve National Protected Areas annual operation plans and budgets (part III, 12 2 p(v)) amongst other objectives. It is written into the legal agreements between the project and the Government that the project will comply with all relevant legislation and will work with the MAFFS and the NPAA to ensure that the project is aligned with Government strategy.

Local Bylaws

Chiefdoms and communities surrounding the project area have a host of local laws and bylaws that may affect various aspects of project implementation as some are related to land use. The project has always consulted with and requested permission from local communities and traditional authorities before initiating any meeting or activity to ensure compliance with, and respect for, traditional systems.

International treaties and agreements

The Gola REDD project will comply with the following international treaties which Sierra Leone is party to:

- The Convention on Biological Diversity (party to, not signed)
- The African Convention on the Conservation of Nature and Natural Resources (signed but not ratified)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora
- The Convention Concerning the Protection of the World Culture and National Heritage
- RAMSAR convention
- Convention on the Conservation of Migratory Species of Wild Animals (signed on MoU for the West Africa Elephant)
- New York Convention on Climatic change
- The Vienna Convention for the Protection of the Ozone layer
- Montreal Protocol on substances that deplete the ozone layer
- The United Nations Framework for Climate Change Convention
- The Rio Declaration on Environment and Development

The Gola Rainforest Conservation LG is entering into a public-private partnership with the Ministry of Agriculture, Forestry and Food Security which outlines the terms of the relationship between the Gola Rainforest Conservation LG (project proponent) and the central government. Under the terms of the agreement the company must comply with all relevant laws and to ensure this happens, the Government closely observes the management activities of the company.

G5.2. Documentation of project approval

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

Government approval

The Forestry Division of the Ministry of Agriculture, Forestry and Food Security of the Government is one of the members of the Gola Rainforest Conservation LG (the project proponent), the company being created to manage the project. In addition the Company will sign a public-private partnership agreement with the Ministry of Agriculture, Forestry and Food Security (MAFFS) of the Government of Sierra Leone, (the Ministry responsible for the management of national parks and protected areas), to manage the project area as a REDD project for the lifetime of the project, the agreement includes the transfer of carbon rights to enable the sale of carbon credits (Joint venture agreement and deeds available to auditor). Agreement to enter into both the company and the joint venture agreement is in the process of being approved by Cabinet and will therefore have full approval from Government to be implemented.

Traditional Authority Approval

The traditional authorities are the Chiefs of the 7 Chiefdoms surrounding the project area. The Paramount Chief is the ultimate authority in each Chiefdom where they serve as the custodians of land in the chiefdom, amongst other functions (Witkowski et al 2013c). As described in Section G3.8, regular meetings are held between the Gola paramount chief council and the project staff regarding the development of the carbon project and other activities and approval has been gained throughout the project development process for various key components to the project design. This included initial approval to develop the project and begin the community consultation process with section and village chiefs and wider community members (February 2012), for the REDD Benefit Sharing Agreement and Forest Edge Community activities (May, September, and October 2012), for the landowner carbon rights agreements (August 2012).

Approval for the location and clearing of the project boundary was obtained from Forest Edge Communities through the boundary demarcation process (see Marris et al 2013) and for the development of the REDD project through Forest Edge Community sensitization meetings and the stakeholder consultation process (see G3.8 and Tatum-Hume et al 2013a). Approval from the heads of the traditional landowners for the project and the transfer of any outstanding carbon rights was gained through meetings and the signing of the landowner agreements. Approval for the implementation of project activities with the forest edge communities was gained through informal agreements with the 122 forest edge communities in 2013.

G5.3. Documentation of project property rights

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.

Management rights to the project area have been held by the Government of Sierra Leone since the Gola Forest Reserves were gazette, a process which began in the 1920s. A change in management practice from that of a Forest Reserve with production objectives to a reserve with conservation objectives was negotiated and agreed to during 2001-2003 through a series of meetings and agreements between the project partners and local communities (see Witkowski et al 2012c for the rights holder analysis and for the description of consultations that occurred during early conservation work). Customary rights to use the land within the reserves for farming and other purposes were altered when the agreed conservation measures were put into practice. The proclamation of the National Park in December 2011 in anticipation of the REDD project did not alter the management rights regime that had been previously agreed to and established with the onset conservation activities. The project proponent, Gola Rainforest Conservation LG, will through a public-private partnership agreement obtain the management and carbon rights to the project area for the lifetime of the project from the Government of Sierra Leone (public-private partnership agreement available to project auditors upon request) and is therefore not encroaching on Government, community or private property.

The project adopted 5 key principles of free, prior and informed consent to guide community engagement activities at the beginning of project development in 2012. To work towards

free, prior and informed consent the project has undergone a series of consultations with each of the identified stakeholder groups (see G3.8). Extensive efforts were made to consult with the traditional leaders, landowning families, and forest edge communities in the leakage belt during each of the key design phases of the project in order to obtain free, prior and informed consent from local stakeholders with customary rights to develop a REDD project, secure any outstanding carbon rights, establish an agreement to distribute project benefits, as well as in the design and implementation of project activities. To date, all major groups of customary rights holders as well as other stakeholder groups have actively participated in consultations and have given consent to the development and implementation of the Gola REDD project. Since the National Park was established early in the project planning process and prior to the development of project documents, the team was unable to secure prior consent for its establishment from all stakeholder groups but the Forestry Division followed due process in establishing the Park which included a community consultation and comment period, the details of which are outlined in the Government of Sierra Leone regulation report (Fofanah 2012).

Moving forward, the Gola project will work with local stakeholders to maintain consent during project implementation. All project activities conducted in the leakage belt will be fully discussed and agreed upon with each individual community before any implementation takes place in that community. The Gola project intends to strengthen its relationship with the forest edge communities to ensure that community members feel ownership not only over the livelihood support efforts, but also over co-management for the community use zones of the national park.

G5.4. Involuntary relocation

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.

Relocation of people

When the development of the Gola project began in 2012, there were no people residing within the boundaries of the National Park. Two communities, Wagikor and Ngendema, are located on land which has been excised from the boundaries of the National Park. Wagikor is currently inhabited and is a forest edge community and therefore will receive the forest edge community livelihood activities but the residents of Ngendema no longer live there; the project does not require the involuntary relocation of people.

Relocation of activities

The deployment of forest rangers mid-2004 began the enforcement of conservation measures that were agreed to in 2001-2003 and prevented local people from carrying out any illegal use of the forest. The baseline scenario of agricultural encroachment was prevented from occurring from 2004 and it was therefore at this point that conservation work required forest edge communities to relocate farming or other activities they had inside the reserve boundaries. As described in G5.3 (and in greater detail in the Witkowski et al

2012c), local stakeholders were consulted prior to the implementation of conservation activities, granted permission for the change in management regime and were compensated for any relocation of activities via the benefit sharing agreement of 2007, although forest edge communities were not provided any direct compensation under this agreement.

In the early stages of REDD project development it became apparent that the gazette boundary for the National Park was not clearly demarcated on the ground and that there were likely to be a number of communities that had established farming activities within the gazette boundary. The team therefore developed a set of protocols to determine the location of the entire boundary in consultation with each community along the border. As a result of this extensive exercise 86 villages were found to share a direct boundary with the Park and meetings were held in each village between the project team, the farmers and village elders to establish the project boundary (see boundary demarcation report, Marris et al 2013). In 12 villages farming activities were found to be occurring within the gazette area of the National Park. To avoid relocating livelihood activities the team moved the location of the boundary to a new, agreed location resulting in a reduction in size of the National Park (ibid). All 86 forest edge communities with joint boundaries have signed agreements over the location of the National Park (project area) and the newly agreed boundary will be re-gazette as the actual boundary for the National Park. The project therefore has a conflict-free, mutually agreed boundary with all boundary communities.

G5.5. Illegal activities in the project zone

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.

Smallholder agriculture is the most widespread activity in the project zone and is the principal threat to project impacts through encroachment into the project area or an increase in agriculture activities in the project zone as a result of leakage. To defuse the threat of encroachment and avoid leakage a two-pronged approach will be used. Firstly forest rangers will continue to be deployed throughout the project area to patrol the forest blocks and ensure the integrity of the forest. Secondly the team in coordination with the forest edge communities has developed a number of livelihood activities designed to increase the productivity and income of the forest edge communities whilst maintaining forest cover. These activities are described in detail in section CM1 and will be implemented with all the forest edge communities.

Other illegal activities that are occurring some areas of the project zone include mining and selective logging. Artisanal mining and small scale logging may affect the climate goals as these activities result in forest degradation, they also may attract migrants to the area in search of economic opportunities. The project team will work with forest edge communities to promote environmental awareness and land use planning in the project zone in order to develop a long term strategic approach to natural resource management and encourage the communities to understand the trade offs between conservation and unsustainable development (see CM1).

G5.6. Title to carbon rights

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.

A legal analysis of carbon rights was undertaken by Climate Focus, an independent expert in international and national climate law and policies. The report concluded that through the various stages of the project area being established as a reserve and later as a National Park, the Government had developed a strong claim to the carbon credits within the project area (Climate Focus 2011, section 3). However, there was some uncertainty as to whether all rights had been obtained and so following legal advice, the project consulted with Paramount Chiefs and the landowners registered on the GRNP landowner register to explain the project and request an agreement to be signed between the Government and each head of a landowning family landowners to transfer any outstanding carbon rights to the government in exchange for an annual payment outlined in the REDD benefit sharing agreement (Forestry Division 2013). In total, 234 agreements have been signed with all 234 heads of landowning families listed in the landowner register providing the government with legal documentation that they have uncontested title to the carbon rights.

The project proponent (the Gola Rainforest Conservation LG) is entering into a public-private partnership agreement with the Government which details the transfer of management rights and carbon rights to the project proponent for the lifetime of the project. A deed will also be signed to secure the transfer of carbon rights which will be registered in Sierra Leone.

Climate Section

CL1. Net Positive climate impacts

CL1.1. Estimate of net changes in carbon stocks due to project activities

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. The net change is equal to carbon stock changes with the project minus carbon stock changes without the project (the latter having been estimated in G2). This estimate must be based on clearly defined and defensible assumptions about how project activities will alter GHG emissions or carbon stocks over the duration of the project or the project GHG accounting period.

The Gola REDD project will prevent the deforestation of carbon stocks in the project area through the activities outlined in G3.2.

The Gola REDD project has used approved methodology VM0007 of the Verified Carbon Standards to estimate the net change in carbon stocks due to project activities. Under this methodology, baseline emissions are estimated ex ante. The methodology includes steps for estimating ex ante emissions under the project scenario. In addition, the methodology provides clear steps for ex post estimation of project emissions.

Project Emissions

(Please note this section is taken from section 3.2 of the VCS PD)

Following VM0007 Methodology Module M-MON the sum of GHG emissions in the project case is equal to the sum of changes from deforestation, degradation, GHG emissions from project activities, minus any forest carbon stock enhancements.

$$\Delta C_P = \sum_{t=1}^{t^*} \sum_{i=1}^M (\Delta C_{P,DefPA,i,t} + \Delta C_{P,Deg,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t}) \quad (1)$$

Where:

ΔC_P	Net greenhouse gas emissions within the project area under the project scenario ; t CO ₂ -e
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum <i>i</i> at time <i>t</i> , t CO ₂ -e
$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum <i>i</i> at time <i>t</i> , t CO ₂ -e
$GHG_{P-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum <i>i</i> in year <i>t</i> , t CO ₂ -e

$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline ²⁰ in stratum i at time t , t CO ₂ -e
i	1, 2, 3 ... M strata
t	1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

For a with project scenario there are anticipated to be no changes in carbon stocks as a result of deforestation or degradation in the project area due to the project activities that will protect the GRNP through enforcement and leakage prevention activities (see G3.1,3.2 and CL2).

GHG emissions will be zero because the Project will not use fertilizers as a leakage prevention activity, and therefore emissions from nitrous oxide are excluded, and emission from fossil fuel combustion is ignored in the baseline and there for can be ignored in the project case²¹.

Non-CO₂ emission from fire related to forest clearance is considered relevant for all areas deforested and will be included for any areas found to be deforested in the project case. These emissions will be calculated following Module E-BB.

$$E_{BiomassBurn,i,t} = \sum_{g=1}^G \left(\left(A_{burn,i,t} * B_{i,t} * COMF_i * G_{g,i} \right) * 10^{-3} \right) * GWP_g \quad (1)$$

Where:

$E_{BiomassBurn,t}$	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t , tCO ₂ -e of each GHG (CO ₂ , CH ₄ , N ₂ O)
$A_{burn,i,t}$	Area burnt for stratum i at time t , ha
$B_{i,t}$	Average aboveground biomass stock before burning stratum i , time t ; tonnes d. m. ha ⁻¹
$COMF_i$	Combustion factor for stratum i ; dimensionless (see annex 1 for default values as derived from Table 2.6 of IPCC, 2006)
$G_{g,i}$	Emission factor for stratum i for gas g ; kg t ⁻¹ dry matter burnt (see section III and annex 2 for default values as derived from Table 2.5 of IPCC, 2006)
GWP_g	Global warming potential for gas g ; t CO ₂ /t gas g (default values from IPCC SAR: CO ₂ = 1; CH ₄ = 21; N ₂ O = 310)

²⁰ For areas with a degradation baseline (i.e. using **BL-DFW**) this parameter shall be set to zero, for areas with baseline set by **BL-UP** and **BL-PL** this parameter may be conservatively set to zero.

²¹ VMD0014, E-FFC: "Fossil fuel combustion in all situations is an optional emission source."

g	1, 2, 3 ... G greenhouse gases (to include carbon dioxide ²² , methane and nitrous oxide)
i	1, 2, 3 ... M strata
t	1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

Forest carbon stock enhancements will be measured in the project scenario following M-MON. As outlined in G2.3 and Netzer and Walker 2013. Gola South was stratified using Module X-STR for areas assumed to be accumulating carbon. In Gola South ground measurements will be used to monitor the changes in carbon stocks through time as specified in the carbon pool modules. For Gola Central and North it will conservatively assumed that no carbon stock enhancement is occurring.

If Gola South is subject to degradation activities (as described in Section 4 and Module M-MON Step 2) the emissions from these activities will be estimated and deducted from the amount sequestered.

Enhancements will be estimated following M-MON:

$$\Delta C_{P,Enh,i,t} = \sum_{t=1}^t \sum_{i=1}^M ((C_{P,i,t} - C_{BSL,i}) * A_{Enh,PL,i,t}) \quad (8)$$

Where:

$\Delta C_{P,Enh,i,t}$	Net carbon stock changes as a result of forest carbon stock enhancement in stratum i in the project area at time t , t CO ₂ -e
$C_{P,i,t}$	Carbon stock in all pools in the project case in stratum i at time t , t CO ₂ -e
$C_{BSL,i}$	Carbon stock in all pools in the baseline in stratum i ; t CO ₂ -e ha ⁻¹
$A_{Enh,PL,i,t}$	Project area in stratum i in which carbon stocks are accumulating but that would have undergone planned deforestation in the baseline scenario at time t ; ha
i	1, 2, 3 ... M strata
t	1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

The eligible area is determined from the area due to be deforested in each year of the baseline (Netzer and Walker 2013)

$$A_{Enh,UP,i,t} = A_{BSL,PA,unplanned,t} \quad (11)$$

²² Carbon dioxide may be omitted where carbon dioxide emissions are calculated in an alternate module through stock change

Where:

$A_{Enh,UP,i,t}$ Project area in stratum i in which carbon stocks are accumulating but that would have undergone unplanned deforestation in the baseline scenario at time t , ha

$A_{BSL,PA,unplanned,t}$ Annual area of unplanned baseline deforestation in the project area at time t , ha yr⁻¹

i 1, 2, 3 ... M strata

t 1, 2, 3, ... t^* years elapsed since the start of the REDD project activity

The net change is then equal to the carbon stock changes as a result of the project minus the carbon stock changes without the project (see section G2.3).

Table 30. Ex ante net changes in carbon stocks as a result of project activities

t	y	BSLunplanned - Strata 1		BSLunplanned - Strata 2		Total Baseline Carbon emissions t CO2e (cumulative)	Total Project Carbon emissions t CO2e (cumulative)	Ex ante net change in carbon stocks as result of project t CO2e (cumulative)
		ha	t CO2e	ha	t CO2e			
1	2012	337	172,744	704	322,179	494,923	0	494,923
2	2013	413	216,950	628	295,545	1,007,417	0	1,007,417
3	2014	353	192,799	688	330,026	1,530,243	0	1,530,243
4	2015	446	245,888	595	295,507	2,071,638	0	2,071,638
5	2016	435	247,408	606	307,167	2,626,214	0	2,626,214
6	2017	487	281,158	554	290,120	3,197,492	0	3,197,492
7	2018	518	304,749	522	282,194	3,784,436	0	3,784,436
8	2019	534	320,799	507	281,161	4,386,396	0	4,386,396
9	2020	543	333,998	498	282,630	5,003,024	0	5,003,024
10	2021	552	346,930	489	284,444	5,634,398	0	5,634,398
11	2022	560	355,878	481	278,891	6,269,167	0	6,269,167
12	2023	558	358,855	483	278,771	6,906,793	0	6,906,793
13	2024	508	337,946	53	299,878	7,544,617	0	7,544,617

				3				
14	2025	514	343,645	52 7	297,194	8,185,456	0	8,185,456
15	2026	540	359,850	50 1	285,069	8,830,374	0	8,830,374
16	2027	553	369,386	48 8	279,043	9,478,804	0	9,478,804
17	2028	542	366,537	49 9	284,025	10,129,366	0	10,129,366
18	2029	528	361,447	51 3	291,059	10,781,872	0	10,781,872
19	2030	533	366,129	50 8	289,256	11,437,257	0	11,437,257
20	2031	529	366,271	51 2	291,597	12,095,126	0	12,095,126
21	2032	534	369,003	50 7	289,629	12,753,757	0	12,753,757
22	2033	548	376,320	49 3	283,460	13,413,538	0	13,413,538
23	2034	527	366,774	51 4	292,452	14,072,764	0	14,072,764
24	2035	543	375,745	49 8	284,701	14,733,210	0	14,733,210
25	2036	554	381,535	48 7	279,780	15,394,524	0	15,394,524
26	2037	579	394,690	46 2	268,256	16,057,470	0	16,057,470
27	2038	579	395,548	46 2	267,608	16,720,626	0	16,720,626
28	2039	581	397,393	46 0	266,119	17,384,139	0	17,384,139
29	2040	591	403,002	45 0	261,173	18,048,314	0	18,048,314
30	2041	629	423,352	41 2	243,155	18,714,821	0	18,714,821

CL1.2. Estimate of net changes in emissions of non-CO₂ gases

Estimate the net change in the emissions of non-CO₂ GHG emissions such as CH₄ and N₂O in the with and without project scenarios if those gases are likely to account for more than a 5% increase or decrease (in terms of CO₂-equivalent) of the projects overall GHG emissions reductions or removals over each monitoring period.

Under the baseline scenario, any emissions from fossil fuels and nitrogen application are ignored. Therefore, the only non-CO₂ emissions accounted for is from biomass burning following deforestation during site preparation for the post-deforestation land use.

Subsistence crop-fallow farming is the vast majority of the reason for deforestation in the project area (Witkowski et al 2012a). Crop-fallow involves clearing and burning the vegetation (Witkowski 2012; USAID 2007b; Nasi et al. 2006). Therefore GHG emissions from biomass burning is expected to occur on all land deforested during site preparation. Biomass assumed to be extracted for wood products is excluded from the estimation of biomass emission estimation.. The emission from biomass burning was estimated following Module E-BB (Table 31).

Table 31. Non-CO2 emissions from biomass burning (for equations see Netzer and Walker 2013)

	Strata 1: GRNP North	Strata 2: GRNP South	Description
AG Biomass	629.3	578.0	Ave aboveground biomass stock before deforestation t d.m./ha
$B_{i,t}$	580.9	533.5	Ave aboveground biomass stock, after logs removed, before burning, t d.m./ha
Emissions per hectare, CH4	37	34	CH4 Emission from biomass burning per hectare, t CO2e/ha
Emissions per hectare, N2O	16	15	N2O Emission from biomass burning per hectare, t CO2e/ha

CL1.3. Estimate of other emissions resulting from project activities

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 fertilizers will be used during leakage prevention activities. Therefore, the only project non-CO₂ emissions would be the result of deforestation taking place inside the project boundaries. Emissions from any biomass burning following deforestation will be calculated using module E-BB of VM0007.

$$E_{BiomassBurn,i,t} = \sum_{g=1}^G \left(\left(A_{burn,i,t} * B_{i,t} * COMF_i * G_{g,i} \right) * 10^{-3} \right) * GWP_g \quad (1)$$

Where:

$E_{BiomassBurn,t}$ Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t ; tCO₂-e of each GHG (CO₂, CH₄, N₂O)

$A_{burn,i,t}$ Area burnt for stratum i at time t , ha

$B_{i,t}$ Average aboveground biomass stock before burning stratum i , time t ; tonnes d. m. ha⁻¹

$COMF_i$ Combustion factor for stratum i ; dimensionless (see annex 1 for default values as derived from Table 2.6 of IPCC, 2006)

$G_{g,i}$ Emission factor for stratum i for gas g ; kg t⁻¹ dry matter burnt (see section III and annex 2 for default values as derived from Table 2.5 of IPCC, 2006)

GWP_g Global warming potential for gas g ; t CO₂/t gas g (default values from IPCC SAR: CO₂ = 1; CH₄ = 21; N₂O = 310)

<i>g</i>	1, 2, 3 ... <i>G</i> greenhouse gases (to include carbon dioxide ²³ , methane and nitrous oxide)
<i>i</i>	1, 2, 3 ... <i>M</i> strata
<i>t</i>	1, 2, 3, ... <i>t</i> * years elapsed since the start of the REDD project activity

CL 1.4. Demonstration of net positive climate impacts

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 other project-related unmitigated negative offsite climate change impacts (see CL 2.3)

(Please note this section is taken from section 3.4 of the VCS project document)

The total net GHG reductions for the REDD Project are calculated as follows:

$$CREDD,t = \Delta CBSL - \Delta CP - \Delta CLK$$

Where,

CREDD,t = Total GHG emission reduction

$\Delta CBSL$ = Net emissions under baseline

ΔCP = Net emissions under project scenario

ΔCLK = Net emissions by leakage

The net baseline emissions in the project area have been calculated following Module BL-UP, and are shown in G2.3 and Netzer and Walker 2013. The net baseline emissions in the project area are calculated to be 6,166,423t CO₂e over the first 10 years of the project.

The net emissions under the project scenario will be monitored ex-post following M-MON.

Emissions due to leakage inside and outside the leakage belt have been calculated following Module LK-ASU, and are shown in CL2. The estimated net emissions from leakage are calculated to be 1,310,622t CO₂e over the first 10 years of the project.

Calculation of VCS buffer

The number of credits to be held in a permanent risk buffer is determined as a percentage of the difference between total emission from unplanned deforestation in the baseline ($\Delta CBSL$)

²³ Carbon dioxide may be omitted where carbon dioxide emissions are calculated in an alternate module through stock change

and with project scenario (ΔCP). Leakage emissions do not factor into the buffer calculations.

The retention rate is determined according to the risk classification of the project, using the VCS tool for AFOLU of Risk of Non Permanence. According to the calculations, it has a total percentage of 10% buffer (See VCS non-permanence risk report).

$$Buffer_{UNPLANNED} = \left(\left(\Delta C_{BSL,unplanned} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC,i,t} + N_2O_{direct,i,t}) \right) - \left(\Delta C_{P,(Unplanned\ Deforestation\ Areas)} - \sum_{t=1}^{t^*} \sum_{i=1}^M (E_{FC,i,t} + N_2O_{direct,i,t}) \right) \right) * (Buffer\%)$$

Uncertainty Analysis

The analysis of uncertainty of carbon stocks was developed according to the Module X-UNC. The purpose of X-UNC is for calculating ex-ante and ex-post a precision level and any deduction in credits for lack of precision following project implementation and monitoring. The module assesses uncertainty in baseline estimations and in estimations of with-project sequestration, emissions and leakage.

A precision target of a 95% confidence interval equal to or less than 15% of the recorded value shall be targeted.

As per X-UNC, Part 1 – Uncertainty in Baseline Estimate:

Step 1: Assess uncertainty in projection of baseline rate of deforestation or degradation. In this case the $Uncertainty_{BSL,RATE} = 0$ where the baseline rate is long term (i.e. historic) average.

Step 2: Assess uncertainty of emissions and removals in project area. Uncertainty should be expressed as the 95% confidence interval as a percentage of the mean. The uncertainty from dead-wood, litter, non-tree, were not analyzed as they are not included in baseline calculations. Fossil fuel combustion and N₂O emissions from nitrogen application, were also not analyzed as they are not included in baseline calculations.

Uncertainty in the emissions from biomass burning is captured in the uncertainty of above ground biomass ($CAB_{Tree,i}$ $Uncertainty_{BSL,SS,i}$).

Uncertainty in the wood products pool is considered undisputedly conservative and therefore $Uncertainty = 0$.

Table 32. Assess uncertainty of emissions and removals in project area

Carbon Pool	Strata	1	Strata 2 (GRNP	Post
-------------	--------	---	----------------	------

Adjusted_C _{REDD,t2}	Cumulative total net GHG emissions reductions at time t ₂ adjusted to account for uncertainty; t CO ₂ -e
Adjusted_C _{REDD,t1}	Cumulative total net GHG emissions reductions at time t ₁ ; t CO ₂ -e
Buffer _{total}	Total permanence risk buffer withholding; t CO ₂ -e

Table 33. Verified carbon units in the first 10 years of the project

t years	Estimated baseline emissions or removals $\Delta C_{BSL,PA}$	Estimated project emissions or removals ΔC_P	Estimated leakage emissions or removals ΔC_{LK}	Estimated GHG emissions or removals $C_{REDD,t}$	Buffer _{unplanned}	VCU
	t CO2e (cumulative)	t CO2e (cumulative)	t CO2e (cumulative)	t CO2e (cumulative)	t CO2e (cumulative)	(cumulative)
1 2012	547,578	0	169,827	377,751	54,758	322,993
2 2013	1,113,063	0	345,207	767,856	111,306	656,549
3 2014	1,688,614	0	493,959	1,194,654	168,861	1,025,793
4 2015	2,283,143	0	647,616	1,635,527	228,314	1,407,213
5 2016	2,890,802	0	741,847	2,148,955	289,080	1,859,875
6 2017	3,515,397	0	838,703	2,676,694	351,540	2,325,154
7 2018	4,155,789	0	938,009	3,217,779	415,579	2,802,201
8 2019	4,811,268	0	1,039,655	3,771,613	481,127	3,290,486
9 2020	5,481,452	0	1,108,939	4,372,513	548,145	3,824,368
10 2021	6,166,423	0	1,179,752	4,986,671	616,642	4,370,029

* The project start date is August 2012 and all years are therefore based on an August to August calendar i.e. year 1 is August 2012 to August 2013 etc.

CL1.5. Avoiding double counting of emission reductions

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

The Government of Sierra Leone has clear and uncontested rights to manage the project area and is the exclusive owner of carbon rights to the project area (see section G5.6). The Government of Sierra Leone is entering into a public-private partnership with the project proponent to transfer these rights to enable the project to sell the credits generated by the project activities. The public-private partnership agreement stipulates that the Government will not directly market, sell or otherwise deal with the Gola carbon credits or enter into any similar agreement with another party of the Gola project area. Therefore, there is no risk the credits will be sold by another entity.

The Gola REDD project is also seeking validation with the VCS with the objective of generating voluntary carbon credits (VCUs). The project will be registered on the VCS project database and on a dedicated registry system which will check other GHG programs to ensure that the same offset has not been registered elsewhere.

An internal registry will also be created and maintained by the project proponent which contains information on each sale of VCU's made throughout the projects lifetime. This will enable the proponents to transparently demonstrate to the Government and other stakeholders the transactions made by the project.

CL2. Offsite climate impacts (“leakage”)

CL2.1. Leakage assessment and estimate

Determine the types of leakage that are expected and estimate the 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.

(Please note this section has been taken from the VCS PD section 3.3)

Leakage was determined following VM0007 Module LK-ASU.

Various independent studies have established the primary driver of deforestation in Sierra Leone is from small scale agriculturalists (BCP project proposal 2009, MAFFS 2004:8). The National Poverty Reduction Paper (2005:33) cited small scale agriculture to make-up around 75% of Sierra Leone's labour force. This is particularly true for the rural population living in and around the Project Area and Leakage Belt, where nearly the entire population engages in subsistence agriculture (Witkowski 2012a, Showers 2012, Bulte et al 2013). There are other threats from logging, mining and industrial agriculture (e.g. palm oil or coffee plantations), but none of these threats are “planned²⁴” and surveys indicated

²⁴ According the VM0007 planned deforestation is the Conversion of forest lands to a deforested that is legally permitted. Also Documentation must be available to clearly demonstrate with

that in the Project Area and Leakage Belt villagers do not engage in such activities without the participation of immigrants who bring with them the skills, capital and equipment (Witkowski 2012a). Without protection of the Project Area, local deforestation agents would continue to convert forest into the bush fallow cycle, resulting in deforestation inside the project boundary.

Such deforestation would occur inside the Project Area (Netzer and Walker 2013) in the absence of the Gola REDD project but could be displaced to outside the Project Area as a consequence of the REDD project, resulting in leakage. Protection of the project area may also reduce immigration into the area as economic opportunities to exploit the project area for mining or logging area prevented (Witkowski 2012a, Cuni-Sanchez 2012b), however, such deforestation agents are conservatively ignored in the baseline scenario.

The Gola REDD project will reduce the threat of deforestation through continued protection of the Project Area and will reduce leakage in the Leakage Belt through community livelihood activities which consist of 6 different elements:

- 1) Capacity building for crop production; to improve productivity on existing crop fallow land in order to increase yields and reduce the need to convert forest into the farm bush cycle
- 2) Capacity building for cocoa production; to improve productivity and farmer income from cocoa production and other diversified sustainable income generating activities that maintain forest cover
- 3) Savings and Internal Lending Schemes; to enable Forest edge communities to achieve financial independence
- 4) Co-management and land-use planning activities; to improve the well-being and resource governance capacity of FECs whilst maintaining a biodiverse forest through co-management and land-use planning activities in the project area and leakage belt
- 5) Environmental awareness raising; develop and implement an education program to enhance environmental awareness and promote community participation in the management of the GRNP
- 6) Benefit sharing agreement and distribution; implement and monitor mechanisms that equitably compensate stakeholders and promote incentives for conservation practices in the project zone and offsite zone

Activities one and two (agriculture and cocoa) are predicted to have the greatest immediate effect on leakage mitigation as they are designed to improve both farmers productivity and post-harvesting storage and processing thereby increasing yields and sales and reducing deforestation pressures.

credible evidence and documentation that indeed the land would have been converted to non-forest use if not for the REDD project.

For detailed information on the community livelihoods work see SIA Synthesis report (Tatum-Hume and Witkowski 2013).

Nevertheless, leakage due to the avoided unplanned deforestation in the project area is expected and an ex-ante estimate was calculated following the steps established in the approved methodology. It is important to mention that leakage prevention activities were not fully operational at the start of the project (1st August 2012). Therefore leakage may be higher in the initial months and years of the project as leakage prevention activities become fully operational. However, any such leakage will be monitored as delineated in VMD0015.

Step 1. Estimation of baseline carbon stock changes and greenhouse gas emissions in the Leakage Belt

The baseline for the Leakage Belt was developed following the BL-UP Module. The same criteria used to estimate the carbon stock changes in the Project Area were used in this step:

Forest strata: Due to limited information on carbon stocks in the Leakage Belt it is conservatively assumed that the Leakage Belt forests have the same carbon stocks as Gola Central/North. This is conservative because Gola Central/North has the highest carbon stocks and is undoubtedly the least disturbed forest in the Reference Region (See G2.3, Pre deforestation strata).

Post deforestation strata: Farming is the primary livelihood activity for the vast majority of community members all of whom engage in agriculture in a crop fallow cycle (See G2.3, Post deforestation strata; Witkowski et al 2012a; Bulte et al 2013).

Carbon stocks and emissions: Carbon stocks for forests and post deforestation land cover were determined in Section G2.3 (Table 16 and Table 17). Emissions from carbon stock changes, wood products and biomass burning were also calculated in G2.3 (Table 18, Table 19, Table 21). Net emission in the Leakage Belt are calculated in CL2, and shown below in Table 34 (See Netzer and Walker 2013 for more information).

Table 34. Estimation of baseline carbon stocks changes and GHG emissions in the Leakage Belt for the first 10 years of the project.

t y		AreaBSLunplanned - Leakage belt			Total carbon stock change in baseline in LB Δ CBSL,LK,unplanned
		ha	t CO2	t non-CO2e (EBiomassBurn)	t CO2e (cumulative)
1	2012	1,544	791,586	82,643	874,229
2	2013	1,544	815,873	82,643	1,772,745
3	2014	1,544	840,207	82,648	2,695,600
4	2015	1,544	864,449	82,643	3,642,692
5	2016	1,544	888,737	82,643	4,614,072
6	2017	1,544	913,024	82,643	5,609,740
7	2018	1,544	937,358	82,648	6,629,746
8	2019	1,544	961,600	82,643	7,673,989
9	2020	1,544	985,888	82,643	8,742,520
10	2021	1,544	1,010,175	82,643	9,835,338

Step 2. Estimation of the proportions of area deforested by immigrant and local deforestation agents in the baseline

In order to calculate the proportion of deforestation by immigrants in and around the project area ten percent of communities within two kilometers of the park boundary were visited²⁵; out of the 125 villages within that radius, 13 were randomly selected. Results from the survey (Witkowski 2012a) are quoted below.

“Only one village, Tigbema, maintained a register of inhabitants, so questions regarding migration and population were asked to four key informants in each of the other villages

²⁵ All communities within 4km of the park boundaries are known as forest edge communities and lie between the PA boundary and the edge of the LB i.e. within the leakage belt, this meets with the LK-ASU (VMD0010) criteria for sampling communities within 2km of the boundaries of the LB and the PA.

except for Jajej, which was not included as it is currently uninhabited. Interviewees report that the villages do not experience high influxes of immigrants²⁶ especially when there are no mining or logging activities in the area; on average, residents that have recently arrived (within the past 5 years) represent only 3.9% of the population. Where there are migrants, all respondents indicated that the migrants undertake activities in the same way as the villagers do; i.e.: the farming practices they use are the same. According to 83% of respondents, strangers were doing subsistence activities, primarily farming, in both swamp and upland areas. 17% of respondents indicate that the migrants undertake commercial activities in addition to the subsistence activities. All respondents indicated that the farm size of migrants is the same (60%) or smaller (40%) than those of villagers. Most people reported that villagers do the same amount or more of activities that cause deforestation than migrants do.²⁷ No strangers were reported to be farming inside the park (Witkowski 2012a)."

"Activities such as logging and mining tend to attract immigrants to the villages and it appears that villagers do not engage in such activities without the participation of at least a small number of migrants. Through discussions with community members, it was found that the sampled villages (FEC) themselves tend not to be involved in small scale commercial logging as in most cases the required skills, capital and equipment for mining and logging activities comes from outside the villages (Witkowski 2012a)."

From this information the proportion deforested by residents and immigrants in and around the Leakage Belt is:

Residents ($PROP_{RES}$) =97.1%

Immigrants ($PROP_{IMM}$) =3.9%

Step 3. Estimation of unplanned deforestation displaced from the Project Area to the Leakage Belt

Ex ante assessment

According to the module, the estimated carbon stock changes and the GHG emitted in the Leakage belt should be multiplied by a factor less than 1, which represents the percentage of deforestation that would be displaced in the Leakage Belt.

The effectiveness of the proposed Gola REDD project in managing leakage relies on REDD financing for the initiation and implementation of effective leakage prevention

²⁶ When asking about migrants, the question was phrased as "people who have moved to the village since the last election and have stayed or will stay in village". The last election was 5 years ago (and thus aligns with the BL-UP definition of migrant as those having lived in the area <5 years), but we found we had to add a reference event as it was difficult for people to identify 5 years. We had to add "have or will stay in the village" as without that people were unclear if they should report the number of visitors. We then asked how many were villagers returning after the war and the difference is the number of migrants reported.

²⁷ 94% of respondents reported villagers doing more or the same amount of farming as migrants. For logging, plantations, and mining, the percentage of respondents reporting villagers were doing more were 82%, 66%, and 57% respectively.

programs that increase social wellbeing, reduce the pressures for deforestation, education, alternative livelihoods, and other social development programs (See Tatum-Hume and Witkowski 2013).

The leakage prevention activities will be implemented in a phased approach until 2019, an evaluation will then be carried out of the effectiveness of leakage prevention activities and the next phase of activities will be planned for based on the results. Between now and 2019 activities are expected to address the vast majority actors involved in deforestation (See Tatum-Hume and Witkowski 2013). While the project aims to be 100% effective through implementation of the leakage prevention activity plan it is acknowledge that leakage will occur as these activities become operational, therefore a staggered rate is considered reasonable and conservative.

The effectiveness of the proposed Gola REDD project has therefore been estimated on a biennial basis based on the implementation of leakage prevention activities. It is thought that this approach is more conservative and more accurate than providing an average figure because the project will become more effective as more leakage prevention activities are established and communities increasingly see the benefits.

The calculation of the phased leakage rate is based on;

2012-2013; Project starts; Forest edge communities are involved in the selection and development of activities aimed to mitigate leakage and provide positive livelihood benefits but activities do not begin. Buy in to the project is high but activities do not begin therefore we conservatively put a high leakage figure in as 30% leakage

2014-2015: During 2014, 75% of villages in the leakage belt will begin receiving either the cocoa or agricultural activity as part of round 1 of activity implementation. The other 25% of villages will receive livelihood activities but with no anticipated direct impact on deforestation rates. We therefore use this as a justification to project ex-ante that leakage mitigation activities will be 75% effective i.e. 25% leakage.

2016 and 2017; Round 2 of leakage activities are implemented; Forest edge communities that have not yet received either the cocoa or the agriculture activity will now receive it. Therefore 100% of forest edge communities will have either the cocoa or the agriculture activity (or both). We believe it is conservative to assume ex-ante that leakage mitigation activities will be 85% effective i.e.15% leakage

2018 and 2019: Round 3 of leakage activities are implemented; at the end of this round all forest edge communities will have received the agriculture activity, the cocoa activity and the savings and lending scheme activity. All forest edge communities will have received multiple road show events and the yearly education scholarships. Leakage will therefore be low and is conservatively estimated as 15%

2020 onwards; An evaluation of effectiveness of leakage prevention activities from both a leakage mitigation and livelihoods perspective will have been carried out and new phase of leakage mitigation activities developed following the results. Projecting leakage beyond 5 years from the development of this analysis (2014) is highly speculative. Goals for the project would see leakage mitigation activities at 90% effective i.e. leakage 10%

The implementation plan for leakage mitigation activities in the 122 FECs can be found in Tatum-Hume and Witkowski 2013.

Table 35. Estimation of unplanned deforestation displaced from the Project Area to the Leakage Belt.

Year		Area _{BSLunplanned} - Leakage belt			Total carbon stock change in baseline in LB $\Delta C_{BSL,LK,unplanned}$	deforestation expected to be displaced into the Leakage Belt	Net CO ₂ e emissions due to leakage $\Delta CLK-ASU-LB$
		ha	t CO ₂	t non-CO ₂ e (EBiomassBur n)	t CO ₂ e (cumulative)	%	t CO ₂ e (cumulative)
1	2012	1,544	791,586	82,643	874,229	0.3	164,273
2	2013	1,544	815,873	82,643	1,772,745	0.3	333,919
3	2014	1,544	840,207	82,648	2,695,600	0.25	477,807
4	2015	1,544	864,449	82,643	3,642,692	0.25	626,439
5	2016	1,544	888,737	82,643	4,614,072	0.15	717,588
6	2017	1,544	913,024	82,643	5,609,740	0.15	811,277
7	2018	1,544	937,358	82,648	6,629,746	0.15	907,336
8	2019	1,544	961,600	82,643	7,673,989	0.15	1,005,658
9	2020	1,544	985,888	82,643	8,742,520	0.1	1,072,676
10	2021	1,544	1,010,175	82,643	9,835,338	0.1	1,141,173

Ex post assessment

Ex post leakage will be assessed following Module M-MON at the first validation event. Leakage in the Leakage Belt will be estimated following LK-ASU.

$$\Delta C_{LK-ASU-LB} = \Delta C_{P,LB} - \Delta C_{BSL,LK,unplanned} \quad (1)$$

Where:

$\Delta C_{LK-ASU-LB}$	Net CO ₂ emissions due to unplanned deforestation displaced from the project area to the Leakage Belt; t CO ₂ -e
$\Delta C_{BSL,LK,unplanned}$	Net CO ₂ emissions in the baseline from unplanned deforestation in the leakage belt; t CO ₂ -e
$\Delta C_{P,LB}$	Net greenhouse gas emissions within the leakage belt in the project case t CO ₂ -e

If $\Delta C_{LK-ASU-LB}$ as calculated is <0 then $\Delta C_{LK-ASU-LB}$ shall be set equal to 0 (to prevent positive leakage).

STEP 4. Estimation of unplanned deforestation displaced from the project area to outside the Leakage Belt

To assess leakage outside the Leakage Belt the project followed steps a-e in the LK-ASU Module.

Define the total available national forest area (*TOTFOR*).

MODIS land cover for 2012 was analyzed for forest area within 5km of all roads and major rivers. Based on current knowledge of Sierra Leona there are no known fully protected forest reserves and national parks (Cuni-Sanchez 2012b; Witkowski 2012; Netzer and Walker 2013 in Section 1.1.1.1). Forest areas under active management were calculated for existing forest reserves (**Table 36**).

Table 36. Calculation of total available National forest area.

ID	Description	value
AVFOR	Total available national forest area for unplanned deforestation; ha	1,783,800
TOTFOR	Total available national forest area; ha	1,958,350
PROTFOR	Total area of fully protected forests nationally; ha	0
MANFOR	Total area of forests under active management nationally; ha	174,550

$$AVFOR = TOTFOR - PROTFOR - MANFOR \quad (2)$$

Where:

AVFOR Total available national forest area for unplanned deforestation; ha

TOTFOR Total available national forest area; ha

PROTFOR Total area of fully protected forests nationally; ha

MANFOR Total area of forests under active management nationally; ha

Calculate the area of forest in the Leakage Belt as a proportion of the total available national forest area.

Following LK-ASU the proportion of forest available in the leakage belt for unplanned deforestation compared with total national forest is 3.5% (Table 37).

Table 37. The proportional area of forest in the Leakage Belt compared to the total National forest available.

ID	Description	value
PROPLB	Area of forest available in the Leakage Belt for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion	3.5%
LBFOR	Total available forest area for unplanned deforestation in the Leakage Belt; ha (calculated from the Leakage Belt Forest Cover Benchmark Map)	62,932
AVFOR	Total available national forest area for unplanned deforestation; ha	1,783,800

$$PROP_{LB} = LBFOR / AVFOR \quad (3)$$

Where:

PROP_{LB} Area of forest available in the Leakage Belt for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion

LBFOR Total available forest area for unplanned deforestation in the Leakage Belt; ha (calculated from the *Leakage Belt Forest Cover Benchmark Map*)

AVFOR Total available national forest area for unplanned deforestation; ha

Stratify Total available national forest area for unplanned deforestation (AVFOR) by carbon stock.

According to the methodology, the stratification of AVFOR by carbon stock has to be made. However there is very limited information on carbon stocks in other parts of Sierra Leone. Therefore an assessment of current published literature on biomass stocks for the region was conducted. The assessment showed that carbon stocks for leakage belt are slightly higher than the IPCC and EC default values, and lower that one report for Upper Guinea forest by Lewis et al. (2009) (Table 38).

Table 38. Comparison with other published literature for Upper Guinea region of West Africa.

Description	Mg C ha ₁	t CO ₂ e ha ⁻¹	Source
-------------	----------------------	--------------------------------------	--------

West tropical forest IPCC default value	155	568	Penman et al (2003)
Moist tropical forest IPCC default value	130	477	Penman et al (2003)
Tropical rainforest in Africa > 30% canopy cover EC default value	204	748	European Commission (2010)
Tropical moist deciduous forest EC default value	156	572	European Commission (2010)
Mean of 833 x 1 km ² cells overlapping Gola forest extracted from GIS dataset	122.3	448	Baccini et al. (2008)
Mean of 33 plots in undisturbed Upper Guinea forest	195.3	716	Lewis et al. (2009)
Average	160	588	

The report by Lewis et al. (2009) was for forest areas to the south of the project area in Liberia where conditions are increasingly wet and tropical. The vast majority of forests in Sierra Leone are north of the Project Area where conditions are dryer. Based on a biomass map from Saatchi et al. (2011) the biomass of forest areas appears to decrease north of the project area (**Figure 15**).

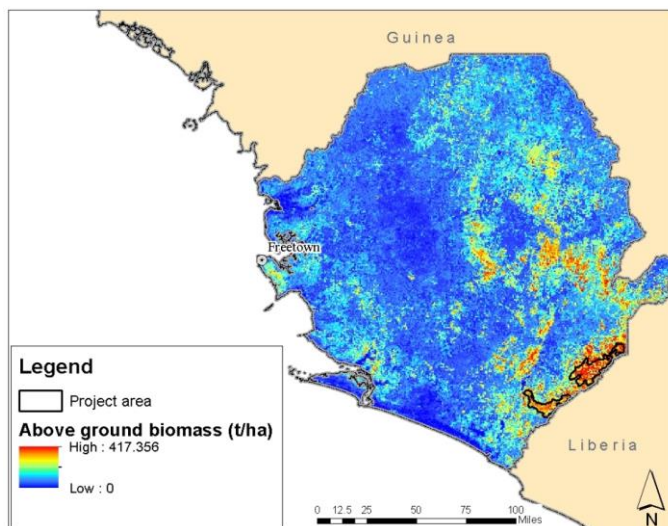


Figure 15. Above ground biomass in Sierra Leone from Saatchi et al. (2011)²⁸

²⁸ Saatchi, Sassan S., et al. "Benchmark map of forest carbon stocks in tropical regions across three continents." *Proceedings of the National Academy of Sciences* 108.24 (2011): 9899-9904.

This suggests that the forest in the GRNP contains some of the highest biomass forest in Sierra Leone because of its southerly location. Based on this analysis it was thought to be conservative to assume to average biomass from all published literature, 588t CO₂e ha⁻¹ (Table 39).

Table 39. Calculation of the proportion difference in carbon stocks between forests in the Leakage Belt and outside the Leakage Belt in Sierra Leone.

ID	Description	value
PROPCS	The proportional difference in carbon stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion	89.9%
COLB	Area weighted average aboveground tree carbon stock for forests available for unplanned deforestation outside the Leakage Belt; t CO ₂ -e ha ⁻¹	588
CLB	Area weighted average aboveground tree carbon stock for forests available for unplanned deforestation inside the Leakage Belt; t CO ₂ -e ha ⁻¹	654.7

$$PROP_{CS} = C_{OLB} / C_{LB} \quad (4)$$

Where:

$PROP_{CS}$ The proportional difference in carbon stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion

C_{OLB} Area weighted average aboveground tree carbon stock for forests available for unplanned deforestation outside the Leakage Belt; t CO₂-e ha⁻¹

C_{LB} Area weighted average aboveground tree carbon stock for forests available for unplanned deforestation inside the Leakage Belt; t CO₂-e ha⁻¹

The proportion of leakage from immigrant population is equal to the immigrating proportion multiplied by the proportion of available national forest area outside the Leakage Belt multiplied by the proportional difference in stocks between forests inside and outside the Leakage Belt (Table 40).

Table 40. The proportion of leakage for areas with immigrant populations

ID	Description	value
LKPROP	Proportional leakage for areas with immigrating populations; proportion	3.4%
PROPIMM	Estimated proportion of baseline deforestation	3.9%

	caused by immigrating population; proportion	
PROPLB	Area of forest available for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion	3.5%
PROPCS	The proportional difference in stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion	89.9%

$$LK_{PROP} = PROP_{IMM} * (1 - PROP_{LB}) * PROP_{CS} \quad (5)$$

Where:

LK_{PROP} Proportional leakage for areas with immigrating populations; proportion

$PROP_{IMM}$ Estimated proportion of baseline deforestation caused by immigrating population; proportion

$PROP_{LB}$ Area of forest available for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion

$PROP_{CS}$ The proportional difference in stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion

Ex-ante leakage from immigrant deforestation agents

Leakage due to the proportion of the baseline deforestation actors who are displaced to areas outside the Leakage Belt is equal to the change in stocks in the baseline scenario minus the change in stocks in the project scenario multiplied by the proportional leakage factor for areas with immigrating populations.

The leakage caused by deforestation actors that will be displaced outside the Leakage Belt is equal to the equation below. The results for the baseline period are presented in Table 41.

$$\Delta CLK-ASU,OLB = (\Delta CLK-ASU,OLB - \Delta CP,LB) * LKPROP$$

Table 41. Net cumulative CO₂ emissions due to unplanned deforestation displaced outside the Leakage Belt

	Area _{BSLunplanned} - Leakage belt	Total carbon stock change in baseline in LB $\Delta C_{BSL,LK,unplanned}$	Net CO ₂ e emissions due to leakage $\Delta C_{LK-ASU-LB}$	Net CO ₂ e emissions due to displaced unplanned deforestation on outside LB $\Delta C_{LK-ASU,OLB}$
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t	y	ha	t CO2e (cumulative)	t non-CO2e (EBiomass Burn)	t CO2e (cumulative)	t CO2e (cumulative)	t CO2e (cumulative)
1	2012	1,544	791,586	82,643	874,229	164,273	5,553
2	2013	1,544	815,873	82,643	1,772,745	333,919	11,288
3	2014	1,544	840,207	82,648	2,695,600	477,807	16,153
4	2015	1,544	864,449	82,643	3,642,692	626,439	21,177
5	2016	1,544	888,737	82,643	4,614,072	717,588	24,259
6	2017	1,544	913,024	82,643	5,609,740	811,277	27,426
7	2018	1,544	937,358	82,648	6,629,746	907,336	30,673
8	2019	1,544	961,600	82,643	7,673,989	1,005,658	33,997
9	2020	1,544	985,888	82,643	8,742,520	1,072,676	36,263
10	2021	1,544	1,010,175	82,643	9,835,338	1,141,173	38,578

$$\Delta C_{LK-ASU,OLB} = (\Delta C_{BSL,LK,unplanned} - \Delta C_{P,LB}) * LK_{PROP} \quad (6)$$

Where:

$\Delta C_{LK-ASU,OLB}$ Net CO₂ emissions due to unplanned deforestation displaced outside the Leakage Belt ; t CO₂-e

$\Delta C_{BSL,LK,unplanned}$ Net CO₂ equivalent emissions in the baseline from unplanned deforestation in the leakage belt; t CO₂-e

$\Delta C_{P,LB}$ Net CO₂ equivalent emissions within the leakage belt in the project case; t CO₂-e

LK_{PROP} Proportional leakage for areas with immigrating populations; proportion

In each monitoring period the area deforested in the Project Area and Leakage Belt will be assessed as per Module M-MON following sub-steps f-g of LK-ASU.

Step 5. Emissions from leakage prevention activities

Leakage prevention activities are not expected to have emissions from biomass burning or fertilizer use. Where they are use these emission will be accounted for.

$$GHGLK,E = 0$$

Step 6. Estimation of total leakage due to the displacement of unplanned deforestation

The total GHG emissions due to leakage are finally calculated with the following equation:

$$\Delta CLK-AS,unplanned = \Delta CLK-ASU-LB + \Delta CLK-ASU,OLB + GHGLK,E$$

The results for the baseline period are presented in Table 42.

Table 42. Total leakage due to displacement of unplanned deforestation

CL2.2. Leakage mitigation

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

The Gola REDD project will reduce the threat of deforestation through continued protection of the project area and will reduce leakage in the leakage belt through community livelihood activities which consist of 6 different elements (as outlined in CM1.1):

- 1) Capacity building for crop production; to improve productivity on existing crop fallow land in order to increase yields and reduce the need to convert forest into the farm bush cycle
- 2) Capacity building for cocoa production; to improve productivity and farmer income from cocoa production and other diversified sustainable income generating activities that maintain forest cover
- 3) Savings and Internal Lending Schemes; to enable forest edge communities to achieve financial independence
- 4) Co-management and land-use planning activities; to improve the well-being and resource governance capacity of forest edge communities whilst maintaining a biodiverse forest through co-management and land-use planning activities in the project area and leakage belt
- 5) Environmental awareness raising; develop and implement an education program to enhance environmental awareness and promote community participation in the management of the GRNP
- 6) Benefit sharing agreement and distribution; implement and monitor mechanisms that equitably compensate stakeholders and promote incentives for conservation practices in the project zone and offsite zone

Activities one and two (agriculture and cocoa) are predicted to have the greatest immediate effect on leakage mitigation as they are designed to improve both farmers productivity and post-harvesting storage and processing thereby increasing yields and sales and reducing deforestation pressures.

For detailed information on the community livelihoods work see SIA Synthesis report (Tatum-Hume and Witkowski 2013).

Nevertheless, leakage due to the avoided unplanned deforestation in the project area is expected and an ex-ante estimate was calculated following the steps established in the approved methodology. It is important to mention that leakage prevention activities were not fully operational at the start of the project (1st August 2012). Therefore leakage may be higher in the initial months and years of the project as leakage prevention activities become fully operational which is why a staggered leakage rate has been applied. However, any such leakage will be monitored as delineated in VMD0015.

CL2.3. Net leakage impacts and leakage buffer

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)

The unmitigated negative offsite climate impacts are found in Table 41, these negative offsite impacts were then added into the total leakage figures found in Table 42. In the calculations shown in CL1.4, (Table 33), the total leakage figures from Table 42 were deducted from the final evaluation of climate impact.

CL2.4 Leakage and non-CO₂ gases

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

Fertilizers will not be used as a leakage mitigation activity. Therefore, no non-CO₂ gases are expected to take place as a result of project activities in the off-site area. Potential emissions resulting from biomass burning in the leakage belt as a result of displacement area are accounted for according to EM-BB in VM0007 and are presented in Table 34.

CL3. Climate impact monitoring

CL3.1. Initial climate monitoring plan

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. 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.

Description of the monitoring plan

Revision of the baseline

The Baseline will be reassessed every ten years (when the project baseline must be revisited) or every five years where conditions trigger²⁹ more frequent baseline renewal based on the methods written in the Methodology Module VMD0007:

- Calculate the area of each land cover category (i.e. forest and non-forest) within the project area and, where required, the leakage belt.
- Update the Forest Cover Benchmark Maps for the reference region, project area and leakage belt.

²⁹ This trigger will be based on changes in conditions on the ground that are considered potentially significant to forest carbon stocks. Such as major changes in policy that relate to the project area, major natural disturbance, a new influx of immigrants due to unforeseen events like refugees.

- Estimate the total area deforested during the historical reference period in the reference region for rate - *RRD (ARRD,unplanned,hrp)*.

Monitoring project activities

The project activities that are described in G3.2 will make up the management plan for the project. The Management Plan will be reviewed and where appropriate revised every 5 years. The implementation of the activities occurs through the development of Annual Operating plans. Each activity is devolved to the relevant sub-department and the superintendents of each sub-department are responsible for developing, implementing and monitoring the work plans for members of staff to carry out the activities. The work is supported by the technical advisors for each sub-department. For example, the activities of the Park rangers, (which deliver the objectives of Gola 1 in table 4 section 1.8), are overseen by the Superintendent of Park Operations and supported by the technical advisor for Park Operations. The Park operations team uses the software MIST (Management Information system), which is a database management system designed for conservation management needs, to collate information gathered by Park rangers on which areas of the project area they visited, which dates and what threats were encountered etc. This ensures effective and efficient monitoring of Park Operations and activities. The Community Development team is responsible for implementing all of the activities described in goal 2 of G3.2 that involve local stakeholders. A Community Monitoring Plan has been developed to monitor all the chosen indicators of this component of the project (Henman 2013) and surveys and standard operating procedures that will be used to gather information through out the lifetime of the project are currently being developed. The third area of activities (goal 3 of G3.2), surrounds the research work that will be carried out for measuring and enhancing biodiversity in and around the project area. A monitoring plan has been developed (Hillers and Tatum-Hume 2013) and the methodologies and protocols to collect the required data are under development and will be available to the auditor for review.

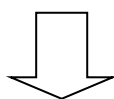
Organizational structure, responsibilities, and competencies

Data generation, storage, and reporting

Generation, recording, storing, aggregating, collating and reporting of data will be conducted by the team responsible for each aspect of the monitoring activities as described above. All data that is gathered is stored into the relevant files on a central database in the project office in Kenema. The database is backed up every week on to external hard drives. The database is shared and stored in the UK offices of the RSPB (who provides technical support to the management team) as a backup. It is the Superintendents and the Technical Advisors of each sub-department who are responsible for ensuring that their teams data is correctly entered and stored in the data base and that reports are produced at the required time intervals. Field data and survey responses are also stored as paper versions in the Kenema office and where appropriate are electronically scanned and stored on the central database.

Figure 16. Data generation, storage and reporting

Data Generation	Storage	Archiving and reporting
Park Ops Forest Rangers & Technical advisor	Field data - Surveys and GPS - MIST database at project office	Monthly progress reports to mgment, bi-annual synthesis reports
Social monitoring CD team & technical annual Advisor	Field data - Activity and longitudinal surveys, activity data - Excel databases at project office	Monthly progress reports to mgment, bi- annual synthesis reports
Biodiversity monitoring Research team & technical Advisor	Field data - Surveys - Excel databases at project office	Monthly progress reports to mgment, bi-annual synthesis reports
GIS information RSPB and field support From research team & Data management staff	- Geo-databases Analysis of imagery etc - Arc view, MODIS etc databases held by RSPB and shared with office	Annual reports



END USES AND USERS OF INFORMATION

- Information will be compiled into different formats for reporting to;
- GRCLG Directors and Members
 - Local stakeholders (dissemination to local communities, regional and local Government, NGO forums, research groups)
 - For verification reports
 - For forestry division/MAFFS/NPAA
 - Publication

Monitoring greenhouse gas emissions and removals

In order to calculate the net greenhouse gas emissions in the project case in the project area and the leakage belt a 3 step procedure will be applied (as per M-MON).

STEP 1. Selection and analyses of sources of land-use and land-cover (LU/LC) change data

Medium resolution remotely sensed spatial data shall be used (30m x 30m resolution or less, such as Landsat, Resourcesat-1 or Spot sensor data). In general, the same source of remotely sensed data and data analysis techniques must be used within the period for which the baseline is fixed. If remotely sensed data have become available from new and

higher resolution sources (e.g. from a different sensor system) during this period then it is possible to change the source of the remotely sensed data. Equally if the same source is no longer available (e.g. due to satellites or sensors going out of service) an alternate source may be used. A change in source data may only occur if the images based on interpretation of the new data overlap the images based on interpretation of the old data by at least 1 year and they cross calibrate to acceptable levels based on commonly used methods in the remote sensing community.

Monitoring of the Project Area and Leakage Belt will be conducted using the same methods and sensors as was used in the development of the baseline to create land cover maps with forest non-forest classification $\geq 90\%$ accuracy (See BL-UP Part 2 and Mitchard 2012). This includes Landsat (or most similar dataset to Landsat) and ALOS PALSAR if available at the time of verification. It will be carried out by the RSPBs conservation data management team by a GIS analyst. If for any reason the sensors that were used for the baseline are not available the most similar sensor type will be used to replace it. This is unlikely to be the cases as Landsat 8 was launched in 2013 (3 months from the writing of the Project Document). The ALOS PALSAR (radar data) may not be available. In this case the project proponent may select another commercially available radar sensor, or if no suitable radar is available only use Landsat imagery

For the calculation of each category of land use change:

- The area of each category within the project area will be calculated in the project area and leakage belt
- The forest cover maps of reference for the project area and leakage belt will be updated.
- The remaining forest area within the project zone will be updated.

Following M-MON the data will be collected for the entire reference region and will be no more or less than 1 year from the data of baseline renewal. The entire Project Area and Leakage Belt will be available for the year that monitoring and verification occurs.

Processing LU/LC Change Data

All remote sensed data will be prepared for analysis using geometric correction and georeferencing and cloud and shadow detection and removal that are scientifically approved methods (i.e. following guidance from GOLFC-GOLD). Processing should follow the same methods used in the development of the baseline (Mitchard 2012)

Post-processing and accuracy assessment

Post processing will follow M-MON guidance and strict scientifically approved methods. This will include mapping areas of change and calculating the area of each category in both the Project Area and Leakage Belt following the same or similar methods used to establish the baseline (See Mitchard 2012). This will enable the updating of the forest cover benchmark maps and updating the remaining area of forest in the RRL.

To avoid issues of cloud cover obscuring the image, we will use multi-date images for the remote sensing analysis to ensure less than 10% cloud cover as was done in the initial analysis (See Mitchard 2012).

To reduce small isolated areas from being classified as deforested a 5x5 majority rule filter will be applied to the final land cover map (See Mitchard 2012).

A detailed accuracy assessment will be conducted and all efforts will be made to achieve the required 90% accuracy of the overall classification.

Change detection

To assess land cover change a “combined” (i.e. cross-tabulation) should be used to create a single map where each pixel represented a unique combination of class over the entire period. The maps that are combined will be classified into 3 classes forest, non-forest and water. All pixels that are classified as “water” at any of the time points should be reclassified into a single water class to avoid accounting for deforestation as the conversion of forest to water.

Step 2 Interpretation and Analysis

Monitoring deforestation

Monitoring of emission resulting from deforestation that occurs in the Project Area and Leakage Belt will be conducted following common good practice in the remote sensing field, and every effort will be made to follow the same methods as were used in the baseline (See BL-UP Part 4 and Mitchard 2012). Following from Step 1 “Selection and analyses of sources of land-use and land-cover (LU/LC) change data” will produce an estimate of the emissions resulting from any deforestation that occurs within the project area and leakage belt ($\Delta CP, Def, i, t$).

The calculation of net carbon stock change as a result of deforestation will follow M-MON and any other referenced VM0007 Modules (e.g. CP-W).

Monitoring degradation

Monitoring Degradation through of trees for illegal timber of fuelwood and charcoal

Emissions due to extraction of trees will be monitored and emissions estimated. Due to the anticipated high deforestation rate in the leakage belt modules BF-DFW and LK-DFW may need to be used in the future once the baseline is reassessed. A Participatory Rural Appraisal (PRA) will be conducted in order to determine whether degradation occurs. In this sense, these steps will be followed:

- A PRA will be conducted every 2 years by the Community Development team. If the results indicate that the project area has no pressure from this type of degradation, then it will be assumed that: $\Delta Cp, Deg, i, t = 0$.
- If the results of the PRA indicate that there is potential for degradation, then the team will:

- Obtain a “penetration distance” in the PRA (distance that the degradation agents can enter from the nearest access points).
- Identify the most important access points to the vulnerable area.
- From said points, draw the distances and create a Buffer Area with a width equal to length.
- Establish transects to evaluate the buffer zone. The assessed area should not be lesser than 1% of the buffer area.
- If stumps are not found (harvested trees), then it is assumed that $\Delta C_{p, Deg, i, t} = 0$ and the assessment is repeated every 2 years.
- If stumps are found, then a systematic assessment will be carried out. For this, plots are distributed systematically, being the area to assess $\geq 3\%$ of the buffer area.
- Take into account the diameter of the stumps, which will be assumed as their DBH. If they were very large (e.g. due to buttresses), then the species of the stump is identified and standing trees of the same species are located. Afterwards, their DBH and stump diameter are measured and a ratio between DBH/stump diameter is calculated. With this ratio, the DBH from the stump diameter of the cleared individuals that were found is estimated.
- With the DBH data, the carbon stock of the harvested trees is calculated, using the allometric equation that was employed for the estimation of the tree carbon stocks in the baseline (Chavé Equation).
- It will be assumed that all stock will be lost to the atmosphere.
- This assessment must be repeated every 5 years.

Monitoring degradation due to selective logging

Selective logging is not expected to occur in the project area. However, if such activities are initiated, methods delineated in M-MON will be followed.

Monitoring areas undergoing natural disturbance

Disturbance in the project area, such as tectonic activity (earthquake, landslide, volcano), extreme weather (hurricane), pest, drought, or fire will be monitored on an annual basis, using a variety of remote sensing data types and in on the ground knowledge. Tectonic activity and landslides are rare in the Project Area, but it will be monitored on an annual basis through the United States Geologic Society (USGS) and Incorporated Research Institute for Seismology (IRIS) Seismic Monitor³⁰. Any earthquakes will also be monitored through reports on the ground. All the data will be downloaded and written-up on an annual basis and stored with all other documentation collected for monitoring. If an event has occurred that could have affected carbon stocks in the Project Area or Leakage Belt

³⁰ <http://www.iris.edu/dms/seismon.htm>

the project will investigate the extent of the damage through satellite imagery. Landsat satellite imagery will be downloaded and every effort to accurately delineate and forest loss will be implemented. If Landsat is not available or sufficient, other remote sensing data will be investigated. Any event will also be investigated on the ground by field crews. Field crews will assess the extent and carbon loss on the ground through field measurements. The quantification of carbon stock changes will follow M-MON.

Landslides are not a major natural risk in the project area³¹. However, monitoring of these events will be done annually through visual interpretation of Landsat imagery and information obtained on the ground from field crews during the frequent patrols of the project area. All the data will be downloaded and written-up on an annual basis and stored with all other documentation collected for monitoring.

Extreme weather and drought, will also be monitored on an annual basis through National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center, International Best Track Archive for Climate Stewardship (IBTrACS)³². Any extreme weather events and drought will also be monitored through reports on the ground. All the data will be downloaded and written-up on an annual basis and stored with all other documentation collected for monitoring. If an event has occurred that could have effected carbon stocks in the Project Area or Leakage Belt the project will investigate the extent of the damage through satellite imagery. Landsat satellite imagery will be downloaded and every effort to accurately delineate and forest loss will be implemented. If Landsat is not available or sufficient, other remote sensing data will be investigated. Any event will also be investigated on the ground by field crews. Field crews will assess the extent and carbon loss on the ground through field measurements. The quantification of carbon stock changes will follow M-MON.

Pests, are unknown to cause major forest die-back in the Project Area, however every effort will be made to monitor it. There are no current monitoring methods in Sierra Leone for pests. The GRNP project staff will make every effort to monitor this on the ground. If an event has occurred that could have effected carbon stocks in the Project Area or Leakage Belt the project will investigate the extent of the damage through satellite imagery. Landsat satellite imagery will be downloaded and every effort to accurately delineate and forest loss will be implemented. If Landsat is not available or sufficient, other remote sensing data will be investigated. Any event will also be investigated on the ground by field crews. Field crews will assess the extent and carbon loss on the ground through field measurements. The quantification of carbon stock changes will follow M-MON.

Fire will be monitored on an annual basis through assessments of MODIS Active Fire and Burned Area Product³³. Because the MODIS data can be very sensitive to even small

³¹ Columbia University Center for International Earth Science Information Network (CIESIN). <http://sedac.ciesin.columbia.edu/theme/hazards/data/sets/browse>

³² <http://www.ncdc.noaa.gov/oa/ibtracs/index.php?name=ibtracs-data>

controlled burns from slash and burn agriculture this data will be cross referenced with visual inspection of burned areas in Landsat imagery for every year. Fire will also be monitored through reports on the ground. All the data will be downloaded and written-up on an annual basis and stored with all other documentation collected for monitoring. If an event has occurred that could have affected carbon stocks in the Project Area or Leakage Belt the project will investigate the extent of the damage through satellite imagery. Landsat satellite imagery will be used to accurately delineate the area of forest loss. If Landsat is not available or sufficient, other remote sensing data will be investigated. Any event will also be investigated on the ground by field crews. Field crews will assess the extent and carbon loss on the ground through field measurements. The quantification of carbon stock changes will follow M-MON.

Monitoring areas undergoing carbon stock enhancement

The Gola REDD Project intends to monitor forest carbon stock enhancement in the stratum Gola South.

It is not anticipated that any of Gola South will be subject to degradation. However PRA will be conducted to ensure this is not occurring (See Monitoring Degradation).

Carbon stock enhancements will be measured based on permanent plots established in 2006 and revisited in 2012 (Tatum-Hume et al 2013b). Enhancements will be monitored following M-MON. All the plots will be re-measured following Standard Operating Procedures for Carbon Stock Enhancement (See appendices folder).

Monitoring project emissions

Emissions from non-CO₂ due to biomass burning is conservatively expected to occur in all areas of deforestation during the project's life. These non-CO₂ emissions have also been accounted for in the baseline.

Emissions from N₂O as a result of nitrogen application is not expected to occur in the project case as fertilizers will not be used as part of the agricultural project activities (increases in production focus on cultivation and post-production techniques). No monitoring will therefore be required. If any N₂O is applied in the project case these will be accounted and monitored.

Emission from fossil fuel combustion is not accounted for in the baseline and therefore is not required to be accounted for in the project case. Also emission from fossil fuel combustion, a result of using project vehicles for project activities, is not significant as it results in less than 5% of net anthropogenic removals by sinks, whichever is lower.

Step 3 - Documentation

A consistent time-series analysis of land-use change and the associated emission will be monitored following M-MON steps 1-2. The procedures for steps 1-2 will be documented including:

- a. Data sources and pre-processing: Type, resolution, source and acquisition date of the remotely sensed data (and other data) used; geometric, radiometric and other corrections performed, if any; spectral bands and indexes used (such as NDVI); projection and parameters used to geo-reference the images; error estimate of the geometric correction; software and software version used to perform tasks; etc.
- b. Data classification: Definition of the classes and categories; classification approach and classification algorithms; coordinates and description of the ground-truth data collected for training purposes; ancillary data used in the classification, if any; software and software version used to perform the classification; additional spatial data and analysis used for post-classification analysis, including class subdivisions using non-spectral criteria, if any; etc.
- c. Classification accuracy assessment: Accuracy assessment technique used; coordinates and description of the ground-truth data collected for classification accuracy assessment; and final classification accuracy assessment.
- d. Changes in Data sources and pre-processing / Data classification: If in subsequent periods changes will be made to the original data or use of data:
 - Each change and its justification must be explained and recorded; and
 - When data from new satellites are used documentation must follow a) to c) above

Monitoring leakage

As per step 4 of Module LK-ASU “Estimation of unplanned deforestation displaced from the project area to outside the Leakage Belt” the area deforested in the leakage belt will be monitored in each monitoring period ($A_{DefLB,i,t}$). The same methods for monitoring deforestation in the project area will be used for the leakage belt.

The leakage belt will be monitored each time the project area is monitored ($A_{DefPA,i,t}$), which will be at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event.

The data and parameters measured in for the leakage belt at each monitoring period include:

MANFOR: Total area of forests under active management nationally

PROPRES: Estimated proportion of baseline deforestation caused by population that has been resident for ≥ 5 years

PROTFOR: Total area of fully protected forests nationally

TOTFOR: Total available national forest area

CL3.2. Development of a comprehensive monitoring plan

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.

A full monitoring plan has been developed (see CL3.1). The results of monitoring and verification will be made publically available on the project website and disseminated to communities and stakeholders through radio shows, meetings and notice boards, amongst other methods.

Community Section

CM1. Net Positive community impacts

CM1.1. Estimate of impact of project activities on communities

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 defensible 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.

The project used the methodologies outlined in the Social and Biodiversity Impact Assessment (SBIA) manual for REDD+ projects (Richards and Panfil 2011) to estimate project impacts through the theory of change approach (Tatum-Hume and Witkowski 2013).

A net positive impact is expected for all community groups over the lifetime of the project based on the beneficial impact that the implementation of project activities will have on local livelihoods and the resources on which those livelihood activities are based, compared to the without project scenario (G2.4).

The community groups identified by the stakeholder analysis in section G3.8 that will be impacted by project activities are; Paramount Chiefs, Landowning families and forest edge communities and are discussed below. Offsite Communities are discussed in CM2.1.

Paramount Chiefs

Had the project area remained a production Forest Reserve, Paramount Chiefs would have been entitled to receive benefits from any commercial logging activities taking place in the reserves (Witkowski et al 2012c, Forestry Act 1988). Although in practice, the Paramount Chiefs report that this did not occur, the entitlement existed and therefore the project has impacted this potential without project benefit. By making direct payments to Paramount Chiefs via the Benefit Sharing Agreement³⁴ (currently set at \$1000 per year for each of the 7 Paramount Chiefs), the project aims to ensure that Paramount Chiefs will not be negatively impacted by conservation management actions and thus receive a net positive financial benefit from the project.

Amongst other responsibilities, Paramount Chiefs serve as agents of development and are the custodians of land in their Chiefdoms (Gola project context report Witkowski et al 2012c). The Chiefdoms of the Gola area were a rebel stronghold during the period of civil conflict;

³⁴ This amount is currently set at \$1000 per year for each of the 7 Paramount Chiefs. The amounts outlined in the Benefit Sharing Agreement are not fixed and may fluctuate in line with the revenues generated from the sale of credits and with re-negotiation of the agreement

infrastructure, housing and livelihoods were devastated by the impacts of the war and these areas have received very little support from the Government or from development agencies to help communities recover (ibid). Through the financial³⁵ and in-kind benefits provided to the communities of the Chiefdoms outlined in this section and in CM2 the project will provide long term support to these impoverished and neglected Chiefdoms, supporting the Paramount Chief and District Councils in their development objectives.

Landowning families

The Chiefdoms surrounding the GRNP are recognized as the owners of the land within the project area, however no register of landowning families was made at the time the reserves were created (a process which began in the 1920's). A report written in 1908 about the Gola Forests, describes the forests to be largely intact with a closed canopy and the presence of three villages in the area (Unwin 1909; 24); it is therefore not known if any families were actually moved off their land at the time the reserves were created. In the provinces of Sierra Leone no formal written title exists for landowners. Rather, as described in the Gola context report (Witkowski et al 2012c), a customary system of land tenure exists in which the Paramount Chief is the ultimate custodian of the land, but family lineages hold certain areas that their ancestors first farmed and members of the family continue to hold these areas today.

The Forestry Act stipulates that like the Paramount Chiefs, land owning families are also under law entitled to receive payments from the profits of commercial logging activities (Gola Project Context report Witkowski et al 2012c, Forestry Act 1988). In reality, whilst the project area was managed as a production Forest Reserve, no payments were ever made despite commercial activities having occurred for over 30 years. When the partners negotiated with the local communities to manage the Gola Forests in 2001-2003 for conservation objectives, part of the agreement was to make payments to the heirs of the original landowners in recognition of their rights. The first landowner register was completed in 2008 by the Forestry Division of the Government of Sierra Leone to enable landowners to receive payments via a Benefit Sharing Agreement developed by the Gola Forest Programme. These payments will continue under the Gola REDD project and are made in lieu of potential royalties and for complying with the terms of the landowners agreement³⁶. The register currently contains the names of 1141 landowner families, each family is represented by a principle family head (there are 234 principal family heads) who are the heirs of the areas their ancestors purportedly owned land in Gola before it was made into a Forest Reserve³⁷.

³⁵ This amount is currently set at \$9,500 per year for each of the 7 Chiefdoms. The amounts outlined in the Benefit Sharing Agreement are not fixed and may fluctuate in line with the revenues generated from the sale of credits and re-negotiation of the agreement

³⁶ This amount is currently set at \$28,000 to be equally divided between the heirs of the original landowners identified in the landowner register. The amounts outlined in the Benefit Sharing Agreement are not fixed and may fluctuate in line with the revenues generated from the sale of credits and re-negotiation of the agreement

³⁷ It should be noted that it is thought many more families are in the register than ever owned land in Gola, particularly in one of the Chiefdoms, but the register has been publically created and verified by the Section and Paramount Chiefs and so is as accurate as can possibly be made, given the one hundred plus years that have passed since some of the parts of the reserve were created

27% of the principal family heads of the landowning families currently live in forest edge communities and a similar or slightly higher percentage of families are likely to live in forest edge communities; they will therefore also be party to the project activities in the Forest Edge Communities described below.

As landowning families were not moved from the project area, have never received any form of benefit from the Gola forest from commercial logging and many (nearly $\frac{3}{4}$ of principal family heads) live far from the project area and are therefore not likely to have been accessing it for livelihood benefits the project will provide a net positive benefit to this stakeholder group. Landowning families that live close to the Park and may have been accessing the Park for livelihood activities will also be part of the forest edge community livelihood program described below and are the project will therefore not negatively impact these families.

Forest edge communities

Negative impacts of the with project scenario

The primary impact of the project on forest edge communities will be the continued enforcement of conservation measures to prevent illegal activities in the National Park which have largely been in place since 2004; this will prevent forest edge communities from accessing the project area to farm, hunt, log or mine as they have reported doing in the past.

As discussed in G1.8.5, the project area, (the only part of the project zone from which all illegal activities are now prevented), was not fundamental³⁸ for meeting local community's basic needs but it was non-the-less important as an additional source of resources for livelihood activities.

As is the pattern in the leakage belt, the most important activity occurring in the project area for forest edge communities prior to the implementation of conservation measures in 2004 was farming (Witkowski et al 2012b). Farming was carried out in both upland areas and inland valley swamps and served primarily to supplement food grown in farms near the villages and provide an early harvest before the main harvest was due. When questioned, communities could not say whether farming activities in the project area were carried out by a specific subset of villagers e.g. those with poor access to land within the village, instead they claimed that farming was undertaken by which ever households wanted to or had the resources to do so in a particular year. Hunting, fishing, and gathering were widely reported to have been carried out by some members of all forest edge communities; hunting was carried out by men, fishing was primarily carried out by women and gathering by both men and women. These activities occurred as a supplement to activities in farmbush areas in the leakage belt and occurred in an ad hoc manner. Only a few forest edge communities reported to have been involved in illegal logging and mining activities which were either carried out directly by villagers or by outsiders who provided rent to communities in exchange for access to the reserve (Richards 2012).

³⁸ Fundamental is defined as an area which is forming or serving as an essential component of local communities basic needs.

As farming forms the main livelihood of 90% of forest edge community members (Bulte et al. 2013), a second impact on forest edge communities will be the damage to crops caused by wildlife from the project area. Communities report that wildlife conflict existed in the past but has increased since the war. Although the protection of the project area is widely cited as the cause of the problem, it is far more likely that the ban on fire arms which was put in place in 2002 after the civil war has prevented farmers from scaring (or killing) larger animals away from their crops has had a more significant impact on communities³⁹. Communities also acknowledge that human-wildlife conflict was a problem that pre-dated conservation activities, again demonstrating that conservation management is unlikely to be the primary cause of human-wildlife conflict. Communities report that larger species cause damage to crops; Chimpanzees cause problems in cocoa plantations but as a threatened species they are illegal to hunt with or without the Gola REDD project.

A third potential impact is that of increased land conflict within and between villages in the leakage belt and offsite communities as access to farming areas becomes restricted due to increasing populations and land pressures. Currently communities report that land conflicts are not common in the area (Bulte et al. 2013, Witkowski et al 2012a,b, Offsite report, Zombo et al 2012) but this will be monitored throughout the project and the land use planning work described below will assist communities in planning for their future needs and result in clearer land tenure.

Positive Impacts of the with project scenario

The first goal of the project (see G3.1) is to strengthen the protection strategy and effective management of the GRNP. In the absence of the project this would not occur and resources would become depleted through activities that cause deforestation and degradation (see G2.4 and G2.5). The activities carried out under this project objective will ensure that the ecosystem services described in G1.8.4 are preserved and the forest which acts as a natural resource base to underpin many of the livelihood options of the communities is available for future generations, providing a positive benefit to forest edge communities and communities of the greater Gola area.

The second goal of the project (see G3.1) is to create an enabling environment for neighbouring communities to act as committed environmental stewards of the natural resource base through activities that enhance, generate value from and materialize the benefits derived from the project zone's forests and sustainable land use practices'. To accomplish this, the Gola REDD project will implement various activities focused on achieving five objectives described below⁴⁰. The sustainable livelihood improvement projects were developed in consultation with forest edge communities and are expected to help address the major focal issues as determined by the communities themselves (Tatum-Hume and Witkowski 2013). As the vast majority of villagers living in forest edge communities are subsistence farmers, the key to development has been identified both by

³⁹ The fire arms ban was lifted in 2012 and people are now able to own and use a firearm if they have a licence to do so.

⁴⁰ Please note that there are 6 objectives to the second goal of the project but the sixth objective is centred around the implementation and monitoring of the benefit sharing agreement and so is not described in this section of the PD.

the SIA work and by other studies (e.g. WFP report 2008) as improving agriculture production, processing and market access. The overall impact of the Gola REDD project expected to benefit communities is the reduction of poverty and the safeguarding of natural resources in the project zone enabling natural capital to continue to contribute to the livelihoods of nearby villages. The associated theory of change, describing how this impact will be achieved is: *If we build capacity to maintain, improve and capitalize on natural resources and agricultural activities then food security and income will increase resulting in a reduction in poverty and an enabling environment for communities to become environmental stewards and actively participate in sustainable land use planning and resource management* (see Tatum-Hume and Witkowski 2013 for more detail on how the project applied the theory of change).

Objectives of the livelihood program;

1. *Establish sustainable farming practices in forest edge communities that improve productivity on existing crop fallow land*

The aim of this objective is to increase the productivity of farms in the forest edge communities in the leakage belt of the project zone through training in improved farm practices and the provision of inputs to encourage more sustainable farming techniques and in the long term, reduce the hunger gap frequently reported by villages. Supporting farmers to intensify farming activities in their farm bush areas will reduce pressure to clear new areas of forest within the leakage belt and in the National Park and therefore will reduce leakage. This activity will bring both social and biological benefits and therefore fits with the multiple objectives of the Gola REDD project (see Tatum-Hume and Witkowski 2013 for activity results chain). Although the main crop produced on farms is rice as this is the staple food crop of villages, a variety of vegetables for consumption and/or sale are also grown.

Farmer field schools and demonstration fields will offer villages improved practices for growing and increasing yields of a variety of crops including upland/lowland rice, vegetables (such as sweet and hot pepper, okra, eggplant and bitter ball), groundnuts and cassava. The activity is principally implemented over a 2 year period. After the initial 2 years, the villages will continue to be monitored and reviewed every 2 years to assess whether follow-up training or inputs are required. Whether such additional and tailored training and/or inputs are required will depend on the outcome of the monitoring.

During the first year the activity is focused around Farmer Field Schools and is divided into dry and wet season Farmer Field Schools. From December to May the Farmer Field Schools will focus on vegetable growing as this is the season it takes place. From June to November the Farmer Field Schools will focus on upland/lowland rice, cassava and groundnut growing as this is the season these crops are grown (one wet season crop is chosen by each forest edge community Farmer Field Schools). So over a one year cycle farmers will be taught how to improve yields on at least one dry season and one wet season crop.

In the second year Master Farmers are selected from the participants of the first year Farmer Field Schools to receive further training and be focal points of their village to spread the knowledge acquired and enable the improved techniques to continue without the resources of the project.

Welthungerhilfe (WHH) will be implementing this activity with project staff during the first year of the activity. During this time staff will be trained by WHH with a view to continuing the implementation of the activity after the 1 year of training. GRNP staff capacities to implement the project will be assessed at the end of year one and a decision made as to how the activity continues to be implemented.

WHH was identified as a project partner as it has been implementing the Food Security and Economic Development (FoSED) project since 2009 in the Bo, Kenema and Pujehun Districts through an EU-funded project and with Sierra Leonean partners. The Food Security and Economic Development project works in 55 village communities, 20 of which are leakage belt communities but the EU funding for the project ends in August 2014. A major part of Food Security and Economic Development project involves the development of sustainable farming systems and a variety of methods have been tried and tested by WHH since 2009. From the lessons learned WHH is further developing farmer field schools as these are proving more successful than other methods. As such WHH is in a good position to assist the Gola REDD project with the best methods for developing Farmer Field Schools with increased crop production in the villages. Four project field officers will be trained by one WHH field officer for undertaking Farmer Field Schools trainings and providing the on-going support that farmers, particularly Master Farmers require, through learning by doing (see Tatum-Hume and Witkowski 2013 for further detail and implementation plan).

2. To improve productivity and farmer income from cocoa production and other diversified sustainable income generating activities

During the 10 year period of civil conflict in Sierra Leone, many people left their villages in the Gola area, migrating to temporary refugee camps, towns and cities or even to neighbouring countries. As cocoa is typically shade-grown, and planted in mixed polycultures which retain native trees, if a plantation is not managed the natural advantage cocoa has of being grown within a forest canopy (e.g. resistance to drought and improved pollination) is traded as productivity declines with too much shade as less pods are produced and more losses occur through pests and disease. As a result of farmers moving out of their villages during the civil conflict, plantations became overgrown and are unproductive and farmers have struggled to carry out any rehabilitation since their return to their villages after the conflict ended. Farmers are very interested in the rehabilitating and improving the management of their cocoa plantations, but do not have adequate know-how to replace trees that are too old or diseased or improve productivity (Witkowski et al 2012b).

Despite cocoa having been an important source of income for farmers in the pre-war period, production and quality throughout Sierra Leone is currently very low. As a result the exported product is currently realizing a low price on the world market which means that farmers are also receiving a low price. Redevelopment of the cocoa sector represents an opportunity for the country which the government has recognised and recently prioritised with the development of a National Sustainable Agricultural Development Plan which includes a Smallholder Commercialization Program (NSADP 2009). The Government of Sierra Leone has identified the cocoa sector as one of the pillars for growth and is aiming to bring Sierra Leonean cocoa back to the global market. The Sierra Leone Investment and Export Promotion Agency (SLIEPA) was created in 2007, with the goal of facilitating investment. The Government has a target of producing 25,000 tonnes by 2015. The Government is keen to develop the cocoa processing sector to add further value into the

supply chain since cocoa from Sierra Leone is currently shipped as beans for processing elsewhere. The Government has given tree crops a “tax holiday for 10 years” (up to 2020).

This project activity therefore not only fits in with the ambitions of cocoa farmers in the leakage belt but also with National agricultural strategies.

The aim is to build on the national momentum for cocoa by re-habilitating shade-grown cocoa plantations to provide farmers with an increase in productivity and therefore an increased, diversified source of income which will help reduce poverty in the villages of the leakage belt. Maintaining shade grown plantations may also help enhance habitat connectivity within the matrix of agriculture and forest landscape that exists between the blocks of the GRNP (the project area) in the leakage belt. Promoting land-use practices that are favourable to both wildlife and people and which maintain carbon stocks will be beneficial to the multiple objectives of the Gola project.

In the medium term, the objective of the activity is for leakage belt farmers who wish to achieve certified cocoa standards such as Fairtrade and the Rainforest Alliance can do so as these standards have a consumer-facing brand and strong marketing teams in Europe which can help strengthen the price achieved for the villages cocoa.

The activity follows a farmer field school approach with a one year dedicated to the training of Master Farmers. Immediately after receiving each training the Master Farmers will go back to their villages and train the rest of the farmer group in the techniques they have learnt at the Farmer Field School. In year 2, the progress of the farmers will be monitored by a field officer and refresher and dedicated trainings tailored to the needs of the Farmer Field school groups will be provided by the field officer. During years 3 to 6 the farmers progress will continue to be monitored and refresher training provided as required. Farmers that wish to achieve certification for their farms will be supported during this period to do so – the details of this are currently being developed (see Tatum-Hume and Witkowski 2013 for further details on the activity and implementation plan)

3. To enable forest edge communities to achieve financial independence

Forest edge communities frequently identified during PRA exercises that access to cash to develop alternative livelihood activities or support agricultural development was a constraint to development. Households in forest edge communities have scarce financial resources and no means to secure small loans or access to any secure method of saving money. If money is lent to farmers by for example traders who buy the farmers products it is often with high rates of interest usually in the form of a large proportion of the product being produced. During PRA exercises women in particular expressed a need to access micro-credit as they would use it to engage in the petty trade of items that are not available in forest edge communities e.g. salt, seasoning, batteries, clothing etc as well to fund agricultural activities including for example paying for farm labour or for the marketing of produce. Loans can also be useful to enable households to meet their immediate needs without having to sell their crop when it is still in the field or to middlemen, meaning they can sell their product by weight once it has been harvested and processed, thus achieving a higher price. Villagers reported that any additional income made from these activities would be invested into a number of areas depending on the need of the household from education and improved housing to food and health issues. Supporting forest edge communities in the creation and training of

sustainable savings and lending groups will therefore provide community members, and in particular women (as this group expressed a greater interest in micro-finance), with the means to access credit and generate their own sources of diversified income.

Investigations into possible mechanisms to support communities to develop internal, self-sustaining systems for savings and lending led to the SILC programme run by Catholic Relief Services in Sierra Leone and other parts of Africa. The aim of the 'Savings and Internal Lending Communities' (SILC) scheme is to empower farmers, and often, female-headed households to increase their financial assets as well as providing them with the knowledge and skills to better manage their own scarce financial resources. In addition to providing a safe place to save and lend to group members, the SILC methodology also builds cohesive groups that work together to solve individual, group and community problems. Group management skills such as organizing meetings, keeping basic financial records and initiating basic business planning are also strengthened. There is also a special fund, known as the 'social fund' which every member contributes a fixed amount to, to help at special times like illness, death, marriage, etc. SILC groups form an important basis for what is known as 'Integral Human Development' (IHD) as it builds up individual and community financial assets through savings and internal lending; human assets by facilitating skill development in numeracy, bookkeeping and following policies and procedures; social assets through electing a committee and drafting a constitution; solidarity through supporting the poorest members of the community and building group cohesion and self-reliance through the SILC meetings; political assets by their ability to speak up as a community; and physical assets by investing their loans into income-generating activities (SILC, a basis for Integral Human Development, CRS Publication, November 2006)

The aim is to enable forest edge communities to achieve financial independence through establishing a secure means of saving money and procuring small loans that can be used for petty trading or for investments into agricultural activities. Savings and the social fund will provide members with a financial safety net should any shocks occur. By creating internal savings and lending groups, villagers will either be able to generate alternative incomes or invest in their farming activities. The additional income generated from new or expanded income-generating activities will in the long term help reduce poverty.

The activity is implemented over a 2-year period, with the SILC groups receiving training and support throughout the 2 years. In the last 6 months of the 2 years, a 'Private Service Provider' is chosen from each group by its members to act as the future supervisor of their group. This person is also trained to support the setting up of new groups within their village (or elsewhere).

4. To improve the well-being and resource governance capacity of forest edge communities whilst maintaining a biodiverse forest

Forest Edge Communities have traditionally accessed areas of the GRNP to extract NTFPs including medicinal plants and to fish; such activities have supplemented the main livelihood activities carried out around their villages. Areas important to secret societies and linked to old burial sites are also thought to exist within the GRNP, although such information is not accessible to outsiders. Forest edge communities are still permitted to enter the GRNP and extract NTFPs but the PRA exercises carried out during Gola REDD project development revealed that many villagers do not understand their rights and believe that the forest

rangers will prevent their access to the Park. Weak governance in other Forest Reserves in Sierra Leone has led to encroachment into the reserves of agricultural activities. This would also occur in the baseline scenario for the project area. Forest edge communities have stated that they will act as guardians of the forest if they are involved in its management (Witkowski et al 2012b) developing co-management agreements will therefore result in better governance of the National Park through the long term support of the forest edge communities in enforcing regulations.

This activity will consult with the forest edge communities to negotiate the development management plans for community use zones in the National Park. The management plans will enable the community use zones to be sustainable, well-managed areas generating products of commercial value which can be used to increase the income generating activities of the forest edge communities. They will also secure the support of the forest edge communities in protecting the National Park from illegal activities. The long term objective is to improve the well-being of people now and in the future while supporting a diverse population of animals and plants.

Outside of the National Park in the forest edge communities, the activity will develop land use mapping and planning within each forest edge community to enable communities to plan the sustainable use of their resources for current and future generations. Communities will be encouraged to develop by-laws around the use of forest resources, where these do not currently exist. The objective of this activity is to reduce unplanned deforestation in the leakage belt.

The project will work with forest edge communities to map areas that were used in the past for resources and cultural activities within the GRNP. The work will be led by the community development under the guidance of a co-management supervisor. The maps will be used to establish community use zones within the National Park that will be jointly managed and monitored by the communities. The participatory mapping will begin with a rough map drawn in the dirt or on paper with village members outlining where resources are in relation to recognizable geographical features, these areas are then walked and plotted with a GPS to make them identifiable in the GIS map for the community to see. Rules will be developed and jointly agreed between forest edge communities and local authorities about who can do what when, how and utilize how much of a resource in the zones to ensure sustainable use of the resources. The agreements will also outline the roles and responsibilities of all the parties including monitoring resource collection. The agreements will strengthen local resource rights and empower local communities to manage forested areas for improved conservation outcomes.

Forest edge community land-use maps will also be developed for their land outside the park for planning purposes, in the same way as the maps of the community use zones are established. What can be done on this land is different to that inside the Park so different rules may be applied by the community (logging for example is allowed outside the Park if a license is obtained which may form part of a land use plan). The involvement of the local authorities may also be different due to the different rules applying to land-use outside the Park. Different by-laws may also apply between forest edge communities. How planning is undertaken following the (participatory) land-use mapping will need to be assessed on a case by case basis but a current land-use map in itself will be an extremely useful tool to see

what is being done where and what potential future changes may be needed to ensure the land is sustainably used.

The direct benefits for the forest edge communities include: the sustainable utilisation of NTFPs and fish inside park ensuring resources for future generations; the creation of clear unambiguous rules about who can do what where, when, how and utilise how much (this will also regulate what outsiders can do, if anything); organised and reliable support from the local authorities (particularly the District Forestry Office and police) and GRNP to assist communities with enforcement of rules; and shared decision making and accountability for resource use inside the park increasing a sense of ownership in conservation outcomes. It will also provide clear land-use maps for current uses outside the Park in the leakage belt which can be used for sustainable use planning purposes in this area.

The development of the co-management approach for the Gola REDD project will begin with a pilot with 2 clusters of forest edge communities to test the methodologies and assess the overall approach and villages' willingness and capacity to engage with the process. Once trialed and adapted the activity will be implemented in further forest edge communities (see Tatum-Hume and Witkowski 2013 for further details)

5. To enhance environmental awareness and promote community participation in the management of the GRNP

Increased capacity building and awareness raising efforts will be carried out in the forest edge communities focusing on the importance of a healthy environment, its contributions to human well-being and the value of standing forests and natural resource management. Raising awareness on a range of environmental issues from climate change, to endangered species and co-management to sustainable land use planning is part of the process to empower forest edge communities with the knowledge and skills to engage in project activities. Aiding community members to identify and understand the non-financial benefits, ecosystem services, and ways in which the forest and natural resources serve as the foundation for local livelihood strategies will facilitate the development of environmental stewards in this generation and the next.

A number of activities aimed at different audiences will be implemented in order to achieve this objective. Roadshows have proven to be an effective way of engaging forest edge communities, particularly adults, with environmental concepts and these will be continued. In secondary schools nature clubs are promoted by the Government, (The Environmental Protection Agency), to engage pupils with environmental issues and nature clubs will be reactivated and supplied with educational materials and ideas by the project. For youths, a volunteer scheme has been developed and promoted through which youths selected by their communities will under take short turns volunteering with the project. They will be engaged with activities such as boundary brushing, biodiversity monitoring, trail cutting, tour guiding, and patrolling with the forest rangers. They will receive basic training on park management and research, in addition to a small stipend and be encouraged to apply for vacant positions within the project team.

All of the above strategies to achieve net positive impacts for the project's local stakeholder groups have been formalized in a consent based agreement between the project and the 7 Chiefdoms, the 2012 Benefit Sharing Agreement (BSA). The benefit sharing agreement will be signed by the 7 Paramount Chiefs and has been publicized in open meetings and via radio chat shows and after the sections relevant to specific stakeholder such as landowning

families and forest edge communities had been discussed in focal groups and landholder meetings (see section G3.8). The effective and transparent implementation of the benefit sharing agreement is a further objective of the project outlined in G3.1, goal 2, objective 6.

Conclusion

With the project, the project zone will be a well-managed area, able to provide significant benefits for local communities. Net positive benefits will be experienced as the project will ensure the maintenance of critical ecosystem services, including provision of freshwater, prevention of erosion, and maintenance of the micro-climate critical for the region's most important economic crops. Secondly, the project will enhance the existing primary livelihood activity in the area, farming, as well as provide community members with viable livelihood alternatives to the overuse and unsustainable extraction of natural resources. This will aid them in avoiding the illegal activities they sometimes engage in within the park boundaries and decrease logging and mining activities that produce unreliable benefits while degrading the natural resource base. Improved knowledge of sustainable farming practices, inputs and increased access to capital will improve productivity of land already integrated within the crop-fallow system and thus increased income and food security. The land use planning and co-management encouraged by the project, coupled with the support leveraged from other development organizations will also be critical in providing a net positive benefit to communities. Together, these activities will help communities avoid the degradation of natural resources, which is critical as if this occurs, those resources will be unable to support the livelihoods of the communities to the extent that they do today, thus communities will increasingly have to rely on cash to buy their basic needs. In order to obtain the necessary funds, they would have to intensify land use, further degrading the land and resources. With the knowledge and tools provided through the Gola REDD project, communities will be able to avoid this. The communities will become environmental stewards of the natural resource base that underpins their livelihoods through the project's activities that enhance, generate value from and help ensure that increased benefits from the project zone's forests and sustainable land use practices materialize for the communities.

CM1.2. Impact of project activities on High Conservation Values

Demonstrate that no High Conservation Values identified in G1.4.8.4-6 will be negatively affected by the project.

Section G1.8, recognized that areas of HCVs 1 to 4 were located throughout the project zone. Areas falling under HCV 5 that are 'fundamental for meeting the basic needs of local people' were identified as being located primarily in the leakage belt area of the project zone rather than the project area; the project area was used only to supplement livelihood activities occurring in the leakage belt. In order to ensure that HCV 5 is not negatively affected by the project, community management zones will be created in the project area to enable forest edge communities access to NTFPs and fishing areas that have been traditionally accessed in the past. The activities to increase agricultural production in bush fallow areas of the leakage belt (see CM1.1) will enable forest edge communities to increase yields within their community lands instead of using the project area. As the project aims to support communities in conserving and maintaining access to areas of high conservation value throughout the project zone, as per G3.1, and as the project area will be managed for conservation objectives there will be no negative impacts to any HCVs.

CM2. Offsite stakeholder impacts

CM2.1. Potential negative offsite stakeholders

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

Offsite villages are defined as those beyond the project zone but within the boundaries of the 7 Chiefdoms of the Greater Gola area. There are approximately 372 communities in this area. From offsite community surveys, there are 2 potential negative impacts on offsite villages that may arise from project activities. The first is due to restrictions on access to the project area for illegal activities such as hunting, logging, mining and farming. As revealed by the survey work (Zombo et al 2012) and confirmed by earlier work carried out by independent social scientists (Bulte et al. 2013), offsite communities did occasionally access Gola obtain resources to complement those obtained within their community lands but to far lesser extent than forest edge communities (Davies and Richards 1991). If populations continue to increase over the project's lifetime and increase pressure on land availability, a second potential impact may arise from conflicts over land use with forest edge communities in the project zone (Sierra Leone's population growth rate is reported to be 2.3% [UN statistics 2010] but is often lower in the most rural areas.) The species of wildlife that Forest Edge Communities in the project zone report as damaging their crops include primarily large mammal species such as Chimpanzees and buffalo. Such species are forest dependent species that are restricted to areas with large areas of continuous forest tract – as are found in the project area and some parts of the project zone. It is highly unlikely that such species would stray beyond the project zone which stretches 4 km around the project area and into the offsite area. Wildlife conflict from the project area is therefore not considered a negative impact for offsite communities.

CM2.2. Mitigation of negative offsite stakeholder impacts

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

No pattern emerged over which offsite communities were accessing the project area (e.g. communities closer to the project zone or with less community forest) or over whether there was a sub-set of offsite community members using the reserve more than others e.g. women or landless households (Zombo et al 2012). Communities reported that the people using the reserve varied each year. It is therefore not possible to target communities or individuals with mitigation activities for the loss of access to the project area. Instead, the project will provide each of the 7 Chiefdoms with an annual community development fund which is to be used by communities for implementing sustainable development projects; the amount each Chiefdom will receive is currently set at \$9,500, as per the benefit sharing agreement. Potential project ideas will be developed by the offsite communities, selected and evaluated by Gola community development committees (GCDCs) consisting of elected offsite community members and implemented by offsite communities where projects are approved (see GRNP 2013). The impacts of these projects will be monitored by the committees. A formal community development fund scheme was trialed by the Gola Forest Program between 2008 and 2012 and the lessons learnt are being used to develop the new Community Development Fund mechanism for the Gola REDD project.

If land conflicts arise as a result of project activities they are more likely to occur in the areas where land from the forest edge communities meets the land of offsite villages that lie closest to the project zone. The few land conflicts that were reported in the surveys were on the whole as a result of poor knowledge of boundaries and accidental incursions onto another villages' land. In order to mitigate for this potential impact, land use mapping and planning activities will be developed based on natural clusters of villages and include offsite villages bordering with the project zone. By mapping family claims to land, tenure will be clearer and planning future land uses will ensure greater awareness of farming and fallow areas.

In addition to the above activities the project will provide other benefits to offsite communities through project activities that raise awareness of environmental protection such as school nature clubs and the Gola road show, through education scholarships, employment to the project as permanent or casual staff and capacity building exercises.

The project will monitor for both positive and negative impacts in offsite villages through out the projects lifetime; if negative impacts attributable to the project are found then further activities will be planned to mitigate any effects.

CM2.3. Net impacts on other stakeholder groups

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

All stakeholder groups were identified in G3.8 and the impacts of the project on these groups was evaluated in CM2.1 and CM2.2, there are no further groups of stakeholders whose well-being will be affected by the project.

CM3. Community impact monitoring

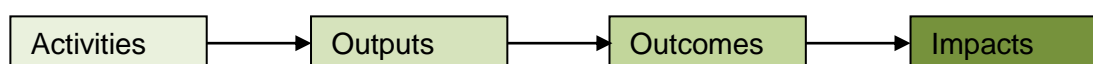
CM3.1. Preliminary community monitoring plan

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 monitoring plan has been developed following guidance from the CCBA Social and Biodiversity Impact Assessment Manual for REDD+ Projects (Richards & Panfil, 2011), which recommends the *theory of change* approach as an appropriate and cost-effective impact assessment approach for community monitoring of REDD+ projects.

The theory of change approach allows project developers to identify causal chains from project activities, to short-term outputs, from outputs to outcomes, and from outcomes to impacts through applying anticipated cause-and-effect sequences. Such an approach is not only cost-effective and a useful framework for developing a logical project design, but is useful to help projects overcome the challenge of substantiating impacts which will be achieved in the long term. This can be achieved through the monitoring of tangible outcomes to demonstrate that the casual chain is being followed, which in turn can provide confidence that the impacts will be achieved.

Figure 17. Causal chains underlying the theory of change



The Gola REDD project started in 2012 and is therefore at an early stage of development. The emphasis of the community monitoring plan is therefore on the project level short and medium term output and outcomes of the casual chain. Medium and long-term impact monitoring may be revised for later verifications taking into account changes in project implementation and other factors outside of the project that could be contributing to the impacts identified through the theory of change process.

The Gola REDD Project Monitoring Plan will be a “living” document in the sense that it will be adjusted over time in response to feedback and adaptive management to ensure continual improvement and relevance. If it is found that there are unanticipated issues in collecting identified indicators, a more appropriate indicator will be identified and incorporated in to the monitoring plan. Similarly if new activities are incorporated or unanticipated effects of the project are observed new monitoring protocols will be developed to address them.

The plan has drawn on the ‘Synthesis Report on the social impact assessment for the Gola REDD project’. The 10 areas which will be monitored include the five community development activities that focus on the Forest Edge Communities, any negative impacts to forest edge communities due to wildlife, offsite communities, worker rights, the grievance mechanism and governance (see Table 43).

Table 43. Areas of activity to be monitored

Category Number	Areas to be monitored	Focal Issue being addressed/issue
1	Crop intensification and increased production activity	Poverty Reduction
2	Improved cocoa production and post-production	Poverty Reduction
3	Saving and internal lending communities (SILC)	Poverty Reduction
4	Co-management of community use zones in the GRNP and land use mapping and planning in the leakage belt	Poverty Reduction Improved Governance
5	Education	Poverty Reduction Improved Governance
6	Crop Raiding by Wildlife	Monitoring identified possible

		negative impact
7	Chieftdom development fund	Poverty Reduction
8	Workers Rights and Employment Scheme	Worker rights
9	Communication and grievance procedures	Improved governance
10	Government capacity building	Improved governance

The theory of change, an analysis of anticipated cause and effect sequences from project activities through to outcomes and eventual long-term impacts, has been applied to the project's different community related activities and has served as a guide to develop appropriate indicators and monitoring requirements in line with the CCBS. All selected indicators can be found in the monitoring plan along with the theory of change to justify their selection, a small selection of indicators is found in Table 44.

Whilst the monitoring plan has been designed around the activities themselves some of the outcome and impact indicators overlap as they are targeted at the same overall impact, for example increasing farmer incomes, which in turn should help to reduce poverty. Short term output indicators will be measured as the activities are being implemented and will therefore be reported on to management from 2014. The majority of medium term, outcome indicators will be measured at the end of the implementation of an activity (i.e. at year 2 after implementation), through activity survey the first such results will therefore be available from 2016. The impact indicators are measured through longitudinal surveys that are carried out every 5 years (the baseline longitudinal survey is being undertaken in January and February 2014, the subsequent survey will therefore be carried out in January and February 2019).

Table 44. A small selection of indicators for community monitoring

Area of activity	Output indicator	Outcome indicator	Impact indicator
Crop intensification and increased production activity	Number of Farmer Field Schools implemented	Number of hectares of intensified crops planted Yield of harvested crop	Farmers better able to meet basic food needs with reduced hunger gap
	Number of trained Master Farmers		
	Number of farmers trained by Master Farmers		
Improved cocoa production and post-production	Number of Master Farmer field schools established and meetings held	Cocoa yield per ha Improved quality of cocoa harvested	Farmers increased ability to meet basic needs from increased income
	No. of participants at		

	farmer field schools No. of fermentation boxes supplied		
Saving and internal lending communities (SILC)	No. of SILCs established, size and location Value of the savings	Number and value of loans taken Number of new groups set up by PSPs	Reduced short term crises as a result of support from social fund of SILC group
Co-management of community use zones in the GRNP and land use mapping and planning in the leakage belt	Number of Community Use Zones mapped Number of Land use plans under development	New by-laws drafted and adopted Active forest edge community engagement in protection of project zone	Improved participatory governance structure for the decision making and management of the GRNP
Education	Number of secondary school scholarships provided to forest edge communities Number of people attending roadshows	Number of years of secondary school education completed by FEC children Improved education on natural resource management by forest edge communities	Communities supporting the protection of the Park
Crop Raiding by Wildlife	Source and scale of crop raiding evaluated Farmers trained in mitigation measures	Less cropland is damaged by wildlife Farmers adopt mitigation measures	Farmer perception of wildlife conflict Change in species composition in project zone
Chiefdom development fund	Number of project proposals implemented Number of communities directly benefitting from CDF projects Money distributed	Improvement in core areas of development selected in activity plans	Increased income, health, food security
Workers Rights and Employment Scheme	Number of resignations Number of women employed	Low staff accident level/ improved safety record in the workplace	Example of good employment and workers rights model in Sierra

		Job satisfaction	Leone
Communication and grievance procedures	Register of grievances recorded Report on how grievances have been handled	Grievances resolved by community management	Good relations between communities and project
Government capacity building	Government staff on secondment with the project Contribution to national level policies, law review processes, strategies, PAM guidelines	Government implementing best practices learnt from working with project in other protected areas	Government has capacity and resources to manage GRNP with minimal international support

CM3.2. Preliminary High Conservation Values monitoring plan

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 (G1.4.8.4-6) present in the project zone.

HCV 5

As previously established, the project area is not fundamental to meeting the basic needs of local communities. It is understood that the project area serves as an additional source for meeting basic needs rather than a fundamental source. The project has been designed to involve forest edge communities in the development of co-management zones in the project area (GRNP) and therefore have access to areas to sustainably extract NTFPs and fish to meet any additional requirements for basic needs as they have likely done in the past. The establishment of co-management zones will be monitored through those indicators presented in Activity 4.

HCV 6

As previously established, the project zone does comprise areas which meet HCV 6. This is because they provide for two critical traditional cultural activities:

Secret society (Sande and Poro)

Secret Societies are a central part of the Mende culture. As part of the initiation process, children are required to spend time in a special part of the bush isolated from members of the opposite sex (Leach 1996); the locations of these areas are only known to members of the societies and not to outsiders but they are understood to be largely within the bush areas of the leakage belt in the project zone rather than in the project area (Personal communication, GRNP Community Development staff and Green Africa staff).

Burial grounds

Burial grounds and graves are considered sacred areas and there are strict rules about respecting such areas (Bulte et al. 2013; 24). Such sites have been encountered within the project area but these are found as biodiversity survey work is carried out rather than as a result of a deliberate effort to identify such areas. Burial grounds are also present in the leakage belt.

Monitoring HCV 6

Secret Societies: given the areas used by secret societies are secret it is not possible to map or preserve and particular areas for this activity. However, given the overall objective of the project is to preserve forest, it seems the project activities would be well aligned to meeting the needs of secret society for forested lands to carry out their meetings.

Burial grounds and graves: these areas are not currently mapped but the location of sites will become clearer as the project develops Co-Management within the project area. Monitoring of these activities is covered in Activity 4 and its indicators.

CM3.3. Development of comprehensive community monitoring plan

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.

Please see the CCB social monitoring plan (Henman 2013) for details of the full monitoring plan, the protocols and surveys required to implement the plan are currently under development and will be available to the auditor upon request. Once finalized these documents will be made available on the Gola projects website and the plans as well as the results as they are established through the project reports will be communicated to stakeholders via the appropriate mechanisms identified for each group.

Biodiversity Section

B1. Net positive biodiversity impacts

B1.1. Estimate of impact of project activities on biodiversity

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 defensible 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 will bring multiple benefits for biodiversity resulting in the following net positive impacts for biodiversity.

Habitat loss and fragmentation

As described in previous sections, it is estimated that between 10% and 30% of the Upper Guinea forest cover that existed at the turn of the 19th century remains ((Poorter et al. 2004). Reducing deforestation and degradation in the project zone is one of the main goals of the project activities which will reduce habitat loss and fragmentation. Since many of the threatened species in the project zone are forest-dependent (see G1.7 and G1.8), preventing forest loss is of major importance to these species. The impacts of the project activities can be summarized as follows:

- Conversion of forest to agriculture is reduced through leakage prevention activities that increase production in existing farm bush areas of the leakage belt in the project zone, following the theory that land sparing in which high yield farming is combined with protecting natural habitats from conversion to agriculture, will have a positive effect on biodiversity (Phalan et al 2011). In the project area forest patrols will prevent deforestation and so there will be minimal loss of habitat throughout the project zone. This will benefit all forest dependent species in the project zone.
- There will be reduced deforestation in the project area from agriculture and other illegal activities so the quality and amount of this habitat and the species that are confined to it will positively benefit, especially the true primary forest specialists such as Jentink's duiker, Western red colobus and several species of birds and amphibians will benefit.
- In the leakage belt of the project zone, project land use planning activities developed with Forest Edge Communities will ensure that key corridor areas for wildlife populations are maintained thereby reducing forest fragmentation so species can move between different parts of the forest, enhancing the viability of small populations, especially species with large home ranges (e.g. forest elephant) will benefit.

Disturbance

- Small-scale mining and logging activities can result in disturbance and opening up the forest by making trails and access roads. Project activities will ensure that no illegal activities will take place inside the project area. This will benefit many species that are shy or sensitive to disturbance, including forest elephant, chimpanzees,

pygmy hippo, ungulates, or nesting birds. Water pollution from mining will be minimised which will be of direct benefit to aquatic biodiversity.

- In the leakage belt of the project zone, sustainable resource use will be promoted and key areas of importance for wildlife will be set aside through the development of land use maps and plans, thus reducing disturbance to shy and sensitive species.

Species loss

The project activities are expected to have net positive impacts on biodiversity by minimizing species loss.

- One of the most obvious and direct effects of the project activities is reduced hunting pressure in the project area (see G2.5). Species that are especially targeted by local hunters are the primates and duikers. Among the primates, especially the Vulnerable Sooty Mangabey and colobines are susceptible to hunting. This includes the Endangered Western red colobus, which is reported to be easily affected by hunting, because of their large size, conspicuous habits and relatively slow movements (Davies 1987). Besides primates, duikers are a popular source of bushmeat. They are mostly hunted using snares, and by using spotlights at night to blind them before being shot. The most common species is Maxwell's duiker and this species is also commonly hunted. Terrestrial birds also get caught using snares, including the Vulnerable White-breasted guinea fowl. In the leakage belt of the project zone communities will be involved in capacity building and information sharing events about threatened species to reduce the threats to these species from hunting activities.
- Besides the direct effects of hunting, species loss is minimized as a result of the project activities because of reduced levels of disturbance and habitat loss. These factors have been described above.

Loss of connectivity

A net positive impact of the Gola REDD project will be to enhance the long-term connectivity of the Upper Guinea forests by maintaining the connections between the three forest blocks and by linking the project area in Sierra Leone with the Gola National Forest of Liberia (see Figure 9), through community land use mapping and planning. This will greatly increase the long term viability of this globally important forest area and the threatened species it contains. Such connectivity is particularly important to enable species to maintain genetically viable populations, to facilitate species that have very large home ranges (e.g. forest elephant, leopard), and to allow migration of some species.

As described in G2, without the project there are no positive benefits for biodiversity as the forest would be gradually cut down and as a result forest dependent species (the threatened species in need of protection) would decline in numbers and be hunted. A summary of the impacts of the project activities is given in

Table 45. Overall, it is clear that the net impacts on biodiversity will be positive.

Table 45. Threats, management actions and the impact of project activities on biodiversity.

Threats	Management actions	Net positive impacts
Habitat loss and fragmentation	<ul style="list-style-type: none"> • Protecting the project area to reduce deforestation and degradation (goal 1, G3.1) • Patrols by forest rangers in the project area (goal 1, G3.1) • Education and awareness campaigns in the project zone and wider Chiefdoms (goal 2, G3.1) • Sustainable livelihood projects (goal 2, G3.1) • Land use mapping and planning with Forest Edge Communities (goal 2, G3.1) 	<ul style="list-style-type: none"> • Maintenance of forest cover • No reduction or possibly even an increase of populations of primary forest specialists
Disturbance	<ul style="list-style-type: none"> • Patrols by forest rangers in the project area (goal 1, G3.1) • Education and awareness campaigns in the project zone and wider Chiefdoms (goal 2, G3.1) • Land use mapping and planning with Forest Edge Communities (goal 2, G3.1) 	<ul style="list-style-type: none"> • Maintenance or Increase in populations of sensitive species (e.g. White necked Picathartes)
Species loss (hunting)	<ul style="list-style-type: none"> • Patrols by forest rangers in the project area (goal 1, G3.1) • Education and awareness campaigns (goal 2, G3.1) 	<ul style="list-style-type: none"> • Reduced net species loss; increase of populations of sensitive species • Reduction in hunting threats (snares, number of poachers)
Pollution from mining or forest damage from logging	<ul style="list-style-type: none"> • Patrols by forest rangers in the project area (goal 1, G3.1) • Education and awareness campaigns in the project zone and wider Chiefdoms (goal 2, G3.1) • Land use mapping and planning with Forest Edge Communities (goal 2, G3.1) 	<ul style="list-style-type: none"> • Healthy riverine systems • Intact forest canopy and understorey
Loss of connectivity	<ul style="list-style-type: none"> • Development of sustainable management plans with Forest Edge communities in key areas between project areas and the Liberian border (goal 2, G3.1) • Agriculture project to increase productivity in land that is already within the bush-fallow cycle (goal 2, G3.1) • Rehabilitation of cocoa farms in 	<ul style="list-style-type: none"> • Connectivity between large forest patches and other areas of conservation interest across the border in Liberia allowing for transnational gene flow and the maintenance of viable populations in the face of climate change

	shade grown plantations to maintain forest cover between blocks (goal 2, G3.1)	
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B1.2. Impact of project activities on High Conservation Values

Demonstrate that no High Conservation Values identified in G1.4.8.1-3 will be negatively affected by the project.

Since many of the HCVs identified in section G1.8 depend on the availability of large areas of contiguous forest, the project activities to maintain and enhance the forests of the Project Zone are expected to have a significant positive impact on HCVs. The conservation of these HCVs along with all forest-dependent biodiversity is one of the main goals of the Gola REDD project.

As significant concentrations of biodiversity in the project zone are forest-dependent they will benefit from the presence of the project. Several of the threatened and endemic species only occur in pristine lowland rainforest and are susceptible to disturbance such as hunting, forest degradation etc. Examples are the Endangered Jentink’s duiker, Gola malimbe and Western red colobus. Project activities such as forest patrols to check for illegal deforestation, hunting etc. are essential to ensure the survival of these species. In addition to the individual HCV species, the entire landscape unit of Gola Forest including threatened or rare ecosystems benefit from these project activities.

No negative impacts on HCVs are expected as a result of the project activities. The project activities do not entail any form of forest degradation or other negative impact on the forest. Some project activities may give minor disturbance, such as forest guard patrols or research activities. However these impacts are temporary and probably negligible, certainly in comparison by the disturbance that would be caused by illegal logging, mining or hunting.

Offsite negative impacts to HCVs are not anticipated as the offsite zone has a low biodiversity value (see B2.1).

Table 46. A summary of the HCVs and management actions to ensure their protection

HCV criteria	Relevance to the project	Management actions to protect HCV	Target
<p>HCV 1 Globally, regionally or nationally significant concentrations of biodiversity values</p>	<p>The project zone contains many threatened species in significant concentrations that meet the HCV1 criteria (see Table 6)</p>	<p>Patrols by forest rangers to reduce deforestation and hunting activities in the project area</p> <p>Community environmental awareness raising activities</p> <p>land use mapping and planning in the leakage belt</p> <p>Ecotourism</p> <p>Livelihood activities to increase crop productivity and maintain forest cover</p>	<p>Stable or increasing populations, stable or increasing species distribution, decreasing threat encounter rate</p>
<p>HCV 2 Globally, regionally, nationally significant large landscape –level areas where viable populations of natural populations occur in natural distribution and abundance</p>	<p>The project zone is a globally and nationally significant area and contains viable populations of naturally occurring species many of which are threatened</p>	<p>Patrols by forest rangers to reduce deforestation and hunting activities in the project area</p> <p>Community environmental awareness raising activities</p> <p>land use mapping and planning in the leakage belt to create wildlife corridors between the blocks of the project area</p>	<p>Diversity and distribution of species is maintained, forest ecosystem remains fully functioning, forest cover maintained or increases in the project area, trees showing growth</p>

<p>HCV 3 Threatened or rare ecosystems</p>	<p>The project area is a nationally significant landscape and globally recognized biodiversity hotspot</p>	<p>Patrols by forest rangers land use mapping and planning</p>	<p>Forest cover maintained or increases within and between blocks of the project area and trees are growing to full potential</p>
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B1.3. Project activities and invasive species

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 management of the project area will try to counter the spread of any invasive species, such as the shrub *Chromolaena odorata* or grasses such as *Imperata cylindrica* that have been introduced to the region by others. The following management actions with respect to invasive and non-native species are identified for the project area:

- Invasive plants. If any site is identified where there are significant numbers of exotic plant species, a simple monitoring system will be put in place to determine whether the exotic species are extending in area or receding over time. In case the exotics are found to be extending, appropriate control or eradication measures will be undertaken.
- Tree crops. Small plantations of tree crops, including oil palm, cacao and some fruit trees, have been found within the project area. These areas were farmed by local communities before the period of civil conflict but were subsequently abandoned during the war and have overgrown. These trees will be allowed to die out naturally as a result of competition with native vegetation. The situation will be monitored after five years to determine whether any further action is required.

In the leakage belt of the project zone, where livelihood activities will be implemented with the forest edge communities, the project will not use any invasive species to improve crop productivity.

B1.4. Project activities and non-invasive species

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 species that will be used in the agricultural components of the project activities will be both native and non-native species. Any non-native species that will be used in the project activities will have been tried and tested by our project partner WHH in agricultural projects in Sierra Leone to improve productivity before used in the forest edge communities (Per comm., WHH)

B1.5. Project activities and GMOs

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

The Gola REDD project will not use any GMOs in the project activities.

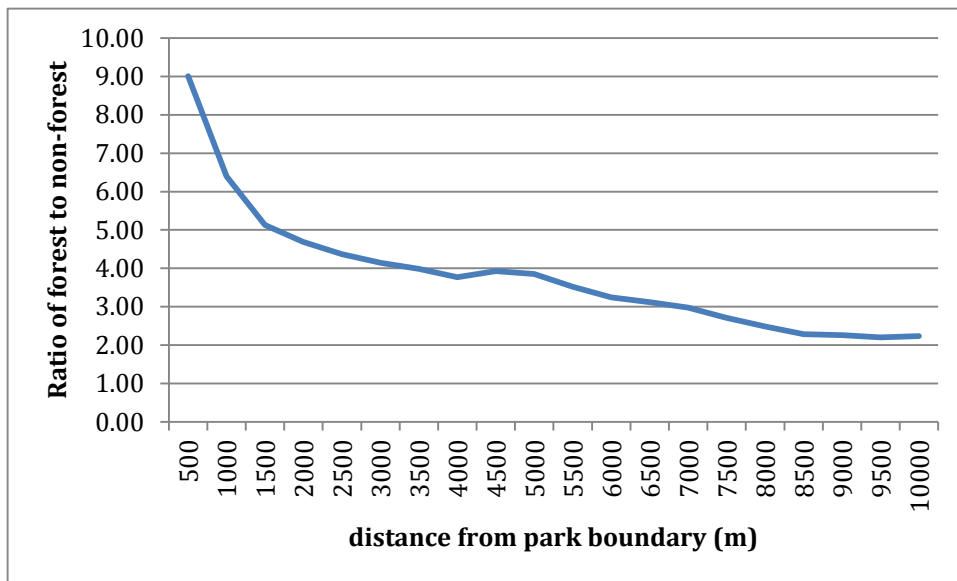
B2. Offsite biodiversity impacts

B2.1. Potential negative offsite biodiversity impacts

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

From analysis of ratios of forest to non-forest at increasing distance from the project area it is apparent that the areas of forest beyond the project zone are restricted to small patches of remnant forest, any other forest having become incorporated into the bush-fallow system (see Figure 18, Figure 19).

Figure 18. Forest to non-forest ratios with distance from the project area



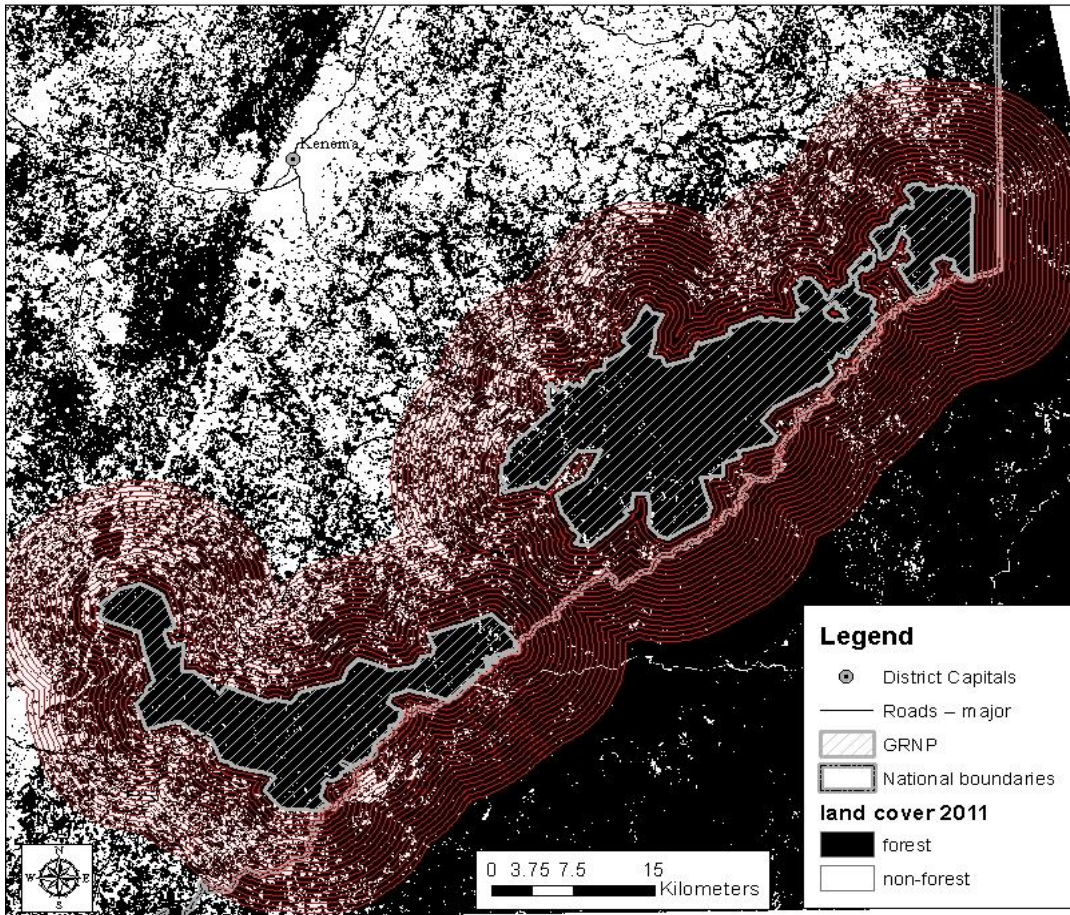


Figure 19. Forest cover in the vicinity of the project area

(red lines are at 500m intervals)

As explained in section G2.5 forest loss and fragmentation has an adverse effect on biodiversity and as a result, biodiversity in the offsite zone is already low; endangered and threatened species having long since been absent from such areas (Ganas 2009), (this is confirmed in a recent study carried out by Hillers and Mauana 2011 which looked at Pygmy hippos; offsite villages where pygmy hippos were reported to have been encountered in the past and where signs of pygmy hippos are found today has dramatically declined).

Potentially negative offsite biodiversity impacts as a result of the project could include a relocation in hunting pressure or activities that result in degradation or deforestation to the offsite zone but as any remaining forest is already significantly degraded, harvestable timber species and larger primates i.e. species with a high biodiversity value having been removed some time ago any impacts will be on species that are not threatened.

As very few people living in communities in the offsite zone were using the project area to farm in pre-conservation work (see section CM2 and Zombo et al 2012), farming activities will not be displaced to the offsite zone.

B2.2. Mitigation of negative offsite biodiversity impacts

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

Impacts on biodiversity in the offsite zone are expected to be minimal but in spite of the minimal risk to biodiversity in the offsite zone the project will engage with offsite villages for a number of activities that aim to foster support for biodiversity conservation and increase awareness of the importance of forests and biodiversity.

Discussing how the natural resource base underpins many communities' livelihoods with offsite communities via awareness raising campaigns will be a first step towards encouraging offsite villages to place a value on the preservation of forest remnants. This will be followed by the setting up of nature clubs in schools and a youth volunteer program in the offsite area (and project zone) to ensure that future generations also understand the links between forests and wellbeing.

In order to foster political support for the conservation activities the project will also continue to support community selected sustainable development projects via the community development fund that is administered by community elected committees in each of the seven Chiefdoms. Such projects can include reforestation, rehabilitation of plantations, agriculture enhancement projects or other projects that aim to enhance livelihoods in a sustainable manner thus mitigating further impacts on biodiversity.

B2.3. Demonstration of net positive biodiversity impacts

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.

Even without mitigation activities, offsite biodiversity impacts are expected to be minimal. With mitigation activities, there should not be any negative biodiversity impacts in offsite villages and monitoring over the lifetime of the project will reveal if in fact the project is able to improve the biodiversity in the offsite zone. A comparison of potential negative offsite biodiversity impacts in the offsite zone and biodiversity benefits in the project zone was made in Table 47, the overall impact on biodiversity is believed to be positive.

Table 47. Comparison of offsite biodiversity impacts against biodiversity benefits in the project area

Biodiversity impacts in the offsite zone	Biodiversity benefits in the project area	Net Positive Benefit
Possible relocation of hunting pressure (thought to have a low impact as HCV species are largely absent from the offsite zone)	No reduction and possible increase in numbers of forest specialist species as hunting threat is reduced	There is a net positive benefit to wildlife populations that are typically hunted as such species will be protected in the project area
Possible relocation of deforestation and	Maintenance of forest cover in the project area and re-	Maintaining the project area which has high species

degradation activities to the offsite zone	growth in areas that have previously been logged	diversity provides a net positive benefit as it will preserve species that no longer exist in the offsite zone
	Maintenance or increase in wildlife populations sensitive to disturbance	The project area will be managed to maintain a full compliment of species that are naturally found in an Upper Guinean rainforest ecosystem
	Healthy riverine systems	Maintaining forest cover will also help to regulate water flow and quality and thereby the biodiversity found within riverine systems

B3. Biodiversity impact monitoring

B3.1. Preliminary biodiversity monitoring plan

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 goals of the project are focused around maintaining and where possible improving forest cover and condition through out the project zone in order to maintain or increase habitat availability and connectivity for all species but in particular high conservation value forest dependent species. As described in G1.7 and G1.8, the project zone meets 3 of the criteria for high biodiversity conservation value at the species, ecosystem and landscape scales⁴¹.

The biodiversity monitoring plan therefore has been devised to monitor the progress of the project in maintaining and improving the conservation value of the project zone at the species, ecosystem and landscape scale and project activities are designed to create positive biodiversity impacts against the without project scenario (see B1). The impacts will be measured at two levels; the species level and the ecosystem and landscape level.

The selection of indicators for monitoring the outputs-outcomes and impacts of the project followed a theory of change approach, using a causal model to predict the changes attributable to the project and thereby the most relevant indicators for monitoring progress

⁴¹ The monitoring of HCV 5 and 6 can be found in CM3.2 and in the social monitoring plan for the CCB

(see Hillers and Tatum-Hume 2013). Given the species richness of the area, for some aspects of monitoring certain species have been chosen as indicators of overall biodiversity wellbeing, the indicators were selected as they reflect the overall health of the habitat or area of monitoring interest based on many years of prior conservation assessment (e.g. Klop et al 2008, Hillers 2013), see Table 48 for biodiversity indicators.

The overall impact of the project on biodiversity is intricately linked to the management and community livelihood activities of the project. The activities that will result in impacts on biodiversity are management and community related activities from the operational work of the forest rangers to the implementation of the community livelihoods programme (see Hillers and Tatum-Hume 2013).

Ecosystem and Landscape scale

The project will monitor changes in forest cover and condition as a result of project activities through out the project zone through the interpretation of satellite imagery and through ground work that monitors degradation and threats to biodiversity. A two-pronged approach will be used as remote sensing methods alone may not pick up on the finer spatial scale activities caused by degradation. Forest cover changes will be monitored through the interpretation of satellite imagery. The project will follow VCS methodologies and the approach is outlined in the VCS PD and in the VCS emissions monitoring plan. Threats to the condition of the forest will be monitored through the analysis of threat surveys that are completed by the forest rangers as they carry out their patrolling activities. The threat surveys collect data on a range of variables from visible signs of forest degradation such as tree stumps to freshly cut trails, encounters of gun cartridges, snares or mining pits. As described below the work for monitoring species will also be used as an indicator of the health of the forest at the ecosystem scale.

Species scale

Species have long been used as indicators of the health of a habitat. Species that are particularly susceptible to environmental or human disturbance, are present in the area at the beginning of the project activities and are relatively easy to encounter are those that make the most suitable indicators to monitor project attributable changes. The taxa, species and methodologies selected to monitor changes in the different habitats of the project reflect nearly 25 years of conservation research in the area carried out by the past conservation work. A diversity of species and taxa have been chosen in order to provide a broad understanding of the impact of the project on biodiversity. For example as different species will manifest changes at different rates, some species may change in distribution and abundance faster than others and may act as indicators of the beginnings of an uphill or downhill trend, this is especially true of the large bushmeat species such as Chimpanzees and pygmy hippos or those that are sensitive to disturbance such as the White necked Picathartes. Other species occupy different habitats within the forest and so by choosing a range of species we can monitor the impacts across the wider landscape e.g. pygmy hippos tend to be found along the forested margins of streams and rivers whilst Chimpanzees are found in undisturbed areas of near primary forest. As it is vital for the project management team to understand whether the operational and livelihood activities being implemented are having the desired biodiversity impacts, monitoring a wide range of species that provide

indications of impact for different forest habitats or timescales are very useful and will enable management to adapt actions as appropriate (see Table 48).

Methodologies to measure longitudinal change in population status and range through out the project zone are based on best scientific practice and follow standardised protocols for data collection and analysis. Methodologies include bird surveys and point counts, camera trap surveys, mammal transects and nest surveys and are detailed in the methodology section.

Table 48. Species indicators and justification for their inclusion

Species	Group	Justification	Methodology
All terrestrial bird and mammal species, in particular HCV species including Western Chimpanzee, Sooty Mangabey, Jentinks Duiker, Zebra Duiker, Pygmy hippopotamus, Forest elephant, White breasted Guineafowl	Birds and Mammals	These species are all HCV species and are all forest dependent species. The presence/absence and abundance of these species will provide a measure of the pressure that biodiversity is under, the health of the forest and monitor the success of protection efforts	Camera traps through out the project zone following a grid based methodology
Western red Colobus, Western pied Colobus, Diana monkey	Primates	These monkeys are not only indicators for the status of the forest habitat and for the pressure from hunting. They are also very important seed dispersers thus playing an important role in forest ecology. Furthermore, they are a diverse group with some species being dependent on relatively undisturbed forest, making them valuable indicators of forest conditions.	Primate surveys in the project area following line transect methodologies
Western Chimpanzee	Primate	This is an endangered species (HCV) under pressure from hunting and requiring large areas of suitable habitat. It is a good indicator of forest quality and disturbance	Line transect Nest surveys through out the project zone
Pygmy Hippopotamus	Mammal	This is an endangered species under threat from habitat loss and hunting. It is an indicator of	Surveys, camera traps and dung sampling through out project zone and in

		disturbance and hunting pressure	offsite zone
White-necked Picathartes	Bird	Endemic and vulnerable species (HCV). Indicator of disturbance and changes to habitat.	Nest surveys in the project zone and offsite zone
Tai toad and other species	Amphibian	Amphibians are widely recognized as excellent indicators of the health status of a forest habitat and the Tai toad is an HCV species and therefore important to monitor	Plot sampling throughout the project zone

B3.2. Preliminary High Conservation Values monitoring plan

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 (G1.4.8.1-3) present in the project zone.

As the project zone, and the project area in particular is a biodiversity hotspot and meets HCV1-3, indicators to monitor the effectiveness of measures to maintain or enhance HCV biodiversity are a central component of the biodiversity monitoring plan (see Table 49).

Table 49. Monitoring summary for HCV components of the Gola REDD project

HCV criteria	Parameter to be measured	Variable	Monitoring activities and measurement frequency	Indicators	Target
HCV 1 Globally, regionally or nationally significant concentrations of biodiversity values - threatened and endemic species	1. Species composition	1. Diversity of forest dependent bird community	Bird point counts (every 4-5 years)	Abundance and diversity of species encountered	Stable or increasing populations, stable or increasing species distribution, decreasing threat encounter rate
	2. Population structure of species	2. a. Distribution of key species 2.b Abundance of key species	Camera traps, transect and plots surveys, nest surveys (every 1-5 years)	Abundance and diversity of species encountered	
	3. Species threat	3. Threat encounters	Threat encounter surveys (ongoing, monitored by the Operations team)	Number of cartridges and snares found in project area	
HCV 2 Globally, regionally, nationally significant large landscape –level areas where viable populations of natural populations occur in natural distribution and	Ecosystem condition	Diversity and distribution of forest dependent birds and mammals	Camera traps, bird point counts, primate surveys (every 2-5 years)	Abundance and distribution of species encountered (reflecting the health of the forest)	Stable or increasing populations, stable or increasing distribution of species

abundance					
HCV 3 Threatened or rare ecosystems	Ecosystem integrity	1. Forest cover 2. Forest enhancement	1. Interpretation of satellite images (before every verification event) 2. Vegetation surveys (before every verification event)	Change in forest cover and connectivity between forest blocks of the project area Changes in above ground biomass	Forest cover maintained or increases within and between blocks of the project area and trees are growing to full potential

B3.3. Development of comprehensive biodiversity monitoring plan

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.

A full biodiversity monitoring plan has been developed (Hillers and Tatum-Hume 2013) and standard operating procedures are under development and will be available upon request to the auditing team. Once finalized, the plan and the monitoring results as they are gathered will be placed on the projects website (www.golarainforest.org) and disseminated to stakeholder groups via relevant meetings and forums. The Community Development Relations Officers will be responsible for disseminating the monitoring plan to FECs (especially highlighting when and why monitoring is carried out within the leakage belt) and the results of the field monitoring as it develops (see the Communication strategy for CDROs with FECs in the FEC communications folder in the appendices of Tatum-Hume et al 2013)

Gold level section

GL1. Climate change and adaption benefits

GL1.1. Anticipated local climate change scenario

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.

Climate Scenarios for Sierra Leone

According to the National Adaptation Plan of Action (NAPA) for Sierra Leone, the most likely climate change scenario for the country is an increase in average temperature of 6-9% by 2100, a reduction in rainfall, changes to rainfall patterns and an increase in extreme weather events including drought, strong winds, thunderstorms, landslides, heat waves, floods, and intense seasonal rainfall, amongst others (NAPA 2008). This is confirmed also in more recent modeling work reported in the second National Communication on Climate Change to the UNFCCC (2012) which used climate data from 1961 to 1990 to construct climate change scenarios for the country based on GCM, HADCM, UKTR, ECHAM modeling.

During discussions with local residents around the GRNP to understand communities perceptions of changes in weather and it's impacts on their livelihoods many villages reported that the seasons have been changing and they are experiencing more rain in the dry season and more erratic weather patterns overall (Witkowski et al 2012b). Unpredictable changes in rainfall patterns and the onset of the rainy season affects a farmers ability to clear land to farm, to predict when the best time is to plant seed and harvest seed as well as the growth of the crop; effects can be both positive and negative but between 2007 and 2009, more negative shocks than positive were reported by surveyed forest edge communities (Bulte et al 2013).

Potential impacts of future scenarios

Sierra Leone is ranked 177 out of 187 countries on the Human Development Index (UNDP 2013). Since gaining independence in 1961 it has struggled to achieve socio-economic stability; the decade long period of internal conflict from 1992-2002 destroyed much of the country's economic and physical infrastructure in addition to affecting the nation's human capital. Sierra Leone is likely to experience multiple impacts from climate change in different sectors of the economy and sections of society and in the Climate Change Vulnerability Index (that analyses climate change vulnerability down to 25km² worldwide), is ranked in the top 10 countries at 'extreme risk' (Maplecroft 2011).

Changes in climate are expected to affect both the quantity and quality of water, land and soil resources. Ecosystem services are critical for Sierra Leone as agriculture is the largest sector of the economy and provides employment for over 65% of the labour force (National Communication on Climate Change 2012). As rice is the staple food crop in Sierra Leone grown by small scale farmers under rain-fed conditions, changes in rainfall patterns, intensity or amount will have significant impacts on agricultural productivity and livelihoods and indeed impacts are already being experienced (National Communication on Climate Change

2012). In addition, changes in the length of the growing season or in the range of pests could prove devastating for crops and negatively impact production stability. If agricultural yields decline, there will be a significant resultant impact on food security, income and health for small holder farmers in Sierra Leone. Resultant fluctuations in food prices and trade will also impact small holder farmers. Combined, these impacts will serve to exacerbate poverty (National Communication on Climate Change 2012; p157).

Despite the abundant water resources, access to safe drinking water is very limited as a result of unavailable or limited functional infrastructure for water supply. Today only about 32% of the rural population has access to a reliable water supply.

Changes in rainfall patterns and intensity will also have an impact on water supply as despite the country having fairly abundant water resources, access to safe drinking water is very limited due to the lack of functional infrastructure; only about 32% of the rural population has access to a reliable water supply (National Communication on Climate Change 2012; p159). Shortages in water availability for consumption as well as productivity are likely resulting in outbreaks of pests and disease whilst heavy rain and strong winds may cause damage to crops and standing forests.

Increases in temperature and a drying climate are also likely to cause shifts in the range and composition of species, which will affect both biodiversity and carbon stocks (Faucet et al 2012).

The anticipated biophysical and socio-economic impacts combined with very low levels of human (information, knowledge, health), physical (technology, infrastructure), social (policies, institutions) and financial capital to mitigate or respond to those impacts make Sierra Leone highly vulnerable to climate change.

Potential changes in local land use scenarios

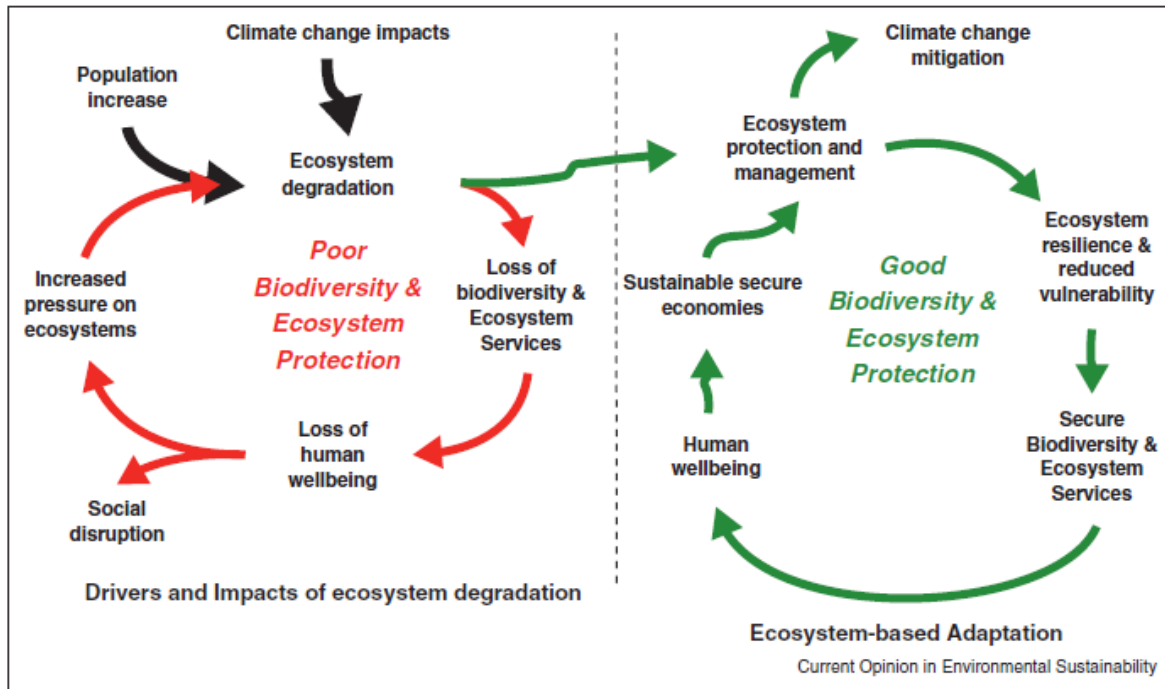
Ninety percent of people in forest edge communities depend on subsistence agriculture. As discussed above, this sector is highly vulnerable to climate change as it is based on rain-fed farming (NAPA 2008) and the ecosystem services that underpin food production (Munang 2013). Without the project, there will be no action towards conserving forest resources and ecosystem services in the project area, no capacity building in sustainable agricultural practices and environmental awareness with forest edge communities and no land use planning in the project zone leading to the continued uncontrolled conversion of forests to the farm bush cycle and extensive ecosystem degradation. Ecosystem degradation undermines food production and results in ecosystems becoming less stable and less able to withstand shocks and pressures and consequently declines in the delivery of key ecosystem services are experienced (Munang et al 2013b). This would undermine food production, the availability of clean water, and soil fertility, amongst other services, thereby threatening human health and livelihoods. Farmers in forest edge communities rely on soil micro-organisms to maintain soil fertility and on wild species for crop pollination; such services are often undervalued (TEEB 2010). Unpredictable changes in rainfall patterns will result in a disruption to the farming calendar causing lower productivity and yields. As farming is the main source of income, farmers may clear more forests to farm or try to further exploit forest resources such as timber and minerals to gain cash income; both scenarios would result in further loss of forest. Fragmented and degraded forests are more susceptible

to impact from fire as they are drier and carry higher fuel loads (Laurence 2003) and so a cycle of ecosystem degradation similar to that seen in the left of will ensue.

Figure 20 will ensue.

Figure 20. Impacts with and without ecosystem-based adaptation

(source; Munang 2013)



GL1.2. Community and biodiversity impacts of local climate change

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.

Climate change is not believed to be a risk to project benefits as the management activities that will be introduced by the project in the project area and leakage belt focus on effective conservation management of forest resources and ecosystem services, and sustainable land use planning and agricultural practices respectively (see G3.1) which will help maintain forest cover in the project area and increase connectivity between all the forested areas in the project zone and between the project zone and the forests across the border in Liberia. These activities are designed to reduce climate exposure and sensitivity as they will improve the management of natural resources while protecting the biodiversity values and ecosystem services that contribute to communities’ livelihoods and ensuring that habitat connectivity is maintained.

Climate

As a result of a drying climate, a possible risk for the climatic benefits of the project could result from an increase in fire disturbance leading to carbon flux. The project will therefore be mitigating such risk firstly by maintaining maximum forest cover in the project area which will help maintain moisture in the forest system thereby reducing fire risk. Secondly, through using an early warning system to alert the management team to fires in or close to the project zone and thirdly by raising awareness with forest edge communities about strategies to reduce fire risks and by maintaining corridors between forest blocks to reduce the risk of fragmentation and therefore susceptibility to fire (Cochrane 2001).

Community

The risk for the communities in the project zone is if the climate change impacts lead to the socio-ecological system becoming locked in to the left-hand part of the cycle displayed in will ensue.

Figure 20. As local people have a strong reliance on the services the forest provides (hydrological regulation, soil quality) and reliance on rain-fed agriculture the project intends to incorporate the principles of an ecosystem-based approach for adaptation (Andrade et al 2011) to conserving forest because healthy ecosystems are more resilient. Maintaining healthy forest ecosystems will help maintain hydrological regulation during extreme events, help maintain the regulation of micro-climates vital for coffee and cocoa production, and ensure the continued provision of alternative food sources and NTFPs. Project objectives that result in sustainable natural resource management in the project area and project zone via co-management and land-use planning activities will therefore strengthen community knowledge and governance over forest resources that underpin their adaptive capacity and mitigate community risk to climate change.

As agriculture is the primary livelihood activity in forest edge communities, project activities will enhance food security, income generation and soil fertility through increased technical assistance to improve cultivation techniques in both staples and cash crop agriculture and post-production storage.

Biodiversity

For biodiversity benefits, the risk is that climate change will impact on the diversity of species able to live in the project zone if a drying climate or temperature increases contract the range that some species, particularly amphibians are able to survive in. Already the project zone contains species that are endangered and meet vulnerability and irreplaceability criteria (see GL3.1 and GL3.2), the risk for these species is therefore that their habitat ranges may become so limited that viable populations cannot be maintained. To minimize this risk project activities focus on maintaining large areas of forest and in maintaining and enhancing the connectivity between forest which will enable species to find different micro-climates and altitudinal gradients that will enable the site to serve as a refuge for migrating and permanent species.

Incorporating the principles of an ecosystem-based adaptation approach will enable the project to harness 'the capacity of nature to buffer human communities against the adverse impacts of climate change' (Munang et al. 2013:2) and create an ecosystem resilient to climatic impacts (Munang 2012). The Gola REDD project activities will therefore stabilize

and mediate predicted climate change impacts by conserving and enhancing the biodiversity and ecosystem services that underpin local livelihoods.

GL1.3. Identification and mitigation of risks to community and biodiversity benefits

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.

Forest edge communities already face multiple constraints to development (see G1.5). Climate change will exacerbate these existing rural development challenges, particularly as rural communities do not have the resources to switch to alternative livelihood strategies. Likewise, the project zone remains the last stronghold for a number of endangered species in Sierra Leone (see GL3.1 and GL3.2) and climate change will negatively impact on the conservation status of these species. Bioclimatic envelope models highlight the importance of the project area as a site for maintaining viable populations of species (Hole et al. 2011) in the face of climate change. The anticipated impacts of climate change are summarized in Table 50.

Table 50. Summary of anticipated climate change impacts on Communities and Biodiversity

Anticipated Biophysical Climate Change Impacts	Impact on Community (CO) and Biodiversity (BD)
Changes in micro-climate especially rainfall and temperature	<ul style="list-style-type: none"> • Disruption of agricultural calendar, disruption of production stability, and lower yields of staple food crops such as rice, resulting in an impact on food security. Lower productivity will also mean households have less produce to sell resulting in a lower income, both factors are likely to result in malnutrition and therefore affect health (CO) • Shifting pattern in the distribution of trees and wildlife populations (BD) • Altered prevalence or spatial distribution of some infectious disease vectors (CO) • Changes in the range and distribution of agricultural pests and diseases (CO) • Negative impact on coffee and cocoa production resulting in reduction in income (CO)
Erosion from increased and heavier rainfall	<ul style="list-style-type: none"> • Sedimentation of streams and water supply leading to a loss in fish biodiversity and availability affecting protein availability for local people (BD, CO) • Nutrient leaching and loss of soil fertility affecting crop productivity (CO)
Increased frequency and severity of extreme weather events e.g. storms and droughts	<ul style="list-style-type: none"> • Increase in disease and deaths (CO) • Increase in economic damage (through crop failures or destruction) (CO)
Ecosystem degradation	<ul style="list-style-type: none"> • Changes in the quantity and quality of land, water and soil resources (CO)

	<ul style="list-style-type: none"> • Loss of suitable habitat resulting in biodiversity loss (BD)
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GL1.4. Project activities that assist local communities to adapt to climate change

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

Forests provide a rich source of natural capital for local communities; in essence they provide essential ‘life support systems’ i.e. ecosystem services, that people depend on. Healthy, fully functioning ecosystems are more resilient to climate change stresses and therefore enhance resilience to climate change impacts (Munang et al 2013). As mentioned, project activities are designed to reduce climate exposure and sensitivity as they will protect the natural resources, biodiversity values and ecosystem services that underpin communities’ livelihoods ensuring that habitat connectivity is maintained.

Assessment of FEC vulnerability to climate change has been through informal discussions with community members to date, future activities will therefore include a more formal participatory approach and awareness raising to assist communities in understanding future impacts and to encourage the adoption of activities to mitigate those impacts. Activities such as the promotion of Savings and Internal Lending Communities (to increase financial capital within forest edge communities for alternative economic activities), implementation of sustainable and conservation agriculture techniques (to improve food security and soil fertility), environmental awareness building and co-management (to create local resource ownership and resilient institutions), can reduce the sensitivity and/or enhance the adaptive capacity of communities; a summary of how the project activities will assist both biodiversity and communities to adapt is found in Table 51.

Table 51. Summary of how project activities will assist communities and biodiversity to adapt to climate change

Anticipated Climate Change	Impact on Climate (CL), Community (CO) and Biodiversity (BD)	Impact of project activities	Result
Changes in micro-climate especially rainfall and temperature	<ul style="list-style-type: none"> • Disruption of agricultural calendar and lower productivity in staple food crops such as rice (CO) • Negative impact on coffee and cocoa production resulting in reduction in income (CO) • Shifting pattern in the distribution of trees and wildlife populations (BD) • Changes in the range and distribution of agricultural pests and diseases (CO) 	<ul style="list-style-type: none"> • Awareness raising of climate change and adaptive agricultural techniques • Broaden income generating options available to forest edge communities so not dependent solely on sustainable agriculture • Maintenance of corridors between forest blocks to allow species to migrate as climate changes • Improved agricultural techniques and integrated pest management reduce impact of agricultural pests 	<ul style="list-style-type: none"> • Enhanced resilience to effects of climate change • Reduced vulnerability to climate change through increased adaptive capacity, decreased sensitivity, and reduced exposure • Improved adaptation to predicted impacts of climate change
Erosion from increased and heavier rainfall	<ul style="list-style-type: none"> • Sedimentation of streams and water supply (BD, CO) • Loss of soil fertility (CO) 	<ul style="list-style-type: none"> • Land use planning to avoid the conversion of inappropriate areas for agriculture • Promotion of methods to improve soil fertility (e.g. use of legumes, maintaining canopy to reduce run-off, maintaining root systems to divert and encourage infiltration etc) 	
Increased frequency and severity of extreme weather events e.g. storms and droughts	<ul style="list-style-type: none"> • Increase in disease and deaths (CO) • Increase in economic damage (through crop failures or destruction) (CO) 	<ul style="list-style-type: none"> • Increased incomes enable families to access health care • Improved agricultural techniques and livelihood diversification reduce vulnerability and enhance resilience 	
Ecosystem degradation	<ul style="list-style-type: none"> • Changes in the quantity and quality of land, water and soil resources (CO) • Loss of suitable habitat resulting in biodiversity loss (BD) 	<ul style="list-style-type: none"> • Enhanced agricultural techniques, institutions and knowledge help people maintain quality and compensate for changes in quantity of resources • Maintenance of corridors between forest blocks to 	

		allow species to migrate as climate changes • Research and monitoring efforts allow for adaptive management of GRNP	
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GL2. Exceptional community benefits

GL2.1. Human Development ranking

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.

The project zone is located in Sierra Leone, which in 2012 was ranked 177 out of 187 countries on the Human Development Index (UNDP 2013).

GL2.2. Project benefits to the lowest 50% of households

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.

The Gola REDD project is not seeking a gold level in community benefits. The project activities are not targeted to the poorest quartile of a community for a number of reasons. Firstly, from the PRA work, it was noted that there is great reluctance amongst community members to rank themselves in terms of well-being, they all consider themselves to be poor and want to be involved in the project activities (and introducing a targeted activity that is not approved by the community was not considered a viable option). Secondly it is considered that poorer households tend to be more risk adverse in their livelihood strategies and would therefore be unwilling to adopt any new techniques introduced by the project activities until they have been tried and tested by other community members. Poorer households, identified as being 'strangers' or female headed households are therefore likely to benefit in the medium term as new farming techniques, training and SILC groups expand and are taken up by the wider community, although as described in GL2.3 some special measures have been incorporated into livelihood activities.

GL2.3. Barriers to project benefits reaching the poorer households

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.

Project activities have taken into account the fact that poorer households tend to be more risk adverse and have time constraints to their involvement in livelihood activities. Special measures have therefore been introduced into the farming activities (crops and cocoa) to include poorer households in the short term (see activity descriptions in Tatum-Hume and Witkowski 2013). As described above in the medium to longer term it is anticipated that poorer households will uptake on activities once they have been tested by other households.

GL2.4. Identification and mitigation of negative impacts from project to poorer households

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.

As outlined in G1.5, the poorer households in forest edge communities are more likely to be either stranger-headed households or female-headed households as they have less ability to access good areas of land for farming. PRA did not identify these same households as more frequently accessing the project area to farm. Livelihood activities have been designed to ensure that these poorer households are involved in the livelihood activity, for example in the agricultural activity, through the provision of seed inputs to 2 poorer households from each forest edge community (one female headed and one male headed where possible). An agreement will be developed between the landless farmer and the landowner he rents land from to ensure the farmer has access to a piece of land to grow the rice seed. Once the rice has been harvested the landless farmers will pass the same amount of seed to another landless farmer within the village with a similar agreement in place. (NB It is not considered appropriate to directly target these households for their involvement in Farmer Field Schools due to the time constraints these families often have).

GL2.5. Effectiveness of community impact monitoring with focus on poorer households and women

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.

The community impact monitoring will include households with both stranger-headed and female-headed households to monitor the long-term impact of the project on these groups.

GL3. Exceptional biodiversity benefits concept

GL3.1. Vulnerability

Vulnerability Regular occurrence of a globally threatened species (according to the IUCN Red List) at the site.

GL3.1.1. Critically endangered and endangered species

Critically Endangered (CR) and Endangered (EN) species – presence of at least a single individual

1 Critically endangered species and 8 endangered species are present within the project site. More than 1 individual of each species are present (

Table 52).

Table 52. Endangered and critically endangered species present in the project site

Gola Malimbe	<i>Malimbus ballmanni</i>	Endangered
Hooded Vulture	<i>Necrosyrtes monachus</i>	Endangered
Western red colobus	<i>Procolobus badius</i>	Endangered
Western chimpanzee	<i>Pan troglodytes verus</i>	Endangered
Pygmy hippopotamus	<i>Choeropsis liberiensis</i>	Endangered
Jentink's duiker	<i>Cephalophus jentinki</i>	Endangered
	<i>Phrynobatrachus annulatus</i>	Endangered
	<i>Hylarana occidentalis</i>	Endangered
Tai toad	<i>Amietophrynus taiensis</i>	Critically endangered

G3.1.2. Vulnerable species

Vulnerable species (VU) - presence of at least 30 individuals or 10 pairs.

The Gola REDD Project believes it can achieve the criteria laid out in the optional criteria GL3 'Exceptional Biodiversity Benefits' to achieve Gold Level status, on the basis of meeting the criteria for "vulnerability" as described. In addition, the criteria for "irreplaceability" are also met. The project zone is home to several threatened species, some of which occur in good numbers. This makes the project zone a key site for the conservation of these species.

Vulnerability

The project zone is listed as an Important Bird Area (Fishpool & Evans 2001) and is part of the Upper Guinea Forest biodiversity hotspot defined by Conservation International (Myers et al 2001). Based on these criteria, the project zone is classified as a Key Biodiversity Area (KBA) (Langhammer et al. 2007).

Mammals

Over 40 species of large mammal are known to occur in the project zone (Lindsell et al. 2011), of which four species are listed as Endangered and five species as Vulnerable. The three primates that are considered Vulnerable are all widespread and common within Gola. The numbers of Zebra and Jentink's duiker are currently unknown as this is a very furtive species that is difficult to survey, but work using camera traps will help overcome this problem during future monitoring activities. African forest elephant is now very rare in Gola and probably does not meet the threshold of 30 individuals. Approximate numbers of Pygmy hippos are thought to be between 100 and 150 individuals (pers.comm. Annika Hillers). The project therefore meets the vulnerability criteria for endangered and vulnerable mammal species.

Table 53. Threatened mammals recorded in the project zone

Based on Lindsell et al. (2011). Status refers to the 2011 IUCN Red List Category, updated from www.iucnredlist.org.

English name	Scientific name	IUCN status	Numbers in PZ
Western pied colobus	<i>Colobus polykomos</i>	Vulnerable	5000 – 8000
Western red colobus	<i>Piliocolobus badius</i>	Endangered	10,000 – 20,000
Sooty mangabey	<i>Cercocebus atys</i>	Vulnerable	2000 – 15,000
Diana monkey	<i>Cercopithecus diana</i>	Vulnerable	15,000 – 45,000
Chimpanzee	<i>Pan troglodytes verus</i>	Endangered	<500
Pygmy hippopotamus	<i>Choeropsis liberiensis</i>	Endangered	Est 100-150
Jentink's duiker	<i>Cephalophus jentinki</i>	Endangered	To be confirmed
Zebra duiker	<i>Cephalophus zebra</i>	Vulnerable	To be confirmed
African forest elephant	<i>Loxodonta cyclotis</i>	Vulnerable	<50

Birds

As described in section G1.7, the project zone is listed as an Important Bird Area (Fishpool & Evans 2001) and holds a high proportion of the threatened and endemic species of the region. In

Table 54 all threatened bird species that occur in Gola are listed. One species is listed as Endangered, i.e. Gola malimbe. This species seems to be extremely localized within the Central block of the project area. In addition, six species are listed as Vulnerable. Of these species, White-breasted guineafowl, Rufous fishing-owl, Yellow-bearded greenbul and White-necked picathartes have a wide distribution within the project zone, although not necessarily in high densities. The guineafowl, greenbul and picathartes certainly meet the threshold of 30 individuals or 10 pairs; for the fishing-owl this is also likely but its numbers are difficult to assess. Although the Western wattled cuckoo-shrike and Nimba flycatcher

seem to be very rare in Gola and may not meet the abovementioned thresholds, overall the project meets the vulnerability criteria for endangered and vulnerable bird species.

Table 54. Threatened birds recorded in Gola Forest.

Status refers to the 2011 IUCN Red List Category; data are from BirdLife International (2011), updated from www.birdlife.org/datazone/species/index.html. The threshold refers to the GL3.1 threshold of at least 30 individuals or 10 pairs.

English name	Scientific name	IUCN status	Population above threshold?
White-breasted Guineafowl	<i>Agelastes meleagrides</i>	Vulnerable	Yes
Rufous Fishing-Owl	<i>Scotopelia ussheri</i>	Vulnerable	Yes
Western Wattled Cuckoo-shrike	<i>Lobotos lobatus</i>	Vulnerable	No
Yellow-bearded Greenbul	<i>Criniger olivaceus</i>	Vulnerable	Yes
Nimba Flycatcher	<i>Melaenornis annamarulae</i>	Vulnerable	No
White-necked Picathartes	<i>Picathartes gymnocephalus</i>	Vulnerable	Yes
Gola Malimbe	<i>Malimbus ballmanni</i>	Endangered	n/a

Amphibians and reptiles

Gola Forest is home to over 40 species of amphibians (Hillers 2009), of which four species are currently considered threatened (**Table 55**). In addition, one reptile (African dwarf crocodile *Osteolaemus tetraspis*) is listed as Vulnerable.

Table 55. Threatened amphibians recorded in Gola Forest.

By Hillers (2009). Status refers to the 2011 IUCN Red List Category, updated from www.iucnredlist.org.

Species	IUCN status	Population above threshold?
<i>Amietophrynus taiensis</i>	Critically endangered	n/a
<i>Conraua alleni</i>	Vulnerable	n/a
<i>Phrynobatrachus annulatus</i>	Endangered	n/a
<i>Hylarana occidentalis</i>	Endangered	n/a

GL3.2. Irreplaceability

Irreplaceability. A minimum proportion of a species' global population present at the site at any stage of the species' lifecycle according to the following thresholds:

GL3.2.1. Restricted range species

Restricted-range species - species with a global range less than 50,000 km² and 5% of global population at the site; or

Globally significant source populations - 1% of the global population at the site

Irreplaceability

Besides the “vulnerability” criteria, the Gola REDD Project also meets the criteria for “irreplaceability”. As described above, several species found in the project zone have an extremely localized global distribution. Although exact population sizes of many species are unknown, *at least* the following species are believed to meet several of the “irreplaceability” criteria.

Table 56. Species meeting the ‘irreplaceability’ criteria

Species	Irreplaceability criteria	References
Pygmy hippopotamus	2.4, possibly 2.1	Lindsell et al (2011), Hillers & Muana (2011) http://www.iucnredlist.org/details/10032/0
White-breasted Guineafowl	2.1, 2.4	Klop et al (2010), http://www.birdlife.org/datazone/speciesfactsheet.php?id=306
Rufous Fishing-Owl	2.1, 2.4	Klop et al (2010), http://www.birdlife.org/datazone/speciesfactsheet.php?id=2234
White-necked Picathartes	2.1, 2.4	Monticelli et al (2011), http://www.birdlife.org/datazone/speciesfactsheet.php?id=6263
Gola Malimbe	2.1, 2.4	Klop et al (2010), http://www.birdlife.org/datazone/speciesfactsheet.php?id=8560
<i>Phrynobatrachus nov. sp.</i>	2.1, 2.4	Hillers (2009)
<i>Amietophrynus taiensis</i>	2.1, 2.4	Hillers (2009)

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Annex 1. List of project reports (supplied to the auditor as appendices)

Reports

Climate Focus. 2011. Gola Forest REDD project, Analysis of legal issues.

Cuni-Sanchez, Aida. 2012a. Ground truth survey work in the reference region report

Cuni-Sanchez, Aida. 2012b. Forest Edge Communities of the Reference Region report

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Witkowski, Kelly, Abdulai, Bob, Zombo, Joseph, Zombo, Moses, Navo, Samuel, Katua, Jenkins, Musa, Amara, Senesie, Peter. 2012b. FEC Focal Group Report

Witkowski, Kelly, Kanneh, Fomba, Tatum-Hume, Emma. 2012c. Gola REDD project context report

Zombo, Joseph, Abdulai, Bob, Witkowski, Kelly. 2012. Offsite Village survey report

Other files

Baseline Carbon Calculations – Excel file

GRNP. 2013. List of published and unpublished ecological research from the project zone

Project boundaries - KMZ file

Reference region calculations – Excel file

Financial Analysis (confidential file)

Project Agreements (confidential file)

Project HR files (staff handbook, employment policy, templates etc)

Standard operating procedures for measuring carbon stock enhancement