



KARIBA REDD+ PROJECT MONITORING REPORT 2011-2012



In partnership with the landowners:

Binga RDC

Hurungwe RDC

NyamiNyami RDC

Mbire RDC

Document Prepared By

South Pole Carbon Asset Management Ltd.



Project Title	<i>Kariba REDD+ Project</i>
Version	<i>8</i>
Report ID	<i>Identification number of this document</i>
Date of Issue	<i>16 August 2013</i>
Project ID	<i>902</i>
Monitoring Period	<i>1 July 2011 to 30 June 2012</i>
Prepared By	<i>Tilmann Silber</i> <i>Florian Reimer</i> <i>Yougha von Laer</i>
Contact	<i>Technoparkstrasse 1</i> <i>8005 Zurich</i> <i>Switzerland</i> <i>Phone: +41 43 501 35 50</i> <i>Fax: +41 43 501 35 99</i> <i>www.southpolecarbon.com</i>

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1 PROJECT DETAILS

1.1 Summary Description of Project

The Kariba REDD+ Project is located in northwestern Zimbabwe, partly along the southern shore of Lake Kariba, the largest artificial lake in the world by volume. The project area of 784'987 hectares of forest (consisting of woodland and open woodland) spans four provinces: Matabeleland North, Midlands, Mashonaland West and Mashonaland Central. The project is administered by four Rural District Councils (RDCs): Binga, Nyaminyami, Hurungwe and Mbire.

The project is community-based and consists of implementation of activities in conjunction with the local population. The project, which started on July 1st, 2011 will generate a total of around 196'513'929 carbon credits from the reduction of deforestation. Additional carbon benefits resulting from stopping degradation will not be claimed. The main causes of deforestation are socio-economic (subsistence agriculture, the collection of firewood and poaching activities) and settlements. Decreasing deforestation will be achieved through a series of activities that are designed to improve significantly the livelihoods of locals, such as improved agriculture, beekeeping, fuelwood plantations and fire management. In addition, a significant share of the project's carbon income will be invested in general activities that promote and guarantee project sustainability. The project's Community and Project Sustainability Fund is structured to benefit whole communities, specifically including the poorest members of society. The fund will be used to improve health and education in the project area due to long term activities.

The project area lies within the Zambezian biome of the Zambezi basin.¹ The major ecosystem includes mopane and miombo woodland. The project area is an important wildlife area, showing significant populations of African elephants, lions, impalas, hippos, buffalo, leopard and crocodiles, along with a wide variety of birds, including the IUCN red list vulnerable species Southern Ground Hornbill, Lappet-faced Vulture, and White-headed Vulture.

In the past, the natural resources of the project areas supported significant populations of wildlife, including elephants, which, in turn, supported a variety of tourism and safari activities. However, the economic and political crises over the past decade led to a decrease in tourism. Poaching also escalated in the project area. As a result, wildlife populations have been severely reduced.

There is no significant income to offset the cost of the activities to mitigate deforestation without carbon revenues. In the absence of active protection that creates sustainable economic alternatives for communities, the land in the project area will be cleared for non-sustainable alternative land-use scenarios.

The project boundary includes CO₂ emissions in the project and the baseline scenario and includes the following carbon pools:

- Above-ground (large & small) tree biomass

¹Timberlake, J. (2000), Biodiversity of the Zambezi basin. Occasional Publications in Biodiversity No. 9, Biodiversity Foundation for Africa, Bulawayo, Zimbabwe. Available online under http://www.biodiversityfoundation.org/documents/BFA%20No.9_Zambezi%20Basin%20Biodiversity.pdf.

- Above-ground non-tree (shrub) biomass
- Below-ground (large-and small) tree biomass
- Below-ground non-tree (shrub) biomass
- Standing dead wood
- Long-lived wood products

The carbon pool soil is selected in the project's PD, but is conservatively excluded for the first monitoring period. Long-lived wood products have been proven and validated² to not occur in the project area and are therefore not monitored. Biomass of large and small trees is not separated as discussed in the PD, section 2.3.

1.2 Sectoral Scope and Project Type

This is an AFOLU REDD project that aims to avoid mosaic deforestation and degradation. The project is not a grouped project.

1.3 Project Proponent

Carbon Green Investments (Guernsey)
18-20 Le Pollet Street
St. Peter Port
Guernsey
UK, GY1 1WH

1.4 Other Entities Involved in the Project

Entity Involved	Contact Information	Roles/Responsibilities
South Pole Carbon Asset Management (South Pole)	Technoparkstrasse 1 8005 Zurich Switzerland Phone: +41 43 501 35 50 Fax: +41 43 501 35 99 www.southpolecarbon.com	South Pole elaborates and oversees the development of appropriate project design and monitoring techniques in line with the guidelines of the VCS and CCBS. South Pole is a globally active carbon project developer and consultant with a long and successful track record working on forestry-based carbon projects. In 2011 and 2012, South Pole was elected the Best Project Developer of the Voluntary Carbon Markets. ³
Environment Africa (EA)	www.environmentafrica.org	EA implements activities that protect forested wilderness areas. EA is an

² See PD, section 2.4.6.4.

³<http://envirofinance.wordpress.com/2011/02/11/whatever-happened-to-jp-morgan/>

		NGO working in Southern Africa, which contributes its expertise and experience to the community engagement side of the project.
Black Crystal Consulting (Black Crystal)	http://blackcrystal.co.zw/	Black Crystal supports the biodiversity component of the project and is involved in the on-the-ground assessment of carbon stocks. It is a Zimbabwean environmental consultancy agency with a long track record in working with natural resources in Zimbabwe and neighboring countries.

1.5 Project Start Date

The project start date is July 1st, 2011.

1.6 Project Crediting Period

The project crediting period is 30 years. The start date of the crediting period is July 1st 2011, the end date is June 30th 2040.

The implementation of the management structure and activities addressing the deforestation drivers (protection plans) began on, as well partially before, July 1st, 2011 together with the associated investments. These investments refer to research, fieldwork and capacities conducted by Black Crystal and Environment Africa and further to management and protection work such as reporting, communication, capacity and control activities. In addition, all bilateral agreement for the verified emission reductions between CGI and the RDC have been signed before the project start date, in March 2011 (for Binga, Hurungwe, Mbire and Nyaminyami). Supporting documentation has been provided separately to the auditor at project validation.

The baseline is reassessed every 10 years after the project start date and during the crediting period and is validated at the same time as the subsequent verification. The baseline will thus be re-assessed latest after June 30th 2021 and re-validated at the same time the monitoring period July 1st 2021 to June 30th 2022 is verified.

1.7 Project Location

The *Kariba REDD+ Project* is located in northwestern Zimbabwe, partly along the southern shore of Lake Kariba, the largest artificial lake in the world by volume. The project area spans four provinces: Matabeleland North, Midlands, Mashonaland West and Mashonaland Central. The project is administered by four Rural District Councils (RDCs): Binga, Nyaminyami, Hurungwe and Mbire. The project is community-based and implements activities in conjunction with the local population. As the affected communities all live within the boundaries of the project area, the

project zone equals the project area in this project. A brief description of the four participating RDCs is given below.

Binga

The Binga RDC area is located in the Matabeleland North province. It has a forest cover of 157'652.5 hectares and encompasses a prime wildlife area that includes 22 kilometers of Lake Kariba's shoreline. It serves as a corridor, connecting the Chizarira National Park, the Omay South Wildlife Area and the Matusadona National Park. The resulting area makes for a vast and contiguous wildlife area that is roughly 900'000 ha in size.

Nyaminyami

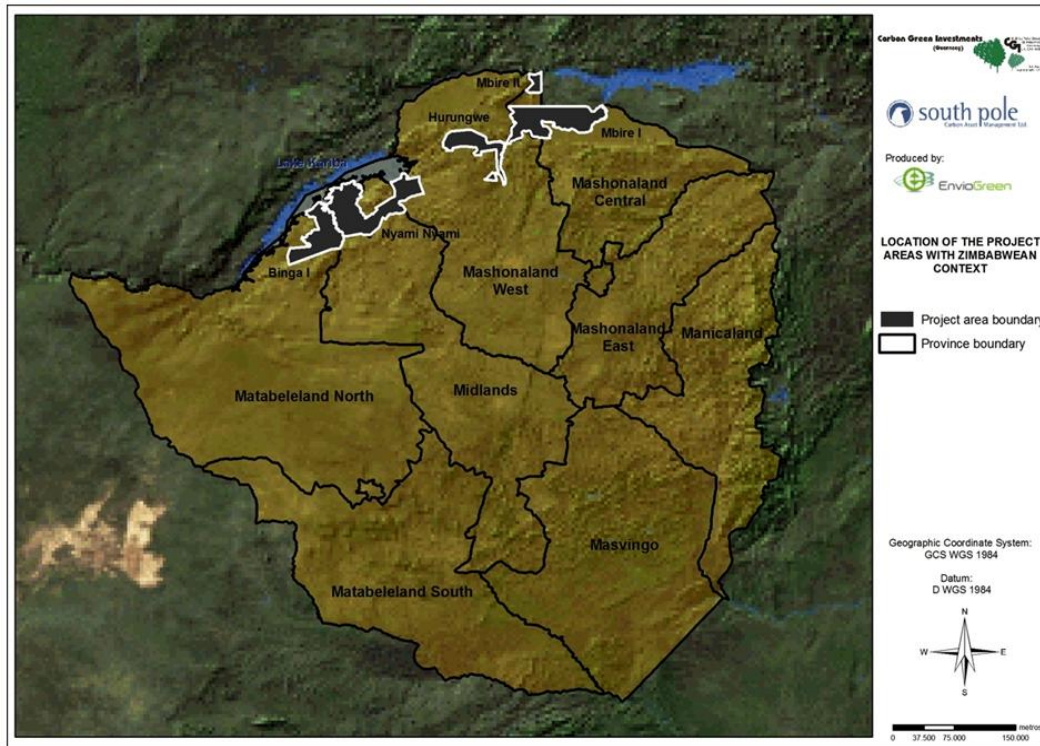
The Nyaminyami RDC area lies in the district of Kariba in the province of Mashonaland West. The Nyaminyami forest covers 226'341.46 ha and connects the Matusadona National Park with the Charara Safari Area. It shares borders with the Binga RDC area. Ecotourism is popular in Nyaminyami, and the most popular ecotourism destination is the shore of Lake Kariba, with its several fishing and safari camps.

Hurungwe

The Hurungwe RDC lies in a remote, rural part of the province of Mashonaland West. It is adjacent to Mana Pools National Park and has a forest cover of 131'480.28 ha.

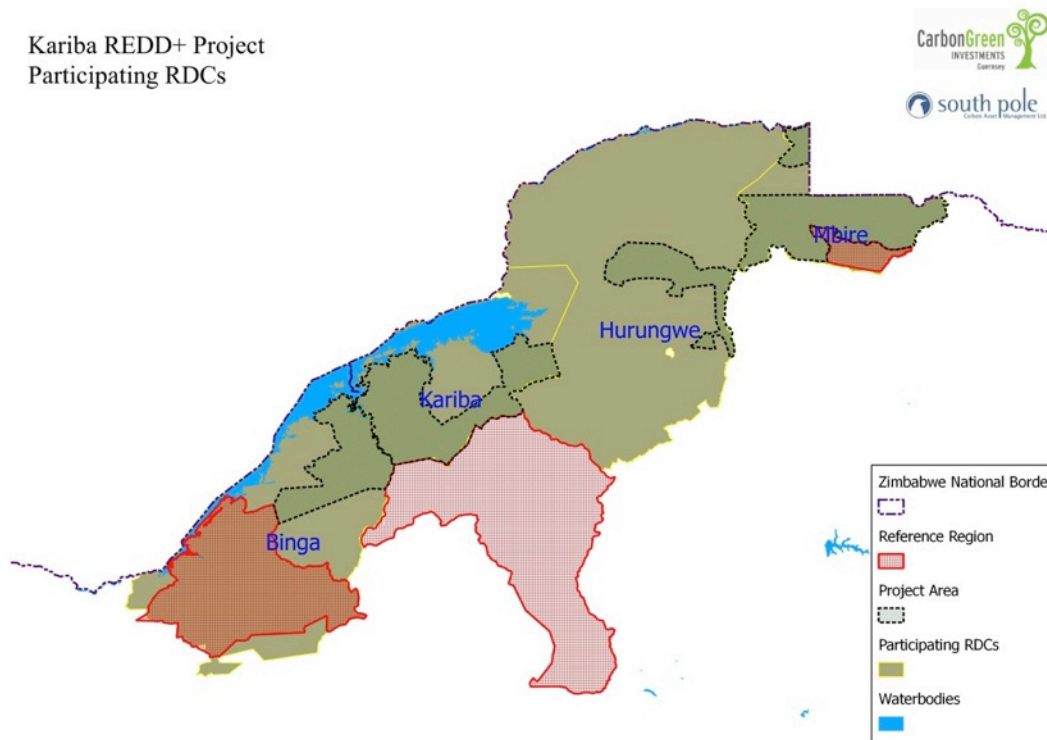
Mbire

The Mbire forest area covers 269'513.1 ha within the province of Mashonaland Central. It serves as a stepping-stone between Mana Pools National Park in the northwest and the Umfurudzi Safari Area in the southeast.



Map 1: Location of the project in Zimbabwe

Kariba REDD+ Project Participating RDCs



Map 2: Location of the project areas

1.8 Title and Reference of Methodology

VM0009 - Methodology for Avoided Mosaic Deforestation of Tropical Forests, v1.1

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Implementation status and operation of the project activities:

The Kariba REDD+ Project had successfully rolled out its project activities to avoid deforestation in the project area and mitigate leakage in its first year after project start while it underwent validation. Area Managers for every of the four participating RDCs begun setting up their base in the respective area in their responsibility to establish the permanent local presence of the project's staff. Several project activities directed at the livelihoods of communities in the project have begun to be rolled out and seen good reception and participation, up to even levels unexpected like in the case of artisanal honey production. The interest to shift away from ineffective agriculture and deforestation that degrade the environment and still leave people marginally poor is large in the local population. The broad consensus for forest conservation and implementation of improved conservation agriculture by extension services and capacity building has shown very positive effects on observed deforestation (see section 4.4).

Improved Agriculture (Binga, Hurungwe, Mbire, Nyaminyami)

Field Officers made a tour of the Foundations for Farming organization and received training in conservation farming. The practical demonstrations were administered so that the team could grapple the important aspects of the serious conservation techniques. Emphasis was done to be region specific when implementing conservation agricultural works since spacing and depth as well as crop management differ according to climatic conditions of a particular area.

Targeted farmers were identified and preliminary training has taken place in various wards of each RDC with assistance from the AGRITEX officers so that the farmers could start land preparation for the coming rainy season.

Conservation farming inputs were received and distributed. Champion farmers were supported with wheelbarrows and bicycles on top of the inputs they received. The type of inputs distributed suits best the low rainfall region that most of the operational wards fall within and this will go a long way in improving household food security. Champion farmers are farmers who are taking a leading role in practising conservation farming. The selection criteria targets farmers with interest or experience in conservation farming. Such farmers have been trained through training of trainers and have established demonstration plots, which have been turned into farmer field schools where fellow farmers come to learn different conservation farming technologies such as soil and water conservation, soil fertility enhancement techniques, post-harvest handling of crops etc. Each champion farmer is supposed to reach out to ten other farmers and for this reason each of the champion farmers have been given a bicycle by the project so that he conducts what is known as farmer to farmer extension.



Picture 1: Training of improved agriculture activities, as close to ZERO tillage as possible.

Community Gardens (Binga, Hurungwe, Mbire, Nyaminyami)

Field visits were conducted to verify proposed sites for establishing community gardens. Sensitization on garden establishment was carried out. Garden design trainings were also carried out.

Delivery of garden fencing materials was done. Construction of community gardens has been completed, with some minor additions which need to be done. Such as lower wire mesh on the fencing to stop small animals entering the gardens and damaging the young plants.

Community gardens were prepared and ready for the delivery of the gardening inputs. The communities have shown great interest in the gardens and put in a large amount of effort to get these gardens to the stage where they are able to reap fresh produce year round.



Picture 2: Newly fenced nutrition garden

Borehole & Irrigation resuscitation (Binga, Hurungwe, Mbire, Nyaminyami)

Local authorities were engaged to pin point boreholes and irrigation schemes that needed resuscitation and rehabilitation. Assessment of the boreholes was determined to put together a bill of quantities for materials needed for rehabilitation. Engineers were also engaged in assisting in the repairs.

The Department of Irrigation provided Environment Africa (EA) with a bill of quantities for the Tyaba Irrigation, which was identified as a priority area. Engineers were engaged to assess all the irrigation schemes in the area.

Wells, which support various villages, have been identified. A lot of the wells are not protected so plans are in place to protect these natural water sources.



Picture 3: Irrigation restoration



Picture 4: The Community pulling together to drain the eroded area on the other side of the Dam wall at the Tyaba Irrigation Scheme. Set to start doing repairs on wall



Picture 5: Repairing of the damaged dam wall

Beekeeping (Hurungwe, Mbire, Nyaminyami)

Beekeeping is very popular for the local villagers to earn some cash and to feed their families. Whilst gathering information on the ground of the number of current beekeepers, it was discovered that most of them were using the traditional beehives, which are made from tree bark. Observations were made that fresh traditional beehives (trees cut for this purpose) were being mounted and that the beekeepers were then using fire to harvest their honey. These fires often get out of control and lead to extremely destructive veld fires.

Starting with these current beekeepers was a good entry point to introduce modern beekeeping, so that they use Kenyan top bars beehives (KTB), which are environmentally friendly and produce a better yield for the keepers and in turn creating more income for their family.

Beekeeping suits and smokers have been distributed so that the harvesting of the honey is done correctly without using open fires.

Start up materials have been delivered for the KTB hives, the registered beekeepers receive training on how to construct hives so they are able to make their own for sustainability. In turn there shall be many keepers with many apiaries who shall guard their trees.

Registration of beekeepers was carried out. Field visits were done to the beekeepers.

The number of beekeepers increased by 48% within 2012.



Picture 6: Capacity building on honey production with Environment Africa

Fuelwood plantations

Although this activity is only being implemented in phase II, A farmer was identified in Gonono (Mbire) with experience in nursery establishment skills and had gum tree seeds. A total of 1000 pockets were sourced to establish nursery at his homestead and the tree seedlings are ready for transplanting into pockets.

Social Forestry – Indigenous Knowledge Systems (Hurungwe, Mbire, Nyaminyami)

A total of 28 traditional shrines have been identified in Binga (4), Hurungwe (9) and Mbire (15). For Nyaminyami no sites have been identified so far. Information was collected from local traditional leaders and spirit mediums. The traditional leaders emphasize the need of a combined approach to protect these shrines.

Follow up visits are needed to be made with the traditional leaders and document conservation IKS as well as using the GPS so as to place the sites on the ward maps. Generally the sites are well conserved with no incidences of veld fires or tree cutting.

Alternative and sustainable building materials (brick making)

This activity is only being implemented in phase II.

On the Ground Management teams & Fire management (Binga, Hurungwe, Mbire, Nyaminyami)

The On the Ground Management (OGM) has been out in the field at every opportunity possible. Whilst out project activity check ups were made, patrols to establish problem areas where there is deforestation is taking place which have been identified and plenty of interaction within the Council and Community has taken place. Good relationships have been made on the ground with a huge amount of support from the community – with a large amount of trust in the Team Leaders. This support and trust is absolutely crucial.

With a great amount of organization the necessary fire fighting trainings took place well before the dry season was upon us. The communities were extremely supportive of these trainings and

were eager to learn how to reduce veld fires and how to if possible stop the fires or most certainly slow them down. Firefighting materials were delivered and trainings were carried out.



Picture 7: Fire fighting training



Picture 8: Councilors attending interpretation of EMA (Environmental Management Agency) Act Workshop in Mbire Rural District Council boardroom (left), participants at improved agriculture trainings (right)

Newsletters (Binga, Hurungwe, Mbire, Nyaminyami)

Carbon Green Investment (CGI) published various newsletters covering topics such as general information and progress of the project, topics of environmental awareness and education, and information about the progress of the project implementation activities (based on each RDC). The newsletters are provided separately to the auditors.

Management of leakage and non-permanence

It is assumed that the natural conditions do not lead to leakage: Agents of deforestation have generally a very low mobility to implement baseline activities (subsistence agriculture) and are loyal to communal rights of their communities and the support of their villages. Even if the mobility situation would change in the future (which is not expected and not promoted by the project proponent), the legal status of surrounding land prohibits agents of deforestation from living adjacent to the project area to utilize forests outside of the project area. Agents of deforestation adjacent to the project area only possess traditional usufruct rights in the project area, as surrounding lands are either National Parks, privately owned commercial farms or communal lands of other ethnicities. Agents of deforestation with usufruct rights in the project area generally do not possess financial resources to buy or lease land outside of the communal land and this is also not a common practice in this region. Therefore it has been assumed that no leakage of emissions is expected from the Kariba REDD+ Project. However, leakage risks will be mitigated by roll-out of project activities also in the leakage area, including improved agriculture and fire-management.

As wildfires are the single major non-permanence risk, the fire management had always taken a central role in the development of the Kariba REDD+ Project, including fire awareness capacity building, training of fire brigades and cold early burning of herbaceous fuel vegetation in the understory (see also PD section 1.8 and Newsletters per RDC).

Please see the detailed implementation reports (Newsletter to Rural District Councils) with a timeline per RDC provided separately to the auditors.

2.2 Project Description Deviations

Soil carbon stock is not verified in the first verification, but will be included in following verification events. The project proponents will also include the soil emissions from the 2011-2012 monitoring period in the second verification event.

2.3 Grouped Project

This is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Please refer to section 4.1 of the PD.

3.2 Data and Parameters Monitored

All parameters are monitored as required in Annex B of the methodology. Please also refer to section 4.2 of the PD.

3.3 Description of the Monitoring Plan

A full description of the monitoring plan is given in the PD. A total of 142 permanent sampling plots (PSPs) have been implemented in the two forest strata “Woodland” and “Open Woodland”. The allocation of these plots over the two forest strata is shown in the below table.

Table 1: Number of permanent sampling plots and location between forest strata.

Stratum	Number of permanent sampling plots
Woodland	29
Open woodland	113
Total	142

Map 3 shows the distribution of the PSPs over the project area.

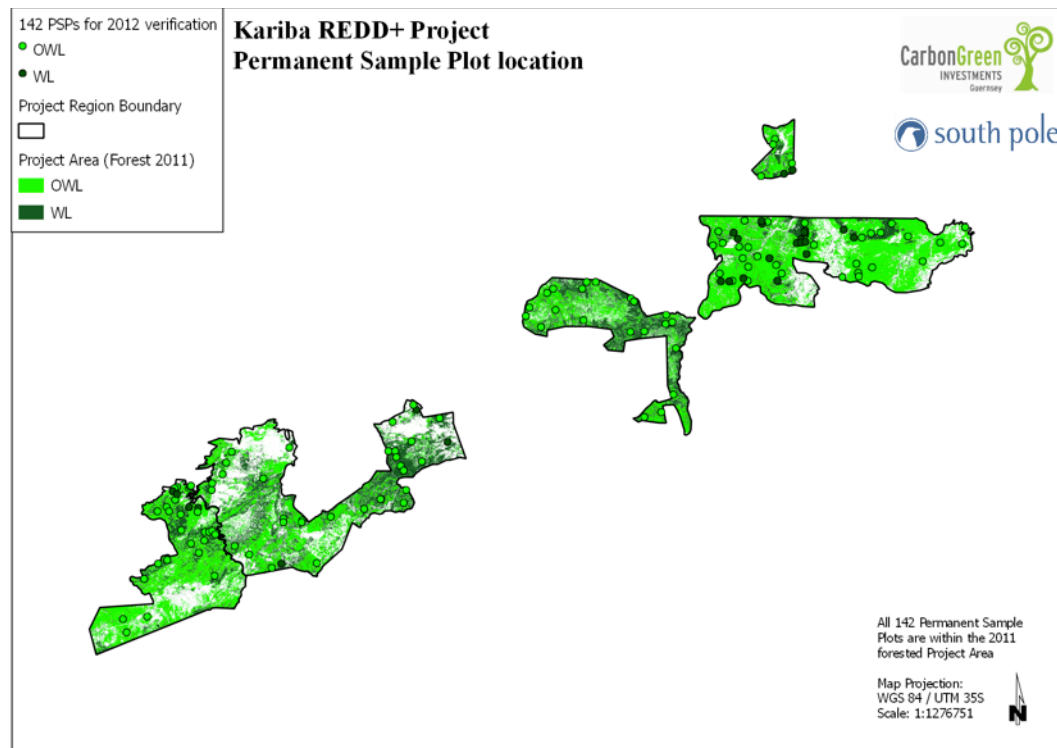
QA/QC

Different measures have been implemented in order to ensure a high accuracy of the collected data from the PSPs.

- Field data is recorded by a trained¹⁷ monitoring team following the Standard Operation Procedures on a standard field data sheet.
- Field data is uploaded to MOVERS by a single person, the head of the CGA project team. During this process, the field data are checked for any inconsistencies, which are then clarified with the field team.
- The team of South Pole conducts a second consistency check on the data on MOVERS. Any apparent inconsistencies are reported to the CGA Team and re-check in the original field data and the field team.

¹⁷ The monitoring team has been trained and supervised by the experienced local environmental consultancy Black Crystal. Evidence of the training is provided separately.

- Regular cross-checks are conducted in order to identify any inconsistencies in how different sampling teams assess PSPs. In order to do so, a random set of PSPs is selected and re-visited by a sampling team other than the one that had originally implemented the PSP. Any inconsistencies between the results of the original sampling and the second sampling are identified. In case the inconsistency was caused by a different application of the SOPs between both teams, this is clarified in a joint workshop of all measurement teams, if necessary including external experts. In case inconsistencies result from simple errors (e.g. misreading of measurement tape), appropriate action is taken to prevent such errors going forward. Any identified errors are corrected in the original field data sheet and on MOVERs, so that the correct value is reported for the relevant monitoring period.



Map 3: Location of Permanent Sampling Plots throughout the project area.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The cumulative deforestation model of the Kariba REDD+ Project predicted for 2012 a loss of 3.19%.

The baseline emissions are summarized in the Table 2 below.

Table 2: Overview of Baseline Emissions.

Stratum	Total baselines emissions [tCO ₂ e]
Open Woodland	3,846,356
Woodland	2,744,181
TOTAL	6,590,537

4.2 Project Emissions

Emissions from burning: No emissions from the burning of woody biomass as a result of project activities in the project area have occurred. The project activities do not encourage increased burning of woody biomass. Very much to the contrary, reduced burning, firefighting training and cold burning of non-woody biomass to avoid serious woody-biomass burning are integral parts of the project.

Forest fires: The Project proponent understands that should significant forest fires occur during the project crediting period, a map of the boundaries of the fire during the monitoring period will be elaborated. A significant forest fire would change the detected landcover from forest to non-forest in the deforestation monitoring (see parameter in section 3.2). No major forest fires other than those listed in the deforestation results were detected in the monitoring period.

Event number	Date	Woody biomass consumed in tonnes
N/A	N/A	N/A
TOTAL		0

4.3 Leakage

During this first monitoring period, a total of 50 leakage sampling plots¹⁸ were sampled, leading to a average degradation and deforestation in the leakage area of 0.084, cf. Table 3. Using this value, the lag parameter was calculated using eq. 9 as $\hat{\delta}_{LE} = -2.0716$. The resulting leakage model is provided in the PD.

Table 3: Results from the first monitoring of the leakage sampling plots.

Leakage Factor	Number of sampling plots
0	38
0.2	7
0.4	3
0.6	0
0.8	2
1	0
Total number of plots	50
Observed degradation $\hat{d}_0$	0.084

The lag period of the project is determined using the leakage monitoring of the first monitoring period. As required by the methodology for this case, none of the assessed leakage plots showed a degradation larger than 0.8. Based on this, it can be assumed that leakage has not occurred in the first monitoring period (VM0009 v1.1, section 10.3.3). In subsequent monitoring periods, leakage will be determined comparing the monitoring results of the leakage plots with the leakage model.

¹⁸ For a map showing the location of the leakage plots, refer to the PD, section 3.3.4.

4.4 Summary of GHG Emission Reductions and Removals

The confidence deduction for this monitoring has been calculated according to Equation 35 based on the average uncertainty (Equation 36) and accounts for 0 tCO₂e.

Net GHG Emission Reductions and Removals (NERs) are calculated using Eq. 34. The below table summarizes all components of Eq. 34. The total amount of VCUs is separated by 50% each into vintage year 2011 and 2012. This is due to the fact that the monitoring period covers 6 month in 2011 and 6 month in 2012.

Table 6: Calculation of NERs and VCUs.

Emission components	Value
Estimated Baseline Emissions in tCO ₂ e	6,590,537
Confidence deduction in tCO ₂ e	0
Project Emissions in tCO ₂ e	0
Leakage Emissions in tCO ₂ e	0
NERs in tCO ₂ e	6,590,537
NERs to Buffer Pool in tCO ₂ e	1,087,439
Total net VCUs to project proponent in tCO₂e	5,503,098
Net VCUs to project proponent in tCO ₂ e, vintage 2011	2,751,549
Net VCUs to project proponent in tCO ₂ e, vintage 2012	2,751,549

5 ADDITIONAL INFORMATION

Accompanying documents

- Final calculation of emission reductions ("130813_KARIBA ER MP 1_final_V8.xls")
- Forest Cover Map SOP ("130618_Kariba_Forest_Map_SOPs.docx")
- Leakage plot data and lag factor calculation ("130731_Leakage plots and lag factor_V5.xls"; submitted with the PD)
- SOP for biomass data collection ("130724_SOP FOR TREE DATA COLLECTION FINAL.doc").
- Non-Permanence Risk report for verification ("130816_Kariba Non-Permanence Risk Report_MP1_V4.pdf")
- List of allometric equations ("130401_Allometric eqns for auditors_v3.xlsx")
- Description of functioning of MOVERS ("130328_MOVERS Kariba_V2.docx").
- Data storage, allometric equations and calculations on MOVERS (access is provided to the auditors)
- Further reference and supporting documents