



Lower Zambezi REDD+ Project

Rufunsa District, Zambia



Roan antelope (Hippotragus equinus) photographed on Rufunsa Conservancy

Project Design Document

To the Climate, Community and Biodiversity Alliance Standards (2nd Edition)

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Prepared by:	BioCarbon Partners
Contact:	BioCarbon Partners 6 Tukuluh Road Longacres, Lusaka, Zambia www.biocarbonpartners.com info@biocarbonpartners.com
BCP Contributing Authors:	Hassan Sachedina, Leon-Jacques Theron, Molly Crystal and Wesley Roberts
Technical Advice Provided by:	ecoPartners LLC 

About BioCarbon Partners

BCP is an African-headquartered and majority African citizen owned REDD+ development social enterprise. BCP's vision is to ensure that most benefits of African forests are retained within Africa. BCP's mission is to reduce poverty and to enhance conservation through the forest carbon markets. BCP's hallmarks are a focus on dryland forest REDD+ projects in Africa, as well as local presence, access and expertise. BioCarbon Partners has an experienced team of African professionals. BCP's management staff have accumulated a combined total experience of 101 years of professional conservation and development implementation in Africa. BCP has launched Zambia's first pilot REDD+ demonstration project known as the 'Lower Zambezi REDD+ Project'.

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ACRONYMS

AFOLU	Agriculture, Forestry, and other Land Uses
AGNT	Above Ground Non-Tree
AGOT	Above Ground Other Trees
AUDD	Avoided Unplanned Deforestation and Degradation
BCP	BioCarbon Partners
BGB	Below Ground Biomass
BGNT	Below Ground Non-Tree
CBH	Circumference at Breast Height
CCBA	Climate, Community and Biodiversity Alliance Standard
CET	Community Engagement Team
CF	Conservation Farming
CFTP	Conservation Farming Training Program
CFU	Conservation Farming Unit
CLZ	Conservation Lower Zambezi
CPO	Community Projects Officer
DBH	Diameter at Breast Height
DEM	Digital Elevation Model
DJF	December, January, February
DNA	Designated National Authority
ECA	Eco-charcoal Association
EIA	Environmental Impact Assessment
ENSO	El Niño Southern Oscillation
F&A	Finance and Administration
FD	Forestry Department
FPIC	Free, Prior and Informed Consent
GMA	Game Management Area
GNI	Gross National Income
GRZ	Government of the Republic of Zambia
HCV	High Conservation Value
HR	Human Resources
IBA	Important Bird Area
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Intertropical Convergence Zone
LD	Lying Dead Wood
LZNP	Lower Zambezi National Park
MAM	March, April, May
MRV	Monitoring, Reporting and Verification
NERs	Net Emissions Reductions
NP	National Park
PCM	Project Consultation Meeting
PTA	Parent Teacher Association
REDD+	Reducing emissions from deforestation and degradation including conservation, sustainable forest management and the enhancement of carbon stocks.
SADC	Southern Africa Development Community
SD	Standing Dead Wood
SI	Statutory Instrument
SOC	Soil Organic Carbon
SON	September, October, November
SOP	Standard Operating Procedure
TFCA	Trans-frontier Conservation Area
UNFCCC	United Nations Framework Convention on Climate Change
UNZA	University of Zambia
USD	United States Dollar
VCS	Verified Carbon Standard
ZAWA	Zambia Wildlife Authority
ZDC	Zone Development Committees
ZEMA	Zambia Environmental Management Agency

EXECUTIVE SUMMARY

The Lower Zambezi REDD+ Project (Project) is a reducing emissions from deforestation and degradation (REDD+) project on 38,781 hectares (ha) of privately-owned land in Rufunsa District, Zambia. The Project Area is known as 'Rufunsa Conservancy' (Conservancy), and is owned by a Zambian company named Sable Transport Limited. The Conservancy is one of the last intact areas of forest within Lusaka Province (named after the nearby capital city), and provides a 60-kilometer buffer to Lower Zambezi National Park (NP), a strategic protected area in Zambia in a globally significant trans-frontier conservation area. Lower Zambezi NP is adjacent to Mana Pools National Park in Zimbabwe which is a UNESCO designated World Heritage Site. The population of the Project Zone is approximately 8,300 people living in 28 villages spread within 4 community zones.

The Project Proponent is BioCarbon Partners Limited, which is responsible for getting the Project certified and for early-stage Project finance.

The core project climate activities undertaken include forest carbon inventorying, modeling cumulative deforestation patterns, and soil carbon assessments. Core community project activities include up to eighteen different types of community-based deforestation mitigation initiatives designed to create sustainable, scalable alternatives to deforestation, and strategic, meaningful incentives that comprise part of pay for performance programs that support forest conservation. Core biodiversity project activities include forest conservation systems, biodiversity monitoring and management, and fire management.

The Project is being developed to conform to the Climate, Community and Biodiversity Standard (CCBS, Second Edition) and the Verified Carbon Standard (VCS, Version 3.3). Furthermore, the Project is aligned with the Government of the Republic of Zambia's (GRZ) National REDD+ Program, implemented through the Forestry Department.

Please contact Hassan Sachedina (Hassan@biocarbonpartners.com and +260 971729034) or Leon-Jacques Theron (leon@biocarbonpartners.com and +27 824598070) of BioCarbon Partners with any questions, comments or concerns regarding the Lower Zambezi REDD+ Project.

GENERAL SECTION

G1. ORIGINAL CONDITIONS IN THE PROJECT AREA

G1.1 – GENERAL INFORMATION: THE LOCATION OF THE PROJECT AND BASIC PHYSICAL PARAMETERS

Location

The Lower Zambezi REDD+ project is located approximately 120 km southeast of Lusaka and falls within the miombo eco-region which is host to a plethora of endemic species. It falls within the recently declared Rufunsa district and borders the Lower Zambezi National Park to the east and south, Chiawa Game Management Area (GMA) to the west and the Soli Shamifwi Royal Establishment (Chief Unda Unda's Chiefdom) to the north (Figure 1). The project area is accessible by road via the small towns of Chinyunyu and Sinjela on all-weather dirt roads. The project area is the Rufunsa Conservancy, privately owned by Sable Transport Ltd, a local Zambian company. The project area consists primarily of intact, primary miombo woodland that has never been logged with some open grassland and deep ravines with dense Acacia woodland. The project area is 38,781 ha in size. A portion of Rufunsa Conservancy has been encroached by illegal charcoal producers and this area has been excluded from the project area (labelled Encroachment, Figure 4).

There are an estimated 8,300 people living in the project zone which falls in the Rufunsa district which is further divided into four zones and 28 villages (Table 1). The project zone is bound between -15° 16' 57.72"S - 28° 58' 25.68"E (NW Corner) -15° 16' 57.72"S - 29° 23' 43.4394"E (NE Corner), -15° 35' 51.3594"S - 29° 23' 43.4394"E (SE Corner), and -15° 35' 51.3594"S - 28° 58' 25.68"E (SW corner).

Table 1. Lower Zambezi REDD+ Project Location and Administrative Jurisdiction.

Conservancy Size	38,781 ha
Province	Lusaka
District	Rufunsa (formerly Chongwe)
Wards	Nyamanongo and Unda Unda
Zones	Namanongo, Chilimba, Mweeshang'ombe and Ndubulula
Villages	Chikobeni, Nyamakau, Kasumba, Mwalilanda, Ben Shikakota, Chikoloma, Muyobe, Mulilwa, Malilakufwa, Mwachombela, Mweeshang'ombe, Chikuse, Shimaluba, Lumwengo, Mutonka, Mwankomesha, Kantyantya, Chipungu, Musanshika, Kabandi, Kanyetu, Chundu, Nsambilo, Chifita, Kampamba, Sunta, Mulimba & Shatunka

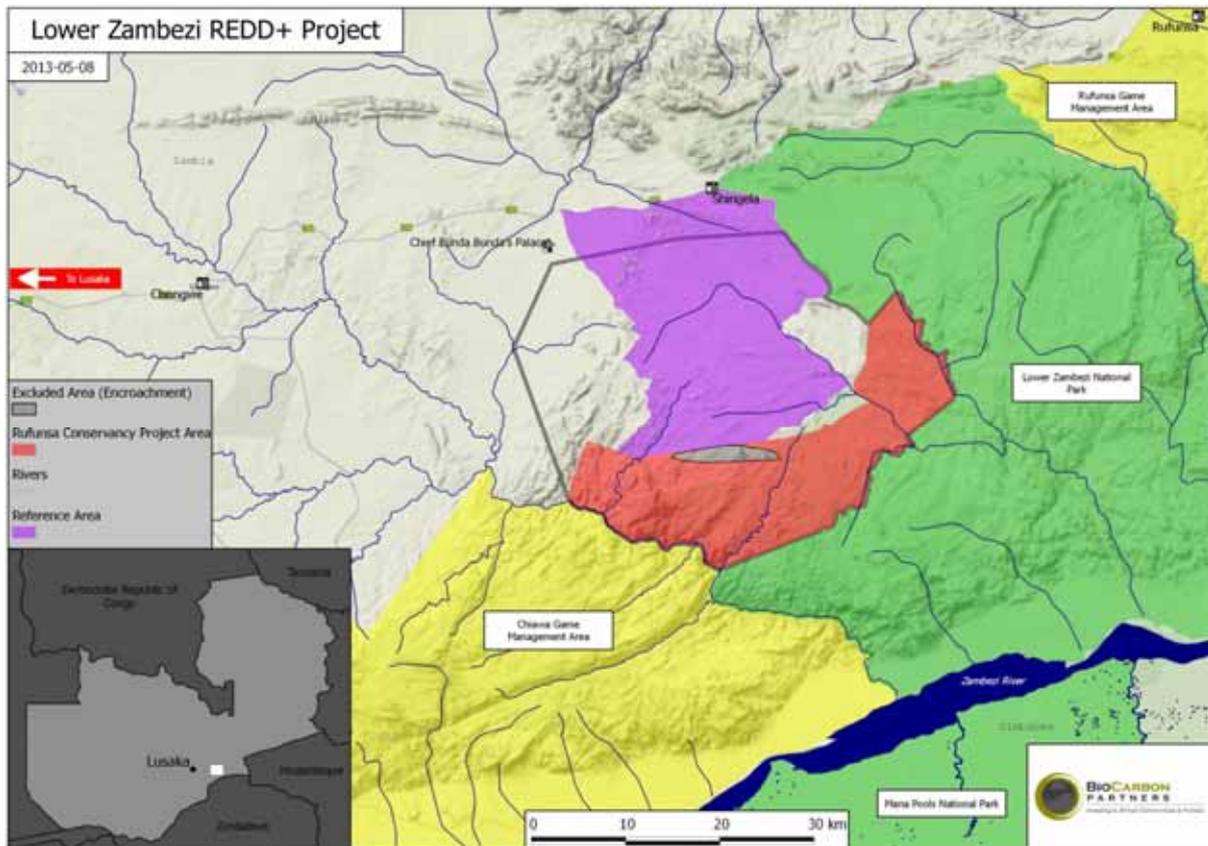


Figure 1. Situational Analysis of Rufunsa Conservancy in relation to Lower Zambezi NP, Mana Pools NP, Chiawa Game Management Area and the Great East Road.

Climate

The nearest meteorological station to Rufunsa Conservancy, run by the Zambian Meteorological Department,¹ is located in Lusaka and data from this station was used to describe the climate of the project area. Annual precipitation varies between 800-1100mm and falls primarily in the summer months from November to May. Zambia is well known for its annual variance in precipitation, placing even more significance on water catchments and the headwaters of rivers such as those found in the project area. Rainfall is strongly influenced by the movement of the Inter-Tropical Convergence Zone (ITCZ) as well as the El Niño/Southern Oscillation (ENSO) phenomenon. The climate is subtropical with three distinct seasons: the cool dry season from May to August, the hot and dry season from August to November, and the hot and wet season from November to April. The wet season is characterised by rainfall and thunderstorms, which occasionally are severe and sometimes contains hail. The regular pattern for movements of air masses generates a dominating wind direction from east-south-east during most parts of the year. Temperatures in the region vary from above 30 degrees Celsius during the hottest month (October) to average daily temperatures of between 20 to 25 degrees Celsius at other times of the year.

¹ <http://www.zmd.gov.zm/>

Geology

The Rufunsa Conservancy geology is dominated by the Karoo supergroup, which covers almost two thirds of the present land surface of southern Africa. Rufunsa Conservancy formations contain significant amounts of carbonate rocks (Limestone and Dolomite) which are sedimentary in nature; quartzite and laterite. The geology results in a complex stepped landscape where higher lying areas are underlain by Kangaluwe and Rufunsa formations and lower-lying regions are made up of older basement rock formations. The topography is characterized as rolling hills with deep river valleys (Pettersen *et al.* 2012).

Soils

Within the project area the majority of the upland soils are orthic and are almost all sandy in nature, with little clay or organic component resulting in a low nutrient status. Their colour ranges from light-brown (sand-rich) to medium or slightly dark-brown where the organic component increases. Soils with a higher organic component are generally only found at a few locations in the main valley tracts. Locally, where the soils are iron-rich, which is where they overlay iron formation rocks, they are red-brown. Plateau soils derived from the basement complex geology result in the generally poor soils. This suggests that agriculture on these soils will be marginal due to acidity and lower fertility such that agents of deforestation will farm low quality maize in areas of the ranch in a baseline scenario for 3-4 years following which, the process of slash and burn will be repeated in adjacent pristine Miombo woodlands. In addition, the poor quality of the soils results in highly erodible landscapes especially susceptible to gully type erosion (Pettersen *et al.* 2012). A broad scale classification of soils is shown in Figure 2, indicating similarities between the project and leakage areas.

Topography

Figure 2 shows the soils (A) and topography (B-C) of the Lower Zambezi REDD+ project area. Dominant soils found in the project area include Lithosols, Orthic Ferralsols, and some Chromic Luvisols along the northern border of the Zambezi river valley. The Lithosols soils are shallow skeletal soils typically found in steep mountainous regions. Orthic Ferralsols are found in the northern part of the project zone, this soil is typically found in flat well drained areas where soil development is not hampered by steep slopes and imperfectly weathered rock fragments. Chromic Luvisols are found in the southern part of the Leakage zone and do not feature strongly in the project zone. The topography of the area is shown in B and C of Figure 2. The digital elevation model shown in B indicates that the topography of the reference area, project area and leakage area share common characteristics. This is also seen in the slope map shown in C.

Blue and green colours designate flat slopes while the brown colours show areas of steep slopes. This map was used to derive the project accounting area. The soils data is derived from the (FAO, 2003) while the digital elevation data were derived from the ASTER GDEM Version 2 (NASA and Japan ASTER Program, 2011).

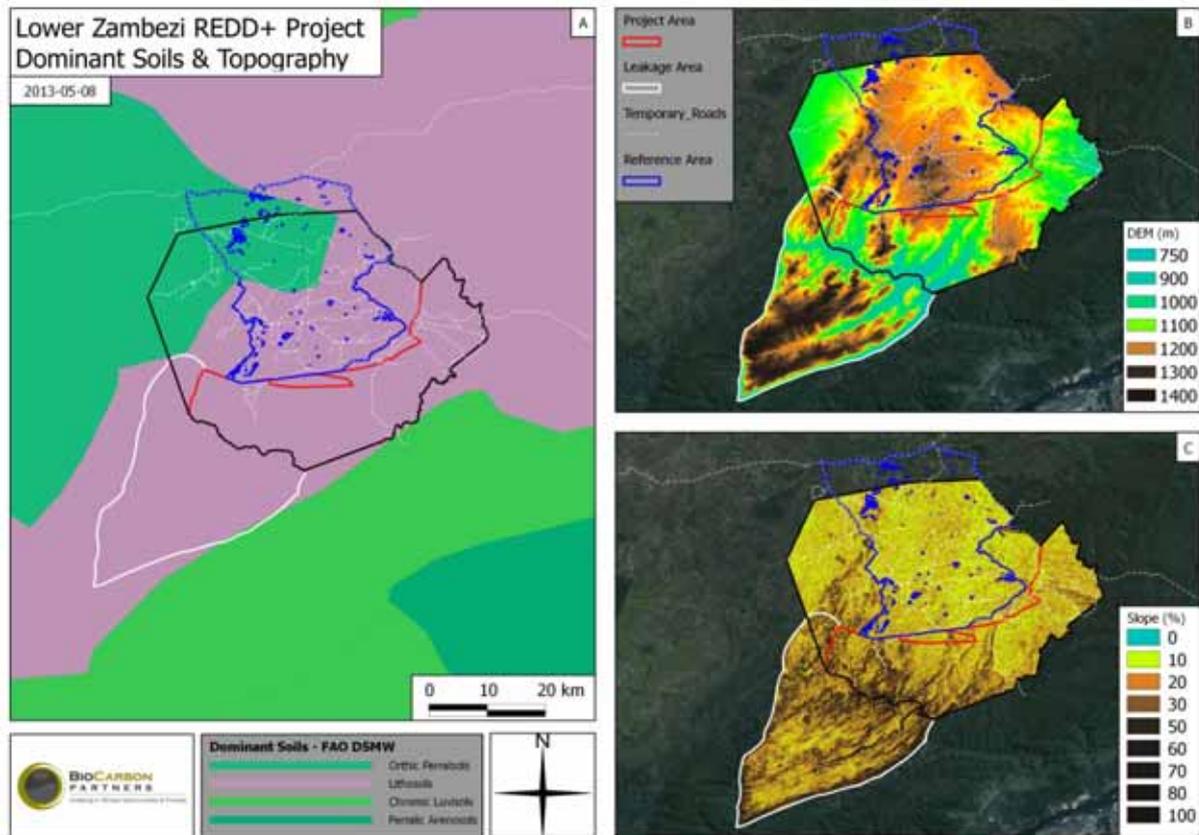


Figure 2. Soil types a), DEM b) and slope map c) of the Lower Zambezi REDD+ Project indicating similarities between the project area and leakage area.

G1.2 – GENERAL INFORMATION: THE TYPES AND CONDITIONS OF VEGETATION WITHIN THE PROJECT AREA

The Lower Zambezi REDD+ Project falls within the miombo ecoregion. Floristically, the miombo ecoregion forms a swathe of woodland that stretches from Tanzania to Angola, including Zambia, Zimbabwe, Mozambique and parts of Malawi. The miombo woodlands of this area are closely linked to the largest of White's (1983) Regional Centers of Endemism within Africa. Miombo plant communities are dominated by trees belonging to the family Caesalpiniaceae, characterized by *Brachystegia* and *Julbernardia* species (White 1983).

Historically, miombo forests had relatively low populations, partially due to poor soils, which made them less desirable for cultivation (Chenje and Johnson 1994). The human population of the miombo ecoregion is now relatively high, and growing. It includes Zambia's capital city of Lusaka (pop. 1.7 million). The project area is located within Lusaka Province. Proximity to the capital city places the project area under significant deforestation pressure due to charcoal demand in Lusaka, and high rates of peri-urban immigration driving land use change. Aside from protected areas, there is little miombo left within the miombo ecoregion that has not suffered some form of degradation (Chenje and Johnson 1994). Rufunsa Conservancy represents one of the very last areas of intact miombo forest within Lusaka Province.

The majority of the Rufunsa Conservancy consists of intact miombo woodland ranging from sparse to dense canopy cover (Figure 3).

Some of the common tree species found on Rufunsa Conservancy were *Brachystegia spiciformis*, *Brachystegia manga*, *Isoberlinia angolensis*, *Julbernardia globiflora*, *Diplorynchus condylocarpon* and *Pseudolachnostylis maprouneifolia* and are listed with their corresponding importance values in Table 2. Importance values were calculated based on data collected in 26 plots during a rapid viability study. Other sub-dominant species included the important fruit tree *Uapaca kirkiana*, as well as *Syzeqium guineense*, *Burkea africana*, *Lanea discolor*, *Piliostigma thonningii* and *Bobgunnia madagascariensis*. *Azelia quanzensis* is one of the few, sought after commercial timber species found on the property, albeit at very low densities. In total, some 67 tree species were found on Rufunsa Conservancy during an initial plot based biomass survey consisting of 26 plots.

In addition to the species identified in the viability biomass assessment, a local Zambian vegetation expert, Mike Bingham, identified a further 74 tree species and 58 shrub, sub-shrub and grass species during an unstructured survey over a two day period (See Appendix A for the complete species list).

Miombo is interspersed with some Munga woodland, dominated by *Acacia* species, which covers the bottoms of the less severe ravines. The most diverse vegetation type in the Lower Zambezi escarpment area is riverine forest in deep, protected ravines. These ravines are especially prominent along the courses of the Mwambashi, Chongwe and Musangashi rivers which traverse the project area. Interspersed amongst the miombo are several wetlands known locally as *dambos*; grassy wetlands interspersed along drainage common in miombo woodland (Barnes 1998), where a variety of grasses such as *Hypparhenia spp.* and sedges comprise the dominant vegetation layer (Pettersen *et al.* 2012). The viability study showed that canopy cover within the ranch is roughly 30-40% and the canopy in excess of 5m, often above 15m, thus qualifying as forest according to Zambian forest definition which is “land with tree crown cover of more than 10%, an area of more than 0.5ha and the trees must be able to reach a minimum height of 5m at maturity” (FAO 2000).

Three major vegetation strata were identified within the project area (Figure 2): Dense Tree, Light Tree and Grassland (Figure 3). The vegetation strata depicted in Figure 3 were determined based on two disparate sources of information. Initially, the viability study, which saw the enumeration of 26 biomass plots, was used to identify the vegetation strata present. Following the completion of the viability sampling, BioCarbon Partners employed the use of both high resolution satellite data (Google Earth), as well as medium resolution Landsat TM imagery to confirm the stratification. Section G1.4 outlines the technical details of the classification, briefly, a supervised classification was employed using training data derived from biomass sampling as well as field work activities.

Table 2. Tree species on Rufusa Conservancy ranked according to Importance Value.

Species	Frequency	Density	Dominance	Importance Value
<i>Brachystegia longifolia</i>	20	99.47	2.38	45.65
<i>Brachystegia manga</i>	16	84.17	2.26	40.19
<i>Brachystegia spiciformis</i>	8	10.20	1.12	14.18
<i>Brachystegia utilis</i>	8	17.85	0.69	12.19
<i>Diplorhynchus condylocarpon</i>	10	24.66	0.35	11.49
<i>Julbernardia globiflora</i>	9	11.90	0.45	9.57
<i>Isoberlinia angolensis</i>	3	14.45	0.69	9.46
<i>Pseudolachnostylis maprouneifolia</i>	1	31.46	0.41	9.44
<i>Rothmania globosa</i>	14	11.05	0.18	9.40
<i>Uapaca kirkiana</i>	3	27.21	0.33	8.88

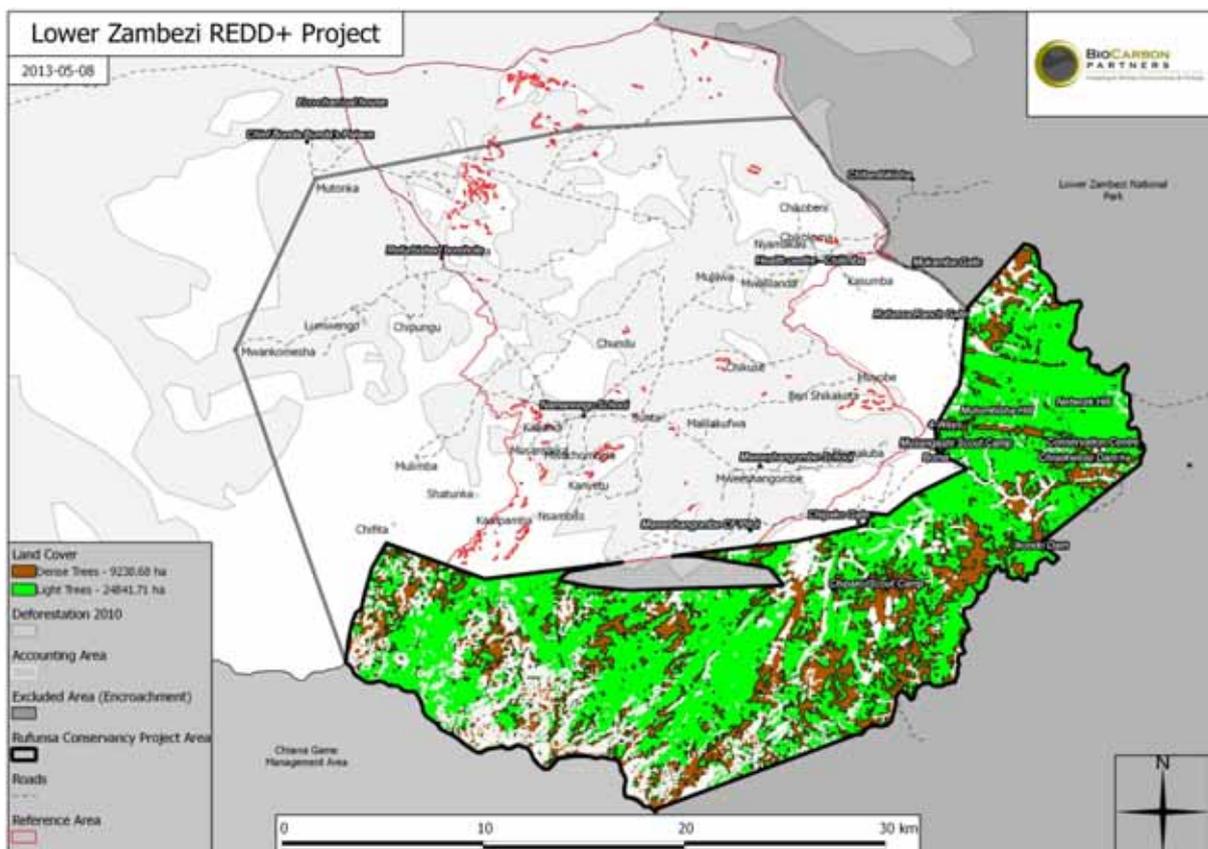


Figure 3. Land cover map of Lower Zambezi REDD+ Project showing vegetation stratification, project area and accounting area. Also included is deforestation in the Reference Area and Project Zone up to 2010.

G1.3 – THE BOUNDARIES OF THE PROJECT AREA AND THE PROJECT ZONE

Project Area Boundaries

The project area is the boundary of Farm 10800, or Rufunsa Conservancy, as shown in Figure 3 and coordinates listed in Table 3. Sable Transport Limited, a Zambian registered and 100 percent Zambian citizen owned company, privately owns Rufunsa Conservancy under leasehold from the Government of the Republic of Zambia. This area was originally registered as a game ranch for wildlife tourism operations. Due to a lack of resources and wildlife poaching pressure, the area has not been used or promoted for eco-tourism or hunting and has been operated as a *conservancy*². The project area boundaries are clearly defined in a Government of Zambia issued title deed (copy will be shown to the Validator).

For the project area boundaries as well as the vegetation stratification shown in Figure 3, it is important to note that while the title deed outlines the boundaries of the conservancy, the reader will see that a portion of this area has been removed along the northern boundary. This excluded area has been removed as this portion of the property has been encroached by illegal squatters currently undertaking charcoaling and subsistence agriculture activities. The boundaries of the exclusion area are based on a survey undertaken by BioCarbon Partners. Each illegal squatting household was surveyed with additional location data also collected using a hand held Global Positioning System (GPS). A convex hull was then generated around these points and used to adjust the boundaries of the conservancy. BioCarbon Partners will not be including this area in the calculation of net emission reductions.

There will be no BCP eco-charcoal production in the Project Area (Rufunsa Conservancy-boundaries as per title deed) or the accounting area or the excluded encroached area. The area that has been excluded from the project accounting area has been occupied illegally by charcoal producers and subsistence agriculturalists from the neighboring community due to ignorance of the boundary location. It has been decided that the best option is to exclude the encroached area from carbon accounting as including it will most likely make it necessary to relocate the occupants which could lead to unnecessary conflict.

Eco-charcoal will only be produced in the project zone outside of the project area and accounting area as described in Figures 18 and 19.

² Conservancy (definition): an area designated to conserve and protect an area of land and its associated natural resources in a holistic way that incorporates human benefits.

Table 3. Lower Zambezi REDD+Project boundaries.

Project Boundary	Location
Northern Boundary	Communal lands
Northern Extent	-15° 20' 19.32"
Southern Boundary	Lower Zambezi National Park
Southern Extent	-15° 35' 51.36"
Eastern Boundary	Lower Zambezi National Park, Mwambashi River
Eastern Extent	29° 23' 43.44"
Western Boundary	Chongwe River
Western Extent	29° 1' 34.68"
Project Zone	Location
Northern Boundary	Great East Road
Northern Extent	-15° 14' 26.16"
Southern Boundary	Lower Zambezi National Park
Southern Extent	-15° 35' 51.36"
Eastern Boundary	Lower Zambezi National Park, Mwambashi River
Eastern Extent	29° 23' 43.44"
Western Boundary	Mwachombela village
Western Extent	29° 12' 14.04"
Encroached Area	Location
Northern Boundary	Communal lands
Northern Extent	-15° 28' 50.52"
Southern Boundary	Lower Zambezi REDD Project Conservancy
Southern Extent	-15° 29' 51"
Eastern Boundary	Lower Zambezi REDD Project Conservancy
Eastern Extent	29° 13' 42.96"
Western Boundary	Lower Zambezi REDD Project Conservancy
Western Extent	29° 7' 29.28"

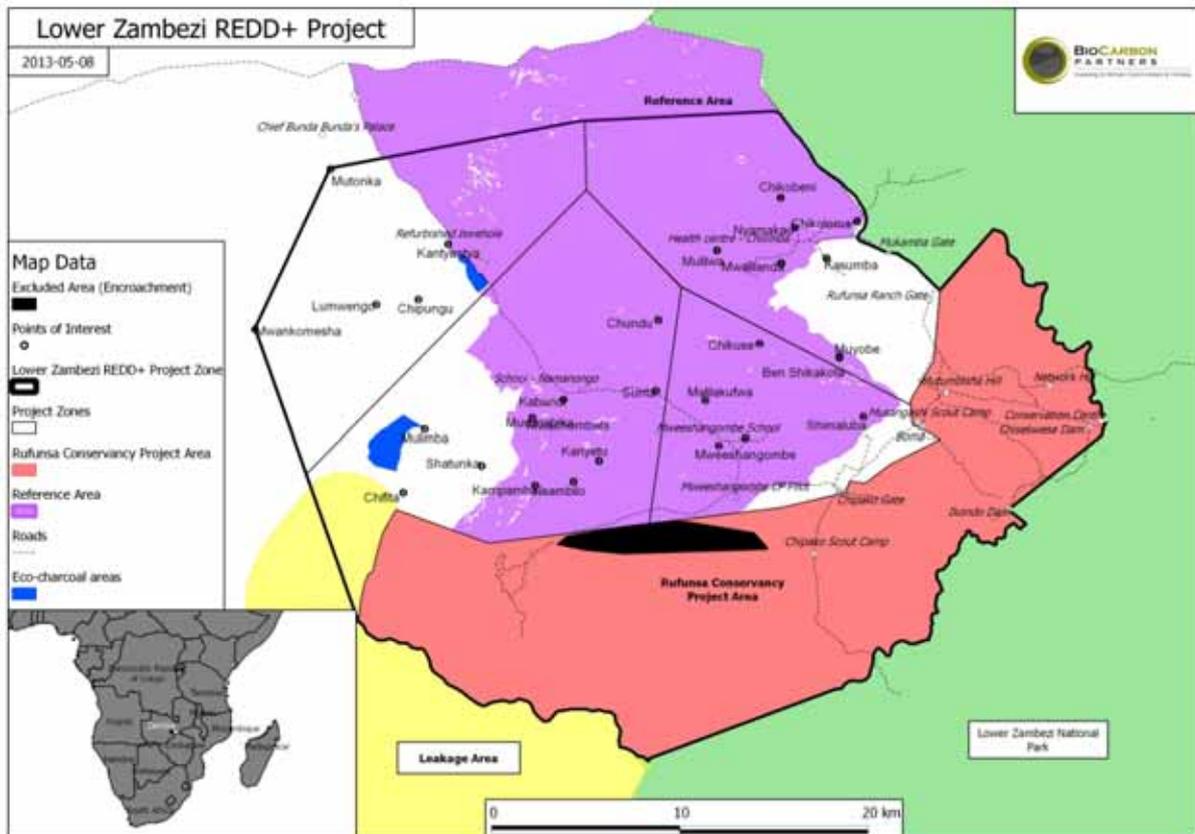


Figure 4. Location of Lower Zambezi REDD+ project, Rufunsa District, Zambia. The map outlines the project area, project zone, communities and portion of the leakage area as well as the reference region used for calculating deforestation rates.

Project Zone

The project zone is also delineated in Figure 4, and it is comprised of local stakeholder communities that will participate in, and directly benefit from, project activities. The project zone is located to the north of the project area as the area to the south and east is the Lower Zambezi National Park, and to the southwest is the Chiawa Game Management Area (GMA). The rationale for selecting the project zone boundaries included:

1. To the east and south of the project area is the Lower Zambezi National Park, where human habitation is legally prohibited;
2. The main drivers and agents of deforestation are to the north of the project area in four community 'zones' named Namanongo, Ndubulula, Chilimba and Mweeshang'ombe. Within these four zones are 28 villages within 30 km of the project area boundary along two main arterial roads³. One is the Chinyunyu-Namanongo road that was resurfaced with gravel to a high quality in 2012 and is a one-way charcoal extraction route that ends at the Conservancy. The second is the Sinjela to Chilimba road which ultimately enters into Lower Zambezi National Park.

³ Village is defined as a number of homesteads in an area under the leadership of a Headman or Headwoman who is appointed by the traditional ruler of the area (Chief). The village boundaries are defined by local leaders and are usually not titled.

This road is also an active charcoal transport route where it borders communal areas. However, charcoal transportation along this road stops before the Lower Zambezi NP Gate at Mukamba.

3. These two aforementioned two upgraded rural roads link to the Great East Road, to the north of the project zone. This all weather road is one of four major tarmac roads leading to Lusaka, and links the capital city to the East of Zambia, and Malawi. The Great East Road ultimately links villages in the project zone to charcoal and other markets in Lusaka. Hence, communities with some form of access to this road, and within 30 km of the project area have been included in the project zone.

The participating villages and their coordinates are summarised in Table 4 below.

Table 4. Villages falling within the project zone of the Lower Zambezi REDD Project that will be participating in project activities.

Number	Village Name	Coordinates	
		S	E
Zone: Chilimba			
1	Chikobeni	15.32492	29.23305
2	Nyamakau	15.33936	29.24038
3	Kasumba	15.35405	29.25618
4	Mwalilanda	15.35664	29.23391
5	Ben Shikakota	15.4016	29.26310
6	Chikoloma	15.33603	29.27097
7	Muyobe	15.40151	29.26319
8	Mulilwa	15.35084	29.20213
Zone: Mweeshang'ombe			
9	Malilakufwa	15.42241	29.19702
10	Mwachombela	15.44397	29.20387
11	Mweeshang'ombe	15.44028	29.21695
12	Chikuse	15.42947	29.27534
13	Shimaluba	15.39472	29.27534
Zone: Ndubulula			
14	Lumwengo	15.3776	29.03373
15	Mutonka	15.31235	29.01026
16	Mwankomesha	15.3902	28.97379
17	Kantyantya	15.3481	29.06903
18	Chipungu	15.37504	29.05454
Zone: Namanongo			
19	Musanshika	15.43181	29.11151
20	Kabandi	15.42292	29.12675
21	Kanyetu	15.45178	29.14459
22	Chundu	15.38379	29.17336
23	Nsambilo	15.46214	29.13206
24	Chifita	15.46821	29.04787
25	Kampamba	15.46407	29.11307

26	Sunta	15.41796	29.1725
27	Mulimba	15.46214	29.13206
28	Shatunka	15.45491	29.08648

G1.4 – CLIMATE INFORMATION: CURRENT CARBON STOCKS WITHIN THE PROJECT AREA

Verified Carbon Standard (VCS) methodology VM0009 v2.1 was followed for the quantification of carbon stocks and Net Emissions Reductions (NERs). The Lower Zambezi REDD+ Project complies with VM0009 as follows:

1. Forest land is converted to non-forest land and the drivers and agents of deforestation in the baseline scenario are consistent with those described in section 6 of the methodology and the end land use in the baseline scenario is non-forest. The project activity is Avoided Unplanned Deforestation and Degradation (AUDD).
2. Land in all project accounting areas has qualified as forest on average across the project accounting areas as defined by FAO 2010 or as defined by the residing Designated National Authority (DNA)
3. Deforestation exists at some point within 120 meters of the perimeter of the project accounting area such that without the implementation of the project activity the project accounting area would be immediately threatened by the agent of deforestation as of the project start date.
4. In the case of baseline type U1, at least 25% of the project area boundary is within 120 meters of deforestation and at least 25% of the project area is adjacent to the reference area. The Lower Zambezi REDD+ Project is consistent with this scenario.
5. In the case of baseline type U2, at least 25% of the project area boundary is within 120 meters of deforestation.
6. Foreign agents of deforestation are unlikely to shift their activities outside the activity-shifting leakage area.
7. The project accounting area does not contain peat soil.
8. A reference area has been delineated for the project accounting area based on the minimum area criteria.
9. As of the project start date, historic imagery of the reference area exists with sufficient coverage to meet the requirements of section 6.7.4 of this methodology.
10. Project activities are planned or implemented to mitigate deforestation by addressing the agents and drivers of deforestation as described in section 8.3.1 of the methodology.

11. The project proponent has access to the activity-shifting leakage area and proxy area to implement monitoring.
12. Logging is not included in the baseline scenario and there are thus no market-effects leakage area.
13. Soil Organic Carbon is selected as a carbon pool and the project falls within a tropical area, the project is thus eligible for using the default value for SOC decay from section 6.18.1.1.

The baseline type for the Lower Zambezi REDD+ Project is U3 – Avoided Unplanned Deforestation and Degradation Frontier or Mosaic. The length of the perimeter within 120m of deforestation is less than 25% of the total perimeter. The baseline type U3 was determined using the following geo-spatial procedure:

1. The property boundary was converted from a polygon to a line file.
2. Deforestation within 120m of the boundary was identified and digitised using a Landsat TM image captured on 2009-06-02.
3. The property boundary was then clipped (Geo-processing Tools in QGIS) using the deforestation within 120m layer identified in step 2.
4. The perimeter of the property was then calculated along with the length of the boundary within 120m of deforestation (Result from clip in step 3)
5. Perimeter = 125.568 km
6. Deforestation within 120m of boundary = 4.221 km
7. Percentage of total boundary within 120m of deforestation is 3.362 %

Spatial data associated with the above calculations has been provided to the auditors and should confirm the values presented. The Landsat scene was chosen as it is the closest scene available to the project start date and thus provides the most accurate assessment of threat to the project boundary at the time of the project start date.

The only deviation from the methodology is the sampling procedure of the Lying Dead Wood pool which was enumerated within inventory plots instead of along transects as suggested by the methodology. Lying Dead wood occurs at very low densities in the project accounting area and the additional time costs of sampling LD along transects could not be warranted. Lying dead wood is an optional carbon pool in VM0009. We believe the deviation will still result in a conservative estimate of LD and it is important to note that LD is an optional carbon pool.

VM0009 requires the demarcation of an accounting area that is defined as:

“The area to which the baseline emissions models are applied for a given baseline type. A forested area within the project area that is subject to deforestation in the baseline scenario.”

The accounting area comprises 34,081 ha of the total project area of 38,781 ha. An explanation of how the accounting area was calculated is provided in Section G2.3.

A further requirement of VM0009 is the delineation of a reference area that is used to estimate deforestation parameters and is similar to the reference region as described in the AFOLU requirements. The reference area was selected based on the guidelines in Appendix D of VM0009. The reference area has to be similar to the project area with regards to landscape configuration, soil types and these similarities can be seen in Figure 2. The reference area boundaries were determined based on the presence of agents of deforestation, similar proximity to the Lusaka market as the project area, the Great East road (a main arterial to the north of the project zone) and the Lower Zambezi National Park.

Land cover stratification for the Lower Zambezi REDD+ project area as well as the adjacent leakage area was undertaken using a Landsat 5 TM image captured on the 14th of May 2008; downloaded from the United States Geological Survey, Global Visualization Viewer (<http://glovis.usgs.gov/>). The six reflectance bands as well as an additional band depicting vegetation cover were used in the classification. The additional vegetation cover band was sourced from a Tasselled Cap transformation (Kauth and Thomas 1976) applied to the six reflectance bands. Data downloaded from the GLOVIS archive are corrected to Level 1, indicating the imagery has been radiometrically and geometrically corrected. Radiometric conversion coefficients supplied in the metadata were used to convert the imagery to radiance / reflectance values prior to the Tasselled Cap transformation. The Greenness channel was then added to six reflectance bands data set. All input channels were then scaled to 8bit integers (0-255).

Supervised classification was employed to classify the land cover into four distinct classes relevant for carbon pool assessment, which included; dense trees, light trees, grassland and bare earth. Supervised classification was employed using the GRASS GIS (GRASS Development Team, 2012) software package. Classification training sites were digitised using expert knowledge of the area as well as a number of field plot locations used for sampling carbon pools (See Figure 3).

Classification was undertaken using the sequential maximum a posteriori (SMAP) (Bouman and Shapiro 1992) estimation function available in GRASS. Following validation of the resulting classification using high-resolution imagery (GeoEye), along with input from the on-the-ground survey teams, the bare earth class was combined with light tree. Finally, the classification output was smoothed using a majority (3x3, modal) filter. Table 5 provides a breakdown of the areas of each land cover class for the total area and the accounting area for both the ranch and the leakage belt.

Table 5. Land cover classification of Accounting Area and Total Project Area using Normalised Difference Vegetation Index, for Lower Zambezi REDD+ Project.

Class	Description	Accounting Area (ha)	Total Project Area (ha)
Dense tree	Full canopy coverage	9,239	10,838
Light tree	Trees without full canopy coverage	24,842	26,260
Grassland	Shrub vegetation with very few trees	Excluded	1,683
Total		34,081	38,781

The project will account for reductions in CO₂ from the prevention of forest land being converted to cropland and associated non-CO₂ emissions from biomass burning during this land use conversion of CH₄ and N₂O.

The following pools will be included as per VM0009:

1. **Above Ground Other Trees (AGOT).** Above Ground Merchantable Trees were not considered as commercial and illegal logging for long-lived wood products are not considered a deforestation threat to the project area. Wood Products were therefore excluded as a carbon pool.
2. **Below Ground Biomass (BGB)**
3. **Standing Dead Wood (SD)**
4. **Lying Dead Wood (LD)**
5. **Above Ground Non-Tree (AGNT)** which included shrubs/saplings but not herbaceous biomass
6. **Below Ground Non-Tree (BGNT)**
7. **Soil Organic Carbon (SOC)**

A rapid pilot assessment was used to determine minimum plot radius and tree size. The methodology used will be provided to the Validator (BioCarbon Partners 2012). All trees with a Circumference at Breast Height (CBH) of less than 15 cm were excluded from the AGOT pool and assessed as shrubs as part of the AGNT pool. Circumference was converted to diameter using spreadsheet software. Circular plots with a radius of 12m were found to be best suited for the vegetation in the project area.

For the purposes of validation, carbon stocks were calculated based on 26 plots that were enumerated within the project accounting area. The majority of the plots were located in the northeast section of the Conservancy, as at that stage, it was difficult to gain entry to other sections. This was due to a lack of suitable roads within the property. Biomass plot locations were defined randomly within the Conservancy, based on the land cover classification so that plots fell within each forest cover class and stored in a GIS.

Based on the classification detailed above, we are confident that the area sampled is largely representative of the Conservancy due to the uniformity of the forest. A supervised land cover classification produced only two forest cover types namely light and dense tree and both were represented in the area sampled. Plots were accurately located using a handheld GPS. All plots were permanently marked and trees tagged for follow up monitoring purposes. A more thorough biomass inventory will be completed to comply with VCS criteria and validation and verification of the project under the VCS. At the time of writing over 150 additional randomly placed plots had been sampled across the entire accounting area in preparation for VCS verification.

Two teams of local villagers were trained to undertake the inventory by BCP staff. Sable Transport Ltd. rangers accompanied teams for security and as local guides. The methods followed were based on recognized vegetation sampling techniques as well as the IPCC guidelines (2006) and described in the BioCarbon Partners REDD+ Carbon Stock Assessment Inventory Field Manual.

Soil Organic Carbon was quantified in 12 soil pits to a depth of 1m where possible. Soil pits were placed just on the edge of biomass plots. Soil samples were taken at three depths: 0-10cm, 10-30cm and 30-100cm. Soils were analyzed for organic carbon content using the Walkley-Black method (Walkley & Black 1934) and bulk density, using a simple known volume method. The soil samples were analyzed in South Africa at the Agricultural Research Council Laboratory Facility in Pretoria (Permit Number: P0052479).

Tree biomass was calculated using existing miombo woodland allometric models that were developed near the project (Chidumayo, 2013). Two generic models were developed by Chidumayo (2013): one a power model and the other a log model. The log model was found to have a lower error level, but slightly overestimated biomass so for reasons of conservativeness we used the power model which is as follows:

$$\text{Wood Biomass (kg)} = 0.0446 \times \text{DBH}^{2.765}$$

The Diameter at Breast Height (DBH) range for the model was 2-39cm and it was developed from a sample size of 113 destructively sampled trees covering 19 species, including the common species in this project. We capped biomass at a DBH = 39cm for all trees over this upper limit as our sampling found trees up to 55cm.

For the purposes of estimating *ex-ante* GHG emissions reductions, proxy factors were used for the SD, LD and AGNT pools. These approximate wood densities for each class are based on the proponent's best knowledge and experience in similar ecosystems. The values will be updated with data from allometry analyses when they are completed.

Table 6 is a summary of the carbon stocks per pool in the project area. This is a conservative estimate of stocks and a more complete survey of stocks will be undertaken for registration of the project under VCS.

Table 6. The Lower Zambezi REDD+ Project Area carbon stocks per carbon pool and vegetation strata. Carbon pool values are for below and above ground combined.

Stratum	n	Area (ha)	Carbon Pool	Mean	Standard Error of the Mean	Lower 95% CI	Upper 95% CI	Total CO2e
Light Tree	23	26,260	Lying Dead Wood	0.0041	0.0009	0.0022	0.0061	108.33
			Standing Dead Wood	1.2961	0.4880	0.2841	2.3080	34,034.35
			Non-tree	26.04	1.76	22.39	29.68	683,727.42
			Other Tree	177.99	16.16	144.48	211.51	4,674,143.45
			Soil Organic Carbon	269.99	50.48	158.88	381.10	7,089,911.14
			12					
Dense Tree	3	10,838	Lying Dead Wood	0.0050	0.0050	-0.0164	0.0263	53.74
			Standing Dead	0	0	0	0	0
			Non-tree	22.26	8.01	-12.22	56.74	241,280.00
			Other Tree	98.88	18.32	20.06	177.71	1,071,702.30
			Soil Organic Carbon	269.99	50.48	158.88	381.10	2,926,140.78
			12					
Grassland	0	1,683	All pools biomass IPCC default	29.6				49,816.80
			Soil Organic Carbon	269.99	50.48	158.88	381.10	454,391.49
Total								17,225,309.79

G1.5 – COMMUNITY INFORMATION: A DESCRIPTION OF COMMUNITIES LOCATED IN THE PROJECT ZONE

The Lower Zambezi REDD+ Project is technically located in Chongwe District, Lusaka Province, although the area within the Project Zone is set to officially fall under the newly created Rufunsa District once the official GRZ Statutory Instrument (SI) is passed. Rufunsa District was announced in mid-2012, and there is a District team in place so the project team is engaged with both District Councils. Chongwe District is based in the town of Chongwe, approximately 40 km from Lusaka. Rufunsa District is based in Rufunsa town, approximately 170 km from Lusaka on the Great East Road.

The Project Zone is comprised of 28 villages in four community zones (Figure 4). The Project Zone was defined so as to include all the stakeholder communities that BCP had identified as currently involved in permanent deforestation activities (such as charcoaling or agriculture) in or near to the Project Area (Rufunsa Conservancy), that are therefore reasonably expected to be impacted by the implementation of REDD-related activities on Rufunsa Conservancy. As the map shows, three of the zones are situated along the border of Rufunsa Conservancy, and one—Ndubulula—is located just north of the Project Area, and is the closest zone to Chongwe town and the Great East Road that leads to Lusaka.

The conditions within the project zone can be best described as rural; the majority of households live without electricity or public water or sanitation services and are primarily reliant on charcoal production and subsistence agricultural activities. Two of the zones (Chilimba and Mweeshang'ombe) do not have government schools or clinics within the zone; the communities have established voluntary community schools which are resource constrained. There is a Government-supported clinic in Namanongo which is not open full-time; it does not house a doctor nor even a certified clinician. Public transport is sparse and communities in the three other zones travel by foot or bicycle up to 25 km to the nearest health clinic (clinics in this context are capable of basic healthcare and referrals). The closest district hospital is in Chongwe town approximately 80 km away from communities. As a result, education levels and school attendance rates are low and high infant mortality rates impact these communities, as BCP has experienced firsthand when a community coordinator's wife lost a child at a local clinic due to complications during pregnancy. Part of the problem is that the two roads leading into the project area are effectively one-way: trucks frequently enter the project zone to collect charcoal, whereas communities do not have regular or easy access to transportation outside of the project zone.

This means that communities further down the road closest to the project area have less access to transport and services which tend to concentrate closer to the Great East Road.

As the sections below will discuss in further detail, approximately 88% of households living within the Project Zone live below the poverty line of US \$1.25 per day⁴. Nevertheless, their relative proximity to the Great East Road that leads directly into Lusaka provides a powerful connection to Zambia’s capital city. This is both a blessing and a curse, as this proximity to the Lusaka charcoal market is simultaneously one of the strongest drivers of deforestation and one of the only major sources of income in the area.

Due to unreliable and out-dated national census information available, BCP undertook a community population census in cooperation with local Headmen and Headwomen with the aim of obtaining more accurate information about the communities that we are working with. To do this, official letters were requested and received from each Headman or Headwoman from every village within the project zone, officially stating the number of male- and female-headed households living within their villages. Using the information that was received, BCP used average household sizes from the 2010 national census to calculate the approximate total population living within the project zone: it is estimated that there are approximately 8,309 people living in 1,167 households within the project zone (Figure 4). Table 7, below, provides a breakdown of the population living within each zone, and a breakdown in terms of the gender of heads-of-household within each zone. Table 8, below, presents information about the total population and Mean household size across all four zones, as well as the mean composition of adults over 15-years-old⁵ among households in each zone.

Table 7. Number of Heads-of-Household & Population By Zone in the Lower Zambezi REDD+ Project (Source: BCP Village Census Data & 2010 GRZ Census for Mean Household Size).

Zone	Heads-of-Household		Households	GRZ 2010 Census Mean HH Size	Total Population
	Male	Female			
Chilimba	216	22	238	7.61	1,811
Mweeshang’ombe	124	123	247	7.74	1,911
Namanongo	305	39	344	6.36	2,187
Ndubulula	295	43	338	7.1	2,400
Project Zone	940	227	1,167	N/A	8,309

⁴ The World Bank provides a \$1.25 (PPP)/per person per day benchmark for “absolute poverty.” This benchmark is referenced in recent World Bank documents (see: World Bank *Global Economic Prospects* 2010 and www.worldbank.org/afr/ and <http://data.worldbank.org/indicator/>) as well as a 2010 Swedfund report, available at: <http://www.swedfund.se/>.

⁵ Chapter 274 of the Laws of Zambia—the EMPLOYMENT OF YOUNG PERSONS AND CHILDREN Act—defines a “child” as a person under the age of fourteen years, and forbids the employment of children. As such, the “workforce” among a population in Zambia constitutes all those persons over the age of 14, who are capable of working (barring disability).

Table 8. The number of adults in each village zone and the number of adults per household for the Lower Zambezi REDD+ Project (Source: Baseline Survey).

Village Zones	Total # individuals in surveyed households	Mean Household Size	Mean # Adults in Households
Chilimba	175	7.61	3.70
Mweeshang'ombe	194/162*	9.70/8.53*	3.00
Namanongo	169	6.04	2.71
Ndubulula	135	7.11	2.37
Overall:	673	7.48	2.96

*Represents the total and average figures for Mweeshang'ombe with/without outlier household

The following sections provide more in-depth information and analysis concerning economic and demographic conditions faced by households living within the Project Zone of the Lower Zambezi REDD+ project as well as a description of local leadership and governance structures concerning land-use and resource rights. The information presented in this section was largely gathered during a project-implemented Baseline Survey, which collected data from 90 households living in the four community zones. Ninety Households were sampled based on an initial survey and then applying the equation of Krejcie and Morgan (1970) that predicted if the 90% Confidence Intervals were to fall within 10% of the mean then at least 89 households will have to be sampled (Box 1). The mean annual household income was KR 6,634.87 ± 1418.679 (90% CI, n = 90), which is higher than 10%, but the sample contained outliers that exacerbated the error.

Box 1: Sample size calculation

The sample size was calculated according to a 90 percent confidence level (Krejcie and Morgan 1970). Sample size is more or less independent of population size. We used the following formula from Krejcie and Morgan (1970):

$$\text{Sample size} = \frac{\chi^2 NP(1-P)}{C^2(N-1) + \chi^2 P(1-P)}$$

χ^2 = chi-square value for 1 degree of freedom at some desired probability level

N= Population size

P= Population parameter of a variable (set to 0.5)

C= Confidence interval

The full data and analysis of this information is compiled in BCP's Baseline Survey Report, which will be made available to the Validator. The data that we have collected and presented here are also augmented by data collected through key informant interviews, semi-structured interviews, triangulation, village meeting participation, focus groups, and local observation that we have gathered over twelve months of involvement and interaction with the local community.

Economic Indicators: Key Livelihood Activities

Although reliable, accurate and updated national census statistics are difficult to obtain, international organizations estimate that approximately 68.5% of Zambia's population of nearly 14 million people lives below a poverty line of US \$1.25 per person per day (CIA, 2013; World Bank, 2006). Recent United Nations figures estimate that approximately 78% of the rural population lives in poverty compared to 53% of the urban population (UN Statistics Division 2012). The 2010 Gross National Income (GNI) per capita for Zambia in USD was calculated at \$1,370 (UN Statistics Division, 2012).

Using an overall income of US \$1.25/day as an international benchmark for the poverty line, the poverty line per person on an annual basis would be US\$ 456⁶. It is indicative of the high-levels of poverty within the Project Zone that the mean annual income per capita within the Project Zone is between approximately US \$170-182 per year, or US \$0.47-0.50 per day⁷, or approximately 60% lower than the international poverty benchmark. It is also illustrative that rural poverty rates are higher in the project zone (88% versus the UN's statistic of 78% of Zambia's rural population living under \$1.25 per day).

Figures 5 and 6 below provide a summary of the mean annual income calculations among households and individuals across the four village zones in Zambian Kwacha (Exchange Rate used is 5,200 ZMK = US\$ 1 at the time of the analysis)⁸. Figure 7 charts income distribution across the four **community** zones and for the Project Zone overall. This figure shows that for all zones except Ndubulula, the majority of households reported annual incomes between KR 0-5,000 (US\$ 0-962). In Ndubulula zone, the majority of households reported annual incomes between KR 5-10,000 (US\$ 962-1,923), and the income distribution chart for this zone more closely resembles that of a middle-income society, where the majority of households receive "moderate" incomes. In contrast, the charts for the other zones show a majority of households living in poverty, offset by a small number of households with significantly higher incomes.

⁶ It is critical to note that these international poverty indicators do not account for subsistence livelihoods—such as subsistence farming—where income may not be such a clear indicator of well being. Given that BCP estimates that communities within the Project Zone engage in a high level of subsistence agriculture, this could explain such high levels of poverty calculated among households living within the Project Zone.

⁷ Two different methods were used to calculate mean per capita incomes within the Project Zone: 1) The per capita income for each household was calculated by dividing the total annual household income by the number of individuals within the household, and the mean was taken of all calculated per-capita incomes as such (resulting in ZMK 946,474 as the mean of all calculated Per Capita incomes from households within the Project Zone). 2) The average total household income (ZMK 6 634 867) was divided by the average household size (7.48) within the Project Zone, resulting in an average per capita income of ZMK 887 278 (US\$ 171 at an exchange rate of 5,200 ZMK to 1US\$).

⁸ Zambia rebased its currency in 2013 with a new exchange rate of approximately 5.2 KR (Kwacha Rebased) per US\$ 1. ZMK figures can be divided by 1,000 to convert the figure into KR.

This is in line with other indicators that, when viewed collectively, indicate that Ndubulula zone is a higher-income area with more diverse sources of income, has a more stable community composition, lower rates of short-term immigration, and higher investment in community services such as schools, when compared to other zones.

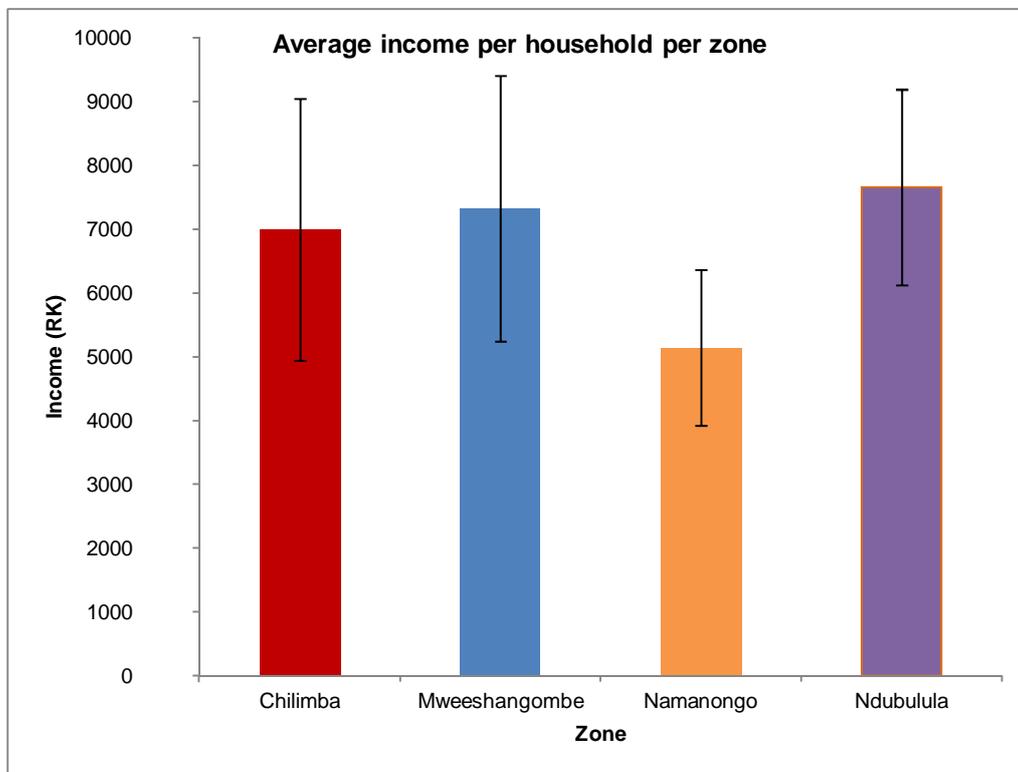


Figure 5. Mean Annual Income per Household and Standard Error of the Mean within Project Zone of the Lower Zambezi REDD+ Project.

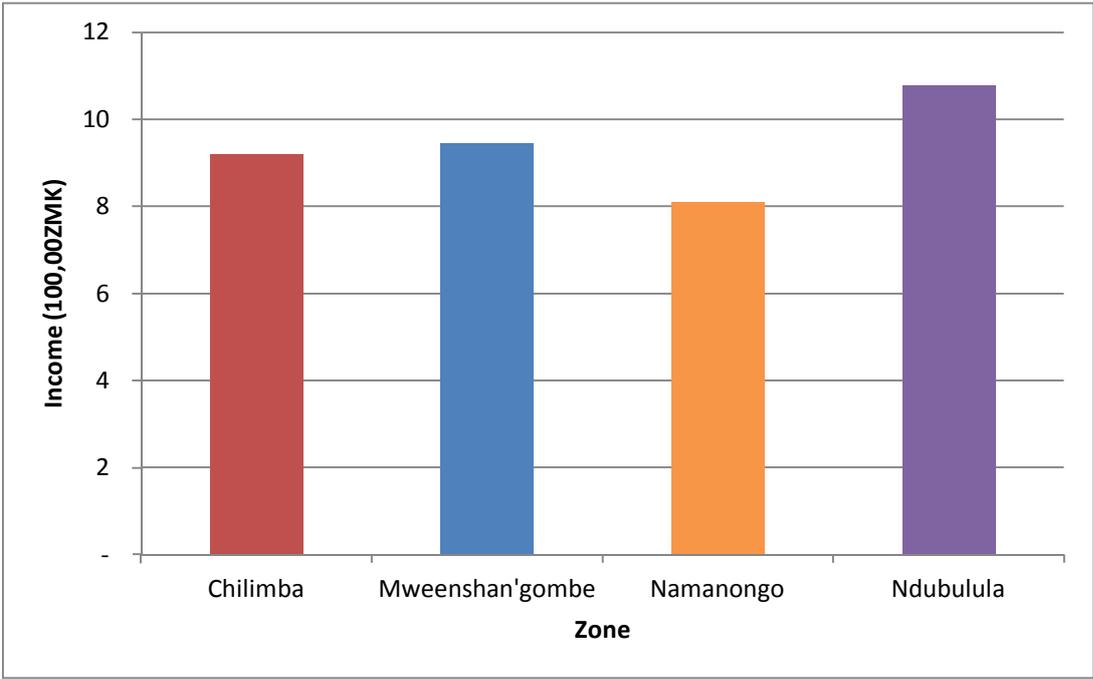


Figure 6. Mean Annual Per Capita Income Within Project Zone.

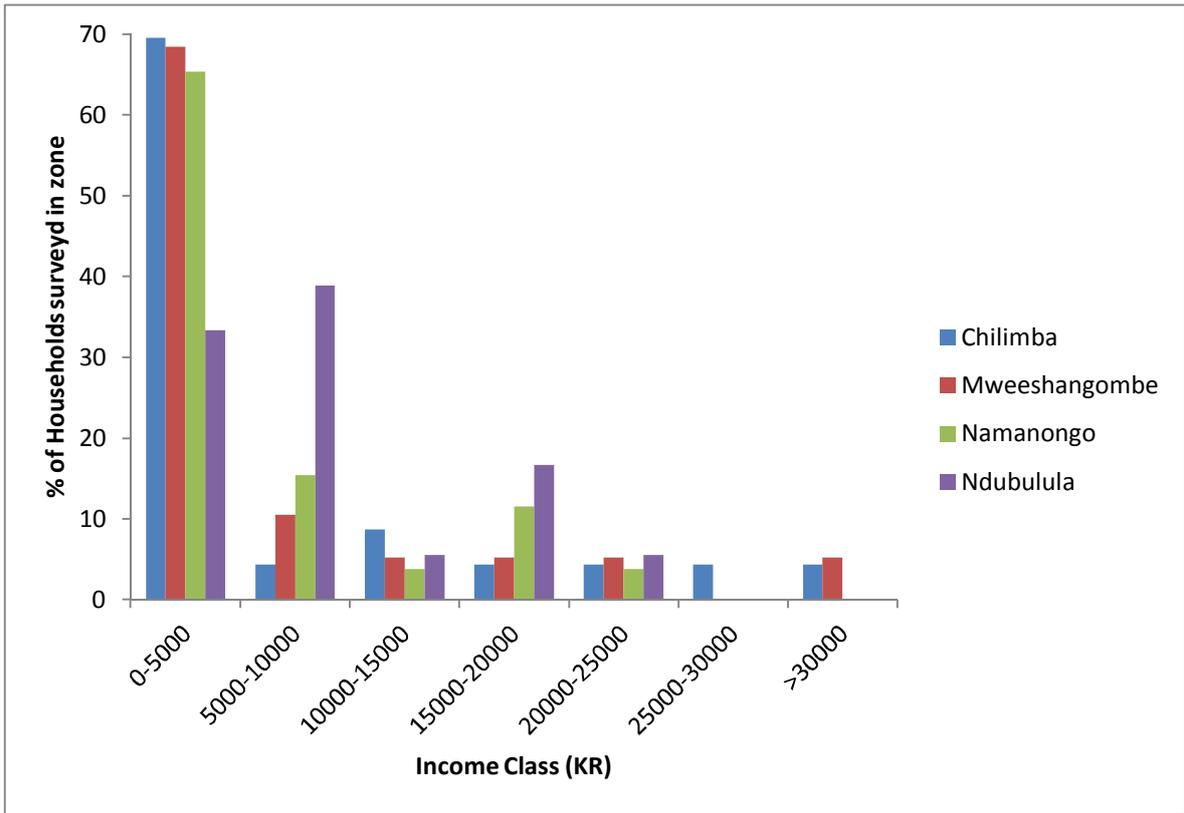


Figure 7. Income Distribution (Across 90 Households).

In addition to general economic indicators concerning income, the Baseline Survey collected information regarding the sources of income within households and throughout the four zones. On average, approximately 37% of total household income was attributable to commercial charcoaling (Figure 8), making charcoal the most significant source of cash income for households in the project zone. A seven-year landmark study by CIFOR (2011) found that forest income (wood, wildlife, plants and other resources harvested from forests) constitutes about 20% of total household income of communities living in or near forests in different countries. Environmental income—defined as forest and non-forest income—contributed about 25% of total household incomes (CIFOR 2011). What is significant about communities living in the project zone is that forest income is almost double that of the CIFOR study illustrating the high dependence on charcoal production for urban markets.

Agriculture was the second-most significant source of income, accounting for an average of 32% of household income. It should be noted that the value reported for income from agriculture does not represent the total amount of agriculture that was produced, but rather, the total amount of income that was generated through the sale of surplus crops and vegetables. As Figure 8 shows, no other sources of income were comparatively important—small business represented the third-most significant source of income within the Project Zone, and that only accounted for an average of 7% of household income.

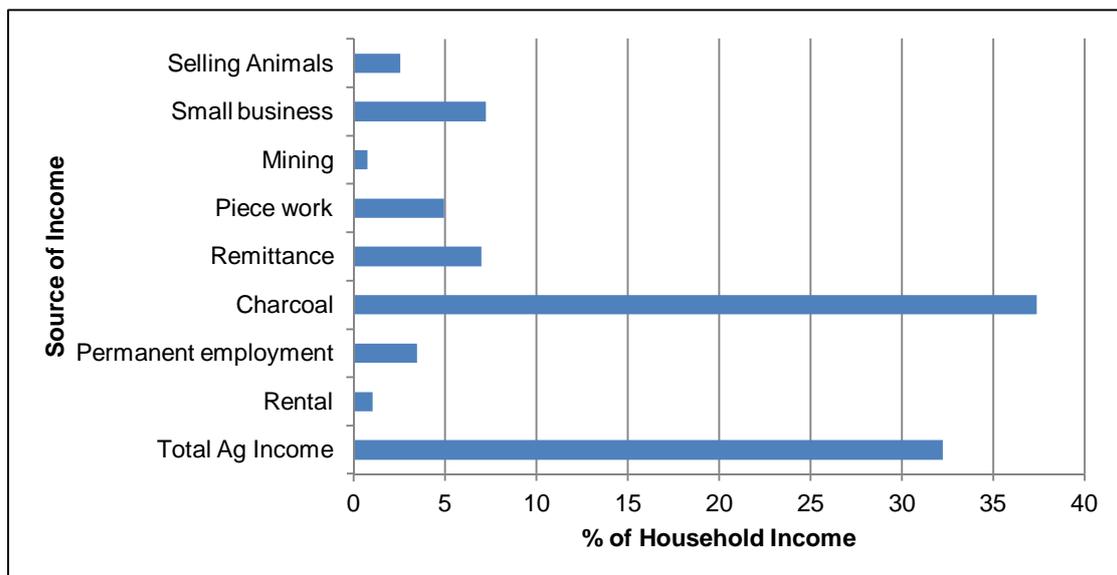


Figure 8. Mean Percentage of Incomes Derived from Various Income Sources.

Of surveyed households, only 7% reported any income from formal employment. This reflects the lack of investors, NGOs, Church organizations and companies creating jobs in the area that now falls under Rufunsa District, and creates an opportunity for catalytic social change through job creation linked to this project.

Incomes from “small business” (meaning informal, self-employment) were more significant: small business accounted for approximately 7% of household income, overall, across all four zones, and ranged from an average of 6% of household incomes in Ndubulula to an average of 10% of household incomes in Mweeshang’ombe. Project activities target a variety of forest compatible businesses, so contributions from this sector through the project should increase significantly.

“Piece work” (irregular, informal casual work) represented an average 5% of household incomes across all four zones, and ranged from an average 1% of household incomes in Mweeshang’ombe to 9% in Chilimba. This could be related to the fact that Chilimba has high rates of short-term immigration, while Mweeshang’ombe has more serious farmers or commercial charcoal producers.

Figure 9 below, presents a composite of information about businesses or “jobs” in the Project Zone, and reveals that there are serious differences between the importance that various types of “work” have for each zone. However, it is important to note that none of these sources of income presented nearly the same significance as charcoal or agriculture among households within the project zone—in no case did the average percentage of income from a source achieve greater than 10% significance within a zone or across all four zones.

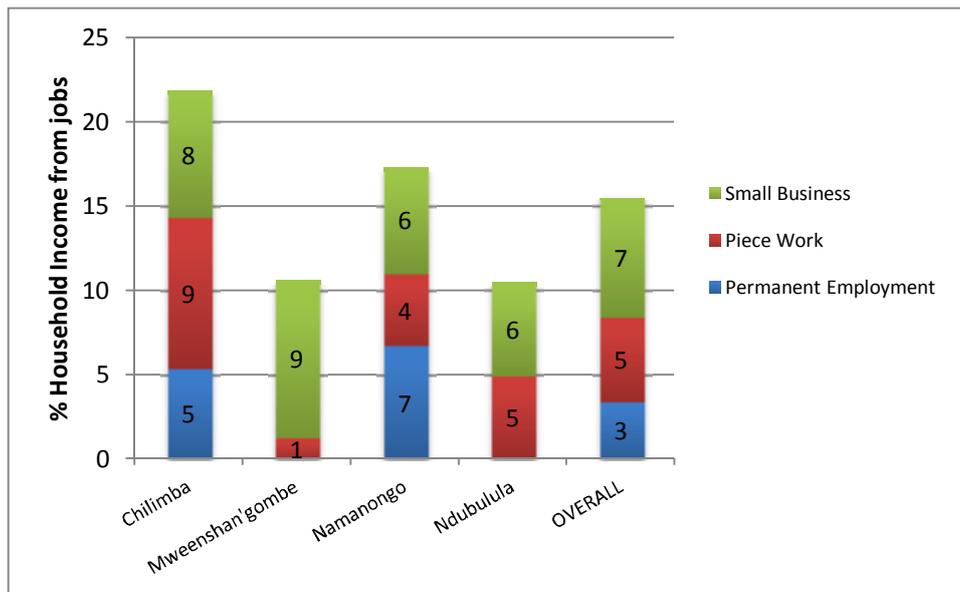


Figure 9. Mean Percentage of Household Incomes from Jobs, by type.

This pattern of a low level of formal employment and a higher level of informal employment among households within the Project Zone is consistent with overall trends throughout Zambia and throughout Sub-Saharan Africa, where employment in the informal sector tends to be high. In rural areas of Zambia, 82 percent of people depend on the informal sector (UNDP 2011)⁹.

Figures 10a and b further reveal the high levels of involvement and dependency on charcoaling as a livelihood and source of income within the community, for example, Figure 10a shows that 90% of households in Mweeshang'ombe zone reported they were involved in charcoal production, and Figure 10b shows charcoal-producing households in Mweeshang'ombe reported an average 66% income dependency on charcoaling (meaning that, on average, 66% of total household income among producers was derived from charcoal).

⁹ Source: http://www.undp.org.zm/joomla/attachments/034_ZHDR2011.pdf

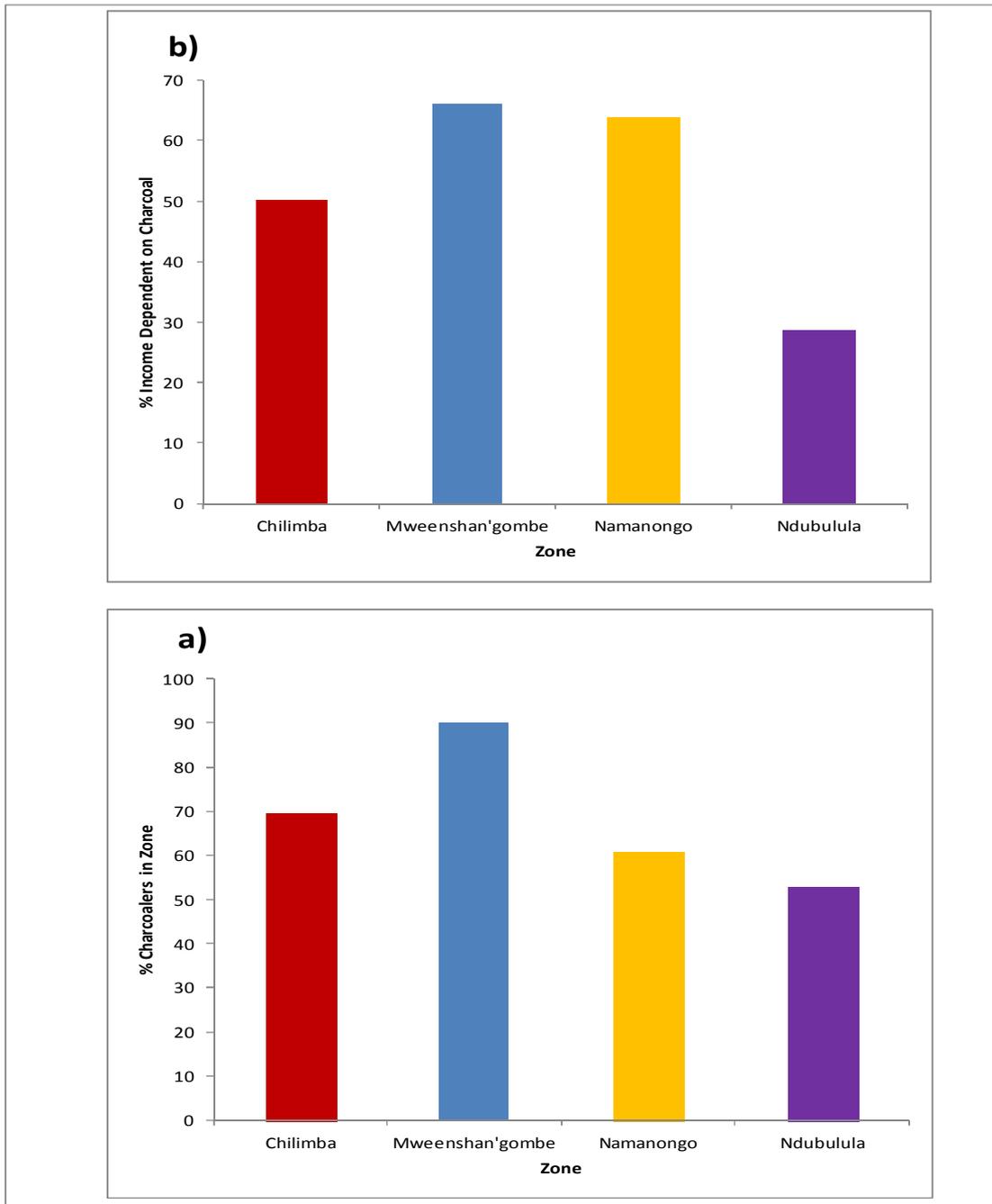


Figure 10. a) Percentage of Total Zone Population Deriving Income from Charcoal Production and b) Average % Income Dependency Among Producers, by Zone.

Current Socioeconomic Conditions: Household Expenditure

Household annual expenses can be indicative of the general well-being of communities, by reflecting the amount of disposable income they are able to spend versus the percentage of their expenses that goes towards “survival” costs, such as food. Figure 11, illustrates the average percentage of total household annual expenses that various “expense types” accounted for among surveyed households.

This figure shows that food was, by far, the most significant expense faced by households: on average, approximately 40% of household expenses within the Project Zone were attributable to food purchases. Households surveyed reported spending a total of KR 2,200 (US\$ 423) each on food within the last year. It was found that households spent an average of KR 329 (US \$63) per person on food last year. These statistics are indicative of low-income households who are struggling to survive, spending the majority of their money on food for their families. However, it should be noted that the survey did not account for total agricultural production among households, and therefore does not provide adequate representation of the amount or significance of subsistence agriculture practices across households within the Project Zone. We asked questions concerning the amount of income that was received from agriculture, and the total amount of household expenses that went towards purchasing food. We did not ask questions about the total amount or volume of agricultural production, or the total amount of food that was consumed per household or per individual. It will be important to include such questions in future rounds of surveys, as an analysis of responses to them would add important depth to socio-economic information provided by the survey.

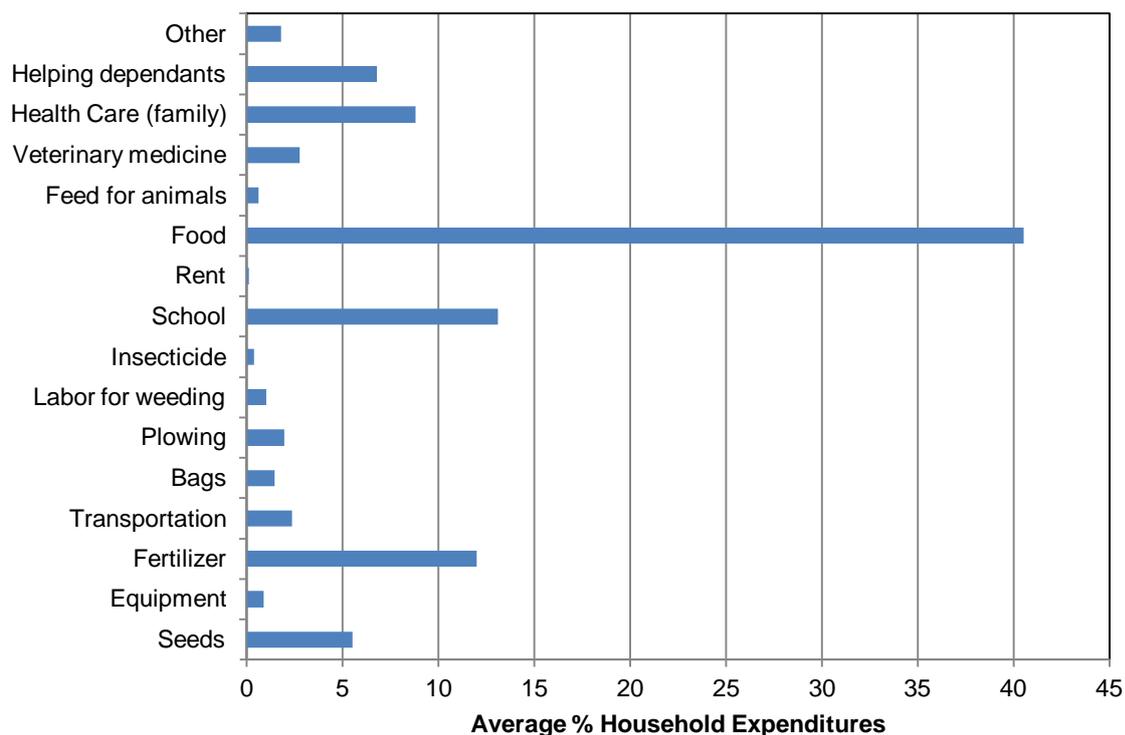


Figure 11. Average Percentage of Household Expenses, by Expense Type.

Expense-related data collected from the Baseline Survey also confirmed that school fees within the Project Zone vary greatly. The surveys showed that some households spend very minimal amounts (such as KR20 per year, or US\$ 4) to send their children to local community schools, while other households spend millions of KR per year (up to KR7,100, or \$1,365) to send their children to government-run schools. BCP's Educational Assessment Report¹⁰ contains further evidence of disparities—and inadequacies—when it comes to education across all four zones, and documents how fee structures differ between schools: educational costs faced by households in each zone vary greatly—ranging from “free” volunteer teaching at Chilimba and Mweeshan'gombe Community Schools, to sometimes prohibitively expensive costs (up to KR 70 (US\$ 14) per child per term) at government-run schools in Ndubulula and Namanongo. The Educational Assessment Report further documents that schools vary not only in terms of their fees, but also in terms of the quality of education that they offer. For example: the Mweeshang'ombe Community School caters to approximately 130 children in Grades 1-3, however, students are limited to a small, one-room, dirt-floor classroom without desks or teaching supplies. Students in Mweeshang'ombe who wish to progress past Grade 3 must walk 15 km—each way—to attend Namanongo Basic School, where they are expected to purchase supplies and uniforms and pay a regular Parent Teacher Association (PTA) fee. In contrast, the Chilimba Community School benefits from a very decent building that was built by an external mining company. However, students there suffer from irregular—and frequently intoxicated—teachers, who lack resources and motivation to teach classes regularly. Even in Namanongo and Ndubulula, where students have access to government-run school facilities, school administrators reported incomplete attendance due to poverty (lack of school fees) and lack of interest in education.

Demographic Indicators

In addition to gathering information about the economic status of households, data were also collected on demographic information about the population living within the Project Zone for the Lower Zambezi REDD+ Project.

In order to identify and compare the origins and relative permanence of residents living within the Project Zone, BCP collected information detailing respondents' ethnic and physical origins, including their places of birth. These data serve as useful indicators of the rate and nature of immigration patterns into the Project Zone.

¹⁰ BCP's Educational Assessment Report (2013) will be made available to the Validator.

Viewed as a whole, the data reveal high levels of immigration into the Project Zone, particularly from Tonga people from Southern and Central Provinces, and particularly into areas along the boundary of the Lower Zambezi REDD+ Project (notably: Mweeshang'ombe and Chilimba zones). Combined with anecdotal evidence in the form of testimony from local residents, these data illustrate a current trend taking place in the Project Zone—and arguably across Zambia—whereby residents of deforested areas relocate to areas of relatively preserved forest, in order to continue engaging in activities such as charcoal production and subsistence agriculture. Forests close to major markets like Lusaka are under specific intense pressure. As such, communally owned forested areas in the environs of the Project are degraded through a combination of charcoal production, poor fire management, and overharvesting. This means that intact forests such as Rufunsa Conservancy and Lower Zambezi National Park now face deforestation pressure and experience encroachment. It also shows a concerning precedent within Zambia of migration being driven by forest and soil exhaustion, and the increasing threat of climate change vulnerability in these communities. Without the intervention of a project like this in helping to make the rural economy more sustainable in the project zone, it is likely the same pattern of deforestation and soil fertility depletion will continue (Figure 12).



Figure 12. Typical project deforestation pattern: a) large scale commercial charcoal production; followed by b) subsistence agriculture (with smoking charcoal kiln in background using trees from this field). Tree stumps in the foreground are burned out in the first years of farming. This, combined with unsustainable farming practices and crop residue burning, leads to emissions.

Using the survey data on places and on dates of birth, and the number of years that respondents have lived in the project zone, the average “percentage of lifetime” that heads-of-household have lived within the Project Zone was calculated. Of the heads-of-household for whom there were sufficient data to calculate their percentage of lifetime spent within the Project Zone, it was found that only 26% had been born within the Project Zone. At the same time, 74% of respondents reported that they had been born outside of the Project Zone, and had since migrated into the Project Zone from other locations.

Table 9 allows for comparison of migration patterns across the four village zones. Just over half of the respondents had moved into the Project Zone from “non-adjacent” areas—as compared to some respondents who had reported moving into the Project Zone from nearby towns, such as Chongwe or Sinjela. Migrants to Ndubulula zone have spent, on average, approximately twice as much time—in terms of absolute years as well as average “percentage of lifetime”—living within the Project Zone than migrants to Chilimba zone reported. The implications of this for community-based intervention are significant. In charcoal producing communities with high immigration, there is less community cohesion, and higher rates of crime, domestic and alcohol abuse. Community engagement and institutional building strategies in these fragmented communities are more involved.

Table 9. Movement of people into the Lower Zambezi REDD+ Project Zone from Non-Adjacent Locations.

Village Zone	Moved from Non-Adjacent locations into Project Zone	Average years spent in current location	Average Percentage of Lifetime spent in current location
Chilimba	10	8	18%
Mweeshang’ombe	11	11	29%
Namanongo	15	11	24%
Ndubulula	12	17	34%
Overall	48	12	26%

Ethnicity is another potentially important indicator of immigration into the Project Zone, as ethnicity is often linked to place of birth for children or their parents. Figure 13 below, allows for comparison of the ethnic composition of survey respondents across all four zones. This figure shows that the immigration rate appears to be high among Tongas, from Southern Zambia, to the two zones that are closest to the Project Area boundary—Chilimba and Mweeshang’ombe. This is indicative information, as it is related to a land use and governance shift in these zones. In the past, the Soli ethnic group occupied the project zone. Reportedly, the Soli did not become involved in commercial charcoal production at scale until immigrants introduced this land use type relatively recently.

The Tonga are commercial farmers and preceding the clearing of new fields comes charcoal production. While the Chief and Headmen are still almost all Soli, there are reports that traditional authority structures are breaking down due to immigration, external charcoal market drivers and resultant local corruption, and easy access to the capital city. In terms of pressure on forests, the proximity of the project zone to Lusaka and openness of Headmen to allocate land to immigrants means that the project zone is undergoing rapid and fundamental landscape-level transformation which is driven, for now, on commercial charcoal markets in Lusaka, followed by subsistence agricultural conversion.

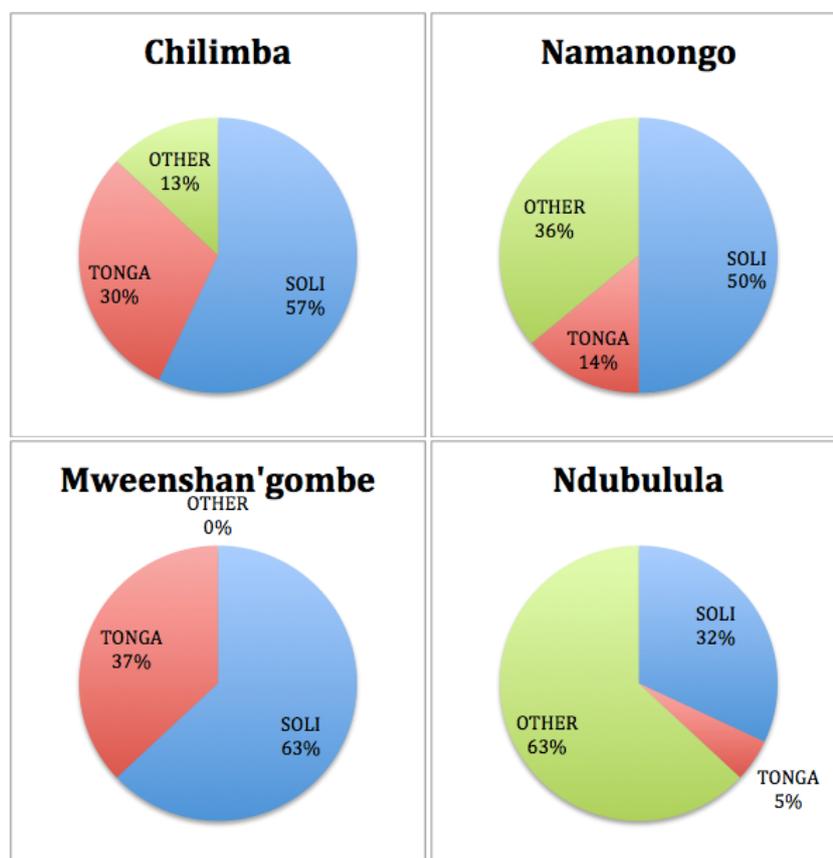


Figure 13. Ethnicity of Survey Respondents Across Zones.

Customary institutions and governance of resources

Traditional leadership structures remain recognized institutions in Zambia, running in parallel with government institutions. Individual Headmen and Headwomen govern the villages that are located within the Project Zone. These Headmen/Headwomen are appointed by, and report to the local Chief—Chief Unda Unda—whose area of influence (“Chiefdom”) roughly correlates with the Districts of Chongwe and part of Rufunsa District.

Chief Unda Unda regrettably passed away only a few days before the submission of this PDD, and a succession exercise is underway.

According to local residents, traditional leaders are primarily responsible for allocating customary (community) land. Headmen and Headwomen control the community land within their village areas, and are able to grant locally recognized land-use rights to local residents who wish to live there. Traditionally, new arrivals are expected to present themselves to a local Headman or Headwoman, who may decide to provide them with access to land and resources. In recent years, villages within the Project Zone have witnessed a new and growing trend, whereby new arrivals present themselves to a local Headman or Headwoman and request “land for farming.” These new arrivals then proceed to cut trees for charcoal production, and once they have depleted the land of its forest resources, they proceed to other areas, claiming the land was “not good” for farming—although this is often not the case. For example, Headman Muyobe (Chilimba) despairs that his village now only holds twelve households, although he used to rule “hundreds” of residents. He claims that he has been let-down many times by potential residents who requested land for farming, and then abandoned the land after “destroying” its capacity through charcoal production. Unsustainable and destructive charcoal production practices often damage soil capacity, as kilns leave “burn scars” that prevent regeneration or farming. Poor cutting practices can result in tree stumps being susceptible to centre rot. When combined with late hot fires, degradation can lead to a steady decline in the state of these forests.

Through discussions with local residents, BCP has learned that local Headmen have been responsible for providing new-arrivals, including transient charcoal producers, with access to hectares of community land and forest resources, in exchange for financial “tokens” of up to KR 1,000 (US\$ 200). In light of these findings, BCP now understands that it must engage with the communities in order to reduce the incentives that local leaders face to “sell” community forest at minimal costs, especially to non-resident charcoal producers who do not invest in the community and who degrade soil quality and forest resources. Already, BCP has begun to address (and reduce) such incentives by launching projects that add value to forested areas, that otherwise do not generate income for local communities as a whole. BCP’s Sustainable Eco-Charcoal Project, currently in its pilot phase in Ndubulula zone, is an example of one such project: by agreeing to protect areas of community forest for sustainable tree-harvesting, Headmen can guarantee revenue for their broader communities through the production and sale of community-based sustainable eco-charcoal product.

In effect, by empowering communities, these community-based deforestation mitigation projects contribute to a “checks and balances” system where communities can hold local leaders more accountable in the distribution, and management of communal resources.

Through project efforts to spread awareness, project management responsibilities and benefits to more households, it reduces room for individual rent seeking in favour of more collective action and benefits.

The project is building communal level forest governance structures in other ways. BCP has worked carefully to build solid relationships and partnerships with local communities, as well as their traditional and governmental leadership representatives. Villages have existing leadership committees but there are no formal institutions at a zone level. This is problematic as natural resources are often shared across villages, as are school and clinic interventions. BCP’s Community Engagement Strategy builds upon local governance structures by working closely with “Zone Development Committees” (ZDCs). ZDC’s are comprised of village-level representatives within a zone, who have been democratically elected by villagers and Village “committees” in each village. In so doing, BCP not only cooperates with existing, village-level representation, but we have also played a large role in creating zone-level institutions where none had previously existed, and where the next-highest level of recognized leadership had formerly existed at the Chiefdom or District level. The ZDC is a transparent forum to filter eligible community project opportunities that are appropriate across village boundaries, and share information of village project progress, both within the zone, and in other zones. In this way, community projects are ‘owned’ and implemented through the community, rather than by BCP.

BCP has obtained “Letters of Support” for the Lower Zambezi REDD+ Project from local Headmen and Headwomen, District Government offices and Chief Unda Unda. All of these documents will be made available to the Validator, and some are included in the Appendices of this Document (Appendices C-E).

Please refer to Section G1.6 for further information concerning customary land and resource-use rights

Summary of Community Conditions:

Households living within the Project Zone for the Lower Zambezi REDD+ Project face high levels of poverty and are significantly dependent upon charcoal production and subsistence agriculture as livelihood activities. Eighty-eight percent of households surveyed reported that they live below the poverty line, compared with a national average of approximately sixty eight percent.

Consistent with trends across Zambia and throughout Sub-Saharan Africa, a very low percentage of the population benefit from formal employment opportunities. Despite their proximity to Zambia's capital city of Lusaka, households within the Project Zone are not connected to electrical grids and do not benefit from public water or sanitation services.

There are one or two schools in each zone, and although only Ndubulula and Namanongo have government-run schools, the other two zones have “community schools,” which are informally run and inconsistently attended. The majority of reported household expenses go towards purchasing food, though there is also evidence of a high degree of subsistence agriculture. In terms of demographics, there is evidence of a significant amount of immigration into the Project Zone from other areas of Zambia, notably Southern Province. This immigration is driven by soil exhaustion and environmental degradation from poor land use practices in other areas, and has been condoned by traditional leaders who have—up to now—received small benefits (“tokens”) from new-arrivals, including transient charcoal producers, to whom they grant land-use rights and access to community forest resources in non-depleted areas. It is important to note that households in the project zone do not use charcoal; they use firewood. The charcoal trade is driven entirely by urban markets. It is highly likely, therefore, that these practices will continue in the project zone and area without intervention or alternatives.

G1.6 –CURRENT LAND USE AND CUSTOMARY AND LEGAL PROPERTY RIGHTS

There are two primary types of land use and tenure rights in the Lower Zambezi REDD+ Project:

1. The **project area** (Rufunsa Conservancy) is held under leasehold agreement with the Government of the Republic of Zambia. This type of 99 year renewable lease within the law constitutes private ownership, and lessees hold title to the land, as well as usage and exploitation rights for the resources on the land. The current land use in the project area is forest and wildlife conservation with future eco-tourism planned.
2. The **project zone** (villages affected by the Lower Zambezi REDD+ Project) is in designated customary land which is occupied by rural villagers, headed by a Chief. Resources on communal land are public, and are held by the President on behalf of the people. Under the customary system *de facto* land Headmen or Headwomen of villages carry out land allocation, although the State still retains *de jure* land ownership. Under the Land Act of 1995, customary land can be converted to leasehold tenure (MLRNP 2010). The current land use in the project zone is primarily unsustainable charcoal production and subsistence agriculture.

Through consultations with members of the local community regarding BCP's intention to launch a REDD+ project on Rufunsa Conservancy, it became apparent that there was some confusion as to the exact location of the Northern boundary of the property. As a result of this confusion, a small number of households (approximately 19) had settled on private property within the boundaries of the Project Area. An additional 24 households live on communal land on or near to the boundary of the property.

Upon learning that there were households living within the boundaries of the Project Area, BCP quickly sent a representative to map and collect census information from them all. BCP additionally conducted a baseline assessment for all of these households, in order to assess the baseline (pre-project) socioeconomic conditions. All of these households have since been consulted regarding the fact that they are living on private property. BCP additionally facilitated a participatory demarcation exercise, in which the Principal Surveyor from the Ministry of Lands, Natural Resources and Environment walked along the physical boundary of the property with local Headmen and community members, to re-mark the boundary and in order to ensure that the location of the boundary was publicly known, and in an effort to give extra local legitimacy to this boundary. The boundary was originally demarcated by the local headmen and community participants during the establishment of the Conservancy in 2001. However, it seems that the boundary has become unclear over time due to a lack of resources to properly mark and enforce this boundary.

BCP has discussed the matter of the encroachment of the property with Chief Unda Unda, Headmen, District officials and landowner. Although there is no contest to the legal legitimacy of the Land Title, and in recognition of the fact that BCP is against involuntary relocations, BCP decided, in consultation with the landowner, to redraw the project area boundary so as to exclude these encroached households from the project and carbon accounting area. The area of the property that encroached will therefore be considered outside of the credit generation zone, as the land these households are currently living on has been converted to non-forest through agriculture and charcoal production. Nevertheless, these households will still fall within the Project Zone, and they will therefore be targeted to benefit from community projects and activities connected to the project on Rufunsa Conservancy. The households who have settled on the property will be allowed to remain and encouraged to join the Conservation Farming Training Program.

In 2007, the GRZ cancelled the title deed of Rufunsa Conservancy citing an administrative error. The landowner appealed to the GRZ citing that local politics that contributed to the issue, and the threats to the land in the absence of protection. These conservation efforts up until that point had been funded in totality by the landowner with no sources of revenue from the land. The landowner took the Attorney General to Court. A Consent Order in favour of the landowner settled the matter in 2009. Legal documentation related to this Case will be made available to the Validator. In 2011, the Government of Zambia reinstated the title deed to Rufunsa Conservancy for 99 years.

This highlights the need for a carbon project on this land, as it has not been *financially* productive from conservation or tourism activities. Poaching and deforestation pressure make this land more valuable currently for charcoal production and farming, while poaching pressure makes the viability of tourism on this land less than marginal. After the period of uncertainty and reduced investment in the land between 2007 and 2009, the landowner made a concerted effort from late 2009 following the Consent Order to enhance conservation investment in the land, and to find alternate sources of income to fund conservation.

G1.7 – BIODIVERSITY INFORMATION: A DESCRIPTION OF CURRENT BIODIVERSITY WITHIN THE PROJECT ZONE

The miombo eco-region covers over 3.6 million km² across 11 countries of southern Africa. The area comprises dry and moist woodlands that support some of the most important thriving large mammal populations left in Africa (Timberlake & Chidumayo 2001). More than half of the estimated 8,500 plant species in this ecoregion are found nowhere else on Earth. There are also distinctive bird, reptile and amphibian populations present (Timberlake & Chidumayo 2001). Miombo woodland is dominated by Caesalpinoid, deciduous woodland and prone to frequent fires.

The Vegetation Map of Zambia (Edmonds, 1976) shows the major component of the escarpment as Miombo woodland, Munga woodland makes up less than 10%, and there are minor occurrences of riparian forest, mopane woodland, deciduous thicket and dambo. Miombo woodland is widely acknowledged to hold significant carbon, biodiversity and socio-cultural significance across Africa. It is also widely recognized that current deforestation trends are a major threat to the continued existence of the Miombo belt. More than half of Zambia is covered in Miombo woodland (Chidumayo, 2001).

A list of the tree species and description of tree diversity can be found in Section G1.2.

A thorough, recent biodiversity survey was undertaken in similar habitat to the project area in the neighbouring Lower Zambezi National Park, approximately 22 km from the eastern boundary (Pettersen *et al.* 2012) in a similar ecosystem (Zambezi Valley Escarpment) to the project area. It can be safely assumed that the Rufunsa Conservancy will share a large proportion of species at this site. The survey was conducted by leading Zambian experts and the data is thus of high quality and has been approved by the Zambian Environmental Management Agency. As Rufunsa Conservancy is directly adjacent to the National Park and the study was conducted in similar habitat with no ecological barriers between the study site and Rufunsa Conservancy, the findings are applicable to the project area.

The rivers at the site studied by Pettersen *et al.* (2012) were seasonal and only three different species of fish were found and a total of 24 different families of aquatic insects were recorded. A standard netting technique was used to survey aquatic insects and fish. As Rufunsa Conservancy has perennial streams and the Chongwe and Mwambashi rivers form two boundaries, it is thus feasible that the piscatorial and other aquatic fauna will be more diverse than in the neighbouring study site.

Pettersen *et al.* 2012 found six amphibian, 10 reptile and 262 bird species. Researchers used systematic transect surveys in a variety of habitats to determine species absence and presence.

Rodents and other small mammals were sampled using Sherman traps baited with a mixture of peanut butter and oatmeal. Bats were sampled using mist nets. Dung, burrows, calls and tracks were also used to determine the presence of more cryptic species such as porcupines (*Hystrix africaeaustralis*), bushbabies (*Otolemur crassicaudatus*) and large spotted genets (*Genetta tigrina*). Some 19 species of small mammals were recorded. Larger mammals included sable antelope, roan antelope, Lichtensteins' hartebeest, eland, buffalo, zebra, elephant, warthog, bushpig, lion, leopard, greater kudu, bushbuck and klipspringer.

82 butterfly species were recorded with riparian habitats standing out as a butterfly hotspot (Pettersen *et al.* 2012). Butterflies were sampled using timed species counts on random walks through a specific vegetation type as well as trapnets at specific waypoints.

On Rufunsa Conservancy there are meaningful populations of roan and sable antelope, common duiker, warthog, bushbuck, zebra and bushpig, although it is possible that there may be small populations of Lichtensteins' hartebeest, eland, greater kudu and klipspringer. Chacma baboons also occur on Rufunsa Conservancy. Large predators such as hyena have been heard on the property and leopard scats have been found. Lion tracks are annually seen in the property in a specific area. There has also been a single sighting of a side-striped jackal.

A biodiversity monitoring system is not yet in place for the project area, although implementing such a programme focusing on all the major taxa of conservation importance in the project area is one of the key project activities (See section G3.1).

Threats

Habitat Loss: Threats to biodiversity are firstly removal of woody species for charcoal production and complete removal of the remaining vegetation strata for subsistence agriculture. This action leads to the loss of nearly all native vegetation and the habitat it provides to associated animals. Large tracts of the project zone have already been cleared for subsistence agriculture (Figure 2).

Poaching: Large animals, particularly mammalian herbivores are threatened by illegal hunting. It is evident that such illegal hunting already has had a significant impact on the project zone and project area. Large mammals have been virtually all eradicated in the project zone. The large mammalian fauna of Rufunsa Conservancy is also artificially suppressed compared to similar habitats in the neighbouring Lower Zambezi National Park (Pettersen *et al.* 2012). Buffalo (*Syncerus caffer*) and eland (*Taurotragus oryx*) have not been seen in the Conservancy for a few years, and eland are considered a species of the verge of local extirpation within the Lower Zambezi ecosystem¹¹. However, lion (*Panthera leo*) and buffalo are resident in the escarpment area close to the Conservancy, and lion signs are reported annually in the southern portion of the Conservancy. Lion range over large home areas and the presence of resident prey species (such as roan and sable), as well as permanent water, make the Conservancy viable lion habitat, even at low densities.

Mining: The Zambian economy has historically been based on copper mining. Surging copper prices globally mean that this sector is a central growth area of the economy. Mining is a further potential threat to the biodiversity of Rufunsa Conservancy.

¹¹ Source: Conservation Lower Zambezi, conservation NGO in ecosystem.

There are prospecting licenses issued overlaying parts of Rufunsa Conservancy, but at this stage no formal applications have been made to prospect and mine on the property. It has to be noted that the study of Pettersen *et al.* (2012) was part of an environmental impact assessment for a copper mine within the Lower Zambezi National Park, only 25 km from Rufunsa. The Zambian Environmental Management Agency turned down the application because it was in a national park. Rufunsa Conservancy, however, does not have the same level of protected status as a national park. There is a potential threat, if it so happens that sufficient copper deposits are found. To date, low grade copper ore has been reported by prospectors (when compared with the Copper Belt in the north of Zambia). This project will likely serve as a deterrent to a possible mining operation in future. The Project Proponent will ensure that this project remains in the spotlight locally and internationally to counter against a possible mining threat, plus our Investment License and the easement confer some added protection.

G1.8 – BIODIVERSITY INFORMATION: AREAS OF HIGH CONSERVATION VALUE

Important Bird Area

Birdlife International has classified Lower Zambezi National Park as an Important Bird Area (IBA). An IBA is a site that is considered critical for the long-term survival of all bird species and their habitat and IBAs are internationally recognized. There is no reason to believe that the Rufunsa Conservancy will not have the same rich faunal diversity of the Lower Zambezi NP, excluding species found along the Zambezi River.

The study conducted on the plateau in the park just 25 km from Rufunsa Conservancy by Pettersen *et al.* (2012) found 262 species as mentioned above, including endangered White Backed (*Gyps africanus*) and Hooded vultures (*Necrosyrtes monachus*)¹². The study reported greater spotted eagle (*Aquila clanga*), lappet faced vulture (*Torgos tracheliotos*) and white headed vulture (*Trigonoceps occipitalis*) which are listed as vulnerable by the IUCN¹³. The southern ground hornbill (*Bucorvus leadbeateri*) is listed as vulnerable by IUCN and is regularly sighted in the project area¹⁴. Long-term resident conservation NGO, Conservation Lower Zambezi, has confirmed sightings of these species in the area.

¹² Source: <http://www.iucnredlist.org/details/106003372/0>

¹³ Source: <http://www.iucnredlist.org/details/106003381/0>

¹⁴ Source: <http://www.iucnredlist.org/details/100600983/0>

Centre of Endemism

The Miombo ecoregion is a centre of plant endemism with over 8,500 species, of which 54% are endemic. The Rufunsa Conservancy represents a sizeable, intact stretch of pristine Miombo. The ecoregion also has a number of endemic bird species such as the Miombo Rock Thrush and Shelley's Sunbird.

There are a number of plant species listed by botanists as species of special interest on the Zambezi escarpment of which Rufunsa Conservancy forms a part¹⁵. These include:

Dicoma niccolifera – the 'Nickel Flower'

Ocimum centraliafricanum – the 'Copper Flower', Zambia's national flower

Oxytenanthera abyssinica- bamboo, heavily exploited for temporary structures

Ochna gambleoides – a local near endemic

Pavetta crassipes – a local near endemic

Protea rupestris – a local endemic; probably the tallest of all the *Protea* species

Pterocarpus brenanii – a local endemic

Rhynchosia insignis – 'munkoyo', heavily exploited for its root tubers

Terminalia sambesiaca – a tall tree of fine form; a potential timber tree

Unfortunately, Zambia has not yet undertaken a complete red-listing exercise for its flora.

High conservation value (HCV) species potentially occurring on the property

Species: In addition to previously mentioned avian HCV's and local plant endemics, the area hosts several threatened mammalian species (Table 9). Elephant (*Loxodonta africana*) numbers in Lower Zambezi National Park, Chiawa and Rufunsa GMAs were last reliably estimated in 2005 at 2,150 individuals. Rufunsa Conservancy shares a boundary of 60 km with Lower Zambezi NP and project scouts have observed recent signs of elephant probing the Conservancy boundary. Suitable habitat and perennial water for elephants is available in the Conservancy and it is possible that poaching pressure has excluded elephants, which are known to avoid areas of human-induced threat. Secure habitat, space and well-protected buffer zones will contribute to the sustainability of this elephant population by allowing elephants to utilize resources across a wider area which includes the Conservancy.

¹⁵ Source: Bingham M.K. Unpublished Report. Survey/Mapping of Key Wildlife Habitats in the Chiawa GMA.

The elephant population today is the lowest number ever recorded, in part due to a severe recent poaching surge linked to consumer demand in Asia for ivory¹⁶. The Lower Zambezi-Mana Pools trans-frontier conservation area (TFCA) is estimated to hold one of Africa's largest elephant populations at 23,000 individuals. Ivory poaching gangs are becoming increasingly organized across Africa. The project area is a known route for gangs targeting ivory in the NP and GMAs. ZAWA has seized ivory and firearms in the project zone in the last year. Poaching gangs are reported to collude with charcoal transporters, who are urban-based truckers, who help to smuggle ivory and bushmeat. Increased security collaboration in the project area with ZAWA, combined with the use of technology and effective community engagement and development projects will aim to help reduce threat to this significant, yet vulnerable elephant population.

Endangered Wild dog (*Lycaon pictus*) occur in the ecosystem. As a far ranging species, wild dog need secure habitat and prey across a vast area. Wild dog are known to occur in three packs in the LZNP, and Rufunsa and Chiawa GMAs. Recent estimates suggest that up to 30 wild dogs exist in the Lower Zambezi ecosystem.

The last confirmed sighting in the area was in February 2012, approximately 19 km from the Conservancy boundary. Wild dog have been seen in the escarpment area (where the Conservancy occurs) before¹⁷. Wild dog are known to range 48 km in a single day. As Rufunsa Conservancy is contiguous to the NP, unfenced, and hosts prey species and has permanent water, there are no barriers to wild dog utilizing the project area. If the recent tourism hunting ban in Zambia reduces security in Rufunsa and Chiawa GMAs, human disturbance may enhance the value of the project area as a relative sanctuary. BCP has entered into a partnership with PRIDE, an Oxford University based predator research program. In collaboration with local stakeholders, BCP would like to find ways to catalyze research on predators in this landscape to better inform management practices.

Lion populations in the Lower Zambezi NP and Chiawa GMA are estimated at up to 40 individuals¹⁸. There is no doubt amongst local conservation managers that the increase of 39,000 hectares of protected habitat will be beneficial to lion. Project scouts have reported lion signs in the southern Conservancy portion, which indicates that lion are utilizing the area. As prey species and security builds up in the Conservancy, lion are likely to utilize the project area more. Another key reason for Rufunsa's importance as a predator refuge is the tourism hunting ban that was announced in Zambia in 2013, specifically of cats.

¹⁶ Source: <http://allafrica.com/stories/201302211116.html?viewall=1>

¹⁷ Source: Conservation Lower Zambezi, NGO based in Chiawa GMA.

¹⁸ Source: Conservation Lower Zambezi.

The hunting ban is projected to substantially reduce security in GMAs by reducing the funding levels available to ZAWA and community scouts, as well as the presence provided through tourism hunting. Rufunsa Conservancy provides sanctuary to predators which are likely to experience increased human disturbance in adjacent or nearby GMAs. The precipitous decline of lion populations across Africa has ignited a strong debate about whether they should be listed as endangered, including a proposal to elevate lion to the US Endangered Species Act. There is no doubt that lion face severe threats in their range, and are in serious decline. With the reduced anti-poaching resources available in Zambia through the hunting ban, areas like Rufunsa Conservancy become more important as they can be managed to enhance threatened species reproduction and survival.

The property has healthy populations of roan (*Hippotragus equinus*) and sable (*Hippotragus niger*), and there is the potential for the population of both species to grow dramatically if poaching can be curbed. Zambian sable are a highly prized game ranching and trophy species in Southern Africa; believed to be different in that they have larger horns, so genetically in between the critically endangered Giant Sable (*H.n. variani*) and generic Sable.

Roan and sable are both species of national interest, so will be monitored by the project as HCVs. Like other ungulates of the miombo woodlands, Sable occur at low density in comparison with ungulate densities in semi-arid savanna. Wilson and Hirst (1977) estimated Sable density at 4 per km² in the Matetsi area of Zimbabwe, which they considered the best Sable habitat in Southern Africa. Due to poaching pressure, we estimate a density of 0.25 sable per km² in the project area based on sightings of herds, meaning that the project area has the potential to increase in density substantially as the habitat is suitable. Sable are a project level HCV species, along with roan and eland antelope, and will be included in a project area monitoring program.

Table 10 illustrates that the majority of HCVs for which the IUCN Red List has population trend data shows a decreasing trend. This illustrates the importance of enhancing the conservation management of additional units of key habitat.

Table 10. High Conservation Value species, global or local conservation status and population trend.

Common name	Scientific Name	Status	Global Population Trend ¹⁹
Wild Dog	<i>Lycaon pictus</i>	Endangered	Decreasing
White Backed vulture	<i>Gyps africanus</i>	Endangered	Decreasing
Hooded vulture	<i>Necrosyrtes monachus</i>	Endangered	Decreasing
Greater spotted eagle	<i>Aquila clanga</i>	Vulnerable	Decreasing
Lappet faced vulture	<i>Torgos tracheliotos</i>	Vulnerable	Decreasing
Southern ground hornbill	<i>Bucorvus leadbeateri</i>	Vulnerable	Decreasing
White headed vulture	<i>Trigonoceps occipitalis</i>	Vulnerable	Decreasing
Elephant	<i>Loxodonta africana</i>	Vulnerable	Increasing
Lion	<i>Panthera leo</i>	Vulnerable	Decreasing
-	<i>Ochna gambleoides</i>	Local Near Endemic	No Red List Data
-	<i>Pavetta crassipes</i>	Local Near Endemic	No Red List Data
Rocket Sugarbush	<i>Protea rupestris</i>	Local Endemic	No Red List Data
Eared bloodwood	<i>Pterocarpus brenanii</i>	Local Endemic	Lower Risk/Least Concern
Nationally Significant: Species in decline in Lower Zambezi NP considered locally threatened²⁰			
Roan	<i>Hippotragus niger</i>	Least Concern	Decreasing
Sable	<i>Hippotragus equinus</i>	Least Concern	Stable
Eland	<i>Tragelaphus oryx</i>	Least Concern	Stable

These factors qualify the project area as containing globally, regionally or nationally significant concentrations of biodiversity values, such as directly adjacent to a protected area, endemism, threatened species.

Strategic Landscape Importance: The Lower Zambezi-Mana Pools trans-frontier conservation area is an area of global biodiversity significance. Mana Pools NP (2,196 sq. km) in Zimbabwe is directly opposite Lower Zambezi NP (4,092 sq. km) across the Zambezi River, and is a designated UNESCO World Heritage Site (Figure 1).

Combined with areas managed as wildlife hunting concessions in Mozambique, this is one of southern Africa’s largest wildlife conservation landscapes—amounting to an estimated 29,000km² ²¹. Wildlife readily cross back and forth between the Zambezi, including elephants. Peace Parks Foundation describes the TFCA as “used by wildlife as a thoroughfare between the escarpment and the Zambezi River”.²²

The Zambezi escarpment is a sensitive landscape as it forms an ecological boundary between the wetter Miombo woodlands north of the Zambezi and the drier woodlands to the south (Bingham pers. com.)²³. Rufunsa Conservancy is located directly adjacent to Lower Zambezi NP (only about 21 km in a direct line to Mana Pools NP), and thus forms an important conservation land unit of this TFCA landscape. The Conservancy is an important buffer zone to the park, protecting 60 km of park frontage.

¹⁹ Source: <http://www.iucnredlist.org>

²⁰ Source: Conservation Lower Zambezi.

²¹ Source: <http://www.awf.org/content/general/detail/3513?print=true>

²² Source: <http://www.peaceparks.org/TFCA.php?pid=27&mid=1019>.

²³ Michael G. Bingham, Zambezian woodland flora expert. Woodlands, Lusaka, Zambia.

This is extremely pertinent as the most vulnerable boundary of Lower Zambezi NP occurs in the north of the park, where Rufunsa Conservancy sits. The reasons for this are that this unfenced park boundary is adjacent to communal areas with a growing human population due to its proximity to Lusaka. The presence of the Great East Road and a thriving charcoal trade mean that there is higher human population pressure on this boundary compared with other park boundary areas. GMAs are managed for conservation and benefit from the presence of photographic and tourism hunting operators and conservation related revenues. The southern boundary of LZNP is the Zambezi River and protected areas in Zimbabwe (Figure 1). Key local stakeholders, including government agencies, recognize the project zone as the source of significant threat to the NP. In a GIS analysis, Rufunsa Conservancy protects 49% of the park's vulnerable boundary that borders communal areas and the Great East Road.

The northern section of Lower Zambezi NP (Mukamba Low Use Zone) has been encroached by local resident. The area is approximately 96,000 hectares, and roughly 30,000-40,000 hectares have been illegally settled. This equates to a roughly 10% decline in the area of the park. The protection of Rufunsa Conservancy (39,000 ha) compensates at a landscape level, by adding approximately what has been lost in the NP with contiguous habitat that is under secure conservation management.

These factors qualify the project area as contributing to globally, regionally, or nationally significant landscape-level areas where viable populations of naturally occurring species exist in natural patterns of distribution and abundance.

Ecosystem services: The property has perennial rivers traversing through it, particularly the Chongwe in the southwest and the Mwambashi River along the northeast boundaries. These two rivers feed into the Zambezi River—the most significant river in the entire region. These two rivers provide valuable dry season wildlife habitat in the core wildlife conservation sections of LZNP. The Chongwe River is critical in that it flows all year round, unlike any other rivers flowing into LZNP. Should these two rivers go dry, this places more intense grazing and browser pressure on the already pressured Zambezi valley floor habitat. The Mwambashi and Chongwe Rivers traverse the project zone. The Mwambashi is especially vulnerable as part of its catchment area is outside of the Conservancy on communal lands vulnerable to charcoal production and land use change.

Fire control:

Due to higher human population density and land use practices, fire is a concern. The project will be implementing a fire control program which involves early burning, hiring of a seasonal community fire control team, and sensitization of local communities about the need to avoid late season hot damaging fires. Late bush fires are also set across the escarpment by illegal hunters to facilitate poaching. Increased investment in security will reduce these incursions into protected areas. These measures will help to control fires in the Lower Zambezi NP.

Funding:

Another project benefit relates to funding. This project seeks to leverage additional conservation finance to help conserve part of this globally significant ecosystem. ZAWA is resource and human capacity strained in this ecosystem. Through securing Rufunsa Conservancy, the project can free up funding and human resources for local Conservation organizations and ZAWA to spread limited human resources and funding to enhance ecosystem protection to understaffed or under-resourced areas.

Wildlife Restocking:

The project will allow for the efficient protection of game on the property and the re-establishment of large mammal species on the property with the aim of positioning Rufunsa Conservancy as a breeding zone to restock depleted areas of Lower Zambezi NP and GMAs.

The river valley in Lower Zambezi NP is currently well protected and experiences relatively high wildlife densities, perhaps in part due to poaching compression. A secure breeding zone to the north of the park in the escarpment will help by providing a secure buffer to the park, as well as a breeding pool of depleted wildlife.

The project area qualifies as an area that provides critical ecosystem services.

Traditional Cultural Identity of Communities: In terms of cultural identity, there is a traditional burial ground in Rufunsa Conservancy. There is an agreement between the landowner and local communities dating to the acquisition of the Conservancy permitting local communities to access these burial grounds whenever needed. The project intends to maintain this commitment.

There are two fruit tree species of strategic livelihood and cultural importance to communities: *Uapaca kirkiana* ('Masuku') and *Parinari curatellifolia* ('Mpundu'). In farmers' fields, these tree species are often the only trees left alive in fields. Villagers do not cut them—not even for charcoal. However, the growth in commercial charcoal production means that cutting practices are becoming more indiscriminate, and an important local community dry season food is converted into charcoal. One project activity seeks to incentive increasing these two tree species' population and value in the project zone through a miombo fruit company to add value, and through community-based nurseries and orchards. These two species are strictly prohibited from any harvesting in the eco-charcoal forests. The decline in *P. curatellifolia* and *U. kirkiana* in the project zone due to charcoal production, late fires, and field expansion corresponds with a potential increase in vulnerability to climate change, that seems to be confirmed by higher temperatures and more erratic rainfall over the last decade. A minuted meeting in Ndubulula illustrated the importance of *P. curatellifolia* and *U. kirkiana* as a community dry season coping strategy:

*"These are the trees we survive on when there is hunger"*²⁴.

There are two species of medicinal plants of cultural importance to communities in the project zone:

1. *Diplorhynchus condylocarpon* ('Mutowa')—people chew the leaves to cure coughs or dysentery.
2. *Cassia abbreviata* ('Mululwe')—people use this to treat malaria.

Therefore, the project zone also qualifies as an area fundamental for meeting the basic needs of local communities and areas that are critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Threats to Biodiversity:

Threats to biodiversity include:

1. Commercial poaching: either for ivory or bushmeat using firearms or snares;
2. Subsistence bushmeat poaching using firearms, snares;
3. Late season fires (especially damaging to birds, insects and reptiles).

²⁴ Minutes, Ndubulula Meeting, 22 February 2013.

BCP's strategy to reduce the threat to biodiversity includes several elements:

1. Expand and enhance the security system at Rufunsa Conservancy to patrol against illegal activities in the project area;
2. Enhance community scout based monitoring of biodiversity to enhance adaptive land management;
3. Increase engagement with communities significantly as partners in this project;
4. Initiate a 'biodiversity banking' scheme whereby communities are paid a lucrative incentive for increases in populations of target species like Sable.
5. Initiate a modest breeding program to encourage wildlife extirpated from the escarpment due to poaching, with the aim of contributing to restocking the NP with species that have declined.
6. Control fires through well planned early burns, and community sensitization.
7. Strategic use of technology to reduce biodiversity threats such as GPS, smart phones, aerial surveillance and remotely triggered cameras.

G2. BASELINE PROJECTIONS

G2.1 – THE MOST LIKELY LAND-USE IN THE ABSENCE OF THE PROJECT ACTIVITY

Participatory rural appraisal techniques were used, including group dynamics (feedback sessions, interviews) and sampling (social mapping, survey data collection, analysis and reporting) to determine the most likely land-use scenario in the absence of the project. Most recently, throughout meetings held from March 19th-22nd, 2013 community representatives from all 4 zones confirmed their expectation that in the absence of this project high levels of deforestation in the project zone would continue, and waves of immigration would continue to threaten the existing project area boundaries, as community forest resources would become increasingly constrained. Such sentiments were also documented in some of the public comments that were submitted to the auditor for review.

To compliment the participatory rural appraisal techniques, the Biomass Emissions Model of VM0009, based on point interpretation of historical imagery, was used to confirm the baseline scenario.

In the absence of the Lower Zambezi REDD+ Project, illegal encroachment onto the private property of Rufunsa Conservancy is likely to continue. BCP undertook a comprehensive survey to determine current land use practices and socio-economic status of people living in the project zone. The overwhelming land use practice in the project zone is charcoal production and subsistence agriculture (Section G1.5). Charcoal production is for the Lusaka charcoal market and subsistence agriculture is for local household use and limited sales to markets further afield. There is limited livestock production due to the presence of Tsetse flies (*Glossina spp.*). There is very little evidence of commercial crop farming. The main crop is maize (*Zea mays*), but a variety of other vegetables ranging from tomatoes to pumpkins are also planted. Other land uses include the collection of firewood and timber for local construction.

Growing crops is a legal land use activity in the project zone. Charcoal production is only legal with the necessary permits, but there are capacity constraints that prevent the issuance of charcoal production permits. Charcoal production is thus continuing, largely unregulated, on an unsustainable scale.

The baseline scenarios are thus as follows:

1. Logging of woody species for charcoal production
2. Forest being converted to cropland for subsistence farming
3. Soil fertility declines through unsustainable subsistence farming which leads to clearing new areas of forest, and the pattern is repeated.

An analysis of Landsat imagery from 1984, 1992, 1999, 2002 and 2010 showed large scale, increasing permanent forest loss across the entire project zone, including inside Rufunsa Conservancy. It is thus clear that the residents of the project zone are dependent currently on land use practices that rely on the unsustainable clearing of intact forest for their livelihoods. From the socio-economic baseline survey it was found that the deforestation is caused by charcoal production and subsistence agriculture. The trend has been continuing since 1984 without any abating and is thus unquestionably the baseline scenario. The population in the project zone is increasing as well, partly due to immigration. It is in fact a trend observed in many parts of Zambia and described as the so-called charcoal trap by Kutsch *et al.* (2011).

Without intervention of the project activities deforestation will continue into the foreseeable future. A physical charcoal count to estimate the amount of charcoal travelling through Chongwe town conservatively suggests that currently 53% of Lusaka's urban charcoal supply originates in and around the project zone. The reason for this could be that forests to the north of the Capital have been cleared; to the west are areas of grassland and forests are further away; and to the south towards the Zimbabwean border has been cleared until it gets too hilly. The closest areas to Lusaka with remaining forest is the project zone and its environs (Figure 14). The likely baseline scenario is that these areas will be completely cleared for charcoal, followed by agricultural conversion that is partly immigration driven.



Figure 14. Overloaded charcoal truck in Namanongo Zone.

G2.2 – FURTHER ADDITIONALITY CRITERIA

Investment analysis - continuation of the project as a hunting ranch

The owner of Rufunsa Conservancy has indicated that the game ranch has not generated any income as a hunting ranch since ownership was assumed in 2001. The owner has maintained the property using its own private funds over the years and has been unable to generate any income from sustainable hunting, or any other land use. This is due to the poaching pressure on large game populations and a lack of funding to effectively manage the land or engage with communities meaningfully.

It is thus no longer feasible to continue running the Conservancy as a potential hunting or photographic tourism location. Without a carbon project there are simply not enough resources available to ward off the mounting threat of deforestation that is encroaching along the border and in some areas inside the boundary. In addition, it is not realistic at present to run the property as a cattle ranch as it is infested with tsetse flies.

The current activities taking place within the project area produce no income, and urgent additional funding is required to continue basic management and to prevent further loss of large game animals and continued encroachment of deforestation agents onto the property.

It is unlikely that income generated through tourism revenues will allow the rapid bolstering of game numbers so as to allow for the development of any meaningful eco-tourism ventures in the short to medium term. Rehabilitation of the wildlife product on Rufunsa is likely to be a long-term effort. It is thus unlikely that the ranch will produce any mentionable income in the near future from tourism. However, with the catalytic intervention of carbon finance, the Conservancy, as the closest wildlife “product” to Lusaka, has the potential to grow its tourism product significantly over time.

Implementation Barriers

As stated above, the current conservation activities (sport hunting or eco-tourism) are simply not producing any income, and it is very unlikely that any other eco-tourism or conservation related activities will produce anywhere near enough income so as to allow for the development of deforestation mitigation programmes or improved land use management to a necessary scale.

Investment Barriers

In order to generate income from eco-tourism or sport hunting, trophy species would need to be purchased and expensive infrastructure put in place to support reintroductions. The fencing, security, infrastructure and the costs of the animals would be prohibitive. The threat of poaching is so high that the cost of making Rufunsa Conservancy a “wildlife product” and in this manner effectively protect the forests under threat under the current scenario is considered to be excessive.

The implementation of deforestation mitigation activities (Section G3.2) cost the project proponent a substantial amount of money to implement and for most of these projects there is no significant income or funding other than those from carbon revenues. These projects are essential for the prevention of leakage and further deforestation in the boundaries of Rufunsa Conservancy.

There are no financial barriers prohibiting the baseline scenario from continuing as is.

Institutional Barriers

As stated above, there is currently a near complete lack of enforcement of local forest legislation due to capacity and funding constraints within government institutions. A significant portion of Lower Zambezi National Park in the northern ‘low use zone’ has been settled illustrating the vulnerability, and strategic buffer importance, of Rufunsa Conservancy to other sections of the Lower Zambezi NP.

All relevant wildlife and forestry laws are listed in section G5.1. They are the Environmental Management Act No. 12 of 2011, Zambia Wildlife Act No. 12 of 1998 and Forests Act, 1999. As stated, the Zambia Wildlife Authority and the Forestry Department are resource and capacity-constrained to effectively enforce these laws. BCP assists both institutions with fuel, transport, communications facilitation and rations in order to assist these agencies at a local level to better enforce the relevant conservation laws.

Barriers due to social conditions

The spread of deforestation throughout the reference region can certainly be attributed to an increase in population. The demand for charcoal outside the region is also attributed to increased population growth, particularly in Lusaka, and a lack of access to alternative urban energy sources.

Common Practice Analysis

Conservation projects on private and communal land are not common at all in the region. Rufunsa Conservancy is the only privately owned wildlife sanctuary in this upper escarpment portion of the Lower Zambezi ecosystem. The only other conservation activities in the area are found on state land, and the only relatively well maintained conservation areas with mentionable large game populations are found on the river valley floor of Lower Zambezi National Park and the Chiawa Game Management Area, both of which have some agents of deforestation present within the boundaries. The difference between these properties and Rufunsa Conservancy is that they are managed by the state and they benefit from state, donor and entry fee revenue sources.

Furthermore, Lower Zambezi National Park is comprised of essentially two separate geographical entities. The river valley floor is rich in wildlife and is a popular tourism destination. However, a significant portion of the park is miombo forest above the escarpment that has very little tourism and more threatened wildlife populations. Management of the national park is focused on the valley floor. In contrast, Rufunsa Conservancy is situated well above the escarpment away from the key tourism circuit and the management presence this draws.

Successful, profitable conservation projects on private land are rare in Zambia and are certainly not “the norm.” The vast majority of such projects are in existence due to the fact that their owners have generated income elsewhere, have foreign philanthropists underwriting loss-making entities, or have enough wildlife to support profitable tourism hunting operations.

Privately owned game ranches in Zambia in 2013 are experiencing a severe crisis as their main source of revenue—tourism hunting—has been banned in unfenced areas (the majority of game ranches are unfenced). This highlights the vulnerability of private game ranches, even those with healthy wildlife populations. Many game ranches are too remote from tourist circuits to be able to benefit from this sector. Owners thus need to invest profits from other economic activities conducted in other geographic locations into these private game ranches in order to conserve them.

In summary, the Lower Zambezi REDD+ Project satisfies the criteria for additionality. A credible baseline scenario is charcoal production and subsistence agriculture. There are no financial barriers preventing the baseline scenario and clearing land for subsistence agriculture is a legal activity in Zambia, so is the cutting down of trees for charcoal if the necessary permits have been acquired and taxes paid.

The Government of Zambia has approved the Lower Zambezi REDD+ Project and particularly the deforestation mitigation activities, especially eco-charcoal production.

G2.3 - CARBON STOCK CHANGES ASSOCIATED WITH THE BASELINE SCENARIO

CO₂ changes

We estimated the impact of the baseline scenario, following VM0009, Version 2.1. A Cumulative Deforestation Model (CDM) was developed based on the interpretation of points from 1984 through to 2010 using Landsat imagery. To characterize deforestation in the baseline scenario, we observed deforestation in the reference area and, in accordance with the project methodology, assumed the same would occur in the project accounting area in the absence of the project activity. The deforestation model was built using a grid of 1555 randomly generated sampling points across the reference area. These points were interpreted in each of 5 years for which satellite imagery was available in order to determine the extent and rate of deforestation.

For each year of imagery, each point was interpreted as forest or non-forest (or if interpretation was not possible due to clouds, shadows, or gaps in imagery). The analysis corrects for bias that would otherwise result from the incidence of points that could not be interpreted in all 5 years of imagery. The results of this interpretation are presented in Table 11 below.

Table 11. Results of deforestation point interpretation for Lower Zambezi REDD+ Project.

Year	Forest	Non-Forest	Cloud/Shadow	No Image	Total
1984	1,555	0	0	0	1,555
1992	1,429	147	0	0	1,555
1999	1,211	344	0	0	1,555
2002	988	567	0	0	1,555
2010	647	908	0	0	1,555

The interpretation data that reflect the onset of deforestation in the reference area were used to fit the deforestation model, a predictive tool to estimate baseline deforestation in the project area. The model employs a logistic function to characterize a distribution (in this case, the proportion of a discrete area that has been deforested) that is bounded between zero and one (or 0% and 100%). This approach to characterizing deforestation in the baseline scenario follows guidance provided in section 6.7 of the VCS VM0009 methodology version 2.1. Because data were available to adequately characterize the historical patterns of deforestation in the reference area, no covariates (e.g., deforestation parameters determined using expert knowledge or a participatory rural appraisal) were applied to the model. Figure 15 below shows the model's depiction of the cumulative level of deforestation in the reference area. Year 0 is the project start date. The model predicts that the entire accounting (34,081 ha) area will be deforested within the 30 year project lifespan.

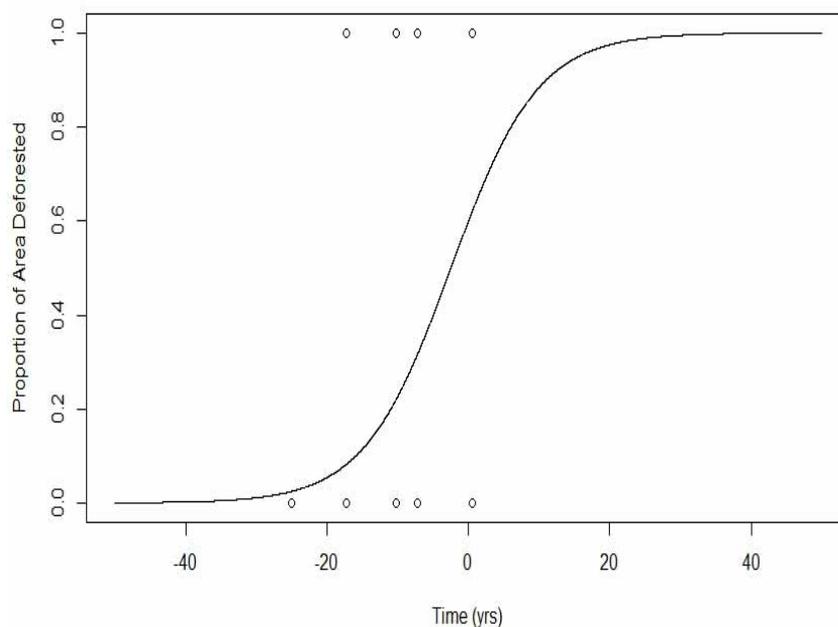


Figure 15. Cumulative Deforestation Model for Lower Zambezi REDD+ Project.

The variables used in the forest carbon stock changes calculations are listed in Table 12. It is important to note that no confidence deductions have been made and that the total carbon stock changes are based on an initial field based pilot study and IPCC default values (IPCC 2006). Important variables such as the soil decay rate and more precise carbon stock estimates for each of the two vegetation strata will be determined in preparation for VCS registration. The current carbon stock estimates and change estimates are, however, conservative. The soil organic carbon decay rate default of 0.2 for tropical regions of the VCS was used in absence of a local decay rate as per VM0009 recommendations.

The perimeter exposed to deforestation was confirmed in field and using high-resolution satellite imagery. A large portion of the boundary is shared with the Lower Zambezi National Park and was thus excluded in the calculation of the proportion of threatened perimeter as per VM0009 (Figure 16).

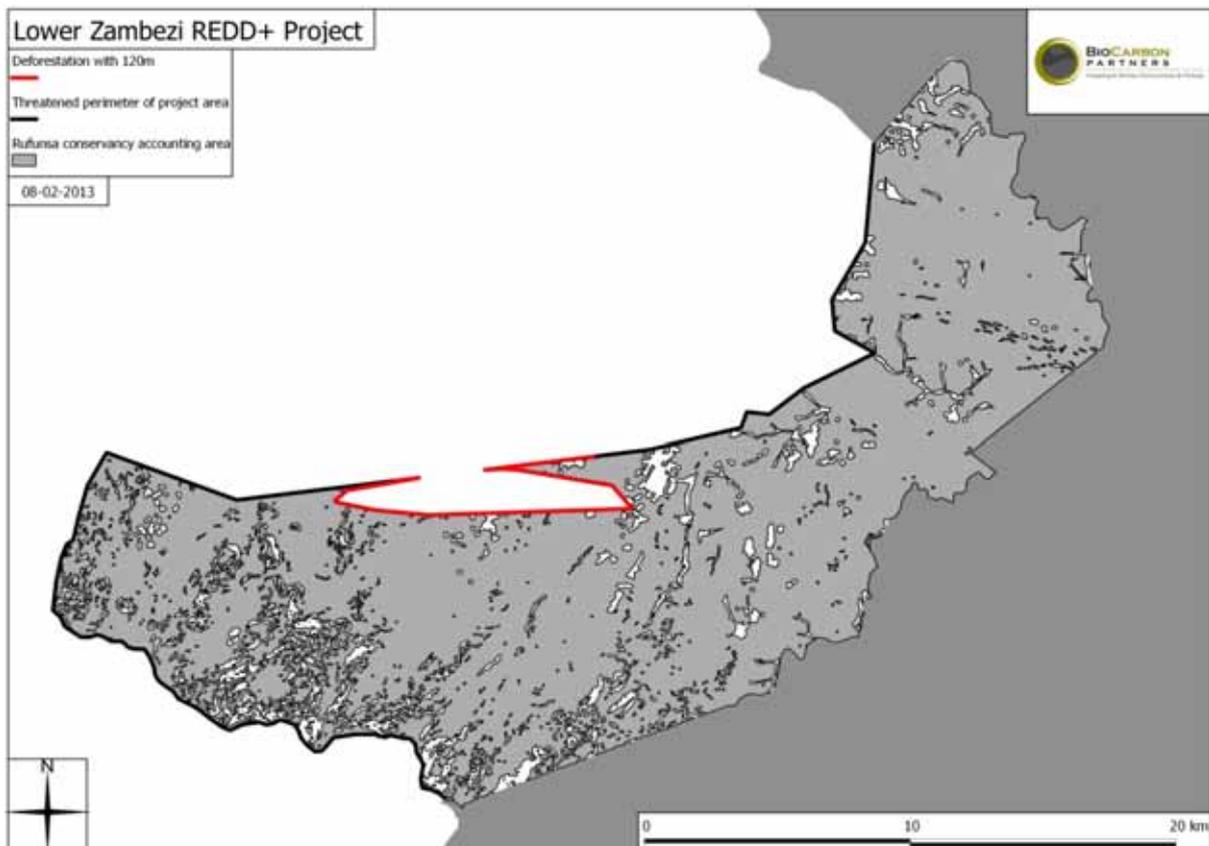


Figure 16. The threatened perimeter and perimeter within 120m of deforestation of the project area of the Lower Zambezi REDD+ Project.

The time between degradation (cutting down woodland for charcoal manufacturing) and deforestation (conversion to agriculture) was determined within the reference region through consultation with local farmers and was the mean was 1.7 years. This determinant factor is known methodologically as q .

The accounting area was calculated by firstly excluding non-forested portions of the project area (bare earth and grassland). Then, all steeply sloped lands (greater than 20 degrees slope) which are inaccessible to agents of deforestation were excluded. The slope of 20 degrees was selected based on the assessment of the maximum slope of fields in the reference area. For clarity, steep slopes were excluded only if the size of the polygon to be excluded is greater than 0.4 ha, in which case a 15 m buffer was created around these polygons. The accounting area comprises 34,081 ha of the total project area of 38,781 ha. A 30m Digital Elevation Model (ASTER Global Digital Elevation Model Version 2) was used in the slope calculation.

Carbon stocks were calculated from a short, preliminary study and conservative soil decay rates were used. The root to shoot ratio used to calculate below ground biomass was taken from the IPCC tables (IPCC 2006). A more thorough assessment of carbon stocks that will comply with VCS criteria and will include the development of a SOC decay model will be undertaken for VCS registration.

Table 12. Variables used to calculate potential Gross Emissions Reductions for the Lower Zambezi REDD+ project.

VM0009 Variable	Parameter	Value	How Determined?
α	Alpha	0.4042	CDM deforestation model
β	Beta	0.000447	CDM deforestation model
A_PAA	Project Accounting Area (ha)	34,081	Spatial analysis
P_PAA	Perimeter of Project Area Subject to Deforestation (km)	125.57	Spatial and remote sensing analysis
P_PAA DF	Perimeter of Project Area within 120 meters of deforestation (km)	4.22	Spatial and remote sensing analysis
-	Project Start Date (date)	2009/10/01	
-	Project Crediting Period Length (years)	30	
-	Date of Initial Verification (date)	2013/10/01	
-	Interval for Subsequent Verifications (years)	1	
c_P BM	Carbon Stocks in Biomass from Project Accounting Area (tCO ₂ e/ha)	195.6	Pilot sample in acctg area
c_B BM	Carbon Stocks in Biomass from Proxy Area (tCO ₂ e/ha)	0	Pilot sample in reference area
c_P SOC	Carbon Stocks in Soil from Project Accounting Area (tCO ₂ e/ha)	269.9	Pilot sample in acctg area
c_B SOC	Carbon Stocks in Soil from Proxy Area (tCO ₂ e/ha)	143.1	Pilot sample in reference area
r_RS	Root-to-Shoot Ratio	0.28	IPCC default value
	Risk Rating	15%	VCS non-permanence risk assessment tool
E_L AS	Activity Shifting Leakage (%/monitoring period)	0%	0% in 1 st monitoring period
U_P	SE Biomass from Project Accounting Area (tCO ₂ e/ha)	0	
U_B	SE Biomass from Proxy Area (tCO ₂ e/ha)	0	
U_EM	SE Point Interpretation	0	
E_P Delta	Project Emissions per Monitoring Period	0	
q	Time between degradation and deforestation (yrs)	1.7	Determined through rural appraisal
λ_{SOC}	Decay rate for SOC	0.2	VM0009 default value

The deforestation parameters estimated from the deforestation model were used to determine to what extent (and at what rate) carbon stocks in the project area would be depleted in the baseline scenario. Gross Emissions Reductions from CO₂ for the 30 years of the project are presented in Table 13 below. The model predicted that the Lower Zambezi REDD+ Project will prevent the emissions of 9,611,864tCO₂e over a 30 year period which is 56% of the total CO₂e stocks stored in the project area. The mean annual emissions reduction is 320,395 tCO₂e yr⁻¹.

Table 13. Predicted gross CO₂ (tCO₂e) reductions per year for the Lower Zambezi REDD+ Project. No confidence or buffer pool deductions have been made.

2009	2013	2014	2015	2016	2017	2018	2019	2020	2021
0	1,896,443	418,328	440,964	419,577	432,953	447,309	407,619	360,563	419,960
2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
335,423	335,115	332,898	329,196	258,243	312,860	241,322	301,694	229,273	219,768
2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
287,201	213,819	205,778	198,932	193,527	189,065	184,034	0	0	0
Total									9,611,864

Non-CO₂ changes – CH₄ and N₂O

From intensive fieldwork by BCP field staff and based on expert consultation, it was found that in the baseline scenario, deforestation takes place by converting all suitable biomass to charcoal and the majority of leftover biomass which includes grass, shrubs, twig biomass and stumps are subsequently burnt to prepare a field. The lag period between charcoal production and conversion to cropland is 1.7 years.

At present the exact percentage of carbon lost due to fire needs to be quantified using a recognised methodology, but until such a stage we will use a conservative estimate of 50% of carbon conversion taking place through burning, in line with other projects in a similar ecosystem (South Pole Carbon Asset Management 2012).

To calculate the non-CO2 emissions from the baseline scenario, equation 2.27 from the IPCC AFOLU guidelines (IPCC 2006) was used:

$$L_{\text{fire}} = A \times M_B \times C_f \times G_{\text{ef}} \times 10^{-3}$$

Where:

L_{fire} = amount of greenhouse gas emissions from fire, tonnes of each GHG e.g., CH₄, N₂O, etc.

A = area burnt, ha

M_B = mass of fuel available for combustion, t.ha⁻¹.

C_f = combustion factor, dimensionless (default values in Table 2.6)

G_{ef} = emission factor, g kg⁻¹ dry matter burnt (default values in Table 2.5)

The annual burnt area was calculated, based on the fact that the CDM predicts that the entire accounting area would be deforested over the project lifespan. The amount of fuel available for burning (the product of M_B and C_f) is 50% of the mean biomass value calculated in the rapid viability assessment and we believe this is a conservative estimate as it did not include herbaceous biomass or litter and it is highly likely that more than 50% of available biomass is burnt.

Total annual baseline emissions from CH₄ thus equals:

$$1,136 \text{ ha} \times 53.4 \text{ (biomass t.ha}^{-1}/2) \times 0.4 \text{ (} C_f) \times 6.8 \text{ (} G_{\text{ef}}) \times 10^{-3} \\ = 148.4 \text{ tCH}_4.\text{yr}^{-1}$$

And over the project lifespan

$$= 4,451.0 \text{ tCH}_4$$

$$= \mathbf{93,470.4 \text{ tCO}_2\mathbf{e}}$$

Total annual baseline emissions from N₂O thus equals:

$$1,136 \text{ ha} \times 53.4 \text{ (biomass t.ha}^{-1}/2) \times 0.4 \text{ (} C_f) \times 0.2 \text{ (} G_{\text{ef}}) \times 10^{-3} \\ = 4.4 \text{ tCH}_4.\text{yr}^{-1}$$

And over the project lifespan

$$= 130.9 \text{ tCH}_4$$

$$= \mathbf{40,582.4 \text{ tCO}_2\mathbf{e}}$$

Using the Clean Development Mechanism Tool for testing significance of GHG emissions (Tool for testing significance of GHG emissions in A/R CDM project activities (Version 01)²⁵) annual CH₄ and N₂O emissions make up only 1.37 % of emissions and are therefore not considered significant.

Annual CH₄ emissions in tCO₂e (3,115.7) / Total annual emissions in tCO₂e (324,864) =
0.96%

Annual N₂O emissions in tCO₂e (1,352.7) / Total annual emissions in tCO₂e (324,864) =
0.42 %

G2.4 – BASELINE EFFECT ON COMMUNITIES

Section G1.5 describes the current socio-economic conditions of communities in the project zone. The assessment found that a large portion of local people live below the national poverty line and are heavily dependent on charcoal production and subsistence agriculture for their survival. Charcoal production methods and agricultural production are inefficient and result in continuous land clearing with low yields. Combined with poor or costly market access, local residents have little chance of improving their livelihoods. Additionally, high deforestation rates combined with high dependency on practices that involve deforestation (such as harvesting for charcoal production or clearing of land for agriculture) indicate the unsustainable nature of current community livelihoods. Inefficient dry land farming methods are likely to lead to soil fertility declines; a common problem in subsistence rain fed dry land farming. Soil and groundwater sources are likely to decline due to deforestation in watersheds. This further indicates the need for interventions that can prevent the loss of natural forest resources from negatively affecting community livelihoods, or forcing migration into other forested areas.

Furthermore, project zone residents have been reliant on wild ungulates for their protein needs, leading to the extermination of most of the large game in the project zone and basically making it impossible to have any form of eco-tourism business that will stimulate local economic growth and create employment opportunities.

It is unlikely that the negative impacts of the baseline scenario on livelihoods will be reversed without the interventions of the project.

²⁵ http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf/history_view

G2.5 –BASELINE EFFECT ON BIODIVERSITY

Agricultural expansion is the main cause of biodiversity loss in southern Africa (Biggs *et al.* 2008) and the project zone of the Lower Zambezi REDD+ project is a prime example of this. Virtually all the large mammals have disappeared from communal lands due to poaching and habitat degradation. Rufunsa Conservancy has significantly reduced large animal diversity compared to the neighbouring Lower Zambezi National Park.

Generally, when savannahs and other natural systems are converted to cultivated fields, biodiversity can decrease by as much as 52% (Biggs *et al.* 2006). Moderate use systems such as rangelands grazed within their limits maintain much higher biodiversity intactness levels.

The baseline scenario – conversion of forested lands to cropland through charcoal production and subsistence agriculture thus has a significant impact on biodiversity in the project zone. On croplands virtually all native species have disappeared, ranging from large mammals through to tree species as well as avifauna and potentially a large cohort of invertebrates (although these are difficult and costly to monitor). Threatened species such as predators and vultures/birds of prey will undoubtedly be negatively affected by the loss of habitat. Nearly all the tree species found within the project area, bar a few fruit bearing species such as *Parinari curatelifolia* and *Uapaca spp.* are removed in forest that has been converted to cropland. The impact on the woody flora is thus severe.

Rufunsa Conservancy is approximately 10 percent of the size of Lower Zambezi NP. If Rufunsa Conservancy is deforested, the ecosystem will lose this important park buffer zone. Deforestation in Rufunsa Conservancy will also fragment connectivity between Chiawa GMA and the northern portion of the Lower Zambezi National Park as the Conservancy serves as a habitat linkage between the two areas.

G3. PROJECT DESIGN AND GOALS

G3.1 - SUMMARY OF THE PROJECT'S MAJOR CLIMATE, COMMUNITY AND BIODIVERSITY OBJECTIVES

The mission and vision of BioCarbon Partners are as follows:

Mission

To reduce poverty and enhance conservation through global carbon markets.

Vision

To achieve transformational social development and conservation returns in Africa through REDD+.

The specific objectives of the Lower Zambezi REDD project are as follows:

- The long-term conservation of the miombo woodlands on Rufunsa Conservancy by means of income generated through REDD+ activities, and in the process, avoidance of CO₂e emissions from land use change.
- Enhancement of biodiversity on Rufunsa Conservancy through efficient conservation practices.
- Manage Rufunsa Conservancy as a buffer zone for Lower Zambezi National Park and Chiawa GMA and as a wildlife corridor.
- Manage Rufunsa Conservancy to contribute to a potential corridor between Lower Zambezi NP and South Luangwa National Park.
- Improve and expand the habitat of key large mammal HCV species such as elephant, African wild dog, leopard, sable antelope, roan antelope and lion.
- Manage Rufunsa Conservancy as a potential source pool of threatened or depleted populations in LZNP.
- Watershed management to ensure year round flows of water in the Chongwe and Mwambashi Rivers as key dry season water sources for Lower Zambezi NP.
- The creation of employment opportunities for people living in the project zone in sustainable industries, thus mitigating deforestation.

- Fire management – implementation of an ecologically sound fire management system that is aimed at preventing potentially catastrophic late season fires through a firebreak system, early, cool season burns and reduction of fuels through community-based seasonal enterprises (such as thatch and reeds for urban markets).
- Alleviation of poverty in neighbouring communities within the project zone through establishment of a suite of sustainably managed economic activities that will reduce deforestation, including sustainable charcoal production and conservation agriculture initiatives.
- Support towards the delivery of critical social services, particularly education, health, sanitation and access to water.
- Assisting rural farmers in the project zone to gain access to markets and improved agricultural value chains.
- Assisting rural farmers with their expansion of produce including non-timber forest products such as honey production.
- Piloting the use of “community covenants” as a tool to link community activities to mitigate deforestation and biodiversity threats.

G3.2 – DESCRIPTION OF PROJECT ACTIVITIES

BCP has worked hard to identify, design and develop projects that will help to achieve its aims of promoting forest protection, reducing deforestation, and improving community livelihoods, in the area in and near to the Lower Zambezi REDD+ Project. Our project activities are intended to bring multiple levels of benefits towards protecting and improving local biodiversity, and improving community livelihoods by providing alternatives to deforestation and promoting resilience against the negative anticipated effects of climate change. Clearly, these positive effects are interconnected and dependent upon one another: by improving property management, we aim to reduce the destruction of soil and forest resources, which will help to conserve and improve local biodiversity and maintain healthy ecosystem functioning. Similarly, by providing communities with meaningful alternatives to deforestation, we aim to improve their livelihoods—including food security—which will reduce the pressures they currently face to engage in activities such as charcoal production or illegal hunting, and will bring significant impacts towards biodiversity and forest preservation. These activities will in turn increase local resiliency in the face of climactic changes.

This section outlines the project's broader project activities, and describes how they explicitly link to our goals concerning climate, community and biodiversity impacts from the Lower Zambezi REDD+ Project. Our main project activities fall under the categories of improved conservancy management and community engagement, including a suite of community-level interventions, projects and investments that fall within this last category. Our largest anticipated community projects are the Sustainable Eco-Charcoal Project and Conservation Farming Training Program. Successful pilot phases of these programs have recently been completed, and both programs are expected to be scaled-up this year so as to include a greater number of participants. BCP has also begun to launch its School Support Program, which is intended to reach all four community zones, and its Tree-Planting Project, which has been undertaken in cooperation with the Forestry Department and is also intended to reach all four zones. Within the first quarter of 2013, BCP is also set to begin launching pilot phases for smaller community projects such as tree nurseries, livestock projects (especially a "village chickens" project), fruit orchards and vegetable gardens. We are still in the project design phases and initial discussions concerning honey and mushroom projects, which have been identified as possible projects to pursue in partnership with local communities.

It should additionally be noted that the core proposed projects—including Community Based Natural Resource Management (CBNRM) activities such as the sustainable harvesting of community forests for eco-charcoal, Conservation Agriculture, and small-scale forest/agricultural businesses such as honey production—have all been evaluated and recommended for inclusion in REDD+ project activities, as part of an official study on "Forest Management Practices with Potential for REDD+ in Zambia" (Kokwe, 2012) that was completed on behalf of the UN-REDD Programme and the Government of Zambia.

Improved Conservancy Management

The conservancy is currently run on a diminished budget with a skeleton staff, few roads, no radio communications and very limited vehicles. The infrastructure is limited to three basic ranger camps and a derelict hunting camp. The hunting camp is being upgraded to a "Conservation Center" where project management and infrastructure will be based. A lean but effective patrolling schedule with ZAWA initiated by the landowner and continued by the project provides security across the project area. It is envisioned that with carbon revenue investment more infrastructure, roads—and most importantly—jobs will be created to run the Conservancy as a world-class conservation land unit.

A comprehensive ecological management plan to significantly improve infrastructure and capacity on the property has been developed, and will be made available to the Validator. The main interventions will be:

- Increase the number of scout outposts
- Hire and increase the number of well-trained community scouts
- Improvement of current scout outposts
- Establishing a communications network
- Increasing scout mobility
- Design and implementation of a professional security system
- Re-train scouts
- Determine game numbers on the property
- Fire management – the implementation of controlled, early burns and fire breaks
- Develop strong working relationship with ZAWA and CLZ to pool resources and pursue common goals
- Enhance conservancy infrastructure to facilitate management

More information on the management of Rufunsa Conservancy can be found in the Rufunsa Conservancy Ecological Management Plan, which will be made available to the Validator.

Eco-Tourism

Once conservation management on the ranch is fully operational, BCP aims to explore the possibility of introducing minimum-impact eco-tourism activities such as tented safaris, self-drive camping, game walks and mountain biking, in order to supplement income from carbon markets. This revenue stream is likely to be quite small. Our target market will be the resident market in Lusaka with a focus on the proximity of the ranch to Lusaka. These activities are also intended to help promote land management and protection, as increased presence and infrastructure in the Conservancy could help to deter potential encroachment or poaching activities. A portion of tourism revenues (10% of gross revenues) will be pledged towards communities as part of a 'biodiversity banking' scheme. This incentive will be in exchange for increases in HCV populations and reduced poaching/illegal activity incidents.

Community Covenants

Community Covenants are a critical component of BCP's Community Engagement Strategy, and they will play an important role in every single community project that we launch. A Community Covenant is a signed agreement between BCP and community representatives, whereby community participants commit themselves to reducing their non-REDD compatible activities in exchange for project investment, support or employment. In this way, Community Covenants explicitly link BCP's community support to the project's overall deforestation mitigation activities, by documenting that BCP support is conditional upon tangible progress towards reducing deforestation. BCP's Community Covenants are designed to serve as mutually binding "contracts" that link project activities and community interventions with deforestation mitigation and biodiversity enhancement efforts, including reducing the risk of "leakage" as a result of these projects. BCP will monitor these covenants to ensure compliance through a decentralized Community Engagement Team (CET).

For example, participants in BCP's Sustainable Eco-Charcoal Project have signed Community Covenants that document their agreement to stop unsustainable charcoal harvesting practices in exchange for the benefits and support they receive from the project. Members of the Eco-Charcoal Association (ECA) have also committed themselves to protect the eco-charcoal forest, as they understand that the benefits they derive from the project are contingent upon their ability to protect this forest.

Community Covenants are reflective of BCP's overall community-based model that places partnerships with communities at the heart of BCP's forest protection efforts. Rather than pursuing an enforcement-based model of land-management, BCP hopes to invest heavily in local communities so as to meaningfully and sustainably address the drivers of deforestation. By allowing communities to feel "benefits" derived from their cooperation towards forest protection efforts, BCP hopes to shift incentive structures away from unsustainable deforestation, and towards more sustainable (and profitable) livelihoods. In so doing, BCP allows local communities to serve as critical partners or "allies" in the implementation of REDD+ activities, who see cooperation with REDD+ implementers as being in their own best "interests". BCP anticipates that this strategy will be more effective and less costly in the long-term when compared with enforcement or protection-based models that spark competition between REDD+ implementers and community members.

Sustainable Eco-Charcoal Production

Nearly 75% of Zambians are reliant on charcoal and firewood to meet their energy demands, and approximately 70% of households in the Project Zone reported income from charcoal production. Charcoal is thus an important commodity, not only to urban and peri-urban residents, but also as a critical livelihood support for rural producers living within the Project Zone for the Lower Zambezi REDD+ Project. Unfortunately, however, current estimates indicate that demand for charcoal is outstripping the regenerative capacity of Zambian woodlands (UNEP 2008).

Through extensive surveys, interviews and discussions with local communities, BCP has identified charcoal production as one of the most powerful drivers of deforestation in the Project Zone for the Lower Zambezi REDD+ Project. Chongwe District (and now Rufunsa District as Chongwe has been divided) is a key charcoal production area for Lusaka. Factors that contribute to this are the District's proximity to Lusaka, the presence of forest, the facility of access and transportation from the tarmac Great East Road, and high levels of rural poverty. Lusaka's annual charcoal demand is estimated at 45,000 tons. BCP's physical counts of charcoal trucks going through Chongwe town suggest that 24,000 tons per year (53% of Lusaka's supply) come through Chongwe and Rufunsa Districts. This could help to explain why the deforestation rate based on the Cumulative Deforestation Model in Chongwe is 11 times higher than the national average deforestation rate. Furthermore, the relatively lucrative nature of charcoal production—as one of the sole sources of income for communities living adjacent to Rufunsa Conservancy—combined with depleted community forest resources, helps to explain the serious threat that charcoal production poses to the Conservancy, as producers move near, or even into, the Conservancy in search of intact forest to clear.

It is clear that current production methods and rates are unsustainable, and also highly inefficient: community producers report between 8-10% efficiency from their kilns (Figure 17).



Figure 17. A large charcoal kiln in Namanongo Zone. The three people in the foreground provide scale regarding the size of the kiln. It is difficult to maintain efficiency with such large kilns.

Unfortunately, current practices of charcoal production are not only destructive, inefficient and unsustainable, but they are also an unattractive “last resort” for many producers. Throughout many discussions, local producers have told BCP that charcoal production is “very hard work” that they only do out of necessity, so as to have access to additional cash to purchase food or farming inputs. Moreover, the study of charcoal production in the project zone revealed that producers receive minimal income compared to transporters and other middlemen. Rural producers are often exploited by transporters who capitalize on the fact that it is difficult for them to access transportation to sell their charcoal in urban markets, and pay extremely low prices for the charcoal they produce. Sometimes, transporters take months to pay producers for charcoal that they have purchased “on credit” to sell in Lusaka, resulting in dangerous “gap” periods for local farmers who rely on that cash to be able to purchase seeds and fertilizer at specific times in the planting cycle. In a recent informal survey conducted by BCP representatives, many charcoal producers reported incomes of under \$50 for three to four months of “backbreaking” work²⁶. Nevertheless, many producers report that charcoal production is not only the last, but often the only, option that they have to make supplementary income, and BCP’s Baseline Survey has documented the extent to which charcoal production is an important source of income for the vast majority of households within the Project Zone.

²⁶ Notes from interviews with charcoal producers on 1 February 2013 are available upon request.

Since charcoal is such an important commodity for rural and urban livelihoods—and in the absence of current viable urban energy alternatives—BCP recognizes that it must engage with charcoal production, to introduce more sustainable practices that bring greater benefits to communities and reduce high deforestation rates in the Project Zone.

To do this, BCP has launched an innovative Sustainable Eco-Charcoal Project within the project zone. This project has been designed based on the results and recommendations of several studies that were undertaken to gain a better understanding of current charcoal production in the area. From these studies, the following issues became clear:

- There is no immediate alternative energy source for charcoal users, and stopping charcoal production in the project zone will simply lead to leakage;
- Unmanaged harvesting is not giving forest patches the opportunity to regenerate;
- The lack of fire management is resulting in rampant, runaway fires that are degrading recovering forest patches;
- Large earth kilns are inefficient and lead to substantial wastage;
- Charcoal transporters and traders (who are usually not local community members) make a disproportionately large percentage of profits;
- Department of Forestry taxes on charcoal are extremely high and possibly result in more illegal charcoal production as producers cannot afford to participate in the formal market.

To address this situation, BCP developed a detailed value chain analysis and business plan,²⁷ with the aim of designing and launching a project that could promote sustainable charcoal production. Local residents were extensively consulted and involved in the project-design phase, and they have clearly indicated their willingness to participate. As with BCP's other projects, participants have signed a Community Covenant that documents their agreement to stop all other unsustainable charcoal practices in exchange for the benefits they receive from participating in the project.

²⁷ Both the Charcoal Value Chain Analysis and Eco-Charcoal Business Plan will be made available to the Validator.

The strategy behind the Sustainable Eco-Charcoal Project is as follows:

- **Identify community forests suitable for harvesting**, in cooperation with communities.
- **Develop a sustainable harvesting plan** based on the “Coup and Shelter belt” system developed by the Forestry Department (FD). This system was developed to maintain as much ecological integrity as possible by clear-cutting alternate strips so that remaining forest strips can serve as biodiversity and seed bank refuges, allowing for forest integrity.
- **Sustainable Forest Management:** Community eco-charcoal association members replant trees in areas of the eco-charcoal forest that was degraded before the project started through charcoal production and road making. ECA members also assist in excluding livestock from the eco-charcoal forest to reduce seedling damage. ECA members also will participate in selective coppicing to encourage trees to regenerate as quickly as possible.
- **Implement an “early burn” fire regime** to allow saplings to survive; late season fires can kill a large number of small saplings, slowing down forest re-growth.
- **Use higher-efficiency kilns** to improve sustainable charcoal production. The project trains participants to use high-efficiency Casamance kilns, as opposed to the inefficient, large earth kilns that local charcoal producers currently use (Figure 12 & 17). The project also promotes the use of small drum kilns that produce charcoal from smaller branches and twigs—adding new value to canopy off-cuts that are otherwise currently stockpiled and burnt, leading to further forest degradation. Current efficiency rates on drum kilns are 38%, or close to 4 times more efficient than traditional earth kilns.
- Assist producers by **providing transportation “at cost”** for sustainably produced charcoal (transferring savings to producers of what would have been lost to external transporters in exchange for forest protection agreements).
- **Negotiate better tax rates from FD and District Councils**, allowing more money to be returned to the project and community from the sale of the product.
- **Develop new markets:** in addition to accessing the mass market, BCP will seek access to other, more profitable markets—such as the middle to high income customers that purchases charcoal from supermarkets. In so doing, BCP hopes to sell the sustainable eco-charcoal product to a “niche” market, at a higher price that brings more benefits to producers. BCP hopes that the project will benefit from the fact that its Sustainable Eco-Charcoal product is currently the only local, sustainably-

produced lumpwood charcoal product available—supermarket charcoal is currently trucked in from South Africa at a significant carbon footprint.

- Community representatives and individual charcoal producers in the program sign a **Memorandum of Understanding (MoU) and Community Covenants** that commit the community to sustainably managing the forest.
- **Demarcation:** After extensive sensitization and participatory boundary mapping, the eco-charcoal forest boundaries are clearly marked with paint and ‘blazing’ to notify would be charcoal producers or loggers that the area is under management.
- **Allow for forest regeneration:** the project aims to promote sustainable harvesting techniques that allow charcoal production to return to the first strip within 18 years depending on soil and forest type. In this way, the bulk of the protected forest area remains under forest definition, while simultaneously producing charcoal and supporting other community project benefits such as wild fruits and mushrooms. GIS has been used to develop an 18-year rotation plan.
- **Provide greater benefits to sustainable charcoal producers:** producers of sustainable eco-charcoal will be paid a higher price for the charcoal they produce using improved kilns. Additionally, improved kilns are designed to function at a higher efficiency so as to produce higher volumes of higher-quality charcoal when compared to traditional kilns, while requiring less labour from producers. These benefits are intended to encourage project participants to continue sustainable charcoal harvesting, as access to such technology (and markets) is contingent upon their upholding the agreement they have signed, which commits them to harvest sustainably from the protected eco-charcoal forest area. In this way, BCP can directly link the benefits that participants derive from this project to the company’s deforestation mitigation activities.
- **Prevent leakage.** Eco-charcoal production will only take place within the project zone and not the leakage area (Figure 1, Figure 17). The project has so far absorbed 15 households, which comprise a number of full-time traditional charcoal producers. The project has also recruited 8 women to operate the drum kilns. Charcoal production under traditional systems often excludes women due to the labour requirements, but drum kilns allow women to access a new livelihood source through eco-charcoal production. As the project grows, the aim of the project is to absorb as many unsustainable charcoal producers as possible as a key leakage prevention mechanism.

- **Form an Eco-Charcoalers Association (ECA)** that enforces the terms of the agreements that have been made between BCP and the community, and to manage additional revenue/funds that are generated through the sale of the eco-charcoal product. This association is an example of the project catalyzing institutional development that positively impacts forest governance at a local level.
- **Establish a Pilot Third Party Certification Scheme:** An important component of the project is for the eco-charcoal to be produced under strict scrutiny that is independent of the Association and BCP. The project is in discussions with Forestry Department to design a pilot eco-charcoal certification system. Given the size of the annual charcoal market in Zambia (estimated at \$60-100 million per year), this project could develop a template for scaling up eco-charcoal to other areas of Zambia through different implementers.

As the strategy outlined above makes clear, the success of the Sustainable Eco-Charcoal Project is predicated upon its ability to make sustainable forest management beneficial to local producers. The overall aim of the project is to provide incentives to local communities to reduce unsustainable deforestation in the area and to promote forest protection. The Sustainable Eco-Charcoal Project is designed to achieve these aims in two main ways:

First, by introducing technology and techniques that allow sustainable charcoal production to bring significant benefits to producers and their communities. To do this, BCP has introduced high-efficiency kilns that allow producers to produce more, higher-quality charcoal, from the same amount of trees and less labour. Additionally, BCP's Sustainable Eco-Charcoal Project addresses the "bottlenecks" that the value-chain analysis and business plan studies identified as barriers to producer benefits. These include: transportation, levies and direct access to markets.

BCP will assist all participants in the eco-charcoal project with transport charged at 'cost-recovery' rates, compared with predatory transportation rates currently being charged. Current calculations indicate that the project will also substantially improve income for participants by linking producers directly to urban markets. As such, the project is anticipated to provide participating eco-charcoal producers with more income from less labour, and to generate additional funds that can be used towards community projects.

Second, conditional access to these benefits is intended to promote the use of these high-efficiency, sustainable production methods. By signing Community Covenants, participants have committed themselves to stopping unsustainable charcoal production methods and promoting protection of the eco-charcoal forest, in exchange for access to the improved technology, transportation, market access and support that BCP will provide to this project. Participating communities must also agree to ensure that tree harvesting for eco-charcoal production does not “spill over” into other areas, so as to prevent leakage from this project. Any incidents of “leakage” connected to this project will be addressed by BCP in cooperation with the local community, and must be resolved so as to ensure that the project is able to continue. It has been made clear to the community that any such incidents of leakage could jeopardize the successful continuation of the project.

The use of Community Covenants allows BCP to explicitly link the benefits that communities derive from this project to their assistance with deforestation mitigation activities; thereby turning project participants into BCP’s “allies” in the implementation of REDD-related activities. By ensuring that communities are receiving benefits from this project, BCP hopes that the community will feel independently motivated to ensure that any threats to the successful continuation of the project are avoided or dealt with. One potential response to “leakage” connected to the project would be to add additional community forest to the protected eco-charcoal forest area, such that the project would be able to increase its capacity to absorb more households, and bring more degraded community forests under sustainable forest management. It is additionally hoped that increased incomes from less labour will serve as incentives for other villages to include other threatened community forests in the project, and to ensure long term sustainability of charcoal harvesting—at least until viable alternative energy sources are made widely available in Zambia.

To date, villages within the zones of Namanongo and Ndubulula have agreed to participate in the project, and villages have demarcated two forest patches totalling approximately 450 hectares of threatened forest to be included in a protected “eco-charcoal forest”. The Sustainable Eco-Charcoal Project is currently being piloted in Ndubulula Zone, where participants have already formed an Eco-Charcoalers Association (ECA), and where 93 hectares of community forest have been set-aside for the project (Figure 18). In January 2013, fifteen participants completed a two-month training course on sustainable harvesting methods and improved kiln technology²⁸.

²⁸ BCP’s Kiln Fabrication Manual will be made available to the Validator.

Both the Casamance and drum kiln models have been successfully piloted. Project participants are currently involved in cutting from the first “strip” of the protected eco-charcoal forest, and they are in the process of assembling their first Casamance kiln using sustainably harvested, licensed wood. They are also actively using the drum kilns to make charcoal from the canopy off-cuts, which would otherwise be burned as “waste”. BCP is now in the process of securing access to transportation for the eco-charcoal producers, negotiating reduced levies with government officials and seeking access to new urban markets. All three of these interventions are anticipated to help derive additional income for eco-charcoal producers. BCP hopes to begin working with villages in Namanongo to launch their pilot phase of the project within this year, and to continue discussions with other communities concerning their interest in launching a Sustainable Eco-Charcoal Project in cooperation with BCP.

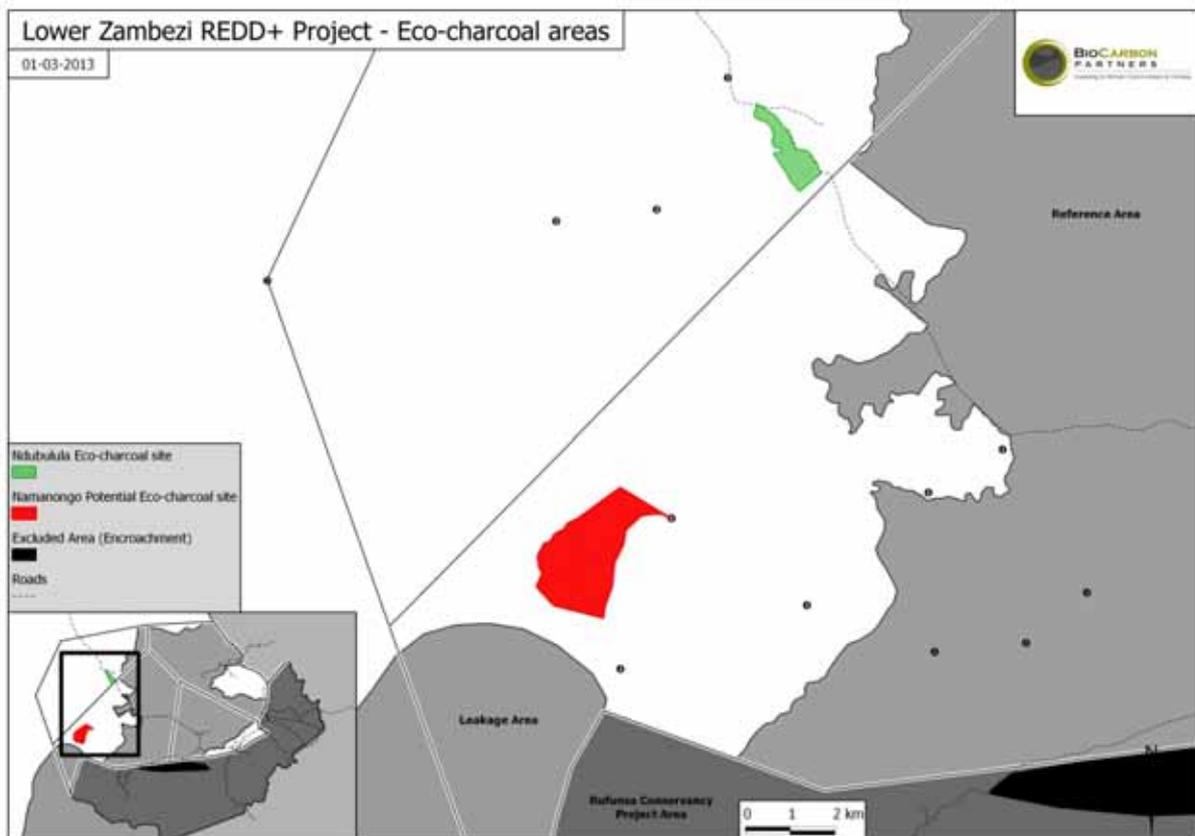


Figure 18. Locations of eco-charcoal sites. Ndubulula site has been launched and enumerated (green) while Namanongo is pending (red).

Conservation Farming

A glance at global mitigation potentials shows that agriculture is one of the leading causes of deforestation—as much as 75% of global deforestation is attributed to agriculture and related land use change²⁹. As such, any attempt to curb deforestation and forest degradation, or to reduce global GHG emissions overall, must effectively address agricultural pressures that contribute to deforestation.

International research and development organizations actively promote minimum tillage farming systems as a component of conservation farming, to conserve soils and to promote food security, biodiversity and water conservation. In such projects, instead of tilling before seeding, seeds are deposited directly into untilled soil by opening a narrow slot trench, or basin. This practice is also seen as a climate change mitigation and adaptation activity, and is thus promoted as a measure to be supported under the United Nations Framework Convention on Climate Change (UNFCCC).

BCP has partnered with a Zambian NGO, the Conservation Farming Unit (CFU), to implement the Conservation Farming Training Program (CFTP). The main aim of this project is to reduce the rate of forest clearing due to low-efficiency rain-fed maize farming, as well as to improve food security and agricultural incomes within the project zone. Current agricultural land-use practices within the project zone result in soil degradation. This eventually creates an incentive for farmers to increase the size of their fields by clearing more forest, in an attempt to seek additionally fertile lands to farm for subsistence agriculture or income-generating agriculture. Inefficient farming practices also result in fewer households having a maize surplus to sell. In order to address these pressures and drivers of deforestation within the project zone, BCP's Conservation Farming Training Program is designed to introduce more productive agriculture systems and value chain systems, to help farmers to increase their food production per unit of land already cleared, reduce emissions from crop residue burning and poor soil management, and to subsequently prevent leakage. This will be achieved by introducing minimum tillage maize production, and through the planting of *Faidherbia albida* trees (germinated in the project nursery) that are nitrogen fixers that naturally fertilize the soil.

²⁹ Sources: <http://www.epa.gov/climatechange/ghgemissions/global.html>, and <http://www.un-redd.org/aboutredd/tabid/582/default.aspx>, and <http://ccafs.cgiar.org/bigfacts/deforestation-emissions/>

The Conservation Farming Training Program was launched in Mweeshang'ombe Zone in November 2012. Due to its initial (and ongoing) success, the program is set to expand to include more farmers at the beginning of the planting cycle in the second-quarter of 2013, and is also anticipated to expand to include other community zones. The program has already trained an initial ten volunteer participants in the principles of minimum tillage farming, and has resulted in 135 *F. albida* trees being planted in maize fields. A number of 0.5 ha demonstration sites have been established to introduce minimum tillage practices to the community. In this upcoming year, the principles of crop rotation and mulching with agricultural waste will also be introduced. Other components of the program that will be introduced in the future include crop diversification, and particularly the planting of indigenous fruit trees such as *Parinari curatellifolia*, *Uapaca kirkiana* and *U. nitida*. A key component of the CF methodology is the complete cessation of crop residue burning. Not only does this improve soil fertility and retain moisture, it also contributes to additional emissions reductions.

Improved Small Livestock Production

Illegal hunting to satisfy protein needs is a common practice among households living within the project zone, and has resulted in the complete depletion of wildlife within the project zone, and significant reductions within Rufunsa Conservancy as well as in the Lower Zambezi National Park. Illegal hunters are also responsible for destructive late fires as they set fire to attract game to the green flush and to improve visibility. BCP's improved livestock projects will specifically assist local communities to find alternative protein sources other than bush meat. It will also serve to generate extra income or a better source of food that will reduce households' dependency on charcoal production as a means of income.

The Improved Livestock projects are designed to introduce improved training and genetic material into herds, with the aim of improving production. New genetic material will be brought into the area, for example, through the introduction of high quality billy goats. People participating in the project must then pass on offspring to other people as "payment" for their participation in the project. In this manner, the project becomes self-perpetuating. Similar projects have already been rolled out by the Department of Agriculture in Zambia, as well as by other organizations, and BCP aims to partner with and seek support from previously successful projects. This includes Baraka Foundation, a US-based NGO that implemented a successful chicken improvement project in Kenya. The Baraka Foundation is currently providing technical advice on intervention design.

Additionally, BCP is specifically interested in launching “village chicken” projects with local communities. Village or indigenous chickens (*Gallus domesticus*) are the most common types of poultry raised in rural areas of Zambia, and there is currently a strong—and growing—market for village chickens in Lusaka, as urban Zambians prefer the taste of village chickens to broiler chickens. In partnership with local communities, BCP has identified village chicken projects as a potential way of improving household diets, promoting food security and resilience, and generating additional income for households. Most village producers keep small flocks of between 5 to 20 birds per household, and BCP intends to help replicate this model among small groups of households within villages. A pass on model will be used, whereby beneficiaries are expected to pass-along offspring from their village chickens so as to help other households begin similar projects. Additional assistance for project participants will be provided in the form of access to transportation ‘at cost,’ and by seeking direct access to markets where they will receive adequate prices for their goods. Village chickens are a low risk and scalable intervention as it focuses on an existing activity and avoids disease-susceptible hybrid chickens. Two village chicken projects have already been established to date, with twelve more anticipated to begin in the next two weeks.

Social Services

a. School Refurbishment

As discussed in Section G1.5, the schools in Mweeshang’ombe and Chilimba Zones currently do not meet minimum government criteria to become district schools. This means that villagers have to pay for school structures, teachers’ salaries, and all associated costs with running a school. It is not surprising that community schools operate at a much lower standard than Government schools. BCP aims to invest in long-term partnerships to refurbish and support these schools to become district-supported schools. Currently, these schools are community operated, so teachers are voluntary and student attendance is erratic. By upgrading these schools to government schools, it is anticipated that the quality and regularity of education available to students within these zones would be significantly improved. The District Department of Education has already requested for the project to upgrade the Chilimba village school (Appendix B).

b. School Support

In addition to facilitating necessary structural refurbishments to community schools, the project aims to provide ongoing support to schools within the project zone, so as to improve the quality of education available to students. To do this, BCP works in close cooperation with school officials and Parent-Teacher Association (PTA) representatives to identify needs that students, teachers and communities face when it comes to education.

BCP hopes to provide educational support, materials and supplies that will facilitate and improve teachers' abilities to teach and students' abilities to learn, particularly with respect to environmental education. The aim is to assist students and schools through the provision of school supplies (such as pencils, notebooks, instructional charts) as well as small infrastructure (desks, classroom repairs, locks to prevent vandalism). Other aims include the provision of support in terms of access to information, resources and materials to environmental education programs, such as curriculum or activities for "*chongololo* clubs" (school environmental clubs).

The School Support program is already being implemented through the BCP Trust. In early February, BCP Trust provided a donation of notebooks, pencils, crayons and other learning materials to students at the Mweeshang'ombe Community School, after learning from the local community that children were having difficulty attending or learning in school due to lack of educational materials. At the same time, BCP representatives also led students through a small "environmental awareness" training, to mark the beginning of the Environmental Education Support Program in the zone.

Following this lesson, members of the local Conservation Farming Training Program and representatives from the PTA helped the schoolchildren to plant 110 fruit tree seedlings, marking the beginning of the Mweeshang'ombe Community School Fruit Orchard—another project supported by BCP, that is designed to improve community livelihoods and to promote forest protection and environmental awareness among youth. The project aims to replicate this engagement with youth through schools in all 4 Zones, including catalyzing school orchards and environmental awareness efforts.

c. Borehole Refurbishment/Access to Water

BCP has already funded the refurbishment of a non-functioning borehole in Ndubulula Zone. In exchange, the community signed a Community Covenant that stipulates that they will adhere to sustainable charcoal production practices, and will promote BCP's forest protection efforts in the area. Subsequently, the community has agreed to the demarcation of a 93 ha forest patch to be used for sustainable charcoal production. The community will benefit from both clean water from the borehole refurbishment, as well as from improved income generated through the Sustainable Eco-Charcoal Project.

BCP hopes to replicate this model in other zones where access to clean water is a serious concern for local inhabitants, and where access to necessary infrastructure and materials for repairs can be easily facilitated by BCP. The high rate of deforestation and more erratic rainfall is reportedly reducing surface water flows which many villagers depend on. Provision of adequate clean drinking water from ground sources is likely to become a more important issue for communities as surface water sources become less reliable.

d. Clinic Refurbishment

Access to affordable and quality healthcare is a notable problem for households living within the project zone for the Lower Zambezi REDD+ Project. In fact, with the exception of the partially functional Namanongo Clinic, the nearest healthcare facility for inhabitants of the project zone is the Chinunyu Clinic—which is a minimum 10 km distance from the nearest community (Ndubulula) and up to 40 km away for residents of Chilimba. Residents who need more-than-basic care must continue to Chongwe (80 km) to seek medical assistance, and serious medical cases must continue to Lusaka (120 km). Travelling to Chongwe or Lusaka adds additional transportation costs to the price of accessing healthcare.

BCP intends to work with the local community to identify the refurbishments that must be made to the Namanongo Clinic, so as to allow it to qualify for government support. This would entail upgrading the infrastructure to where the District would consider posting a full-time medical practitioner to the Clinic so that it is open full-time. By improving and facilitating access to local healthcare, we hope to improve the health and quality of life for residents living within the project zone. This could generate significant goodwill among community members, who would be more likely to support and participate in forest protection efforts.

Sustainable Honey Production

Miombo woodlands are famous for the high quality honey they produce. Unfortunately, traditional honey harvesting techniques lead to forest degradation. Honey collectors typically fell or burn down large trees containing hives, while fires used to smoke out bees often result in destructive, uncontrolled fires.

BCP plans to introduce sustainable honey production projects into the project zone, based on similar successful projects that have been established elsewhere in Zambia. BCP aims to develop market partnerships linking community groups to other social enterprises in Zambia that produce honey for local markets.

In addition to providing much-needed supplementary income streams to families, beekeeping prevents forest degradation and adds value to live forests, as each hive needs a minimum forest area for bees to forage from. Sustainable honey projects would be compatible with other forest protection efforts, for example, if they were located in an area of protected community forest that was also designated for other activities such as mushroom or fruit collection.

Residents of Ndubulula have already received training in beekeeping and have all the necessary equipment, except for hives. BCP intends to explore the possibility of reviving the Ndubulula honey project as a pilot, and then expanding the project to include other villages in other zones. However, due to concerns about the availability of sufficient intact forest to launch a honey project in Ndubulula zone, we are also exploring the option of launching pilot honey projects in areas that are closer to the intact forest area within Rufunsa Conservancy (such as villages in Mweeshang'ombe zone that are located along the Project Area boundary).

Mushroom Project

Miombo woodlands produce large amounts of edible mushrooms during the rainy season, which can serve as an important food source as well as a source of income, as there is a strong demand for wild mushrooms in Zambia. Unfortunately, as with so many other forest resources harvested by local residents, there is very little market access for rural communities and their products are typically only locally consumed or fetch poor prices at local markets. By assisting project participants with access to transportation at cost, the project aims to help local producers/collectors of wild mushrooms to deliver their mushroom products to other more profitable markets, particularly in Lusaka. In particular, BCP intends to allow women's groups to access Rufunsa Conservancy under supervision to seasonally harvest miombo mushrooms from Rufunsa's undisturbed woodlands.

Seasonal Thatch Business

As Section G3.5 mentions, as part of its Improved Conservancy Management Plan, BCP aims to implement a fire management system on Rufunsa Conservancy. In order to prevent potentially damaging, hot, late season fires, we will introduce a system of firebreaks and controlled, rotational early burns. The possibility will be explored of working with local communities to create a fuel-reducing bio-enterprise, such as the harvesting of grass, reeds or thatch from within the Conservancy for construction.

This activity has the added benefit of reducing fuel that would normally burn. BCP would be able to provide project participants with access to urban markets by allowing them to use the same “community truck” that other projects (such as Eco-Charcoal or conservation farming) will use.

Sustainable Brick Making: Hydra-Form Brick Making

Fired bricks are produced in the project zone, albeit on a relatively small scale at present. However, demand for wood fired bricks is increasing. Wood fired bricks consume a significant amount of wood fuel and if this activity continues to increase, this will put pressure on forest resources. However, fired bricks are highly desirable, as buildings made from fired bricks last much longer than the traditional mud huts and require less maintenance. In order to provide a replacement product that places less pressure on local forests, BCP has acquired a hydra-form brick-making machine that can produce bricks using soil and a fractional percentage of cement, and—importantly—does not require firewood burning. The bricks are interlocking and do not require mortar to join them, thereby further reducing the need for CO₂-intense cement.

The hydra-form machine will be made available to local residents for specific community building projects, such as schools or clinics, which are supported by BCP. It will also be made available to local community members on an “at cost” basis for projects that are not directly implemented by BCP, so as to provide a high quality, low-cost alternative to wood-fired bricks. Finally this hydra-form machine will be used to produce bricks in the construction of needed infrastructure (such as ranger posts, housing etc.) within the Rufunsa Conservancy.

Establishment of Community Trust Funds

Community trust funds that will help to manage funds from/for all of the above-mentioned projects in a transparent manner will be established. Community trusts will allow local residents to set their own priorities and to decide for themselves how to distribute profits. Traditional leadership structures will be used to assist with identification of trust representatives, as will local project associations (for example, the Eco-Charcoal Association, in Ndubulula Zone), who may wish to establish a separate trust or savings mechanism.

Tree Nursery and Fruit Orchard Projects

BCP aims to work in partnership with the Zambia Forestry Department and members of local communities to launch tree-planting and tree nursery projects. These projects would intend to raise awareness about the importance of protecting trees, and to promote reforestation efforts. They could also potentially provide an additional source of food or income for participants (especially in the case of tree nurseries). The project aims to explore purchasing in seedlings of specific trees from community members to 1) provide community members with some financial benefits; and 2) to source seedlings that a project nursery can nurture and replant out when the seedlings are stronger. BCP has already launched replanting projects: in Mweeshang'ombe Zone, the establishment of the Mweeshang'ombe Community School Fruit Tree Orchard occurred. BCP and the Forestry Department are also currently working with the participants in the Sustainable Eco-Charcoal Pilot Project to plant trees and reforest degraded areas within the eco-charcoal forest with indigenous hardwoods. BCP's Community Officer located in Ndubulula is also in the process of launching a tree nursery, which will be able to provide trees to local community members. BCP hopes to launch these sorts of projects in every zone, provided that community groups accept the idea and they are able to provide sufficient land with access to water resources, to make the projects possible.

Crop Diversification

Crop diversification is potentially an important source of household livelihoods, and risk management. Currently, most households in the project zone focus to a high degree on growing maize. In partnership with Musika (a Zambian non-profit agricultural value chain enhancer), the project has connected farmers since 2012 with export markets for drought resistant, nitrogen fixing cash crops such as pigeon peas. In late 2012, an invasion of armyworms (*Pseudaletia unipuncta*) in Zambia was declared a national emergency. Farmers throughout the country, including in the project zones, had entire fields of maize wiped out overnight, illustrating the importance of crop diversification³⁰.

Vegetable Production

BCP will assist groups of community members interested in farming vegetables, by providing equipment and training in improved conservation farming techniques, and helping to construct vegetable gardens. Vegetables could be used for consumption or for sale.

³⁰ Farmers in Zambia were unprepared for the unprecedented armyworm invasion. They had not been experienced in many peoples' lifetimes. Increasing temperatures over the last decade in Lusaka Province, and an unusually hot season in 2012, were blamed for triggering the invasion by local communities. The link between climate change and armyworms is not clear but illustrates the vulnerability of rural subsistence farmers to pests.

Participants involved in the project are already anticipated to know how to grow vegetables (as small-scale vegetable production is common among households within the project zone), however, participants may be invited to participate in conservation farming trainings (as described and calculated above) to learn improved farming techniques that could facilitate vegetable production. As this project is intended to promote small business creation, in addition to improving local food security, BCP anticipates that the business-model would be successful enough (given the high demand for vegetables, locally) so as to allow participants to purchase their own seeds on a recurring basis, after BCP has helped them to make an initial investment to launch their vegetable business. The Conservancy is likely to be an initial market for vegetables for staff.

Wood Lots

There is community interest to establish wood lots for fuel and poles. The project will work with willing groups to establish demonstration wood lots/tree farms with trees that are productive for the community grown on abandoned fields.

BCP has also established a Zambian registered non-profit organization named BioCarbon Partners Trust that will help to leverage donor funding and to assist with the design, implementation and management of community projects. The BCP Trust works in close partnership with members of the local community, particularly through the establishment and support of Zone Development Committees (ZDCs) that function as important community-based decision-making structures with local legitimacy (Please see Section G3.8 for more information about our Community Engagement Strategy).

G3.3 - PROJECT LOCATION AND BOUNDARIES OF THE PROJECT AREA, WHERE THE PROJECT ACTIVITIES WILL OCCUR

The project location and boundaries are shown in Figure 1 and 4. Project activities will be implemented throughout the project zone. Conservation activities will be implemented in the Project Area. Deforestation mitigation activities will be focused outside of Rufunsa Conservancy in communal lands located within the project zone (Figure 19). BCP does not anticipate any negative impacts from its projects taking place outside of the project zone.

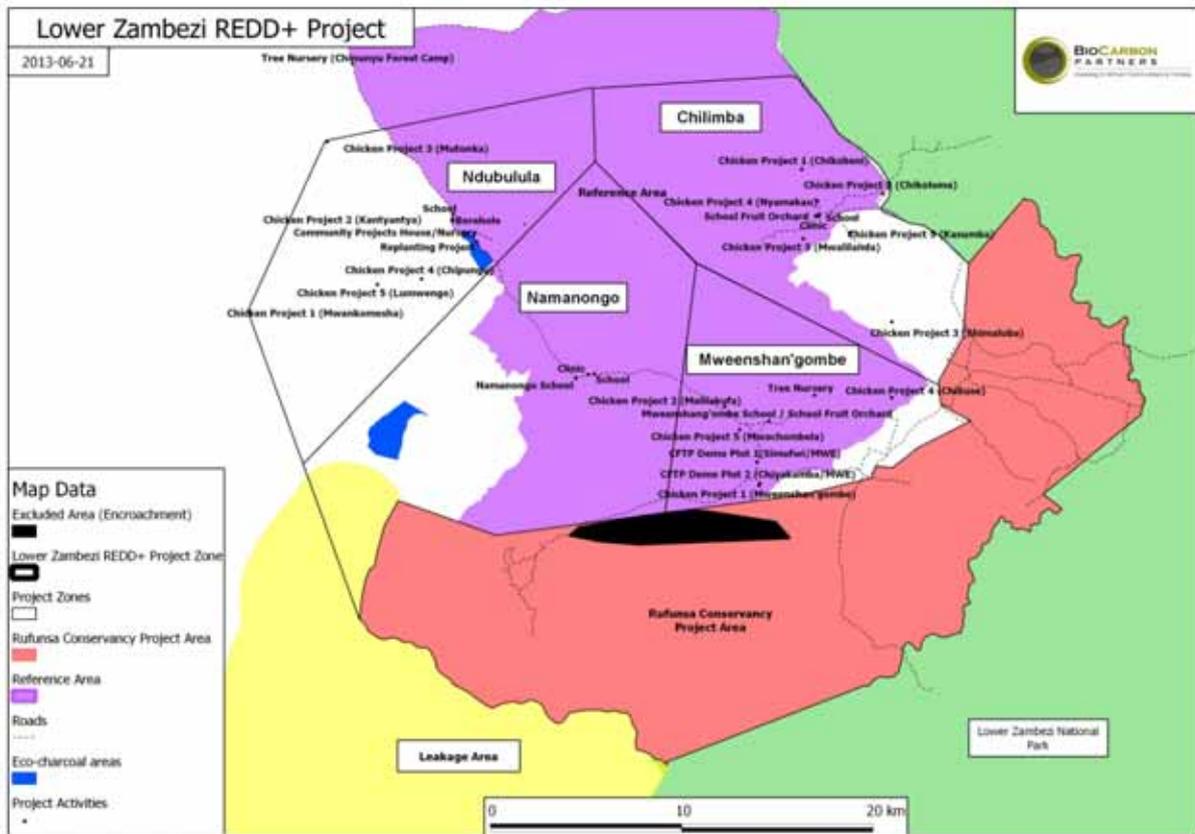


Figure 19. : Location of project activities in the project zone, in relation to the project area where activities (such as land management) will also occur.

G3.4 – PROJECT LIFETIME, GHG ACCOUNTING PERIOD AND MILESTONES

Sable Transport Ltd. has protected Rufunsa Conservancy since receiving title to this area in 2001. However, the Conservancy has been run on an annual loss-making basis since 2001. Sable Transport was approached by entities interested in generating carbon finance from Sable Transport owned properties in the mid 2000s. However, at this time, there was no clear mechanism for forests to generate carbon finance from avoided deforestation at that time. As set out in the VCS AFOLU Requirements (Version 3.3, 2012): “...the project start date of an AFOLU project shall be the date on which activities that lead to the generation of GHG emission reductions or removals are implemented. Such activities may include preparing land for seeding, planting, changing agricultural or forestry practices, rewetting, restoring hydrological functions, or implementing management or protection plans”.

Following a period of uncertainty surrounding the title cancellation in 2007, a period of limited activity followed while the *de jure* status of Rufunsa Conservancy was resolved. However, following the Consent Order being clearly resolved in favor of the landowner in 2009 increased and concerted efforts to mitigate GHG activities were initiated in 2009 by the landowner. The project start date is thus 1st October 2009. All documentation relating to this sequence of events will be made available to the Validator. Important dates for the Lower Zambezi REDD+ Project are listed in Table 14 below.

Table 14. Important dates for the Lower Zambezi REDD+ Project.

Milestone	Date
Project start date	1 October 2009
Project crediting period	30 years
Length of project	30 years
First carbon stock monitoring	February 2012
First assessment and quantification of socio-economic indicators	March 2012
Start date of community projects	February 2012
CCB Validation	April 2013
CCB Verification	April 2015
VCS Validation and 1 st Verification	October 2013
VCS verification interval	Annual
Periodicity of baseline re-evaluation	10 years after start date
Community impact monitoring	Every five years
Carbon Stock Monitoring	Annually
Leakage monitoring	Annually

G3.5 - NATURAL AND HUMAN-INDUCED RISKS TO CLIMATE, COMMUNITY AND BIODIVERSITY BENEFITS

Political Risk

Zambia is a stable and peaceful country with a well-established democracy. Human-induced political risks are therefore low and the project has the approval of central and local government, and traditional authorities. Zambia was one of the first nine UN-REDD Pilot Countries in the World and there is a high level of interest within government for REDD+ pilot projects. This project is significant in that it is the first—and currently only—pilot REDD+ demonstration project in Zambia. It is therefore strategic as a sub-national project which aims to support and feed into the design of a national REDD+ program. The project benefits from solid government support and interest for learning reasons. The project proponent is investing significantly in ensuring that the GRZ is kept well informed of this project, and the project's goals to contribute to national development goals and the national REDD+ strategy.

It is thus reasonable to assume the longevity of the project from a political stability perspective. Zambia is a stable country and BCP has approval and support from all the relevant Zambian Government Departments to implement the project. It is thus reasonable to assume the longevity of the project from a political stability perspective. However, in order to mitigate political risks, BCP proactively consults, engages, coordinates and collaborates with various Government offices, in addition to keeping them regularly informed about the project to keep it in the spotlight.

Risk of Expropriation

The Rufunsa Conservancy has a free and clear title deed. The boundaries have been demarcated with full consultation with local leaders. Zambia has strong investment protection laws and the project proponent has been awarded an Investment Licence from the GRZ. This reduces the risk of expropriation. Rufunsa Conservancy has already been through a legal suit and the highest institutions of the Country upheld the integrity of this title. It is highly unlikely that this land risks expropriation again. In addition, the project will invest in publicizing the project locally and internationally to ensure that the GRZ remains aware of the values that this project is providing the Nation as the country's first and currently only pilot REDD+ project.

To mitigate expropriation risks, the project will invest in publicizing the project locally and internationally to ensure that the GRZ remains aware of the values that this project is providing the Nation as the country's first and currently only pilot REDD+ project. In addition, the Project is building a positive, lasting relationship with neighbouring communities and the Government of Zambia to ensure that the land is productive and beneficial to the Nation.

Income Risk

With the risk that REDD+ market values are less than adequate to sustain the project financially in mind, project financials were modelled on very conservative REDD+ credit prices. However, this is a discrete project with potential high value in the marketplace given its climate, community and biodiversity benefits.

The project proponent has established a not-for-profit organization (BioCarbon Partners Trust) to help counter the risk of low carbon prices affecting community benefits from the project. The Trust aims to leverage funds specifically to support and build upon community benefits. The project is also exploring diversifying revenues into tourism to assist with conservation management costs on the Conservancy.

The project is also exploring diversifying revenues into tourism to mitigate the risk of low carbon prices. In addition, the project will invest in marketing the project and its strategic conservation and poverty reduction benefits in order to seek higher credit prices.

Community Risks

Although some people had settled on the property due to a confusion of the boundary position, as was stated in section G1.6, the issue has been resolved and the area settled has been excluded from the project area.

BioCarbon Partners has consulted extensively with all community stakeholders in order to understand the drivers of deforestation within the project zone and to formulate the most efficient mitigation strategy. BCP has a highly qualified and experienced team that have worked on conservation and natural resource management projects in Zambia and across Africa. This team has already started implementing several pilot projects within a very short space of time. Only projects that have written approval from local residents are implemented, and the link between interventions and deforestation mitigation efforts is further cemented through the signing of Community Covenants that oblige both BCP and participants to comply with project guidelines and connect community benefits to forest protection efforts.

Substantial and repeated crop failure in surrounding communities could lead to increased poaching and charcoal production for financial benefit. More erratic rainfall and pests make this likely, and all of our alternative economic development efforts are aimed at mitigating this risk. This is particularly true of the Sustainable Eco-Charcoal Project, which is based on a strong business model and designed to become a stand-alone, self-sufficient project. It is envisaged that conservation farming training program will be similarly successful, as will the village chicken project.

Although there are always (legitimate) concerns about corruption, in talking to local residents about the history of external involvement in their communities, BCP has learned that corruption is not the only risk that could potentially threaten projects: other difficult community dynamics (such as high alcoholism rates, internal jealousy and belief in witchcraft) have threatened or ruined other organizations' projects in the past.

However, BCP's extensive community engagement efforts and strong local presence have served as powerful tools against these problems. Local community members have explicitly told BCP representatives that we have already set ourselves apart from other organizations by conducting sensitization meetings and consulting local stakeholders prior to implementing our projects, and by closely involving the local community in our project activities. As a result, community members report that they feel greater ownership of the projects that we launch in partnership with them.

BCP has engaged in significant capacity-building efforts among our staff, local community members and local implementation partners, so that we can best avoid and respond to such problems. We are also managing the risk of corruption through the use of Zone Development Committees (ZDCs) and other BCP-supported community consultation and implementation structures (see Section G3.8 for more information about our Community Engagement Strategy). We have endeavoured to create tight systems that do not leave room for manipulation or abuse, and, most importantly, by ensuring that our projects bring tangible community benefits, we have worked hard to reduce any incentives that individuals might feel to engage in destructive or corrupt activities.

Another key risk mitigation strategy is the development of substantial community benefit projects and systems (conservation community covenants).

Fire

The only significant natural risks to the project are fires, drought and a significant increase in elephant populations. Fire is a natural phenomenon in all the higher rainfall African savannahs and is essential for the maintenance of the ecosystem. Fire is a vital, accepted management tool in southern African savannahs (Bond & Archibald 2003) and is strongly controlled by environmental factors such as rainfall and grass fuel load, often more so than human influence (Archibald *et al.* 2009). In fact, in southern African savannahs with rainfall below 1000mm, such as is the case for the Lower Zambezi REDD+ project, rainfall limits tree cover and not fire (Staver *et al.* 2011a). It is only at higher rainfalls that fire differentiates between savannah and forest (Staver *et al.* 2011b). Fire does thus not significantly alter tree cover or above ground tree carbon stocks in southern African savannah (including miombo) ecosystems. A large-scale study spanning 40 years in four different savannah types (rainfall range 447-737mm/yr) found that fire frequency, season and complete fire exclusion did not influence tree density (Higgins *et al.* 2007). Similarly, in a miombo system in Zambia, Chidumayo (1988) found little structural response from the tree stratum after 29 years of fire exclusion.

To further put the impact (or lack thereof) of fire on the miombo woodland trees found in the project area, in an 8 year period (2001-2008), it is estimated that the area was burned somewhere between 4-8 times (Archibald *et al.* 2010). Most savannahs in a stable state such as those found on Rufunsa Conservancy are carbon neutral, regardless of the presence of annual fires (Kutsch *et al.* 2011). Furthermore fire management that aims to prevent hot, late season fires that potentially impact on the AGOT pool is one of the main project activities of the Lower Zambezi REDD+ project.

It can therefore be assumed that this high frequency of fires has been occurring for some time. In spite of the frequency of this fire regime, the woodlands on Rufunsa Conservancy have remained intact since at least 1984, as can be observed from Landsat images used in the CDM.

In addition, BCP will be implementing a fire management system on Rufunsa Conservancy, in partnership with neighbouring communities, with the specific aim of preventing potentially damaging, hot, late season fires. This will be done through introducing a system of firebreaks and controlled, rotational early burns. BCP will explore the potential for fuel-reducing seasonal bio-enterprises, such as the harvest of thatch or grass from within Rufunsa Conservancy by women's groups for urban markets. Access to these markets would be using BCP's 'community truck' that is used in the eco-charcoal and farming value chain businesses. Fire cannot be completely excluded from the conservancy as doing so would lead to the complete loss of the grass sward (Trapnell 1959), and would thus adversely impact the biodiversity through the loss of many grass species and large herbivores, as well as an entire suite of acridids (Prendini *et al.* 1996) and other insects.

In order to mitigate risks, BCP will be implementing a fire management system on Rufunsa Conservancy, in partnership with neighbouring communities, with the specific aim of preventing potentially damaging, hot, late season fires. This will be done through introducing a system of firebreaks and controlled, rotational early burns to mitigate potentially devastating late season fires.

Drought

Drought poses another potential natural risk to the ecosystem. However, just as with fires, the woody vegetation is adapted to drought as the region is exposed to periodic droughts. Droughts are thus not considered a serious natural risk to the project.

An early burning fire management program will mitigate the risks that drought poses in contributing to late season fires that are potentially very damaging to vegetation.

Elephant Damage

Although there are no elephants permanently present in the project zone, adequate conservation measures may well see the return of this large pachyderm in moderate numbers. The impact of elephants on woody vegetation is a hotly debated topic in African conservation.

If large numbers of elephants do start entering the project area, this risk will be mitigated by managing the population by introducing a rotational grazing system by opening and closing access to artificial water points.

It is difficult to determine at what density elephants will start having a significant impact on woody vegetation as the impact is site-specific, however, it is safe to say that elephants do have some impact (Guldmond & Van Aarde 2008) on woody species density. What needs to be kept in consideration is that large tracts of miombo woodland remain intact, despite the presence of elephants (Ribeiro *et al.* 2008). It is unlikely that elephants will increase to such high numbers as to actually threaten the existence of the project. In the event that elephants do return to the project area, their foraging will more than likely result in a minor loss of vegetation but would not jeopardise the project in its entirety.

Natural Disasters

The project area is geologically stable and there are thus no significant threats from seismic activities. Similarly, the risk of flooding is very low as the project area is situated on top of an escarpment and the soils are mostly sandy, thus drain easily.

With a view to mitigating the risk of natural disasters, BCP's community projects are designed to promote and build local stakeholder resilience to disasters, including the negative effects of climate change.

Projects such as crop diversification, income diversification, and our conservation farming training program—which is designed to introduce improved farming techniques—are intended to mitigate the negative effects that disasters, such as the army worm pest that was declared a national emergency in 2012, do not destroy local livelihoods, and to ensure that households are more resilient in the face of changing rainfall patterns, including drought.

G3.6 - MEASURES TO ENSURE THE MAINTENANCE OR ENHANCEMENT OF THE HIGH CONSERVATION VALUE ATTRIBUTES IDENTIFIED IN G1

Maintaining areas of High Conservation Value is at the core of the aims of the Lower Zambezi REDD+ project. The protection of the miombo woodlands on Rufunsa Conservancy and associated species will be achieved by dramatically ramping up management activities as outlined in section G3.2. BCP has already appointed a Project Manager and Operations Manager who are based on the property. Furthermore, scouts will be provided with new equipment, communications and transport and given additional training.

Patrols on the conservancy will be intensified in partnership with the Zambia Wildlife Authority.

The community benefits associated with our deforestation mitigation activities will further serve to ensure a positive attitude towards conservation from neighbours resulting in a natural decrease in poaching and other illegal activities.

Important Bird Area

A comprehensive fire management plan will be implemented on Rufunsa Conservancy to ensure the maintenance of the high value miombo woodlands and the associated habitat it offers to the neighbouring Important Bird Area. Increasing numbers of game birds, such as guinea fowl, are being seen on the Conservancy, and are likely to increase with the introduction of an early and effective fire management program that contributes to higher chick survival rates.

Centre of Endemism

The corridor effect and improved management of the miombo woodlands on Rufunsa Conservancy will ensure that endemic species have a high survival chance.

High conservation value species potentially occurring on the property

The enhanced patrols and improved neighbour relations will lead to a decrease in poaching activities that have significantly impacted on HCV species.

Ecosystem services and other conservation values

The improved management of Rufunsa Conservancy, with the specific aim of maintaining it as a significant biodiversity and ecosystem services asset will ensure that it continues to act as an important catchment of the Zambezi River and act as a migration corridor for HCV and associated species. The improved management of the Conservancy adds valuable contiguous habitat in an ecosystem of global biodiversity significance, in which key resource 'anchors' such as LZNP are under deforestation and encroachment threat.

Community-based activities will serve to protect HCVs through the provision of alternate source of protein (such as the village chicken project). The use of Community Covenants to link project level investments to reductions in poaching will serve as a formal deterrent to poaching within the Conservancy. The proposed 'biodiversity banking' scheme of sharing tourism revenues with local communities will serve as a direct incentive to maintaining HCVs. BCP's investment in two community schools includes environmental education that serves to raise awareness amongst children about the threats of poaching. Community engagement and job creation also assists intelligence networks that are effective in obtaining information that can contribute to better patrol deployment, and identification of poaching gangs.

G3.7 - MEASURES THAT WILL BE TAKEN TO MAINTAIN AND ENHANCE THE CLIMATE, COMMUNITY AND BIODIVERSITY BENEFITS BEYOND THE PROJECT LIFETIME

There is a long-term contractual arrangement in place with the owner of Rufunsa Conservancy who, in turn holds a 99-year lease on the property. Furthermore, the project has been carefully planned to become self-sustaining in the long run. BCP anticipates that Rufunsa Conservancy will be able to attract eco-tourists due to its close proximity to Lusaka. The business plan also calls for developing a game ranching business whereby surplus wildlife could be sold to other conservation properties within Zambia to help restock depleted areas. The Conservancy has a unique opportunity to pioneer integrated diversified conservation revenues streams—catalysed by carbon—as a model for healing degraded land in Zambia.

There are a number of depleted areas in Zambia, yet few projects that aim to innovate products and strategies that are conservation compatible and rehabilitate areas with traditionally low value. Rufunsa's business model incorporates innovative niche tourism development, the development of a breeding center for wildlife, and a center for educational and training opportunities related to conservation.

Deforestation mitigation activities, such as the eco-charcoal project and conservation farming initiatives, have been designed from the outset to become self-sustainable. The eco-charcoal project, for example, will be developed through an open and transparent consultative process, and contractual agreements have been put in place with all participants. These projects, along with the village chicken project, are scalable, replicable and sustainable. They build upon existing livelihood activities that are forest incompatible, but improve them, and make them forest compatible. Thus, the chance of success of these projects is higher as BCP does not need to catalyze significant attitude or behaviour changes.

The project aims to ensure that all project activities implemented become self-sustaining. The Rufunsa Conservancy is being geared towards eco-tourism. This includes exploring innovative niche tourism development, such as adventure education and guiding training. The deforestation mitigation and community development projects in the remainder of the project zone are all designed to become self-sustaining, commercially viable ventures. Some examples of this include the eco-charcoal project, conservation farming, village chickens and honey production. BCP Trust is an entity which is designed to be able to leverage donor funds which are non-carbon funds. BCP has also promoted the development and support of local institutions, such as Zone Development Committees, which are being trained and empowered to manage projects and community natural resources more effectively on their own. The BCP Trust's long-term aims include community ownership and management of all projects; our ongoing training and capacity building efforts demonstrate this, as well as our significant community presence and heavy reliance on community-based decision-making practices.

G3.8 – COMMUNITY AND OTHER STAKEHOLDER INVOLVEMENT AND ENGAGEMENT CONSULTATION PROCESS

Stakeholder Identification

As was discussed in Section G1.5, the Project Zone for the Lower Zambezi REDD+ Project encompasses 28 villages located within four community zones (Figure 4). The Project Zone includes all stakeholder communities that BCP has identified as currently involved in permanent deforestation activities (such as charcoaling or agriculture) in or near to the Project Area (Rufunsa Conservancy), that are therefore reasonably expected to be impacted by the implementation of REDD-related activities on Rufunsa Conservancy.

BCP employed two main methodologies in order to identify these stakeholder communities: first, remote sensing was used to identify areas of deforestation and the communities within them, in the area surrounding Rufunsa Conservancy. Second, BCP's Community Engagement Manager conducted an extensive on-the-ground consultation process with local communities and their leaders, so as to identify communities that were most involved in deforestation activities and most likely to be impacted by REDD+-related activities taking place on Rufunsa Conservancy within the next thirty years. The results of BCP's Baseline Survey provided further information that was used to identify stakeholders and to better understand the nature and extent of their dependency upon deforestation-related activities.

Community Consultation and Involvement in Decision-Making Processes

In order to ensure that BCP's projects achieve maximum positive impacts for local communities, BCP has worked to develop a comprehensive Community Engagement Strategy that focuses heavily on consultation with local stakeholders and involvement of the local community in decision-making processes about REDD-related projects.

BCP's Community Engagement Strategy is uniquely comprehensive in its involvement and empowerment of local communities throughout the decision-making process concerning REDD+ project activities. The strength of our model lies in the way that we treat local communities as "allies" in our efforts to reduce deforestation. By thoroughly consulting and involving communities throughout the project design and implementation process, we are able to benefit from local knowledge and legitimacy that could not come from less inclusive processes. BCP strongly promotes local ownership of community projects, and we believe our project activities will be more robust and effective if they have been designed and supported by local communities. We are proud of the fact that we can truly describe our model as "community based."

The components of the Project Design and Implementation process is outlined below:

1. Community Sensitization

- Promote understanding of REDD+ and BCP activities
- Allow community members to make informed decisions

2. Identification of Potential Projects

- BCP Baseline Survey information and research
- Consultation with local communities
- Project ID Worksheets
- Community Coordinators

3. Zone Development Committees

- Representative consultation and decision-making body
- Builds upon traditional leadership structures
- One for each zone
- Two representatives from every village
- One Lead Representative
- Representatives must be democratically elected from each village
- Help to identify best project types and designs, implementers, and implementation sites

4. Project Consultation Meetings

- Consultation between community, government and BCP representatives
- Representatives from all 4 Zones- 4 ZDC Lead Representatives
- Allows for information-sharing, consultation, discussion, advice
- Seek areas for collaboration and partnership

5. Traditional Leadership

- Village Headmen/Headwomen must be involved in and support final decision-making processes

6. Implementation

- Community Coordinators
- Community Project Officers (CPOs)
- Community Covenants - Agreements between BCP and local communities
- Projects launched in partnership between BCP and local communities
- Promotion of local ownership of projects
- BCP support conditional upon community support for deforestation mitigation and forest protection

The rest of the section to follow describes BCP's community engagement efforts within the Project Zone to date, and provides a more comprehensive explanation of our overall Community Engagement Strategy.

Community Sensitization is among the first and most critical aspects of the Community Engagement Strategy. It is important that local communities understand the workings of REDD+ and that they are informed about, and can directly influence, REDD+-related policies, projects and decisions that affect their livelihoods. We consider it to be in our own interest to ensure that community members are fully informed about our objectives and activities, so that they can make informed decisions and provide us with genuinely relevant feedback. We view communities as our partners in project implementation, and as such, we do not feel it is in our interest to keep our partners "in the dark". We place strong value on transparency, as this allows both sides to make better decisions that are more likely to be effective. An open, two-way dialogue between BCP and local community members is encouraged at all times, and BCP ensures that these meetings provide the opportunity for all community members to ask questions and voice their opinions about REDD-related activities.

BCP began engaging with local communities adjacent to the Project Area in February 2012, when the Community Engagement Manager first began conducting Community Sensitization Meetings in local villages. The purpose of these meetings was to provide local community members with basic information about climate change and REDD+, in accordance with the principle of obtaining Free, Prior and Informed Consent (FPIC). Such meetings were always conducted in appropriate local languages, including Nyanja and Tonga, and were always organized with the permission—and attendance—of local leaders (including village Headmen and Headwomen).

The Community Engagement efforts have been ongoing ever since, and we have now conducted over **51 Community Sensitization Meetings that have resulted in the sensitization of over 1,160 heads-of-households**. From these meetings, 647 heads-of-households living within the project zone have been sensitized—this reflects an estimated 58% "sensitization rate" among the approximately 8,300 individuals living within the project zone (presuming that heads-of-household communicate relevant information with their families).

Although we have sensitized a majority of the community, we are actively pursuing an increased sensitization rate through an expanded community sensitization process that involves targeting remote households that have not yet attended public community sensitization meetings. We are especially aware of the importance of ensuring that all community groups, including minority, women, youth and the elderly groups have been effectively engaged and consulted through our processes.

At the end of each sensitization meeting, a voluntary vote is taken, allowing community members to express their approval or rejection of the REDD+ Project activities. Up to date, we have received a 95% “approval rate” of the project and its activities from the local community, far surpassing the internal target of 75% overall approval for any activity that affects local communities. However, we remain committed to seeking community consent concerning all future project activities that are anticipated to impact community livelihoods. As the sections to follow shall discuss in greater detail, Community Project Design and Implementation Process will be highly dependent upon, and influenced by, community consultation, involvement and feedback.

Community awareness and understanding about REDD+ and project work within the Project Zone has been extensively promoted, there was simultaneous endeavour to develop a strong local presence and to gain a solid understanding of local conditions and dynamics that could affect—or be affected by—REDD+ project implementation.

In September 2012, the Baseline Survey component of the Social Monitoring Programme was implemented. Ninety surveys across all four zones were completed as part of this exercise, resulting in the collection of demographic and socio-economic information from head-of-household respondents as well as further sensitization about project activities.

The information that was gathered from this survey was used to identify local drivers of deforestation (such as poverty, charcoal production and agricultural activities), as well as to identify projects that can meaningfully address these drivers, and particular groups that would benefit most from various types of interventions. For example, socio-economic data gathered through the Baseline Survey identified the poorest households, those that are most dependent upon charcoal production or least productive agriculturally, and those that are most experienced with alternative livelihood strategies such as livestock rearing.

This has allowed the identification of target communities, or even households, that would benefit most from various intervention types. As such, the information collected through the Baseline Survey has helped BCP to make informed decisions about potential projects, and has helped us to design and launch projects that are truly intended to bring maximum community benefits and to effectively reduce deforestation in the project zone.

In addition to gathering baseline socio-economic data, the ongoing Social Monitoring Program will allow assessment of the impacts that its projects have on local communities on a regular basis. This information will be used to help inform decisions about new and ongoing projects, so as to ensure that our projects continue to achieve maximum positive impacts on communities, climate and biodiversity in the Project Zone of the Lower Zambezi REDD+ Project.

However, BCP does not intend to act alone or to rely on survey data when it comes to designing or implementing community projects. In fact, forming partnerships with local communities lies at the heart of the overall REDD+ project model—this is even why we have chosen to include “Partners” in our name. ***BCP recognizes the importance of having a strong local presence combined with intimate local knowledge and legitimacy in the eyes of communities.*** In order to do this, a Community Engagement Team (CET) was formed, which is comprised of a combination of local leaders and project management and development experts. The CET works (and many officers live) actively with the local community to build local project presence, and its members are primarily responsible for the oversight and coordination of community-level project activities. Zone Development Committee (ZDC) structures were developed to provide an innovative and unique approach to community-based participation in decisions, by hybridizing locally democratic representation with traditional leadership structures and authority—at a zone level that incorporates multiple villages.

Within the Project Zone for the Lower Zambezi REDD+ Project, the Community Engagement Team includes four Community Coordinators, one from each zone. These Community Coordinators serve as liaisons between the local community and BCP, and they assist in the identification of potential projects and project participants, as well as the planning and implementation of deforestation mitigation projects.

Throughout December 2012 and January 2013, Community Coordinators were involved in an extensive Project Identification Process, which included consultation with community members about the purpose of community project activities (“to provide incentives and alternatives to deforestation”). This consultative process resulted in the completion of over 30 Project Identification Worksheets that outlined the details of potential projects, including: proposed project type, proposed project implementers, rough project design, expected benefits from the project, anticipated costs, and the “link” between community project benefits and deforestation mitigation efforts—in other words, community members were asked to describe what they were willing to “contribute” towards deforestation mitigation efforts, in exchange for the benefits or support they anticipated to receive from the project (for example, participants in Sustainable Eco-Charcoal Project agreed to stop their involvement in unsustainable deforestation practices). Throughout the process, CET members ensured that community expectations were not raised by stressing that this was purely an “information gathering process” that was intended to help to identify potential projects that could be launched in partnership with the local community.

In addition to the Community Coordinators, we also intend to hire at least two Community Project Officers (CPOs) from within the local community, who will be specifically responsible for assisting with the implementation of community projects. Their role will include assisting with the technical aspects of project implementation, and providing day-to-day oversight and monitoring of project activities. The CPOs are anticipated to play a critical role towards ensuring that projects are designed and implemented effectively, and they will be expected to provide feedback to management that will be used to adjust or improve projects, so as to achieve maximum positive impacts. By hiring CPOs from the local community, we will ensure that our community-based project facilitators have respect and legitimacy in the eyes of the community, and that community members will feel comfortable and open when discussing their opinions concerning community projects with them.

Community-based members of the CET will also play a critical role towards ensuring that community members understand and have access to all necessary elements of the grievance mechanism, which is described in greater detail in Section G3.10 of this document. CET members are expected to be able to handle community concerns responsibly and appropriately.

The Community Engagement Strategy additionally places a high value on respecting and cooperating with local decision-making structures, so as to benefit from local knowledge as well as to ensure local legitimacy of project-related decisions. Throughout interactions with local communities since February 2012, we have worked closely with traditional leadership structures—particularly Village Committees—to ensure that our actions have local legitimacy and approval (“village committees” are traditional local-level institutions that include the village Headman/Headwoman and their closest advisors). We have also sought and received support from the Chief (Chief Unda Unda), who oversees village-level traditional leaders such as Headmen and Headwomen. Interestingly, we have been told that the Chief and his Headmen/Headwomen technically have “parallel” power along with the District Government. However, traditional leadership structures tend to dominate local, village-level decision-making. Nevertheless, we have received documented support (in the form of official letters of support) from traditional leaders in every single zone of the Project Zone, as well as the Chief and local District Government offices (Appendices C-E). Local leaders have played an important role throughout the Project Identification Process, as they have helped us to identify potential projects that would be appropriate to launch in the areas that they represent.

At the beginning of 2013, BCP was faced with tough questions about our project implementation process that we felt neither traditional leadership structures nor the Community Engagement Team could answer alone. As was described above, throughout December 2012, the Community Engagement Team had been deeply involved in the Project Identification Process. After nearly a full year of collecting community feedback and information, by the beginning of 2013, BCP had collected substantial information about potential projects and groups that were interested in participating in them. However, with the limited resources available it was not possible to implement every project identified in the short term. Moving forward, the project needed a mechanism to identify which projects to launch first, where, and with whom with as limited an amount of bias as possible.

Already, we were aware of a significant amount of suspicion and jealousy among community members living within the Project Zone, and we had begun to hear rumours that community members suspected that only “powerful” or well-connected people would be involved in BCP’s project activities. BCP was aware that the perception of bias—whether real or imagined—could pose a serious threat to the legitimacy, and therefore success, of our community projects.

As such, we knew that we could not rely on the existing structures or relationships that we had thus far been dealing with in order to resolve these concerns. We also knew that we needed to find a more appropriate way to resolve important questions about project implementation, including: *what* would the most effective projects be, so as to optimize community stakeholder benefits? *Where* should these projects be implemented first? *Who* should be responsible for implementing them, and *how*? We needed a way to answer these questions that was simultaneously local and overarching, so as to be both effective and legitimate in the eyes of the overall community living within the Project Zone for the Lower Zambezi REDD+ Project.

To do this, we introduced the innovative “Zone Development Committee” (ZDC) system. ZDCs are hybridized decision-making bodies that build upon local traditional leadership structures, while introducing new elements of democratic representation and intra-zone cooperation and communication that did not previously exist among local institutions. ZDC’s serve the function of being a form of ongoing participatory rural appraisal system (PRA); as a forum for local people to examine their own problems, set their own goals, and monitor their achievements. ZDC’s provide a forum for ongoing focus group analysis, key informant discussions, semi-structured interviews and triangulation. Every zone within the Project Zone has its own ZDC, which is comprised of two democratically elected representatives from each village located within each zone. In order to form the ZDCs, the Community Engagement Team undertook the following steps:

1. Throughout January 2013, BCP’s CET members literally contacted and visited *every single village committee*, and encouraged all members of each village committee to attend a zone-wide ZDC Formation Meeting that was scheduled to take place. As was explained above, village committees are traditional local leadership structures that have a high degree of respect and legitimacy in the eyes of the community—BCP therefore understood the importance of consulting and involving village committees in our decision-making process, and ensuring that we proceeded with their absolute support and approval.
2. BCP facilitated a ZDC Formation Meeting in each zone. All village committees from within each zone were invited to the ZDC Formation Meetings.
3. At the ZDC Formation Meetings, it was explained the purpose and structure of the proposed ZDCs, and solicited feedback from the village committee representatives in attendance. It is important to note that representatives from 20 village committees, of the 28 villages within the Project Zone, attended the ZDC Formation Meetings that were held.

4. Meeting minutes (records) from the ZDC Formation Meetings document that there was unanimous support for the idea of forming ZDCs among the village committee members who were in attendance. Village committee representatives also unanimously approved the structure of ZDCs—which includes two representatives from each zone, and one “lead representative” chosen from among all ZDC representatives for each zone. As such, BCP feels that there is sufficient documented “proof” that our innovative ZDC structure has the support of traditional leadership structures.
 - a. Village committees agreed that ZDC representatives should be elected through the most representative process possible;
 - b. Village committees agreed to sensitize their village residents about the structure and purpose of ZDCs, so as to allow villagers to make an informed decision about who they wanted to represent them;
 - c. Village committees agreed that it would *not* be an effective model to allow Headmen to simply appoint ZDC representatives on behalf of their village, since it was necessary to ensure that the representatives had legitimacy in the eyes of local villagers, and since it was necessary to ensure that the village agreed that its selected ZDC representatives would be best able to promote and represent the interests of the village;
 - d. BCP agreed to involve village committees and other traditional leaders (such as representatives of the Chief) in decision-making processes, in tandem and in parallel with the ZDCs;
 - e. Village committees agreed to support the ZDCs, and to uphold decisions made by ZDCs, so long as they were inclusive of local leadership and truly considered to be representative of local interests.
5. Following the ZDC Formation Meetings, village committee representatives returned to their villages to disseminate information about the proposed structure and purpose of ZDCs and to solicit feedback from their communities. Villages then selected their two representatives, and submitted their names to BCP’s Community Engagement Team.

6. 54 representatives from 27 villages have been selected to serve on ZDCs. For Ndubulula, Chilimba and Mweenshan'gombe zones, literally every single village is represented.
 - a. Interestingly, whereas traditional leadership structures—particularly village committees—are primarily composed of older males, a number of women and youth were selected to represent villages on the ZDCs. This adds credence to BCP's initial observation that, were we to rely on traditional leadership structures or our small group of individually-selected representatives alone, we would not be working with the sort of representatives that—given the opportunity—communities would chose for themselves. As such, we strongly believe that our ZDC structure adds a significant degree of local legitimacy and representation that we could not have expected if we had relied upon existing traditional leadership structures alone. Our strategy is therefore a true hybrid model that builds-upon existing leadership structures while adding an additional, innovative layer of local representation that did not previously exist.
 - b. Village representatives are explicitly intended to promote and defend the interests of all community groups living within each village, including: minority groups, women, youth and the elderly.
7. ZDC Representatives organized among themselves to meet and select a lead representative who would be able to serve as a spokesperson on behalf of the ZDC.
8. An initial Project Consultation Meeting (PCM) was held at the end of January 2013. ZDC Lead Representatives from each zone attended the meeting, along with local government officials and BCP representatives. The purpose of the PCM was to promote awareness and transparency among key stakeholders in the project implementation process. BCP used this opportunity to consult community and government representatives, to solicit their feedback and ensure their support of the process moving forward.
9. Meeting minutes from the PCM document that there was unanimous support, from community and government officials, for the creation of ZDCs and for their ability to serve as decision-making institutions throughout BCP's project implementation process.

With the ZDCs now established, BCP is working closely with each ZDC to develop a specific project implementation strategy within each zone. This includes: identifying the best-possible projects to launch, designing the best possible model for each project and selecting the most appropriate individuals or groups to begin launching these projects, so as to optimize community stakeholder benefits. These decisions are absolutely intended to be representative of the overall “best” interests of all community groups, as a result of the representative, consultative process that has underlain ZDC formation from the onset. BCP will also work closely with the ZDCs to develop “priority lists” that balance community needs with BCP’s resource constraints, so as to launch the most effective projects possible, in order of necessity and possibility. These priority lists will additionally be useful planning and fundraising tools for the BCP Trust.

Once decisions have been made about which projects to launch, with whom, and where, BCP’s Community Engagement Team will begin a careful consultation process with community stakeholders involved in each project. Just as was the case with BCP’s overall consultation and sensitization efforts concerning the implementation of a REDD+ Project on Rufunsa Conservancy, BCP will work closely with community-based representatives to ensure that all community stakeholders are fully informed and consulted prior to project implementation, in line with the principles of FPIC. Members of BCP’s Community Engagement Team will cooperate with local traditional leaders and ZDC representatives to organize community stakeholder meetings, in which stakeholders are given the opportunity to seek additional information about proposed projects, to raise concerns or questions, and to provide feedback that is intended to improve project design. BCP will ensure that information about proposed projects is provided in locally relevant and culturally appropriate ways, which includes making sure that explanations are provided in local languages. This extensive community stakeholder consultation phase will be an essential step in the overall project design and implementation process.

Presuming that there is community support for a project to continue towards implementation, members of the Community Engagement Team will ensure to continuously involve and consult community stakeholders throughout the process, even after a project has been launched. BCP’s ongoing Social Monitoring Program will ensure that baseline data is collected prior to project implementation, and that ongoing rounds of surveys gather additional information that can be used to identify and assess the impacts that projects have on community livelihoods.

This information, combined with extensive and continuous community feedback, will be used to help guarantee that projects continue to achieve optimum community benefits, or, that they are redesigned and adjusted to ensure this is the case. As such, BCP's comprehensive Community Engagement Strategy and Social Monitoring Program will help to ensure that BCP's projects benefit from adaptive management strategies that maximize community benefits derived from projects, and help to ensure that BCP continues to achieve its overall aims of improving community livelihoods and reducing deforestation.

BCP's Community Engagement Strategy relies heavily on cooperating with ZDCs and traditional local leadership structures (particularly "village committees") to identify possible projects and target community groups, and to make decisions about project implementation. In so doing, we believe in the ability of our systems to deliver representative decisions that are reflective of local community interests, that will be best-able to optimize community and stakeholder benefits. For all the reasons outlined above, our Community Engagement Strategy truly respects and builds upon local customs, values and institutions, and we therefore anticipate that the decisions that are made will have a high degree of local legitimacy. Additionally, BCP's ZDC model has been designed so as to ensure that the decision-making process concerning community projects is appropriately representative of the needs and interests of all community groups and stakeholders within the Project Zone. Since we can so strongly believe and trust in the appropriateness of the decisions that will be made through these comprehensive systems, BCP looks forward to playing more of a "supporting" role towards implementing community projects that have been identified, designed and selected by local community representatives, in consultation with BCP and government officials. We strongly believe this method will promote local ownership of projects, and will allow BCP to form and develop a truly effective partnership with the local community.

The Validator will be provided with BCP's relevant Standard Operating Procedures (SOPs) concerning: Community Engagement Strategy, FPIC and the Social Monitoring Program. These documents were reviewed by Client Earth, an NGO of activist environmental lawyers who reviewed the SOPs for compliance with international standards³¹.

³¹ www.clientearth.org.

G3.9 –PUBLICIZING OF THE CCBA PUBLIC COMMENT PERIOD TO COMMUNITIES AND OTHER STAKEHOLDERS

The Project Design Document was made available at all civic centres throughout the project zone. Members of BCP's Community Engagement Team distributed additional copies, and they were trained in collecting all potential concerns or grievances about the document. Interpretation of the document was made available in Nyanja, which is the predominant local language that is shared by the vast majority (if not all) residents of the Project Zone. Since there are high levels of illiteracy among community stakeholders, members of the Community Engagement Team helped to coordinate meetings in which the content of the document was explained and presented, and community members are given the opportunity to discuss, ask questions and to provide feedback. This helped to ensure that community members were given an adequate chance to understand what is in the document and to submit any comments that they may have to CCBA. For community members without access to the Internet or smart phones, community members were encouraged to submit written comments to community coordinators for collating for CCBA and the Validator.

Public PDD Launch Meetings were held in all four community zones from 19-22 March, as per the below schedule of meetings:

- 19 March: Ndubulula Zone
- 20 March: Chilimba Zone
- 21 March: Mweeshang'ombe Zone
- 22 March: Namanongo Zone

The BCP Trust Director/Human Rights Officer led each official PDD launch meeting in each zone, in which the contents of the PDD were described to the community, outlines of the PDD were provided to the community (in English and Nyanja), questions and discussions were encouraged, a copy of the PDD was publicly presented to the local Community Coordinator, and all stakeholders were encouraged to view and provide feedback on the document. The purpose of these meetings was to ensure that local community stakeholders were aware of the availability of the PDD, understood the purpose of the PDD dissemination, provided with an introduction to the content of the PDD, and encouraged to become informed of the content of the PDD—either by attending such public meetings (dates for future meetings were planned and publicly advertised), by reading outlines of the PDD (available in English and Nyanja) or by reading the PDD itself.

Copies of the PDD were publicly presented to the local community (pictures confirming this handover have been provided to the Validator). Local leaders, ZDC representatives and interested community stakeholders were in attendance at these meetings, as were the BCP Community Engagement Manager and local Community Coordinator for each zone. All of these PDD launch meetings were formally minuted to ensure a record of the content of these meetings was maintained, in order to demonstrate compliance with the standards set by Indicator G3.9. Copies of the minuted meetings, outlining the content of these meetings, have been provided to the validator for evaluation.

Following the official launch meetings, the BCP Community Coordinator for each zone organized smaller and more local “follow-up” meetings at the village and zone level, to ensure widespread dissemination of information contained in the PDD (as provided in outlines available in English and Nyanja), to make the PDD available for public scrutiny, and to collect questions and feedback from community stakeholders. Many of the community comments that were submitted to the auditor were collected during this time. Such meetings were conducted in local languages, and were held in pre-agreed locations at times that the community identified as acceptable.

Finally, the BCP Trust Director and Community Engagement Manager held formal PDD follow-up meetings throughout the first week of April (April 2-4), prior to the auditor’s arrival. In these meetings, the content of the PDD was discussed again, and community members were encouraged to provide feedback and ask questions.

Throughout this process, and beginning with the official PDD launch meetings that were held in mid-March, BCP representatives raised public awareness about the upcoming Validator site-visits, and posted announcements (in English and Nyanja) about the auditor’s upcoming visits in early April. BCP Community Coordinators and ZDC representatives were instructed to invite local stakeholders from all villages to attend, and to ensure that information about the upcoming meetings was made widely available.

A detailed description of the process by which information about the PDD and upcoming Validator visit was disseminated to local communities is available in the BCP Guide to Community Engagement handbook, which has been provided to the Validator. This document contains pictures of public announcements (in English and Nyanja) being posted throughout the community.

Hard copies of PDD availability announcements (in English and Nyanja), outlines of the content of the PDD (in English and Nyanja) and announcements about the time and location of the Validator site-visit meetings (in English and Nyanja) were provided to the Validator.

G3.10 – CONFLICT AND GRIEVANCE RESOLUTION PROCESS

No conflicts are anticipated regarding project planning or project implementation related to the Lower Zambezi REDD+ Project. In the event that any conflicts or grievances should occur as the result of the implementation of the Lower Zambezi REDD+ project or related activities, BCP has a well-established and publicly known grievance mechanism that has been designed to address and resolve any such problems. The grievance mechanism is clearly outlined and discussed in all of the community sensitization meetings, and contact information for BCP representatives is included on all public communications. Meeting minutes (written records) from all of the community sensitization meetings document that the grievance mechanism has been explained to the local community representatives in attendance—including their right to receive a response within 30 days, and their right to contact third party arbitrators directly should they have any ongoing concerns.

Grievances that are submitted to BCP will be documented, as will the response to any such grievances. These documentations will be reviewed and managed by a third party, to prevent any conflict of interest. Project management will attempt to resolve all reasonable grievances raised, and we commit to providing a written response to grievances within 30 days.

The grievance mechanism is clearly outlined in BCP's Human Resources (HR) Manual as well as our SOPs Concerning 1) Community Engagement; and 2) Social Monitoring. The formal process for handling grievances is clearly outlined in these documents which will be made available to the Validator. The grievance mechanism is also written into all contracts (such as Community Covenants) that are signed between BCP and community representatives, such that BCP and local community members are able to hold each other to account with regard to the delivery of services as per the terms of agreements. The Community Engagement Teams are expected to serve as liaisons between stakeholder communities and the project team. In addition, they are expected to communicate any needs, questions or concerns that either side has.

In the event that community stakeholders have a serious concern or grievance about BCP's Community Engagement Strategy, or if there is an on-going or long-lasting grievance among community stakeholders that BCP has been unable to address, BCP's grievance mechanism allows for the involvement of a neutral third party arbitrator (including legal counsel) that will be able to clarify or resolve the grievance for either or both sides in the dispute. The preferred third party arbitrator, in the event of disputes, would be a representative from an appropriate Non-Governmental Organization with local presence in Zambia—for example, in the event of grievances concerning land, an organization that deals with land-access and/or land-rights will be involved. In the event that there is a grievance concerning food security, an organization such as the Conservation Farming Unit would be involved. In the event that the community prefers to involve local government, BCP has instructed the communities that they are welcome to bring concerns to the District government which is headed by the Rufunsa District Commissioner. BCP has a close working relationship with local government representatives in the area of the project zone, and local District government officials have been identified as a mutually-trusted third party for both the stakeholder communities and BCP.

Throughout BCP's community consultation and engagement processes, BCP informs community stakeholders of their right to seek legal counsel in the event that a serious grievance occurs, as a part of BCP's grievance mechanism.

Our relationships with other Implementing Partner organizations or companies will be governed by legally-binding signed contracts. All contracts with BCP employees are governed by the Laws of Zambia, and any ongoing employment-related disputes or grievances will be resolved through the Zambian Ministry of Labour.

G3.11 – PROJECT FINANCIAL SUSTAINABILITY

The project will derive its income through the sale of Verified Emissions Reductions; a financial plan has been developed and will be presented to the Validator. The sale of VERs will be sufficient to cover the costs of implementation, even if CO₂e prices are low, especially with the combined efforts of the BCP Trust and tourism diversification. BCP has gone to great lengths to secure committed long-term investors. BioCarbon Partners Limited has invested a significant amount of investment into the project to date, and full financials will be shared with the Validator.

As stated earlier, the two main deforestation mitigation activities, namely, the Sustainable Eco-Charcoal Project and Conservation Farming Training Program are designed to become self-sustaining.

G4. MANAGEMENT CAPACITY AND BEST PRACTICES

G4.1 – PROJECT PROPONENT

BioCarbon Partners is the project proponent. It is a Mauritian registered company with the explicit aim of implementing REDD+ projects in African dryland forests. BCP has an expert team of technical, social and scientific experts. All carbon monitoring, socio-economic development planning and conservation management is handled in-house with a strong focus on local capacity building and training. EcoPartners LLC, a US-based forest carbon consultancy firm, was hired to provide advisory services with regards carbon accounting and review of this document. BioCarbon Partners Limited, a Zambian registered limited company, provides employment for the project in Zambia.

BCP has partnered with Musika Development Initiatives Ltd., a local Zambian not-for-profit company that specializes in agricultural value chain development. Musika has seconded a full-time agricultural extension officer to BCP. The Conservation Farming Unit is assisting BCP in the development of conservation agriculture projects. Engineers Without Borders Canada has seconded two engineers to BCP to develop the eco-charcoal project. The United Nations Development Programme's African Training and Management Services Project is supporting this project with specific financial resources for staff training. This funding is being utilized according to a training plan that specifically targets building REDD+ project capacity for Zambian staff, in particular local community members.

BCP also has a highly experienced board of advisors; please see <http://www.biocarbonpartners.com/> for more information.

G4.2 - TECHNICAL SKILLS OF THE PROJECT TEAM

Hassan Sachedina, Managing Director

Hassan was born and raised in Kenya. He has over 15 years of conservation management and community development experience in five continents. Hassan began his career leading a rhino conservation project in the Selous Game Reserve, in Tanzania. Prior to BCP, he was Vice President of Wildlife Works, which achieved the World's first verified REDD projects. Hassan was also a Partner in Conservation Capital, which catalyzed \$210 million of conservation business investments globally.

Hassan's PhD thesis on community-based conservation from the University of Oxford was awarded the Audrey Richards Prize for the best Africanist thesis written over two years from any UK university. He also holds an MSc degree in Environmental Management from Oxford University, and a BA from Middlebury College. Hassan is Gazetted as an Honorary Game Warden in Kenya, and an Honorary Wildlife Police Officer in Zambia, and is a commercial pilot. Hassan is on the Board of the Baraka Foundation, and is a member of the IUCN Sustainable Use and Livelihoods Specialist Group.

Leon-Jacques Theron, Carbon Accounting Manager

Leon-Jacques has wide-ranging experience in developing large scale biomass inventories for REDD projects in Democratic Republic of the Congo and Zambia. He also co-authored assessments on the regional and national scale impacts of climate change on key biodiversity areas, livelihoods and ecosystem services and appropriate adaptation and mitigation responses. Since 1996, he has worked on a wide range of conservation projects in South Africa. He holds an M. Sc. Zoology degree from the University of Pretoria and manages BCP's forest carbon science department including viability analyses and project documentation.

Mainecy Hampeyo, Community Engagement Manager

With extensive experience in facilitating community based programming in Zambia, Mainecy brings over two decades of profoundly important insight to BCP's community engagement strategies. Prior to working with BCP, Mainecy worked as a programme manager for a USAID-funded program. During this time she worked in Liuwa National Park and supported community-based businesses and conservation agriculture. Armed with her motorcycle, Mainecy travels solo to remote communities ensuring they are engaged and consulted in the REDD+ process at every stage.

Molly Crystal, BCP Human Rights Officer / Director, BCP Trust

Molly Crystal holds an MSc in Human Rights from the London School of Economics, and a B.A. in International Studies-Political Science from the University of California, San Diego. She has reported on humanitarian engagement, immigration policies, transitional justice and the psychology of violence, and has worked to resettle refugees from seven Sub-Saharan African countries. As BCP's Human Rights Compliance Officer, Molly is committed to ensuring that BCP's projects meet local, national and international Human Rights standards—and putting the “+” into the company's REDD+ projects (such that they achieve additional community benefits).

As the Director of the Biocarbon Partners Trust, Molly is committed to ensuring that BCP's REDD+ projects provide meaningful alternatives to deforestation and bring significant positive benefits to local stakeholders. Molly oversees BCP's Community Engagement Team, who are responsible for promoting widespread community engagement, identifying local drivers of deforestation, and working with local stakeholders to design projects that meaningfully improve local livelihoods and reduce pressures to engage in deforestation. She also monitors and ensures the company's compliance with relevant human rights standards and the principles of FPIC (obtaining Free, Prior and Informed Consent from stakeholder communities).

Wesley Roberts, Remote Sensing and GIS Specialist

Wesley holds a PhD in Environmental Science from the University of KwaZulu-Natal. A geographer by training, Wesley has spent the last six years working as a researcher for the Council for Scientific and Industrial Research, based in Stellenbosch. Wesley's academic research included a structural assessment of plantation forests—in particular, he explored the use of multiple earth observation data sources as part of a data fusion exercise. Wesley is employed as a Remote Sensing and GIS specialist, and manages all the geospatial aspects of BCP's work. He is passionate about open source software and the use of earth observation data for the monitoring and managing of natural resources.

Josep Oriol, Business Development Advisor

Josep's experience spans four continents (Europe, Asia, America and Africa). Before moving to Africa, Josep practiced corporate and investment law in Spain, and venture capital in the US (Aurora) and Europe (Santander). He also served as CEO for Spain and Portugal at WNI, a publicly-listed Japanese multi-national. Currently, Josep heads the East Africa office of the Kibo Fund (\$45m private equity fund managed by Ciel Capital). A passionate conservationist, he established and led a collaboration for investments in Africa with Verde Ventures (\$20m+ debt fund for conservation enterprise) from 2009 to 2012, which saw VV realize its four first investments in the continent. Josep sits on the Board of I&M Bank in Tanzania (AD), International Medical Group in Uganda (AD), Electromaxx Power in Uganda (AD), and conservation organizations such as Space for Giants (Kenya), BioCarbon Partners (Zambia), and Desert Edge (Kenya). Josep has majors in Law from the 'Universidad Internacional de Catalunya' and Political Science from the 'Universidad Autonoma de Barcelona' (Spain); and an MBA from Duke University's Fuqua School of Business (USA). In 2012, Josep was elected one of forty Young EU-Africa Leaders by the BMW Foundation. Josep supports BCP in credit sales, finance, business development and business strategy.

Steven Rufus, Project Manager, Lower Zambezi REDD+ Project

Steven Rufus was born and raised in Zimbabwe. He spent most of his childhood (including several years in Zambia) exploring national parks, and he has a passion for African wildlife. While an officer in the South African military, he learned how to become a leader and he became adept at living and working in the bush. After the military, Stephen obtained a Masters in Animal Husbandry and Horsemanship. He then spent ten years lecturing at South African veterinary schools, and helped to design and launch the first Equine Science course at Pretoria University. Stephen is an African tourism expert and launched two leading exclusive horse safari companies in Southern Africa. He is passionate about launching comprehensive, community-focused efforts to reduce poaching. Stephen is responsible for the implementation of effective land management, security operations, and infrastructure development related to the project.

Thor Kirchner, Operations Manager

Thor Kirchner is a Zambian-born and raised licensed Professional Hunter (PH). Thor has 10 years of experience in hunting, tourism and wildlife management in Zambia and Denmark. Thor has managed Munyamadzi Game Ranch in the Luangwa Valley for five years. Thor was awarded a certificate in Game Keeping and Wildlife Management at the Wildlife and Hunting school at Kalo, Denmark. Thor's role is to assist in infrastructure development, Conservancy staff training and wildlife management.

Chico Chibeka, Finance Manager

Chico was born in Ndola, Zambia, and grew up on the Zambian "Copperbelt." He completed his secondary studies at David Kaunda Technical School, and then proceeded to obtain his Certified Accounting Technician (CAT) certificate from the Chingola School of Accountancy. In 1999, he completed his CAT certificate at Zambia Centre for Accountancy (ZCAS) and went on to pursue his ACCA. Chico has spent the past ten years working at various accounting and auditing firms, including: Grant and Thornton, BDO Spencer Stewart, and Amazon Associates. Chico also spent five years as an accountant for the Zambian Ministry of Finance. Prior to joining BioCarbon Partners, he was a partner in Envisio Business Consultants. Chico is an accredited member of the Zambia Institute of Chartered Accountants (ZICA) and the Association of Certified Chartered Accountants (ACCA). As BCP's Finance and Administration Manager, he largely oversees BCP's F&A team, human resources management, and systems development and implementation.

Shadreck Mtonga, Eco-Charcoal Project Officer

Shadreck is a graduate from the University of Zambia (UNZA), where he completed a Bachelors Degree in Environmental Education. While at UNZA, Shadreck not only graduated with high academic honours (“upper merit”), but he also demonstrated significant student leadership: he served as the Chairperson of the UNZA Environmental Education Students Association and was the Vice Chairperson of the UNZA Students Union Electoral Commission. Shadreck is a passionate environmentalist and teacher, who cares deeply about working with local communities on natural resource management. Prior to joining BCP, Shadreck helped to design, launch and present a radio program—the Environmental Awareness Programme—at Comet FM radio station, which was designed to raise environmental awareness in Zambia. In his position as a Community Officer for the BCP Trust, based in Ndubulula Zone, Shadreck oversees BCP’s Sustainable Eco-Charcoal Project, and he is involved in launching a variety of community projects at a village level.

G4.3 ORIENTATION AND TRAINING FOR THE PROJECT’S EMPLOYEES AND RELEVANT PEOPLE FROM THE COMMUNITIES

BioCarbon Partners has a well-developed training programme for employees and community members and the documentation will be made available to the Validators. Areas of training include: Climate Change and REDD+ overview, biomass sampling and FPIC compliance. New staff members are also provided with Human Resources (HR) training, to ensure that they are aware of their rights and responsibilities as employees.

As Section G4.4 describes in greater detail, BCP is an Equal Opportunity Employer, and we aim to involve all community groups in the work that we do, regardless of gender, age, ethnicity or other human characteristics. BCP provides training to all new staff, and we ensure that our project leaders are able to effectively provide training to anyone who is involved in project activities.

For example, participants in BCP’s Sustainable Eco-Charcoal Project in Ndubulula received two months’ worth of relevant training on sustainable harvesting techniques and the proper use of improved kilns. Those participants are now able to provide on-the-job training to any new participants in the project, under BCP supervision (to ensure that training is done appropriately). Although five to eight men were originally involved in the Sustainable Eco-Charcoal Project, the Ndubulula Eco-Charcoal Association has since expanded to over fifteen members, eight of whom are women.

The following training courses have been presented to BCP staff either by in-house experts or experts from partner organisations:

A) Compliance with socio-economic standards of the Verified Carbon Standard (VCS) and Climate Community and Biodiversity Alliance (CCBA) Standards

Course Objective

To ensure field extension staff are familiar with the requirements of the above standards and collect the correct field data, as well as follow the correct protocols in their dealings with local stakeholders.

Main topics

- Understanding the principles of obtaining Free, Prior and Informed Consent (FPIC)
- Understanding project baselines and project activities
- Identifying deforestation agents and drivers
- Baseline data collection
- Delineating project areas and project zones
- Using technology, particularly GPS and GIS, to collect spatially referenced data
- Data capturing using electronic devices such as smart phones and tablet PCs
- Data storage and dissemination.

B) Sustainable forest management and charcoal production

Course Objective

To train local stakeholders to become implementers of key deforestation mitigation activities with particular reference to sustainable forest management and charcoal production

Main topics

- The principles of sustainable forest management
- Improved charcoal production using efficient kilns
- Identifying forests suitable for charcoal production and willing participants
- Calculating standing biomass and potential take off
- Mapping of forests using technology such as GPS, smart phones and basic GIS
- Data capturing, cleaning, storage and dissemination
- Monitoring harvesting and charcoal production and ensuring compliance
- Monitoring of transport and sales

C) Forest biomass data collection in compliance with carbon market standards

Course Objective

To train local community members to collect the required forest biomass data for baseline projection purposes as well as future compliance monitoring

Main topics

- Overview of the principles of REDD+
- Overview of the principles of forest biomass enumeration
- Compliance with carbon market standards
- Training in the use of field equipment including GPS, clinometers, tape measures and smart phones
- Plot based sampling – setting up permanent plots and the sampling procedure
- Locating plots using GPS
- Capturing data using smart phones and tablet PCs
- Data cleaning, storage and dissemination
- Soil carbon sampling principles
- Collecting and storing of soil samples
- Collecting and cleaning of soil data

D) Wildlife and forest law enforcement training

Course Objective

To train scouts operating within REDD+ project areas in the enforcement of forest and wildlife laws to ensure adequate protection of core project areas

Main topics

- Wildlife law in Zambia - overview
- Forestry law in Zambia – overview
- The roles and responsibilities of scouts on private property
- Positive community engagement and fostering positive relationships with neighbouring communities
- Engagement with offenders – arrest procedures of poachers and illegal charcoal makers
- Patrol strategies and poaching prevention
- Intelligence gathering

E) GIS, remote sensing and GPS use for forest carbon projects

Course Objective

To train key BCP field staff in the use of Geographic Information Systems (GIS), Remote Sensing basics and Global Position System (GPS) use in order to streamline compliance of projects with carbon market standards.

Main topics

- Introduction to Global Positioning Systems
- How GPS works
- Navigating and capturing data
- Understanding accuracy and signal strength
- Waypoints, tracks and Metadata
- GPS data in QGIS
- Metadata and data management

F) Principles of Deforestation, Climate Change, REDD Mechanisms and BCP's Model

Course Objective

To train Community Engagement Team (CET) members in the principles of climate change, REDD mechanisms and BCP's model, and to empower them to accurately describe and promote BCP's work at a community level, facilitating sensitization, project support and decision-making. After undergoing this training and gaining relevant community experience, members of BCP's CET present an abbreviated version of this program to local communities, so as to raise their awareness and understanding of the significance and implications of a REDD+ project, in line with the principles of BCP's obtaining "free, prior and informed consent" (FPIC) from local communities. CET members are explicitly instructed to target and involve members of under-represented groups in their sensitization and consultation efforts.

Main topics

- Basic environmental principles – deforestation, emissions, the greenhouse effect, climate change
- Demonstrating how deforestation causes emissions that are linked to climate change
- Definition of REDD and what REDD projects entail
- How forest protection relates to REDD
- The main aims and objectives; including forest protection and community benefits
- The model, which focuses on partnerships with the local community
- Identifying causes and drivers of deforestation
- Forming partnerships with local communities to provide alternatives and incentives to prevent deforestation
- Education training: promoting environmental awareness, describing REDD and BCP to communities
- Sensitization and Consultation targets: We aims to inform and involve all community members, and CET staff must ensure to provide relevant training to under-represented people living within the community.

This project benefits from a specific project employee training partnership with the UNDP African Training and Management Services (ATMS) Project, one of sub-Saharan Africa's biggest and most ambitious human capital development efforts in the private sector³².

Training is provided to new BCP employees and project participants at the time of their recruitment/beginning of involvement with BCP projects. The BCP Guide to Community Engagement handbook (which was provided to the Validator in hard copy during her site visit, and which has been uploaded to Dropbox) contains a detailed description of the training that members of BCP's Community Engagement Team receive, as well as an outline of BCP's overall Community Sensitization and Consultation process and Zone Development Committee formation and development process. This handbook also provides a detailed description of the project launch and training process for the Village Chicken Project, which is representative of the way that BCP Trust launches all of its community projects—project participants are provided with initial training and regular follow-up, to allow them to manage and monitor their project participation, with the support of BCP's Community Engagement Team staff.

³² <http://www.amsco.org/atms/index.html>

As BCP's Guide to Community Engagement and SOP Concerning Community Engagement describe, BCP staff and project participants receive regular and ongoing training that is intended to promote local involvement in and ownership of projects, as well as to build local capacity and promote self-sustaining projects that benefit from local knowledge and oversight.

BCP is an "Equal Opportunity Employer," as our Community Engagement SOPs, HR Policy, and PDD describe. We endeavour to include women, minorities, and impoverished households in our projects, with an aim to achieving holistic community empowerment and development. Our Eco-Charcoal Project, for example, has targeted charcoal-dependent households ("the poorest of the poor," as our Baseline Survey data demonstrates) for participation. Currently, 8 of the 15 participants in this project (53%) are women. Similarly, the Village Chicken Project and Conservation Farming Training project have targeted women and youths for inclusion—we aim for 30% of all project beneficiaries to be women, as per our own internal standards.

New BCP staff members are provided with relevant training, which has been designed by relevant staff members. Members of BCP's community-based Plot Team, for example, have received training from senior managers (including BCP's Carbon Accounting Manager), and have access to handbooks and SOPs that have been specifically created to provide ongoing information and training for employees. Similar hands-on trainings and specially designed training programs have been developed for BCP's Forest Protection Officers ("Scouts"), as well as our Community Engagement Team.

G4.4 – EMPLOYMENT EQUITY

BioCarbon Partners is an equal opportunity employer and prides itself in giving people from all walks of life an opportunity for employment. Furthermore, we abide by the relevant Zambian labour laws that prescribe equity.

BCP employs people living within the project zone wherever possible. When jobs cannot be filled from local communities, then the recruitment net is widened up within Lusaka Province (where the project occurs). The entire biomass plot sampling team, several scouts, building and roads maintenance teams, and the Community Coordinators are all local project zone residents. In an area that historically had very few sources of formal employment, BCP's policy of local employment first will likely result in the project becoming a key source of local employments and benefits.

BCP's job application process is straightforward and transparent. When announcing positions, BCP releases a job description that outlines the position, expectations and qualifications that are being sought after. All job descriptions clearly state that BCP is an Equal Opportunity Employer, and that we accept applications from members of all community groups. Job descriptions are physically distributed among communities, and public announcements are made in local languages at community meetings. To apply for a position, candidates are simply expected to submit a CV and cover letter/letter of interest to BCP. In the case of community applicants, BCP allows them to submit less formal lists of qualifications (in the place of a CV), and BCP staff members are instructed to notify relevant BCP managers in the event that an applicant has expressed serious interest but is unable to complete a written application (for example, if they are illiterate). In some cases, BCP will announce a trial day for interested applicants for a more practical position (for example, a field based Scout position): BCP will clearly disseminate information about the place, date and time at which interested applicants are expected to convene, and the hiring process and expectations will be clearly communicated to all interested applicants at that time.

BCP staff members are required to ensure that information about employment opportunities is clearly disseminated to members of all community groups. BCP staff members who are involved in hiring processes are expected to provide equal consideration to all applicants for a position, so long as they meet relevant criteria.

BCP is sensitive to the importance of hiring from under-represented groups such as members of minority ethnic groups and women: our Community Engagement Manager is a woman from an immigrant (Tonga) ethnic group within the community, and members of our Community Engagement Team belong to both Soli (local) and Tonga tribes. Women are represented within BCP's senior management team, finance and administration team, and community engagement team. Future recruitment rounds for forest protection scouts will encourage applications from suitably qualified women. The project's eco-charcoal project specifically targets marginalized charcoal producers, as well as women. Charcoal producers in zone villages are often the poorest of the poor and are underrepresented in village leadership or development opportunities.

G4.5 - RELEVANT LAWS AND REGULATIONS COVERING WORKER'S RIGHTS IN ZAMBIA

Labour and Social Security

There are various legislations that have been enacted to protect the workers in Zambia. Some of these laws are:

The Employment Act (CAP. 268):

Establishes guidelines on employment of an employee in Zambia to be read together with the Minimum Wages and Conditions of Employment (General) Orders. It provides for dismissal of employees and the grievance procedures to be followed as well as basic employment rights relating to leave, working hours, maternity leave, minimum contents to be included in written contracts of service; retirement and redundancy benefits etc.

Minimum Wages and Conditions of Employment Act (CAP. 276) (Statutory Instruments (SI) No. 2 & 3) SI No. 46 of 2012 and the General Order, 2011:

Establishes minimum guidelines for remuneration and conditions of service for employees in Zambia setting out a minimum wage for specific sectors and basic rights and conditions of service.

Industrial and Labour Relations Act (CAP. 269):

Establishes guidelines on employee and employer organisations and on the process of collective bargaining and dispute resolution. It provides for the formation of trade unions and employers representative organisations and recognises the right to strike under specified circumstances. It provides for the settlement of disputes, strikes and lockouts as well as for the use of the Industrial Relations court at which employees can have their grievances and cases heard and determined.

BCP has a professional human resources and administration management team in place in Zambia that is familiar with Zambian labour law and ensures strict compliance to these laws. The project meets or exceeds all applicable laws and regulations covering workers rights. An example of this compliance is related to minimum wage. In 2012, the GRZ increased base minimum wages by approximately 67%. Rural agricultural land units (such as game ranches) in other parts of Zambia are reported to pay some staff according to lower agricultural “rates”. BCP met or exceeded urban minimum wage requirements for project area staff, many of whom are from the local community, in some cases doubling what staff made under previous employers. BCP has also introduced benefits such as staff rations (removing food costs from staff), a benefit which previously was not in place.

Carbon finance will enable the project to build out improved and more comprehensive incentive structures to attract and retain (not to mention, expand the size of the workforce) the best staff. Combined with professional management, training, equipment and investment in staff, a vision of the project is to become one of the most desirable places to work in Rufunsa District, Lusaka Province, the conservation sector more generally in Zambia, and even regionally.

G4.6 - SITUATIONS AND OCCUPATIONS THAT POSE A SUBSTANTIAL RISK TO WORKER SAFETY

All scouts on Rufunsa Conservancy are exposed to safety risks when on anti-poaching patrols. The risks include being shot at or attacked by poachers or attacks by wild animals. All the scouts, however, have exceptional bush knowledge and are managed and trained by Steven Rufus and Thor Kirchner, both professional hunters with a wealth of experience in anti-poaching work and wildlife management. Training programs are designed with technical support from Hassan Sachedina who is a government gazetted Honorary Wildlife Police Officer in Zambia. Scouts will receive training in firearm safety and arrest techniques from government approved trainers. Furthermore, their intimate knowledge of animal behaviour (having all grown up in the bush) ensures that all scouts know very well how to avoid dangerous situations with animals such as elephant, lions and snakes.

In the unfortunate case of a crisis, BCP has a reaction plan in place. Additionally, ever since BCP took over management of Rufunsa Conservancy, scout teams have access to transport and communication, as do all other teams. All scouts are equipped with suitable boots and protective uniforms. Scouts have also been issued with strict official rules of engagement procedures to minimize risk and exposure to armed poachers.

The implementation of fire management also has safety risks. As in the case of anti-poaching patrols, all controlled burning and fire fighting will take place under management of Steven Rufus and Thor Kirchner. The necessary equipment will be issued to all workers participating in these activities, including suitable work wear, communications gear, safety equipment and fire beaters.

Participants in other activities, such as eco-charcoal and conservation agriculture projects, are not employed by the REDD+ project, but their safety is nonetheless a concern. All participants in the eco-charcoal project are seasoned producers and are aware of the risks of cutting wood, packing kilns and removing charcoal. We will, however, equip association members with safety clothing, gloves and boots, and invest in additional training to ensure safe production practices.

Prior to participating in any company supported activity, the company requires participants to openly discuss any potential risks involved in the activity. Staff members are also expected to communicate any potential risks involved in the activity, and to provide participants with any necessary Personal Protective Equipment (PPE), such as work gloves or safety boots. Participants in BCP-supported projects are explicitly instructed not to take unnecessary risks with their personal safety. BCP staff members are expected to provide regular oversight of project activities, and they are required to communicate any concerns about safety to BCP's management team.

Vehicle accidents are a risk to worker safety. Risks will be minimized through maintaining a high standard of vehicle maintenance, and ensuring that drivers are current, well-trained and adequately monitored. BCP drivers sign onto a comprehensive vehicle policy (Copy to be made available to Validator upon request) which strictly outlines company vehicle policy, intoxicants, limits of geographical use, speed limits set internally and an un-authorized passenger policy. In spite of the inherent risks of vehicle accidents in Zambia and on rural dirt roads, BCP is confident that we have taken as many measures as possible to reduce this risk. Our emergency response capacity was recently tested when an employee was involved in a serious motorcycle accident. Organizational management, Project-level management, partners, and our F&A team responded immediately to a life-threatening situation which resulted in the employee being checked out of a government hospital and checked into a private hospital (at company expense). The employee received professional healthcare and was fit for work a month after being discharged.

The Human Resources Manual contains a section concerning Occupational Health and Safety. Since all new employees receive an induction that includes HR orientation, it is expected that all BCP employees will be aware of their rights and responsibilities insofar as promoting workplace safety is concerned. We will, however, equip association members with safety clothing, gloves and boots, and invest in additional training to ensure safe production practices.

The Ndubulula Eco-Charcoal Association has been equipped already with the following safety equipment:

1. Safety boots;
1. Protective full-length work uniforms;
2. Full length leather protective gloves;
3. Face masks.

The Field Plot Team has been issued with the following safety equipment:

2. Work boots;
3. Protective full-length work uniforms;
4. Reflective safety vests;
5. ID Cards to reduce risks when encountering armed anti-poaching patrols or poaching gangs;
6. Communications equipment;
7. Modern mosquito proof tents;
8. First aid kit.

Forest scouts have been issued the following safety equipment:

1. Work boots;
2. Protective full-length work uniforms;
3. Cold weather gear (clothing and sleeping bags);
4. Mosquito proof tents;
5. First aid kit;
6. Communications equipment (VHF radios);
7. GPS Navigation equipment;
8. Headgear.
9. Military style rucksacks designed to carry loads safely.

Additional safety equipment will be procured for field crews. These will be identified through regular team meetings. Vehicles are strictly maintained and equipped with all legally mandated safety equipment such as fire extinguishers. Motorcycle riders are required to wear project-issued helmets and boots at all time.

G4.7 – THE FINANCIAL HEALTH OF THE PROJECT IMPLEMENTER

BioCarbon Partners is a Mauritius registered company in good standing. It is governed by the corporation laws of Mauritius, which ensure that the company remains financially solvent and able to meet its liabilities at all times. The company is owned by five shareholders of good standing and has a Board of Directors of four individuals. BCP is sufficiently capitalized through a combination of private and grant financing, with access to additional private credit lines, if needed. To date, the company has invested \$600,000 in this project, with access to secured additional funds to invest in this project. BCP is able to show the Validator copies of grant and shareholder agreements upon request to confirm secured funds. The secured amount is sufficient to see the project through to revenue generating status. In addition, BCP is actively seeking additional donor funds to enhance the impact of community project development through the BioCarbon Partners Trust, a Zambian-registered not for profit community investment trust.

G5. LEGAL STATUS AND PROPERTY RIGHTS

G5.1 – RELEVANT NATIONAL AND LOCAL LAWS

Environmental Management Act No. 12 of 2011

This Act was passed in the year 2011 and is the Principal Act governing and regulating environmental issues in Zambia. The Act provides for the establishment of the Zambia Environment Management Agency (ZEMA) whose main functions constitutes the protection of the environment and control of pollution in particular so as to provide for the health and welfare of persons, animals, plants and the environment in general.

The Act conforms with the philosophies set out in the Rio and Stockholm Declarations i.e. precautionary principles, polluter-pays principles and transparency and dissemination of information to the general public and public participation (the Act states that the public has the right to participate in decisions concerning the formulation of environmental policies, strategies and plans and to participate in the preparation of laws and regulations on the environment). It states that the Minister shall strive to attain the conservation of biological diversity and fair and equitable sharing of the benefits arising from utilisation of biological diversity. The Government commits itself to cooperating with other governments and local and international organisations in order to protect the regional and global environment. The Agency has various obligations which include *inter alia* conducting surveys on the state of the environment and researching and forecasting environmental changes and undertaking other studies which might contribute to the formulation of policies and preparation of action plans and strategies. In addition, the Agency shall create and maintain an environmental information registry and an environmental fund. The Act provides that forestry resources will be managed in accordance with the Forests Act.

Note SI No. 28 of 1997 relating to the Environmental Protection and Pollution Control (Environmental Impact Assessment) Regulations, 1997 which sets out in which circumstances an EIA or a Project Brief will be required and how these are to be conducted.

The Zambian Environmental Management Agency has no objection against the implementation of the Lower Zambezi REDD+ Project and has exempted it from any EIAs (Appendix F).

Mines and Minerals Development Act (No. 7 of 2008)

The legal framework for mining and mineral resources development in Zambia is the Mines and Minerals Act of 2008. The Act stipulates regulations in acquiring prospecting licences and mining and mineral rights.

The Act provides for the Director of Mines to give consideration to the need to conserve and protect the air, water, soil, flora, fauna, fish, fisheries and scenic attractions and features of cultural, architectural, archaeological, historical or geological interests when deciding whether or not to grant any mining right. In the event that a mining right is granted it shall be granted under such conditions as may be prescribed by the Minister in relation to the conservation and protection of air, water, soil, flora, fauna, fish, fisheries and scenic attractions and features of cultural, architectural, archaeological, historical or geological interests. The Act provides for the creation of an Environmental Protection Fund. It further provides that a holder of a license shall be strictly liable for any harm or damage caused by mining operations and shall compensate any person to whom the harm or damage is caused. Where damage is caused to the environment or biological diversity, compensation shall include the cost of reinstatement, rehabilitation or clean-up measures which are incurred and where applicable the costs of preventative measures. Note too that any person, group of persons or any private or state organisation may bring a claim and seek redress in respect of a breach or threatened breach of any provision relating to damage to the environment, biological diversity.

Note that a holder of a licence who requires the exclusive or other use of the whole or any portion of the prospecting or mining area for the purpose of the licence, in accordance with the laws relating to such acquisition, may acquire a lease or other right to use the same upon such terms as may be agreed between the holder and owner/ occupier of the land. A holder of a licence shall on demand made by the owner or lawful occupier of the any land subject to a mining right, promptly pay the owner fair and reasonable compensation for any damage done to the surface of the land by the operations. Where compensation is not paid or the owner of the land is dissatisfied with the compensation offered, the dispute shall be determined by arbitration.

It also deals with environmental issues pertaining to prospecting and mining. Reference is made to the Statutory Instrument No. 29 of 1997, a subsidiary legislation of the 2008 Mines and Minerals Act that specifically addresses environmental issues.

The act is relevant to the project due to that activities related to large scale mining will take place within the license area. The act provides for regulations concerning environmental protection during construction, operation and closure of mine sites.

This law is applicable to the project as there are prospecting licenses that overlap part of Rufunsa Conservancy (Appendix G).

Zambia Wildlife Act No. 12 of 1998

Passed in 1998, the Act provides a legal framework for the Zambia Wildlife Authority to establish, control and manage National Parks, conserve and protect wildlife and objects of interest in National Parks, establish Game Management Areas, licensing of hunting, control of possession of trophies and to control bush fires.

Water Resources Management Act

The Act came into force in 2011 and repealed the Water Act of 1949 and provides for the control, ownership and use of water. The Act defines the functions and powers; provide for the management, development, conservation, protection and prevention of pollution of water resources and its ecosystem. It provides for the issuance of water licences and permits and rules relating to the construction of dams on existing rivers. In addition it provides for a right of easement over land under specified circumstances, which shall include the right of access to any piece of land contiguous to the water which is the subject of a permit. Note there is a difference between public and private water.

Forests Act, 1999

Enacted in 1973 and repealed by the Forest Act No. 7 of 1999 (CAP 199) of the laws of Zambia. It provides for the establishment and management of National and Local forest conservation and protection of forests and trees, and licensing and sale of forest. It also provides for the establishment of the Forestry Commission and provides for participation of local communities, NGO's and traditional institutions for sustainable management of forest ecosystems and biodiversity. The Act also provides for the implementation of various international conventions relating to the environment. Note the President can declare any land a National Forest and may by compulsory acquisition acquire any land for the purpose of a National Forest. The Act also provides for the declaration of local forests, forest plantations or open areas to be a Joint Forest Management Area.

Zambia Tourism and Hospitality Act No. 24 of 2007

Enacted in 2007, the Act provides for the control of tourism enterprises. The Act, though making no direct reference to environmental protection, does provide for appeals against authorization of tourism projects which are deemed to negatively affect Zambian tourism.

National Heritage Conservation Commission Act No. 23 of 1989

Enacted in 1989, the Act provides for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, pre-historical, archaeological or scientific interest.

Labour and Social Security

There are various legislations that have been enacted to protect the workers in Zambia. Some of these laws are:

The Employment Act (CAP. 268):

Establishes guidelines on employment of an employee in Zambia to be read together with the Minimum Wages and Conditions of Employment (General) Orders. It provides for dismissal of employees and the grievance procedures to be followed as well as basic employment rights relating to leave, working hours, maternity leave, minimum contents to be included in written contracts of service; retirement and redundancy benefits etc.

Minimum Wages and Conditions of Employment Act (CAP. 276) (Statutory Instruments (SI) No. 2 & 3) SI No. 46 of 2012 and the General Order, 2011:

Establishes minimum guidelines for remuneration and conditions of service for employees in Zambia setting out a minimum wage for specific sectors and basic rights and conditions of service.

Industrial and Labour Relations Act (CAP. 269):

Establishes guidelines on employee and employer organisations and on the process of collective bargaining and dispute resolution. It provides for the formation of trade unions and employers representative organisations and recognises the right to strike under specified circumstances. It provides for the settlement of disputes, strikes and lockouts as well as for the use of the Industrial Relations court at which employees can have their grievances and cases heard and determined.

The Land Acquisition Act, Chapter 189 of the Laws of Zambia

The Act makes provision for the compulsory acquisition of land. The President can compulsorily acquire land where he is of the opinion that it is desirable or expedient in the interest of the Republic to do so subject to various obligations which include *inter alia* the requirement to give notice of intention to acquire property and the payment of compensation. Adequate compensations shall be paid and any disputes shall be determined by the courts.

The Lands Act, Chapter 184 of the Laws of Zambia

This Act provides for the continuation of leasehold tenure and the continued vesting of land in the President and the statutory recognition and continuation of customary tenure and it provides for the conversion of customary tenure to leasehold tenure. The Act also provides that a person shall not without lawful authority, continue to occupy vacant land and any person who does shall be evicted. Note that customary land existed in Zambia before the advent of colonialism – under the unwritten indigenous law of tribes. Customary law can be resorted to in the settlement of disputes involving members of tribes and is vital in the settlement of land disputes that may arise in respect of land held under customary tenure.

The project will fully comply with these aforementioned laws.

G5.2 – PROJECT APPROVAL FROM APPROPRIATE AUTHORITIES

The project has the following approvals from central and local government, and traditional authorities in place:

- Appendix C: Letter of Support from the Chongwe District Council
- Appendix D: Letter of support from Chief Unda Unda
- Appendix E: Letters of support from village headmen in all four zones of the Project Zone
- Appendix F: Letter from ZEMA exempting the project from EIA
- Appendix H: Letter of support from the Department of Forestry
- Long-term carbon rights covenant (contract) with the owner of the property, Sable Transport Limited (to be made available to Validator).

G5.3 –DOCUMENTED CONSULTATIONS AND AGREEMENTS THAT THE PROJECT WILL NOT ENCROACH UNINVITED ON PRIVATE PROPERTY, COMMUNITY PROPERTY OR GOVERNMENT PROPERTY.

The Lower Zambezi REDD+ Project is taking place on private property—Rufunsa Conservancy—with the full consent of the owner. There is a legally binding “Carbon Rights Covenant” between the landowners and BCP. This easement agreement transfers the carbon and conservation rights of the project area to BCP. Given the additional history of this land unit, and as the landowner is a key beneficiary of this project, it is highly unlikely that this easement agreement will be challenged by the landowners. All necessary documentation regarding the landowners free, prior and informed consent for the project to take place on the project area is in place and will be provided to the Validator.

The Lands and Deeds Act, Cap 185 of the Laws of Zambia does permit the registration of easements over land. In particular, Section 50 of the Lands and Deeds Act generally provides that whenever any easement in or over land comprised in a provisional certificate or certificate of title is created, for the purpose of being annexed to, or used and enjoyed together with other land, the Registrar shall enter a memorial of the instrument creating such easement upon such Provisional Certificate or Certificate of Title and such memorial shall as from the date of entry thereof have the effect of including such easement in such provisions certificate or Certificate of Title of such other land as appurtenant to the land therein described.

Although the project area is on privately titled land, the project team went an extra step and in the course of six months prior to any agreement being signed, sought consent from communities in the project zone to implement a REDD+ project on Rufunsa Conservancy. This was not a necessary step, but as the project zone is on adjacent communal land where activities would be implemented, and community support for the project is central to its sustainability, we felt that this was an important step. The overwhelming response from community members for a REDD+ project being implemented on Rufunsa Conservancy was positive approval.

In addition, all project activities taking place within the Project Zone are similarly proceeding with the full consent of all local residents, in line with the principle of obtaining Free, Prior and Informed Consent (FPIC) from community stakeholders.

The project is not being conducted on government land, and will not encroach uninvited on government property.

Section G3.8 provides a very detailed overview of the project FPIC process, and more information is available in the Standard Operating Procedures concerning FPIC and Community Engagement, both of which will be made available to the Validator. As Section G3.8 describes, we have pursued a robust community sensitization and consultation process, which has resulted in sensitization of the majority of households living within the project zone. We have also received approval (consent) from the majority of these households, as the table 15 and 16 below demonstrate. This consent was received prior to the implementation of REDD+ project activities, and has continued even after BCP began project implementation. In fact, between October 2012 and January 2013, our community approval rate has jumped from 92% to 95%. BCP believes this increase in approval can be linked to the numerous community projects that were launched during this time, including: a borehole refurbishment project, school support program and the pilot phase of the Sustainable Eco-Charcoal Project and Conservation Farming Training Program. During this time, BCP's community presence has grown and deepened, as we hired additional members from local communities and based additional staff members in village locations. In addition to BCP's formal community sensitization and consultation efforts, community-based CET members are able to respond to local concerns or requests for more information. By strengthening our community ties, BCP is able to provide further sensitization and to solicit additional feedback from local communities, contributing to our community consultation and approval-seeking efforts.

Table 15 provides a summary of all official community sensitization meetings that have been held within the project zone to date. All meeting "minutes" (records) provide a detailed overview of the project FPIC process, and Table 16 includes a summary of attendance and approval rates from all the community meetings that have been held within the project zone to date. All meeting minutes have been counter-signed by community attendees at the meetings and will be made available to the Validator.

Table 15. Date and location of Lower Zambezi REDD+ Project FPIC meetings.

Meeting	Date	Meeting Type (Zone/Village)	Village
1	23-Feb-12	Zone	Mweenshan'gombe
2	14-Mar-12	Zone	Chilimba
3	21-Mar-12	Zone	Chilimba
4	22-Mar-12	Zone	Mweenshan'gombe
5	11-May-12	Zone	Namanongo
6	11-May-12	Zone	Ndubulula
7	29-Jun-12	Zone	Mweenshan'gombe
8	4-Jul-12	Zone	Ndubulula
9	5-Jul-12	Zone	Namanongo
10	11-Jul-12	Zone	Chilimba
11	22-Jul-12	Zone	Ndubulula
12	3-Aug-12	Village	Mulimba
13	9-Aug-12	Village	Kanyetu
14	12-Aug-12	Village	Chuundu
15	24-Aug-12	Village	Chikuse
16	24-Aug-12	Village	Shimaluba
17	13-Sep-12	Village	Nyamakau
18	17-Sep-12	Zone	Mweenshan'gombe
19	18-Sep-12	Village	Chikoloma
20	24-Sep-12	Village	Malilakufa/Mweenshan'gombe
21	3-Oct-12	Zone	Mweenshan'gombe
22	4-Oct-12	Zone	Mweenshan'gombe
23	19-Nov-12	Village	Musanshika
24	19-Nov-12	Village	Shatunka
25	20-Nov-12	Village	Kabandi
26	26-Nov-12	Village	Sunta
27	3-Dec-12	Village	Mwachombela
28	4-Dec-12	Village	Chifita
29	5-Dec-12	Village	Mulilwa
30	6-Dec-12	Village	Kasumba
31	10-Dec-12	Village	Mulimba
32	10-Dec-12	Village	Mwalilanda
33	17-Jan-13	Village	Muyobe

Table 15 provides a summary of the participants in community meetings that BCP has held, including 18 meetings that were held outside of the project zone before the zone boundaries were finalised. It should be noted that this table documents total attendance at meetings, but does not account for double counting, which our overall sensitization statistics have accounted for. As such, this table documents 2,110 participants in meetings, although BCP calculates that 1,160 heads-of-household have been sensitized in total (the discrepancy in numbers can be explained by certain participants who have attended multiple community meetings).

As was mentioned earlier in Section G3.8, BCP representatives take a voluntary vote at the end of each meeting. This allows us to calculate the overall approval rate among community stakeholders for our project activities. In the project zone, 95% of meeting attendants consented to the Lower Zambezi REDD+ Project occurring on Rufunsa Conservancy. Interestingly there were no objections from outside of the project zone, indicating that there is no perceived threat from the project. These approval votes were taken in large part before the project started and approval rates are increasing as the project activities are implemented. The 3% who disapproved of the project cited concerns such as village charcoal production would be stopped. The eco-charcoal project has helped to illustrate that the project encourages sustainable, value added charcoal production. The remaining percentage was people who did not know and opted not to vote for or against the project. Based on the project's investment of resources into thorough community engagement and mitigation projects, individual Headmen along have indicated an interest to include community forest within the project under REDD+. This would increase the benefit flow to communities, as they own the forest, while setting a strong precedent in Zambia for communities to positively engage in REDD+ on communal land.

Table 16. Summary of FPIC meeting attendance and support for the Lower Zambezi REDD+ Project.

Parameter	Activity	Inside Project	Outside Project	Total
Attendance	Meetings Held	34	18	52
	Males	758	686	1,444
	Females	336	330	666
	Total Attendance	1,094	1,016	2,110
Votes	Yes Votes	558	111	669
	No Votes	22	0	22
	Unknown Votes	10	0	10
	Total Votes	590	111	701
Consent to REDD+	Approval Rate	95%	100%	95%
	Disapproval Rate	4%	0%	3%
	Unknown Rate	2%	0%	1%

In light of the widespread sensitization efforts and our comprehensive community REDD+ training curriculum (as described in Section G4.3), we strongly believe that our social data demonstrate our ongoing compliance with the principles of FPIC. Minutes from the meetings we have held (which will be made available to the Validator) clearly document that BCP has fully described the purpose and potential implications of REDD+-related activities to local community stakeholders, in ways that are accessible and appropriate for all community members.

This includes: presenting information in local languages (particularly Nyanja), seeking to include members of under-represented groups in sensitization efforts and following up with villages and households that have not yet attended the community meetings. The content of the Standard Operating Procedures has been presented to local communities in locally appropriate formats such as participatory meetings where feedback was solicited and received. Community Engagement Team members have organized meetings in which the content and implications of company procedures, policies and projects has been explained and discussed in local languages, so as to include illiterate members of the community. Community stakeholders are regularly given the opportunity to provide feedback to BCP, and they have been informed of our grievance mechanism which is always available to them in the event that they have serious concerns.

G5.4 – PROJECT DOES NOT REQUIRE THE INVOLUNTARY RELOCATION OF PEOPLE

As described in Section G1.6, there are illegal charcoal producers and farmers living on Rufunsa Conservancy and in all likelihood this occupation was a result of a misunderstanding of the boundary location.

BCP has consulted with all these households— they will not be involuntarily relocated, and the occupied area has been excluded from the project and accounting area (Figure 4).

There is a farmer , Mr. Chiyakamba, that lives in the project area, however, he will not be relocated. Mr. Chiyakamba will be allowed to maintain his residence within the project area, with no fear of relocation, so long as he does not contribute to new deforestation in the project area. We have already discussed this arrangement with him, and both sides believe it will be acceptable and possible to agree to this arrangement, which will be signed by both parties.

As an already successful farmer and a leader in our CFTP, BCP will work closely with Mr. Chiyakamba to ensure he is able to maintain his livelihood without clearing new fields inside the project area. Mr. Chiyakamba's household located within the project area is one of his four households located in the project zone, he has already cleared sufficient fields for farming, and he does not engage in charcoal production (data from his baseline survey confirm this). It is therefore anticipated that Mr. Chiyakamba will be able to maintain his lifestyle, even if he agrees not to deforest around his household within the project area—this will not be a significant change or sacrifice on his part.

Furthermore, BCP Trust has targeted Mr. Chiyakamba and his household for project-derived benefits; Mr. Chiyakamba is one of the lead farmers in BCP's Conservation Farming Training Program, his house in Mweeshang'ombe village is the site of a Village Chicken Project, and as the Chairman of the PTA he is channeling BCP Trust benefits to the local school. From the beginning of our involvement in Mweeshang'ombe Zone in early 2012, Mr. Chiyakamba has actively participated in and supported BCP activities—his name is documented on numerous attendance sheets from formal meetings and trainings.

G5.5 – ILLEGAL ACTIVITIES THAT COULD AFFECT THE PROJECT'S CLIMATE, COMMUNITY OR BIODIVERSITY IMPACTS

There are several illegal activities taking place in the project zone; the existence of the project is due to the threats that certain illegal activities pose to Rufunsa Conservancy. The vast majority of charcoal production taking place in or near to the project area is done illegally; that is to say without the required government licenses or, in the case of Rufunsa Conservancy, permission of the landowner. It may thus be the intention of the producer to obtain a license for charcoal production, but due to the high cost structure of producing charcoal under the law, combined with limited enforcement capacity, this is often not the case.

The Forestry Department faces funding and capacity constraints but is well aware of the problem of illegal charcoal production. A quote from the February 2012 report, *Current Status of the Forestry Sector in Chongwe District*, gives a good insight into the perspective of Chongwe District Forestry Office:

“The department continues to face huge challenges in the management and protection of biodiversity in its operations. Indiscriminate cutting of our indigenous miombo forests arising from wanton and other anthropogenic activities which includes among other things such as, unsustainable agricultural activities, illegal charcoal production, late bush fires, unplanned settlements, and encroachments in the Forest reserves are among issues of concern facing the district....The issue of illegal charcoal production and trade in the district should be taken seriously because its use is not only for the rural community but is more pronounced in the urban area mainly Lusaka district whose market for the commodity is readily available and at times fails to meet the demand...Most of

the illegal activities of charcoal production in the district are common in customary land where the farmers are opening up land in the pretext of agriculture production.”

BCP's Sustainable Eco-Charcoal Project was specifically developed to counter illegal and unsustainable charcoal production methods, and offers producers the opportunity to earn more from legally produced charcoal. The FD is a partner and fully consulted about the eco-charcoal project.

The eco-charcoal project will mitigate the impacts of illegal charcoaling. It is hoped that in the foreseeable future all charcoal production in the project zone will be done legally, sustainably and certified by a third party, like the FD. This is certainly not an unobtainable goal considering that in a very short amount of time residents have identified two forested areas for sustainable harvesting. This is one of the few sustainable eco-charcoal pilot projects in Zambia, and lessons learned will aim to inform national strategies to scale up sustainable charcoal production.

Furthermore, the boundaries of Rufunsa Conservancy will be actively patrolled by scouts to ensure that there is no further encroachment by illegal charcoal producers.

Poaching is an illegal activity that places pressure on Rufunsa Conservancy. The area has been systematically poached for decades, in part due to proximity to Lusaka. In addition, it is a main thoroughfare into Lower Zambezi NP for ivory and bushmeat poachers, who will likely opportunistically poach, if presented with the opportunity, while moving through the Conservancy. One of the main objectives of the project is to restore animal populations on Rufunsa Conservancy through improved security and community outreach. The project is collaborating with ZAWA as it is recognized that reduced illegal poaching movement in the Conservancy will reduce threats to the National Park. Poachers also light late season fires that illegally cause damage to private and State property. By creating employment and alternative livelihoods through projects like (but not limited to) eco-charcoal production, sustainable agriculture and eco-tourism, there will be less incentive for households in the project zone to engage in illegal wildlife hunting.

Job creation that targets local communities will provide people with a meaningful alternative to poaching. Additional value from tourism will be channelled to communities to reduce poaching infractions. As tourism develops in Rufunsa, a portion of revenues will be invested in community projects. The project also aims to pilot a 'biodiversity banking' system that rewards communities when HCV species increase in number.

G5.6 TITLE TO CARBON RIGHTS

Zambia does not have specific laws dealing with carbon rights. The landowner does, however, have the rights to above and below ground biomass. Furthermore, the Forests Act, 1999, enacted in 1973 and repealed by the Forest Act No. 7 of 1999 (CAP 199) of the laws of Zambia, provides for the establishment and management of National and Local forest conservation and protection of forests and trees, and licensing and sale of forest. It also provides for the establishment of the Forestry Commission and provides for participation of local communities, NGO's and traditional institutions for sustainable management of forest ecosystems and biodiversity. The Act also provides for the implementation of various international conventions relating to the environment. Easements are also permitted within Zambian statutory laws as described in Section G5.3 above.

BioCarbon Partners, the project proponent, has full consent from the landowner to implement the project. The project proponent has clear, uncontested title to the carbon rights. A copy of the "Carbon Rights Covenant" signed between the parties will be made available to the Validator.

CLIMATE SECTION

CL1. NET POSITIVE CLIMATE IMPACTS

CL1.1 - NET CHANGE IN CARBON STOCKS

The project activities that will be implemented as part of the Lower Zambezi REDD+ Project will have a net positive climate impact. The project activities are designed to significantly reduce GHG emissions through Avoided Unplanned Deforestation and Degradation. Based on an initial carbon stock assessment and modelling of deforestation in the reference region and following VCS methodology VM0009 and using default values from IPCC AFOLU Guidelines (IPCC 2006), it is estimated that the Lower Zambezi REDD+ Project will prevent the emissions of 9,611,864 tCO₂e over the project duration of 30 years, as detailed in Section G2.3, specifically Table 13 and Figure 15.

CL1.2 – NET CHANGE IN NON-CO₂ GHG EMISSIONS

There will be a net change in non-CO₂ emissions through the prevention of CH₄ and N₂O emissions associated with the conversion of carbon stored in biomass stocks during the conversion of forest land to cropland in the baseline scenario. The annual net and project crediting period reductions in non-CO₂ emissions have been detailed in Section G2.3 and are conservatively estimated at 134,053 tCO₂e over the lifespan of the project. Non-CO₂ emissions are insignificant as they are less than 5% of total emissions and are conservatively excluded from GHG accounting.

CL1.3 - OTHER NON CO₂ EMISSIONS FROM PROJECT ACTIVITIES

- All fuel use since the beginning of this project averages 770l of diesel per month. Some vehicles (allometry chainsaw, motorcycles, and one vehicle) use higher grade gasoline but to be conservative all emissions were quantified using diesel as a unit. Annual emissions from all fuel use calculated from management accounts (with payment vouchers as supporting documentation) amounts to 24.96t CO₂e/yr using a conversion factor for 100% mineral diesel of 2.6769 kg CO₂e/l (<https://www.gov.uk/government/publications/2012-greenhouse-gas-conversion-factors-for-company-reporting>). This is less than 1% of project emissions reductions and is thus insignificant.

As far as emissions from eco-charcoal production is concerned, these are already accounted for in Section G2.3 as part of emissions from biomass destruction and burning (forest land converted to cropland).

As stated, the eco-charcoal project was specifically implemented to mitigate leakage and reduce unsustainable charcoal production as identified as a deforestation driver in the baseline scenario, so emissions from this activity will certainly be substantially less than from the baseline scenario and there will be no additional emissions, over and above projected baseline emissions.

No project activities will promote or encourage the additional use of synthetic fertilizers.

CL1.4 – NET CLIMATE IMPACT

The net climate impact of the project is considered as the reduction in CO₂e that will result from the protection of 34,081 ha of miombo woodland and is equal to **9,611,864 tCO₂e** over the project duration of 30 years.

CL1.5 – AVOIDING DOUBLE COUNTING

Although Zambia is a signatory of the Kyoto Protocol, it is a non-annex 1 country and therefore has not set an emissions cap. The Lower Zambezi REDD+ Project will, however, be registered under the VCS, one of the most rigorous standards in the world for the voluntary carbon market. All emissions reductions will be registered in an independent register where every single reduction can be identified from issuance to retirement.

There will thus be no double counting.

CL2. OFFSITE CLIMATE IMPACTS

CL2.1 - TYPES OF LEAKAGE

We understand leakage as being a major threat to the effectiveness of climate change mitigation projects, particularly in the land-use sector.

The following potential leakage channels have to be assessed in the *Lower Zambezi REDD+ Project*.

Activity Shifting (Primary) Leakage

Activity shifting leakage in the Rufunsa Conservancy project area may result from a displacement of the agents of deforestation due to the activities of this project. The main project leakage risks are charcoal production and agricultural conversion shifting elsewhere. Miombo woodland is harvested and used in the production of charcoal, which is then sold Provincially in Lusaka (primary market) and Chongwe (secondary market). The Charcoal value chain for this region has been documented in a BCP commissioned report which will be made available to the Validator (Imani Consultants 2012). Local agents typically exploit woodland resources adjacent to their homesteads or within walking distance. Woodlands are primarily cleared for charcoal production and then followed by subsistence agriculture, completing the deforestation process. Once the area around a homestead has been cleared, agents usually approach the village Headman for advice on where they can clear next. Village Headmen then direct the agents to an area where raw materials are available.

The Lower Zambezi REDD+ project will mitigate leakage from several angles:

1. *Sustainable eco-charcoal*: A sustainable eco-charcoal pilot program has been launched that is designed to:
 - a. Absorb unsustainable charcoal producers (agents) into sustainable charcoal production, and to enhance their livelihoods from sustainable forest management;
 - b. Scale up so that more agents and sustainably managed community forests are involved in a recognized eco-charcoal scheme overseen by a body like FD.
 - c. Enhance forest cover and integrity in eco-charcoal producing forests compared with adjacent unmanaged community forests through sustainable forest management. Our aim is to enhance carbon stocks in eco-charcoal forests (even while sustainably harvesting).

- d. Currently, communities participating in the project's eco-charcoal pilot project are receiving about 50% more in payment for eco-charcoal than they would normally in the absence of this mitigation activity. The charcoal is produced in kilns that return 38% efficiency (rather than 8-10% under traditional systems), and use canopy branches that are normally burned as waste under traditional charcoal production. The production of more fuel from the same tree will contribute to reduced leakage. Increased financial benefits, lower labour inputs, and higher efficiency have already resulted in Headmen offering to include more community forest, and more households wanting to join the project.
2. *Subsistence Agriculture*: Following charcoal production usually follows subsistence agriculture. Inefficient dry land agriculture results in reduced soil fertility within a few years and a need to expand the field, or open up a new one. The conservation farming training program aims to grow into a project zone level effort that reduces leakage by:
 - a. Increasing food production from already cleared areas to target self-sufficiency and market surpluses;
 - b. Providing crop diversification alternatives that are drought tolerant and are cash crops that have demand (i.e. pigeon peas);
 - c. Access to transport at cost to farmers who sign 'community covenants' to reduce charcoal production, poaching and field clearing.
 - d. This program is working in collaboration with a regional pioneering leader in CF training techniques (Conservation Farming Unit)³³. We feel that this program has the potential to scale up significantly and reduce the incentive to shift fields to outside the project area.
3. *Mitigation Activities and Community Covenants*: The implementation of community projects target reducing the need to produce charcoal, and increase field size through diversified biodiversity-enterprises. Community covenants are a clear written agreement that project investment is linked to a target of reducing commercial charcoal production dependency, and illegal wildlife poaching. This makes it clear up front to participants in projects and formalizes a pay for performance arrangement. These mitigation projects (other than CF and eco-charcoal) reduce the likelihood of activity-shifting leakage.

³³ <http://conservationagriculture.org/>

4. *Community Institutional Building:* The project is focusing on building community governance structures to better manage community forests and natural resources. Through the formation of project related associations, and the Zone Development Committees, BCP is elevating decision making and transparency to a new level, while, most importantly, enhancing the value of forests as a collective resource. Traditional leader, Chief Unda Unda publicly decried the negative impacts of charcoal production on his people and Chiefdom. The Lower Zambezi REDD+ Project has elevated the issue of communal forest allocations and accountability to a more vigorous debate stimulated, in part, through the higher value these forests can generate through this project. A possible net result is that traditional leaders, due to increased community-led accountability and transparency, curb rampant charcoal forest allocations, and advocate for agents of deforestation to farm rather than produce charcoal.
5. *Employment:* Activity shifting could occur if the project reduces employment in the area and lowers income to the local population. The project, however, will have the opposite impact: agricultural intensification, eco-charcoal production, bio-enterprises and social services investment are designed to improve rural livelihoods. There are few, if any, sources for formal employment in the project zone and local employment is already being created by the project, directly improving the income of households in the project zone.

No leakage of emissions is expected from the *Lower Zambezi REDD+ Project* into adjacent areas. Nevertheless, an extensive leakage monitoring system will be established. As part of this monitoring procedure, a leakage area has been identified and mapped (Figure 4). A rigorous leakage monitoring plan will be put in place to continuously monitor for increased deforestation rates as a result of the project. Should any leakage of deforestation into the leakage belt be monitored, this will be deducted from the net GHG emission reductions. The leakage area is adjacent to the project area with the two sharing almost 25% of their respective boundaries. No eco-charcoal production will take place in the leakage area. Agents have easy access to the leakage area as there are no natural boundaries limiting access. Land cover within the leakage belt has been classified using a Landsat 5 TM image captured in May 2008 (project start date October 2009). An explanation of the classification process as well as the resulting land coverage is provided in section G1. The land coverage in the leakage belt was found to be similar to that of the project area.

In the project zone, agents indicated that they were prepared to travel up to 15km to harvest wood and produce charcoal. In circumstances where they need to travel further a temporary homestead may be established. This clearly makes the identified leakage area within reach of agents of deforestation.

Market (Secondary) Leakage

There is no commercial timber harvesting in the project zone. The miombo woodlands in the region do not have high enough densities of high timber value species and market shifting is therefore not considered as a potential source of leakage.

CL2.2 – MITIGATION OF LEAKAGE

Due to the design of our project activities, no leakage outside of the project area is expected (please refer to CL2.1). The regional charcoal value chain is shown in Figure 18 with model 4a and 4b being the primary models documented. Charcoal producers, on occasion, transport their charcoal to markets in Chongwe and Lusaka, however this is usually a costly exercise that does not happen more than once or twice a year. In general, the producers will sell their goods to traders from these markets who have access to transport. Traders typically travel to the area on an ad-hoc basis seeking charcoal suppliers who have charcoal or who are willing to produce. Project activities outlined in section G3.2 seek to formalise the value chains mentioned above using sustainably managed eco-charcoal forests. These managed forests on communal lands will become the focal point of charcoal production within the project zone, centralising both production and sale. In addition to the centralised production, producers will now be able to pool their resources in terms of transport and access markets not usually available to them. The project activities are designed to benefit local communities and encourage sustainable harvesting of the limited woodland resources within the region.

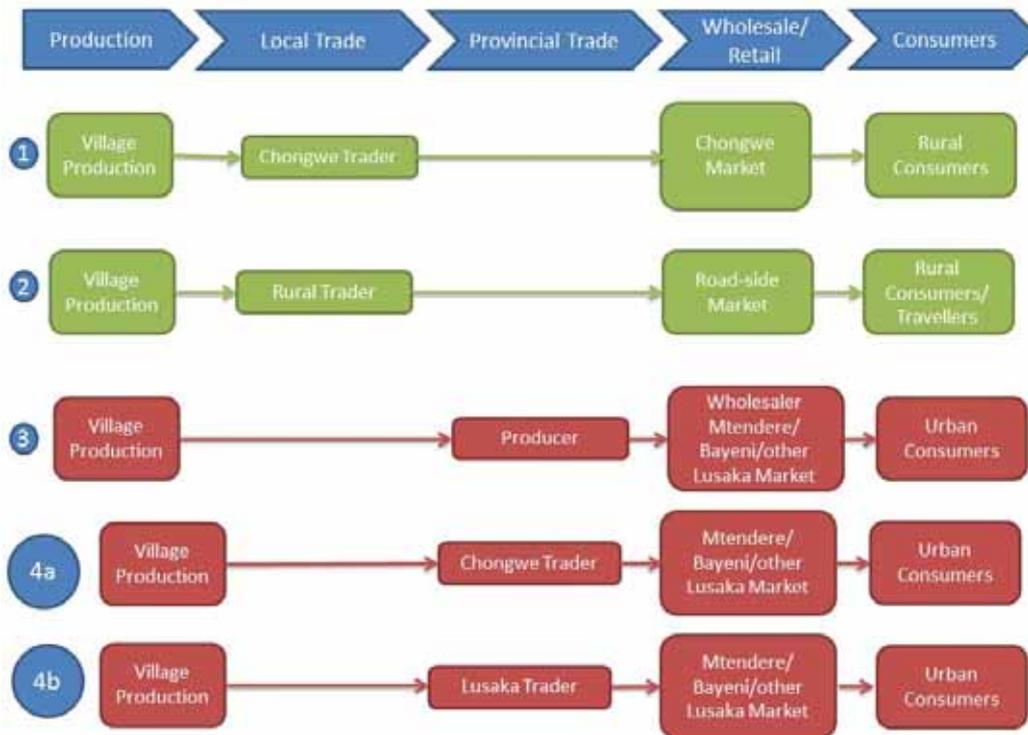


Figure 20. The charcoal value chain in the project zone of the Lower Zambezi REDD+ Project.

In light of the project activities outlined in section G3.2 and mentioned above, the project proponents believe that leakage associated with this project will be non-existent or minimal. However, as part of the CCBA and VCS validation, the project proponent has established an extensive leakage monitoring system. As part of this monitoring system a leakage area has been identified adjacent to the project area. A number of monitoring plots will be established and monitored using the VCS defined methodology (VM0009). These sites will be monitored on a regular basis by the biomass inventory team to identify and record signs of deforestation. In addition, field monitoring will be partnered with satellite earth observation for a spatially explicit assessment of woodland status. Should any leakage be identified, it will be quantified and deducted from the net GHG emissions reduction.

CL2.3 – UNMITIGATED NEGATIVE OFFSITE CLIMATE IMPACTS

Deforestation mitigation activities have been carefully planned using expert local knowledge and no negative offsite climate impacts are expected.

CL2.4 – UNMITIGATED NEGATIVE NON CO₂ CLIMATE IMPACTS

Apart from being insignificant, no unmitigated non-CO₂ emissions are expected.

CL3. CLIMATE IMPACT MONITORING

CL3.1 – CARBON POOLS TO BE MONITORED

The following carbon pools will be monitored as per VM0009:

1. **Above Ground Other Trees (AGOT).** Above Ground Merchantable Trees were not considered as commercial and illegal logging for long-lived wood products are not considered a deforestation threat to the project area. Wood Products were therefore excluded as a carbon pool.
2. **Below Ground Biomass (BGB)**
3. **Standing Dead Wood (SD)**
4. **Lying Dead Wood (LD)**
5. **Above Ground Non-Tree (AGNT)** which included shrubs/saplings but not herbaceous biomass
6. **Below Ground Non-Tree (BGNT)**
7. **Soil Organic Carbon (SOC)**

A record will be kept of all fossil fuel consumption used for project implementation but it is envisioned that it will be less than 5% of total emissions reductions. There will be no significant emissions from livestock or fertilizer.

BCP has developed a comprehensive biomass monitoring field manual that will be made available to the Validators. It is based on best practices as stipulated in the IPCC guidelines (2006).

A total of 183 permanent monitoring plots within Rufunsa Conservancy have been identified and will be quantified for the purposes of VCS verification. A sub-set of these plots will be monitored on an annual basis. Every permanent plot will be measured at least every five years.

The Soil Organic Decay rate will be quantified in a proxy area adjacent to the project area. BCP has already gained permission from local communities to take soil samples on their property.

A set of random, permanent plots will be identified in the leakage belt and monitored by the project's trained biomass inventory team, prior to each VCS verification event, following the methods stipulated in VM0009. Changes in carbon stocks will be further monitored using satellite imagery.

CL3.2 – COMMITMENT TO MONITORING PLAN

BCP will submit the full monitoring plan to the CCBA within the required timeframe of within 12 months of validation. The plan and results of monitoring will be made publically available on the internet and distributed to local communities and stakeholders.

COMMUNITY SECTION

CM1. NET POSITIVE COMMUNITY IMPACTS

CM1.1 – NET POSITIVE IMPACTS ON COMMUNITIES

The deforestation mitigation activities of the Lower Zambezi REDD+ Project were designed to enhance livelihoods in a sustainable manner and not to restrict access to natural resources. As the information that is presented in Section G5.3 demonstrates, BCP has received an overwhelmingly positive reaction from project zone residents in response to our community sensitization, consultation and engagement efforts. We have experienced widespread interest and support in our project activities, both those that have been implemented and those that have been proposed, and in a short period of time there has been tremendous commitment to adopt sustainable practices.

BCP has collected significant feedback and data from local communities, which has helped us to identify and design the proposed project activities that were outlined in Section G3.2. All of these project activities, with the exception of conservancy management activities, are intended to sustainably improve local livelihoods and provide viable alternatives to activities that are dependent upon deforestation (such as unsustainable agriculture or charcoal production practices).

In order to assess and monitor the impacts that our projects have on local community livelihoods, BCP has developed a rigorous Social Monitoring Program (this is explained in greater detail in Section CM3.1, and further information is outlined in our Social Monitoring SOP, which will be made available to the Validator).

BCP has additionally engaged in a rigorous planning process in advance of launching these activities, which has allowed us to estimate and evaluate the impacts that these activities will have on community groups. Moreover, throughout the Project Identification Process that was undertaken by BCP's Community Engagement Team—particularly by the Community Coordinators, who completed Project Identification Worksheets in cooperation with community representatives (see Section G3.8 for a further description of this process)—local stakeholders have been given the opportunity to evaluate and explain the potential impacts that they foresee from proposed project activities. *Project Identification Worksheets that were completed during this process will be made available to the Validator.* Table 17, below, outlines proposed project activities and their estimated impacts on community well-being, as well as evaluations of these impacts by affected groups.

Table 17. Anticipated Impacts of Project Activities on Local Communities.

Project Activity	Estimated Impacts on Community Well-Being			Community Evaluation of Impacts	Anticipated Impact on Community Well-Being
	Economic	Social	Natural Resources		
Agro-forestry (incl. vegetable gardens)	<ul style="list-style-type: none"> + Increased household income from new business + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Increased food security from surplus product + Women, youth and marginal groups able to participate 	<ul style="list-style-type: none"> + Reduced need to clear fields or produce charcoal for additional income . Risk: Project should not be implemented where community water resources are limited 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Improved livelihoods + Gender equal access + Improved nutrition + Less spent on transportation to access vegetables + New business opportunity 	Positive
Conservation Farming	<ul style="list-style-type: none"> + Reduced costs due to higher yields from less labour and fewer inputs (less fertilizer needed) + Reduced transport cost and increased access to farming inputs and implements, through CF Association + Facilitated business opportunity + Diversified cash crops + Increased household livelihoods from maize surpluses 	<ul style="list-style-type: none"> + Increased food security through higher yields + Women, youth and marginal groups able to participate + Reduced time spent weeding (possibly correlates to improved school attendance) 	<ul style="list-style-type: none"> + Reduced need to clear/expand fields to increase agricultural production + Supports deforestation mitigation efforts + More efficient use of water and land resources + Reduced need to produce charcoal for additional income 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Higher yields; improved productivity + More food + Business opportunity 	Positive
Eco-Tourism	<ul style="list-style-type: none"> + New source of income to individuals, households and communities + Business opportunities (tourist market) 	<ul style="list-style-type: none"> + Employment opportunity + Women, youth and marginal groups able to participate 	<ul style="list-style-type: none"> + New incentive to protect forest areas for tourism value + Reduced need to clear fields or produce charcoal for additional income 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Employment 	Positive
Improved Small Livestock Production	<ul style="list-style-type: none"> + Business opportunity 	<ul style="list-style-type: none"> + Improved food security + Diet /nutrition improvement . Risk: Must ensure successful expansion/ “pass along” model; reduce risk of jealousy + Women, youth and marginal groups able to participate 	<ul style="list-style-type: none"> + Manure for organic compost options – reduce need for chemical fertilizers that negatively impact GHG emissions . Risk: Participants must agree to not allow livestock to deforest (i.e.: goats eating saplings) + Reduced need to clear fields or produce charcoal for additional income 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Business opportunity + Improved food security + Improved diet . Risk: ensure community benefits shared; ensure access to resources (i.e. water) does not strain community access 	Positive

Project Activity	Estimated Impacts on Community Well-Being			Community Evaluation of Impacts	Anticipated Impact on Community Well-Being
	Economic	Social	Natural Resources		
Miombo Mushroom Business	<ul style="list-style-type: none"> + Increased household income from new business + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Increased food security from surplus product + Women, youth and marginal groups able to participate 	<ul style="list-style-type: none"> + Adds additional incentive to protect forest areas where mushrooms grow + Compatible with deforestation mitigation efforts + Does not impact water supply + Reduced need to clear fields or produce charcoal for additional income 	<u>Positive:</u> <ul style="list-style-type: none"> + Business opportunity + Improved food security + Easy for women and children to be involved 	Positive
Seasonal Thatch Business	<ul style="list-style-type: none"> + Increased household income from new business + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate 	<ul style="list-style-type: none"> + Reduces fuel load; protection against hot late-season fires + Compliments BCP's "early burning" plan as part of improved Conservancy management + Does not impact water supply + Reduced need to clear fields or produce charcoal for additional income 	<u>Positive:</u> <ul style="list-style-type: none"> + Business opportunity + Easy for women and children to be involved 	Positive
Social Services (ex: school, borehole, clinic)	<ul style="list-style-type: none"> + Reduces cost of access (ie: lower transport costs to attend clinic or schools, less money spent on accessing water or paying for private education or healthcare options in urban areas) 	<ul style="list-style-type: none"> + Targets children and vulnerable groups + Improves community health through access to clean water and healthcare + Improved education and school attendance rates, through shorter distance to attend school and local education available + Less time/money spent accessing better, more local resources 	<ul style="list-style-type: none"> + Use of hydra-form brick machine to construct or refurbish buildings reduces demand for wood-fired bricks; supports deforestation mitigation efforts and reduces emissions + Improves access to community water resources (boreholes) + Does not negatively impact community forest / clearing 	<u>Positive:</u> <ul style="list-style-type: none"> + Improves quality of local options + Reduces costs associated with private, distant options, or transportation + Improves health and education + Improved access to resources . Risk: ensure not to attract in-migration that increases pressure on community resources 	Positive
Sustainable Eco-Charcoal Production	<ul style="list-style-type: none"> + Increased income paid to producers + Generation of funds for community trust + Reduced fees lost to transportation or bribes + Community-run business opportunity + Niche-market product that promotes sustainable, community-based inclusive business 	<ul style="list-style-type: none"> + Reduction in corruption (legitimate fee structure) + Women involved, in drum kilns + Institutional strengthening: Creation of Eco-Charcoal Association to ensure compliance with terms of Community Covenant + Community management of natural resources 	<ul style="list-style-type: none"> + Financial incentives to protect forest and harvest sustainably + Community forest protected + Sustainable harvesting of forest resources + Improved community access to forest resources + Reduced incentive to deforest / compatible with deforestation mitigation efforts 	<u>Positive:</u> <ul style="list-style-type: none"> + Increased income to producers + Increased funds within community + Sustainable use of forest resources + Community involvement in forest protection + Reduced unsustainable charcoal production 	Positive

Project Activity	Estimated Impacts on Community Well-Being			Community Evaluation of Impacts	Anticipated Impact on Community Well-Being
	Economic	Social	Natural Resources		
Sustainable Honey Production	<ul style="list-style-type: none"> + Increased household income from new business + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Additional access to honey for nutrition/diet 	<ul style="list-style-type: none"> + Promotes forest protection for apiaries + Compatible with deforestation mitigation efforts + Does not negatively impact water availability + Introduces sustainable hives; reduce deforestation from traditional methods + Reduced need to clear fields or produce charcoal for additional income 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Business opportunity + Access to community-produced honey (less expensive than to purchase; benefit to diet) 	<p>Positive</p> <p><i>(However, BCP perceives some risk attached to honey projects, due to concern that forest resources are not intact enough in communal areas of the project zone)</i></p>
Sustainable Hydra-Form Brick Making	<ul style="list-style-type: none"> + Reduced money spent on cement (less needed) + Reduced cost of construction for community projects <p>Risk: even if provided access “at cost,” it may be more expensive for communities to use the machine than to make wood-fired mud bricks, as villagers may not value the opportunity cost i.e. the value of their labour days to produce wood fired bricks.</p>	<ul style="list-style-type: none"> + Facilitated construction of community buildings + Community members have access to improved brick-making options 	<ul style="list-style-type: none"> + Reduced deforestation, as no need to cut trees for firewood + Reduced use of cement, which reduces emissions caused by construction 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Improved building structures + Possible employment (community construction projects) 	<p>Positive</p>
Tree Planting (woodlots), Tree Nurseries, Orchards	<ul style="list-style-type: none"> + Possible business opportunity + “Free” trees to local communities (donated by Forestry Department) 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + School Orchards generate interest in tree protection and provide food/business source + Improved diet from fruit trees and <i>Moringa</i> spp. 	<ul style="list-style-type: none"> + Promotes reforestation and rehabilitation efforts + Generates interest in tree protection <p><i>Risk:</i> Project should not be implemented where community water resources are limited</p> <p><i>Risk:</i> area for tree-planting or nursery should not result in deforestation/ clearing</p>	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Potential source of income or employment + Involves community in tree-care and reforestation + Possible source of food (fruit), fertilizer (<i>Faidherbia albida</i>) or nutritional supplement (<i>Moringa</i> spp.) 	<p>Positive</p>
Scholarships programme	<ul style="list-style-type: none"> + Increased financing for education + Reduced household expenditures on education 	<ul style="list-style-type: none"> + Increased school attendance + Focus on youth 	<ul style="list-style-type: none"> + Increased environmental education and awareness, promotes environmental protection 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Improved access to education + Improved environmental protection 	<p>Positive</p>
Crop Diversification	<ul style="list-style-type: none"> + Improved access to seeds + Reduced risk of lost crops + Improved access to agricultural markets through partner orgs + Additional income generation 	<ul style="list-style-type: none"> + Improved resiliency + Promotes food security + Promotes producer cooperatives/associations 	<ul style="list-style-type: none"> + Promotes resiliency and improved agricultural production + Reduced pressure to expand fields 	<p><u>Positive:</u></p> <ul style="list-style-type: none"> + Improved food security, income generation and resiliency to climate change 	<p>Positive</p>

Project Activity	Estimated Impacts on Community Well-Being			Community Evaluation of Impacts	Anticipated Impact on Community Well-Being
	Economic	Social	Natural Resources		
Vegetable Production	<ul style="list-style-type: none"> + Possible business opportunity + Reduced cost of vegetables to local communities (no transport) + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Improved food security 	<ul style="list-style-type: none"> + Participation in business/project can be linked to assistance protecting project boundaries; preventing deforestation . <i>Risk:</i> Project should not be implemented where community water resources are limited 	<u>Positive:</u> <ul style="list-style-type: none"> + Business opportunity + Easy for women and children to be involved 	Positive
Miombo Fruit Company	<ul style="list-style-type: none"> + Possible business opportunity + Increased cash-flow within community due to more households with income + Dried fruit: obtain higher prices due to sale post-season 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Improved food security through improved/continual access to fruit 	<ul style="list-style-type: none"> + Compatible with forest protection projects; fruit can be harvested from protected forest areas + Increased value placed on protecting fruit trees; reduced incentive for deforestation 	<u>Positive:</u> <ul style="list-style-type: none"> + Business opportunities + Forest protection incentive + Involves women, youth and marginal groups 	Positive
Sewing Project	<ul style="list-style-type: none"> + Possible business opportunity + Increased cash-flow within community due to more households with income 	<ul style="list-style-type: none"> + Target women for involvement + Increases training; capacity-building for women/participants 	<ul style="list-style-type: none"> + Can be linked to reducing income from deforestation-dependent activities 	<u>Positive:</u> <ul style="list-style-type: none"> + Income generation; business opportunity targeted at women 	Positive
Edible Insect Project	<ul style="list-style-type: none"> + Possible business opportunity with low start-up cost 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Improved food security + Promote traditional food source/harvesting techniques 	<ul style="list-style-type: none"> + Compatible with forest protection projects; insects can be harvested from protected forest areas + Increased value placed on protecting forest; reduced incentive for deforestation 	<u>Positive:</u> <ul style="list-style-type: none"> + Improved food security + Income generation + Promotes forest protection + Traditional knowledge 	Positive
Savings and loans group	<ul style="list-style-type: none"> + Increased access to finance within communities + Promotes local business development + Community-managed funds promote community projects and business innovation + Increased financial knowledge 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Promotes community-based projects and self-enforcement 	<ul style="list-style-type: none"> + Money can be used to finance alternatives to deforestation + Conditional access to loans can promote forest protection efforts 	<u>Positive:</u> <ul style="list-style-type: none"> + Increased money within communities + Increased financial awareness + Community ownership of finances, projects and businesses 	Positive
Rent-to-own	<ul style="list-style-type: none"> + Reduced cost of access to equipment + Promotes business development + Opens access to equipment/start-up materials for lower-income households 	<ul style="list-style-type: none"> + Women, youth and marginal groups able to participate + Allows greater range of livelihood activities in community 	<ul style="list-style-type: none"> + Equipment can be used to start alternatives to deforestation + Conditional access to equipment can promote forest protection efforts + Improved agriculture or business opportunities reduces need to deforest 	<u>Positive:</u> <ul style="list-style-type: none"> + Promotes inclusive, community-driven business and expansion opportunities 	Positive

In the absence of such projects, as earlier sections have predicted (see Sections G1.5 and G2.1), communities are anticipated to face continued poverty and, in fact, further impoverishment as a result of declining access to natural resources in depleted areas of community forest and land. Using spatial analysis of deforestation patterns combined with extensive community surveying, BCP anticipates that encroachment onto the private property of Rufunsa Conservancy is likely to continue in the absence of REDD+ related activities, as a result of depleted natural resources in community forest areas, and due to pressure faced by households to expand agricultural areas or engage in charcoal production as a means of ensuring food security and access to income. As Section G1.5 described in great detail, BCP's Baseline Survey collected important socio-economic information that revealed high levels of poverty and extreme dependence upon charcoal production as a livelihood strategy among households living within the project zone.

As such, BCP anticipates that its proposed project activities will achieve significant, positive community impacts. These projects have been specifically designed through cooperation and consultation with local community representatives, with the aims of providing alternative sources of income, increasing individual and household incomes, improving food security and reducing dependency upon the depletion of natural resources. By simultaneously improving livelihoods and reducing the pressures that households face to engage in deforestation, BCP hopes to tackle both "cause and effect" in the currently in-virtuous cycle that is leading to increased depletion of community forest resources and the impoverishment of local households who are dependent upon these resources. Furthermore, BCP hopes to improve the resiliency of households living within the project zone to climactic changes, by promoting diversification of income sources and improving agricultural techniques. In this way, BCP hopes to not only improve local livelihoods, but also, to enhance resiliency in the face of potential future climate change related vulnerability.

Given the ominously negative outcomes that BCP's "without project" scenarios have predicted, and given the significantly positive outcomes that our "with project" scenario has proposed, BCP anticipates that its project activities will achieve net positive impacts on local communities, in addition to securing further climate and biodiversity benefits.

Mitigation activities are only implemented with the full consent of people living in the project zone.

CM1.2 – NEGATIVE IMPACTS ON HIGH CONSERVATION VALUES

The project has specifically been designed to protect HCVs and will not negatively impact on any such HCVs. Please see Section G3.2, Project Activities for more information on how negative impacts will be prevented.

CM2. OFFSITE STAKEHOLDER IMPACTS

CM2.1 – POTENTIAL NEGATIVE OFFSITE STAKEHOLDER IMPACTS

The project will not have any negative offsite stakeholder impacts. It is likely that the positive benefits of the project will extend beyond the project zone. The implementation of higher profit yielding charcoal production is bound to attract attention and the positive benefits may well spread outside of the boundaries.

CM2.2 – MITIGATION OF NEGATIVE OFFSITE COMMUNITY IMPACTS

BCP does not anticipate any negative offsite community impacts. However, should any negative impacts arise, BCP's grievance mechanism would continue to be in effect, and BCP representatives would respond to community concerns within the same 30 day window and to the same professional standard that we adhere to for community stakeholder concerns within the project zone. BCP's grievance mechanism has been described in greater detail in Section G3.10 of this document.

CM2.3 – POTENTIAL NET NEGATIVE IMPACTS ON WELL BEING OF OTHER STAKEHOLDERS

There are no stakeholder groups in or outside of the project zone that will be negatively impacted by the project.

CM3. COMMUNITY IMPACT MONITORING

CM3.1 – INITIAL COMMUNITY MONITORING PLAN

BCP's Community Monitoring Plan has two main components. First, in order to monitor general trends in community well being, BCP has developed a repeat round survey that can be used to collect relevant socio-economic data from households. By completing regular rounds of this survey, BCP will be able to identify changes and trends in the data that we receive, and this will allow us to assess the impacts that our project activities have on local livelihoods, in general. It is important to note that BCP's first round of survey data collection (the Baseline Survey that was completed in 2012) gathered important socio-economic data from 90 households living within the Project Zone. Future rounds of surveys will target the same households with the same questions to the greatest extent possible so as to allow for consistency, to increase the accuracy of our identification of trends, and to control for external causes of variation across households. We will also aim to include new households in subsequent rounds of survey completion, so as to broaden and expand the amount of data that is available to us.

BCP's Social Monitoring Program SOP describes these aspects of our community monitoring strategy in full detail. This document, along with the full version of our Baseline Survey questionnaire, will be made available to the Validator. Key indicators that will be monitored through the ongoing Social Monitoring Program are listed in Table 18.

Table 18. Key socio-economic indicators that will be monitored annually in the project zone of the Lower Zambezi REDD+ Project.

Parameter	Monitoring, Reporting and Verification Frequency
Annual household income	Biennial (every 2 years)
Household size and age and gender composition	Biennial (every 2 years)
Income from agriculture	Biennial (every 2 years)
Income from charcoal production	Biennial (every 2 years)
Participation in conservation agriculture	Biennial (every 2 years)
Participation in eco-charcoal production	Biennial (every 2 years)
List of major assets	Biennial (every 2 years)
Highest education level in household	Biennial (every 2 years)
Number of dependants attending school	Biennial (every 2 years)
Direct & indirect benefits from Lower Zambezi REDD+ Project	Biennial (every 2 years)
Employment status	Biennial (every 2 years)

The second main element of the Community Monitoring Plan includes localized assessment of specific project impacts on participants' well being. Prior to launching any project activities that are anticipated to have particular effects (for example: positive impacts on household income generation), the Community Engagement Team will collect specific, relevant data that will allow us to measure and assess the impact that these project activities have on these particular indicators of well being. For example, prior to implementing the pilot phase of the Conservation Farming Training Program in Mweeshang'ombe Zone, BCP representatives collected information from volunteer participants concerning the amount of land they were currently farming, their past and anticipated yields, and the amount of income they received from past harvests. By asking these same questions before and after project implementation, BCP will be able to gather quantitative evidence of the effects that our Conservation Farming Training Program has on farmers' yields, efficiency and agricultural incomes. This will allow us to identify whether the project is achieving its intended effects, or, whether certain amendments to the project must be made—in consultation with participating farmers—so as to improve the project and the impacts that it has on community well-being.

As this methodology implies, specialized surveys will be developed for each project activity, which will allow BCP to assess the impacts that each project has on anticipated aspects of community/participant well being.

Additionally, Table 19 lists general indicators that will be measured and assessed for each of the proposed project activities that were listed in Section G3.2. By regularly monitoring these variables, BCP will be able to assess the extent to which its project activities are successfully providing alternatives and incentives for local community members to reduce deforestation. Positive (+) and Negative (-) indicators are included in this table—for example, a negative indicator would be the recorded number of arrests that have been made of local residents within the Conservancy, who are caught for illegal deforestation or hunting activities. This is because such statistics will be useful to track illegal activities inside of the Conservancy. Such statistics would, in turn, serve as useful indicators as to whether or not BCP's project activities have been successful in their aim to provide meaningful alternatives and incentives to reduce deforestation taking place in and near to the Project Area.

Table 19. GHG mitigation activities - Community impact Measuring, Reporting and Verification (MRV) schedule for the Lower Zambezi REDD+ Project.

GHG Mitigation Activity	Indicator	MRV Frequency
Improved conservancy management	+ No. of local residents employed in Conservancy - No. of local residents arrested in Conservancy (poaching, illegal deforestation)	Biennial (every 2 years)
Eco-Tourism	+ No. of local residents employed in tourism + No. of households supplying produce (meat, vegetables, honey) to tourists	Biennial
Eco-charcoal	+ Hectares of forest under contractual sustainable harvesting agreement + Tons of sustainable eco-charcoal produced + No. of households participating in eco-charcoal production + Sustainable forest management indicators conducted + Price difference between price/kg for eco-charcoal and price/ kg for unsustainable charcoal - No. of participants caught with unsustainable kilns "on the side"	Biennial
Conservation agriculture	+ No. of farmers trained in conservation farming + Hectares under conservation agriculture + Crop production per hectare from conservation agriculture + No. of households participating in conservation agriculture - Extra hectares cleared for agriculture by CFTP farmers after signing of community covenant (deforestation related to agriculture) - Number of households producing charcoal to sell	Biennial
Social services	+ Infrastructure refurbished, including: boreholes, schools and clinics + New infrastructure constructed or rehabilitated + % of school-age children attending school + Average walking distance to school (by zone) + Average walking distance to clinic (by zone)	Biennial
Hydra-form brick making	+ No. of hydra-form bricks produced for use in the project zone and area	Biennial
Honey-production	+ No. of farmers trained and equipped in beekeeping and honey production + Kg of honey produced annually + Hectares of forest included in protected apiary + Number of households reporting improved incomes from honey production	Biennial
Improved small livestock production	+ No. of households participating in project + Amount of livestock produced + Average household consumption of meat (per week) + Average additional household income from small livestock sales - No. of individuals arrested for poaching in Conservancy	Biennial
Mushroom Project	+ No. of households participating in project + Kg of dried mushrooms sold + Average additional household income from mushroom sales	Biennial

GHG Mitigation Activity	Indicator	MRV Frequency
Developing community covenants	+ No. of covenants signed	Biennial
Establishing community savings/ trust funds	+ No of villages establishing funds + Amount of funds generated/saved by trust bodies + Amount of funds distributed by trust bodies + No. of individuals benefitting from savings or trust programs, or loans/grants	Biennial
Tree Planting / Tree Nursery / Orchards	+ No. trees planted + No. trees provided to community members	Biennial

Information generated through BCP's ongoing Social Monitoring Program, individual project assessments and community projects MRV schedule will be used to generate annual "Project Impact Evaluation Reports." These reports will identify areas of improvement and highlight areas where further improvement may still be necessary. As such, these reports are anticipated to guide overall project activities and implementation schedules, so as to ensure that BCP's projects are achieving optimum community benefits. These reports will also be made available to local communities, and information from them will be presented in local languages so as to ensure local understanding. BCP hopes that these reports will serve as useful indicators of our progress, which will help to build trust, pride and motivation among community stakeholders who are involved in project activities.

CM3.2 DEVELOP AN INITIAL PLAN FOR COMMUNITY IMPACT MONITORING TO MEASURE COMMUNITY HCVS

Assessment of maintenance and enhancement of High Conservation Values (HCVs) related to community well-being in the project zone will be included as part of the project's standard monitoring procedure, specifically in the perceptions section of the monitoring program. More specifically, it will be covered in the monitoring campaign of indirect project effects, which is scheduled on a Biennial basis (see section CM 3.1).

The two identified HCVs related to community well-being are:

1. HCV: Areas fundamental to meeting basic needs of local communities (e.g. subsistence, health), and;
2. HCV: Areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

To cover these two HCVs, the following questions are included into the interviews making part of the community monitoring:

HCV 5:

1. Does the REDD+ project increase or decrease your household's access to building material, firewood, medicinal plants and fruits in the project zone?

HCV6:

1. Are you or members of your household restricted in visiting burial grounds in Rufunsa Conservancy to fulfill your cultural needs?"

HCV Perennial Rivers: The project proponent will monitor the flow of rivers periodically (dry and wet season) to ensure that the stated conservation of HCV is being met.

CM3.3 COMMITMENT TO DEVELOP A FULL MONITORING PROGRAM

We commit to developing a full monitoring program within 12 months of validation against the Standards and to disseminate this plan and the results of monitoring, ensuring they are available on the internet and communicated to communities and stakeholders.

BIODIVERSITY SECTION

B1. NET POSITIVE BIODIVERSITY IMPACTS

B1.1 – ESTIMATED CHANGES IN BIODIVERSITY DUE TO THE PROJECT

The Lower Zambezi REDD+ Project will impact positively on biodiversity by protecting almost 39,000 ha of intact escarpment miombo woodland and its associated fauna. The project will in all likelihood achieve the following:

- Increase in locally threatened large mammals (such as sable and roan) to healthy densities.
- Locally present endangered species such as the African elephant, lion and African wild dog will benefit from a significant swathe of habitat that is managed with a goal of enhancing these species.
- Decrease of catastrophic late season fires with the implementation of a controlled burning programme.
- Improved health of woodlands due to the increase in large ungulates and reduction of late season fires.
- Continued survival of an entire suite of miombo woodland species that may have become locally extinct on Rufunsa Conservancy in the baseline scenario.
- Maintenance of eco-system functioning and integrity in forests managed for the production of eco-charcoal using the shelter system that would have otherwise been lost if it was clear-felled for charcoal and then converted to agriculture.

Appropriate methodologies to estimate changes in biodiversity have been implemented. These include:

1. Scout-based monitoring system to estimate changes in wildlife numbers;
2. The use of Geographic Information Systems (GIS);

To date community-based scout teams patrolling jointly with ZAWA have been trained to collect spatial data using GPS of wildlife sightings such as medium to large mammals and HCV species. This data has begun to be mapped monthly to inform adaptive management based on wildlife movements. Previously, scouts collected sighting data using paper data sheets. In addition to scouts, management collect sightings information while moving around the conservancy. Already recoveries and breeding of certain species are being noted thanks to improved protection afforded by the project.

In addition, additional monitoring will be implemented such as:

3. Regular plot sampling and adaptive management to detect invasive species.

Wildlife numbers in Rufunsa Conservancy, and the Lower Zambezi ecosystem have suffered from poaching due to the proximity to Lusaka and Great East Road, and resource constraints faced by law enforcement agencies in Zambia. Increasing human population growth into the project zone, and a lack of resources in the absence of a carbon project, mean that in the ‘without project’ scenario it is unlikely that viable wildlife populations will remain in the project zone or project area in the mid-term.

B1.2 – NEGATIVE IMPACT ON HIGH CONSERVATION VALUES

There will be no negative impacts on biodiversity or biodiversity habitat; one of the main aims of the project is to enhance and conserve biodiversity.

There will be no threats to the strategic landscape. The project is specifically designed to conserve Rufunsa Conservancy and this will have subsequent benefits to the larger landscape by protecting boundaries of two important protected areas namely the Lower Zambezi National Park and the Chiawa Game Management Area. It is in fact designed to prevent potential deforestation in Chiawa GMA which has been identified as a potential leakage area.

B1.3 NON-NATIVE SPECIES USED BY THE PROJECT

The project will use species during its agricultural activities and woodlot establishments (please see section G3.2). Invasive species will not be used. Species used in the Lower Zambezi REDD+ Project’s agro-forestry interventions in the project zone are listed in Table 20.

Table 20. Non-native species used in the Lower Zambezi REDD+ Project.

Common Name	Scientific Name	Invasive?	Agroforestry Use
Maize	<i>Zea mays</i>	No	Crop
Pigeon Peas	<i>Cajanus cajan</i>	No	Cash Crop
Mango	<i>Mangifera indica</i>	No	Fruit
Papaya	<i>Carica papaya</i>	No	Fruit
Moringa	<i>Moringa oleifera</i>	No	Diet supplement
Ana Tree	<i>Faidherbia albida</i>	No	Fertilizer
Natal Mahogany	<i>Trichilia emetica</i>	No	Eco-charcoal/reforesting

B1.4 ADVERSE EFFECTS OF NON-NATIVE SPECIES USED BY THE PROJECT ON THE REGION'S ENVIRONMENT

The project will use non-native species in its agro-forestry activities and woodlot establishments (see section G3.2) listed in Table 19. Invasive species will not be used. No species that are likely to have a negative effect will be used. The population of any invasive species will not increase as a result of the project.

The project proponent will not promote any species that are not already cultivated in Zambia. Selected non-native species can provide substantial benefits. Maize is the key staple in Zambia, and more efficient maize growing is a key element of the project's conservation farming training program designed to reduce pressure on forests. Fruit tree species (mango, and papaya) are already grown in the project zone. Seedlings of these species are promoted by the Forestry Department.

There are no negative impacts of planting these fruit tree species on the region's environment as orchards are located on already deforested land in the vicinity of schools. Any community orchards set up have a clear community covenant specifying that no land can be deforested to set up the orchard. Hence, woodlots and orchards target already abandoned fields and assist in rehabilitation of these areas. Pigeon peas are grown in the project zone intercropped with maize, and are a nitrogen fixing legume. Pigeon peas can be grown on marginal land and are very drought resistant.

Non-native agro forestry species will only be used in the confines of community lands. Leakage mitigation reforestation efforts in protected forests (regardless of private, communal or State owned) will only use indigenous species, such as *Azelia quanzensis* and *Pterocarpus angolensis* which are native hardwoods under significant logging pressure in Zambia; *Uapaca kirkiana* and *Parinari curatellifolia* will be promoted as indigenous fruit trees.

B.1.5 GUARANTEE THAT NO GMOS WILL BE USED TO GENERATE GHG EMISSIONS REDUCTIONS OR REMOVALS.

We guarantee that no GMOs will be used to generate GHG emissions reductions or removals.

B2. OFFSITE BIODIVERSITY IMPACTS

B2.1 IDENTIFY POTENTIAL NEGATIVE OFFSITE BIODIVERSITY IMPACTS THAT THE PROJECT IS LIKELY TO CAUSE.

The project proponent has not identified any negative offsite biodiversity impacts. By enhancing landscape connectivity, and a corridor between the Chiawa GMA and Lower Zambezi NP, the project is likely to have a positive impact on biodiversity. Enhanced conservation management on Rufunsa Conservancy will likely improve habitat conditions for threatened species such as elephant, lion and wild dog. It is envisaged that the rehabilitation of large mammal populations and other animals on Rufunsa Conservancy through better funded and managed protection will have a positive impact on other depleted areas, particularly in parts of the national park and the project zone as the Conservancy will act as a source from where individuals could migrate to re-populate depleted areas.

Displacement of poaching activities is unlikely as wildlife is almost completely depleted in the project zone and neighboring areas. Displacement of poaching into the Lower Zambezi NP is also unlikely as the only option is for poachers to circumvent the Conservancy. This will increase the distance they need to travel significantly due to the Conservancy's 60 km of park frontage, and expose poachers to ZAWA patrols for more days. The closest distance to poachers targeting wildlife on the Valley floor is *through* Rufunsa Conservancy. Increased investment in patrolling, in collaboration with ZAWA, will increase the opportunity cost of this route, and effectively disrupt poaching routes entering or exiting using this route. Poachers mostly live within the project zone, where they will benefit from, and be encouraged to participate in, community-based deforestation mitigation projects.

B2.2 DOCUMENT HOW THE PROJECT PLANS TO MITIGATE THESE NEGATIVE OFFSITE BIODIVERSITY IMPACTS.

A biodiversity monitoring plan in Rufunsa Conservancy will be put into place. Although no negative impacts of the project are envisioned, pro-active adaptive management on the part of the project proponent will address any possible negative impacts.

B2.3 UNMITIGATED NEGATIVE OFFSITE BIODIVERSITY IMPACTS

A biodiversity monitoring plan in Rufunsa Conservancy will be put into place. Although no negative impacts of the project are envisioned, pro-active adaptive management on the part of the project proponent will address any possible negative impacts. The project team will work closely with key stakeholders such as ZAWA to track and exchange information on whether project activities result in any unforeseen negative offsite biodiversity impacts. The project team will respond accordingly and adaptively to any possible negative impacts. However, we envision the net impact of the project on biodiversity will be strongly positive.

B3. BIODIVERSITY IMPACT MONITORING

B.3.1 BIODIVERSITY VARIABLES TO BE MONITORED AND THE FREQUENCY OF MONITORING AND REPORTING.

A biodiversity monitoring program is being developed to quantify and document biodiversity changes resulting from project activities. Scouts are already being trained to record animal sightings and illegal activity occurrences. Ongoing biomass monitoring will ensure that a large number of plant species are also monitored. Resident experts will periodically visit the project area to monitor the fauna and flora in more detail. An initial plan of selected biodiversity variables is presented in Table 21. These will be improved and modified as more information becomes available

Table 21. Biodiversity Impact Monitoring Variables and Monitoring, Reporting and Verification Frequency.

Variable	Monitoring Frequency	Reporting Frequency
Illegal activities		
Poachers arrested	Continuous	Biennial (every 2 years)
Poachers convicted on wildlife or firearms crimes	Continuous	Biennial (every 2 years)
Number of firearms used to poach recovered	Continuous	Biennial (every 2 years)
Number of poaching signs, such as campsites, meat racks	Continuous	Biennial (every 2 years)
Number of poached wildlife carcasses	Continuous	Biennial (every 2 years)
Number of snares recovered	Continuous	Biennial (every 2 years)
Illegal Grazing	Continuous	Biennial (every 2 years)
Illegal charcoal kilns	Continuous	Biennial (every 2 years)
Felled trees in Conservancy	Continuous	Biennial (every 2 years)
Biodiversity Monitoring		
Large mammal type and location	Continuous	Biennial (every 2 years)
HCV type and location	Continuous	Biennial (every 2 years)
Human wildlife conflict incidents	Continuous	Biennial (every 2 years)
Scout patrol days	Monthly	Biennial (every 2 years)
Number of Tree species in permanent plots	Annual	Biennial (every 2 years)

The monitoring of trees will take the form of fixed plot monitoring (tree species in biomass plots), and observations by all staff working on the property on an ongoing basis. Furthermore local experts will be invited to monitor more complex taxa such as avifauna and rare plants at regular intervals, but this will unlikely be annual.

B3.2 – INITIAL HCV MONITORING PLAN

Monitoring of HCVs will form an important component of the overall biodiversity impact-monitoring plan. The project's plan for assessing the effectiveness of measures used to enhance HCVs will include regular HCV monitoring and adaptive management techniques should any measures not maintain or enhance HCVs. Scout patrols in the project area will be daily during which HCV sightings and location data will be collected. With carbon finance, the project could expand on this important data collection, including building Zambian wildlife research capacity, and local community monitoring capacity.

Particular attention will be paid to monitoring key indicators that will identify the success, or lack thereof, of conservation measures to protect all High Conservation Value species and areas.

HCV species will be prioritised by biodiversity monitoring teams. Habitat management will also focus on enhancing preferred habitat for these species.

A combination of monitoring techniques will be used to determine the success of landscape level HCVs such as remote sensing to determine intactness of vegetation and plot based sampling to determine species composition and vegetation health.

B3.3 COMMITMENT TO THE DEVELOPMENT OF A BIODIVERSITY MONITORING PLAN

We commit to developing a monitoring plan within twelve months of validation and make it publicly available to both the local communities and stakeholders, and publicly available on the Internet.

GOLD LEVEL SECTION

GL1. CLIMATE CHANGE ADAPTATION BENEFITS

GL1.1 – IDENTIFY LIKELY CLIMATE CHANGE IMPACTS

The impacts of climate change are primarily reported using the outputs from General Circulation Models (Grotch and MacCracken, 1991, Boko *et al.*, 2007). These models are used to understand how climate is likely to change in the future and thus contribute to informed decision making regarding adaptation and potential mitigation. These models, however, are operated at a coarse resolution and are often inappropriate for local scale projects such as the Lower Zambezi REDD+ project discussed in this document. As an alternative, this project makes use of the UNDP Climate Change Country Profiles published by McSweeney *et al.* (2010). The document outlining projected changes for Zambia is available from the following url: <http://www.geog.ox.ac.uk/research/>.

Projections of future climate change are primarily reported using temperature and rainfall variables with the regional models outputting statistics related to how both temperature and rainfall are likely to change in the next 30 to 90 years (Figures 21 & 22). Primary findings for Zambia are as follows (McSweeney *et al.* 2010):

Temperature:

- Mean annual temperature is projected to increase by 1.2 to 3.4°C by 2060 and 1.6 to 5.5°C by 2090. The range of change predicted under any one emissions scenario is between 1.5 and 2.5°C.
- Regionally, the rate of warming is slightly more rapid in the southern and western regions of Zambia.
- All projections indicate a substantial increase in the number of both days and nights considered 'hot' in the current climate.
- All projections indicate that the number of days and nights considered 'cold' will decrease. In addition, 'cold' nights will decrease in frequency more rapidly than 'cold' days.

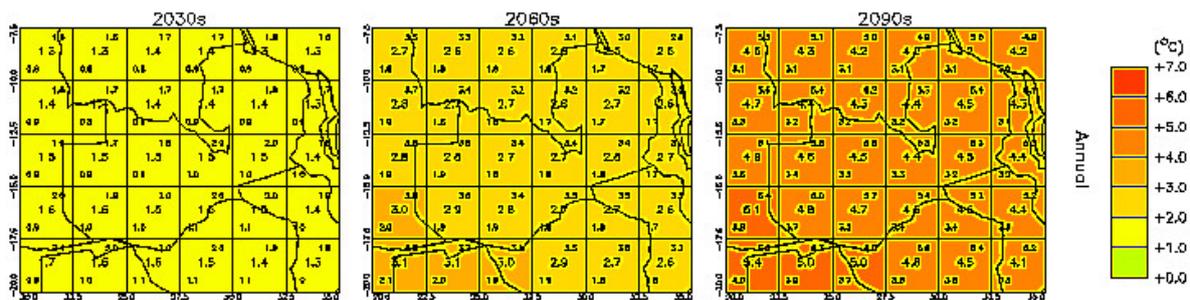


Figure 21. Spatial patterns of projected change in mean annual temperature for 10-year periods (SRES A2 scenario). All values are anomalies relative to the mean climate of 1970-1999. In each grid box, the central value gives the ensemble median and the values in the upper and lower corners give the ensemble maximum and minimum.

Rainfall:

- Projections of mean rainfall do not indicate large changes in annual rainfall, however, seasonally the range of projections from different models is large. Ensemble projections indicate a decrease in September-October-November (SON) rainfall by 2090 while December-January-February (DJF) is set to increase by 2090, particularly in the north-east of the country.
- The proportion of total rainfall that falls in heavy events is projected to increase annually, but mainly in DJF and March-April- May (MAM).
- Projections indicate that maximum 1 and 5 day rainfall events may increase in magnitude in DJF and MAM.

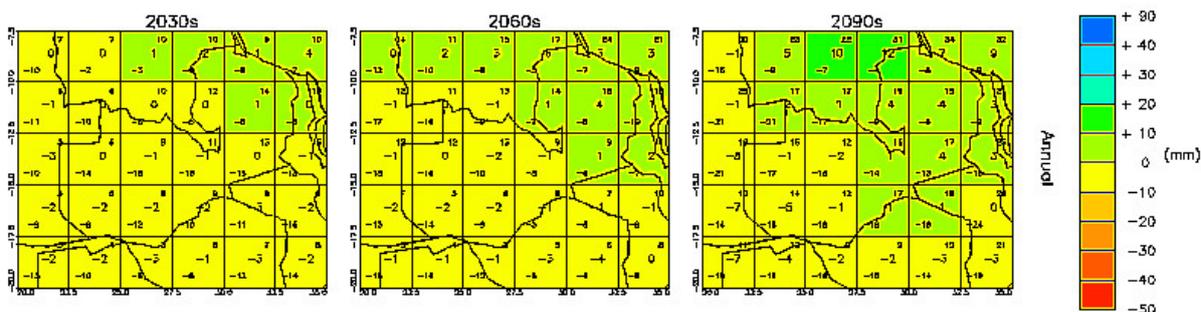


Figure 22. Spatial patterns of projected change in monthly precipitation for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999 given in mm. In each grid box, the central value gives the ensemble median and the values in the upper and lower corners give the ensemble maximum and minimum.

Projections reported above indicate that the Lower Zambezi REDD+ project area is likely to become warmer over the next 30 years with an increase in the frequency of extreme rainfall events particularly in the months of DJF. The Zambian climate is also especially sensitive to the El Niño Southern Oscillation (ENSO) and La Niña (Anti-ENSO) phenomenon. However, climate projections of El Niño events show wide disagreements between models adding additional uncertainty. What is however understood without any uncertainty is that the people living in the project zone are highly vulnerable to any changes in the area brought about by climate or any other anthropogenic driver. As such, the project activities listed earlier seek to improve resilience and adaptation of local peoples, while taking cognisance of the projected climate changes with special emphasis on what appears to be a change in the seasonality of the current rainfall regime. Should temperatures increase and rainfall become more erratic—as is projected, and reported to be already happening by local communities in the project zone—deforestation pressure is likely to increase under the baseline scenario as peoples' dependence on charcoal and poaching could increase in the case of failed or marginal crops. Projections suggest that the area will become hotter and more importantly there appears to be a decrease in the number of cold days, which could have a negative impact on both the fauna and flora within the project area.

GL1.2 – IDENTIFY RISKS TO PROJECT'S CCB BENEFITS FROM CLIMATE CHANGE

Project benefits outlined in section G3.2 seek to reduce vulnerability among the agents responsible for degradation in the project area. Vulnerability will be reduced through diversification and improved livelihoods with the introduction of a number of project-based activities designed to increase the resilience of local communities. Projected changes to the climate suggest that the dry season may become longer with reduced rainfall in the SON period, exacerbated by an increase in extreme rainfall events in the DJF period. Mean annual rainfall is projected to remain largely unchanged, however, the increase in the extreme rainfall events and the increase in mean annual temperature suggest that risks associated with droughts and or floods should be planned for using flexible, reactive and anticipatory management strategies. Additionally, while projections may be uncertain, in a semi-arid region such as the Lower Zambezi REDD+ project area any social development project should account for the natural variability inherent in these systems. As such, regardless of the drivers of environmental change, the Lower Zambezi REDD+ project will develop and implement suitable management strategies alongside their proposed project activities with a view to mitigating risk among communities within the project zone. Identified risks have been outlined below with a short explanation regarding how these will be mitigated.

Crop Failure

Due to the projected increases in temperature and the variable nature of precipitation in the future, crop failure threatens both food security as well as biological diversity. Agents within the project zone are more likely to exploit natural resources through poaching and charcoaling activities if their crops fail. In order to mitigate this, in the short term, agents will be encouraged to practice conservation farming methods such as minimum tillage and moisture conservation practices. In addition, cash crops such as pigeon peas and mangos as well as miombo fruit (*Parinari* or *Uapaca* spp.) will be used to enhance the livelihoods of farmers. Improved farming practices will thus help to buffer local agents against projected environmental change through diversification of livelihoods.

Fire

The flagship BCP project activity is the Sustainable Eco-Charcoal project that will be established within a number of community forests within the project zone. This project seeks to establish a sustainable charcoal business that produces a more efficiently produced and sustainable product while giving producers access to value addition in markets in the Capital City of Lusaka. The project aims to stop deforestation within the project area and encourage sustainable production in pre-agreed zones. A biomass assessment will inform a sustainable harvesting plan to guide eco-charcoal producers. Climate change and or natural variability may have a negative impact on this endeavour, as the regeneration of Miombo woodland post-clearing is largely dependent on the rainy season to stimulate growth. Projections indicate that the area will experience longer and hotter dry seasons with little change in mean annual rainfall. This may lead to increased fire frequency, which may have a negative impact on the regenerative properties of the community forests. It is well known that Miombo woodland is fire adapted, however the harvesting schedule may interfere with the re-growth. As such, BCP will monitor the conditions and will employ a flexible harvesting schedule that takes into account the needs of both the forest and the community. In addition, recent clearings (1 – 3 years old) will be managed in terms of the frequency of fire, and intensity of fire, favouring early burns on a reduced frequency.

Death of tree seedlings

An initiative that seeks to establish a tree seedling nursery that will be used to reforest abandoned fields, and to potentially use these areas to cultivate fruit trees, may be susceptible to reduced availability of moisture. A key project activity within the region is the refurbishment of old disused boreholes. Access to ground water is critical as this will provide households in the area with the water to endure the projected longer dry seasons. This is especially important as pressure on surface water streams is making this water source more erratic to local communities. Tree seedlings will also therefore have access to more reliable sources of moisture and will thus be more likely to survive and help establish new ecosystems in previously degraded areas. With access to ground water and drought tolerant sapling species, climate change and or natural variability will have limited impact on the initiative.

GL1.3 - DEMONSTRATE CURRENT OR ANTICIPATED CLIMATE CHANGE IMPACTS

As outlined in GL1.1, the Zambian climate is heavily influenced by ENSO related events. Typically, El Niño conditions (warm phase) tend to bring unusually high rainfall in the north with the opposite conditions being prevalent in the south. Conversely, La Niña (cold phase) episodes result in dry conditions in the north and wetter conditions in the south. With the uncertainty associated with predicting these events it is difficult to pro-actively negate their impacts. An example of the impacts these phenomena have is the 1997-1998 El Niño event, where abnormally high rainfall in the north resulted in persistent flooding while near drought conditions were experienced in the south. Similarly, a drought in 2004-2005 resulted in major agricultural losses throughout the country.

Projected climate change impacts, as outlined in GL1.1 will exacerbate current problems relating to poverty and vulnerability. Agents within the project area are heavily dependent on the natural environment for their day-to-day livelihoods. Subsistence farming is the general agricultural practice in the area; most farmers produce just enough to feed themselves and their families and supplement their income by keeping chickens and/or goats, with some practising charcoaling as a means of earning additional income. Climate change impacts will have a negative effect on the livelihoods of these people, as their resilience to shocks associated with climate change is very low. An example of this is the dry land farming commonly practised—this form of subsistence agriculture is particularly dependant on seasonal rainfall, which is predicted to change over the next 30 years.

Diversification of crops with a move towards a mix of both subsistence and cash crops, as well as drought tolerant species, along with access to ground water will help to improve resilience of the local people and result in their being less likely to return to unsustainable agricultural practices. Localised changes to rainfall resulting from deforestation are not expected as Zambian rainfall is controlled by the movement of the ITCZ which is not affected by localised land use changes.

Anticipated climate changes are likely to have an impact on the well-being of biodiversity conservation by reducing the amount of dry season water available in the ecosystem—in the case of a drought—reducing the amount of available habitat to species. This could result in habitat compression and degradation around remaining water sources. More erratic rainfall could also compromise biodiversity by affecting fire regimes, if more fuel is created in heavier rainfall periods, but longer hotter dry seasons might exacerbate late season hot fires.

GL1.4 - DEMONSTRATE THAT PROJECT ACTIVITIES WILL MITIGATE CLIMATE CHANGE IMPACTS

Environmental impacts resulting from climate change will have a negative impact on communities within the project zone. The current reliance on monoculture subsistence farming places the communities within the project zone in a highly vulnerable position in terms of their resilience to shocks associated with extreme climatic events. Droughts and floods experienced during ENSO events highlights the need for diversification of livelihoods within the project zone. Projected changes to the climate indicate that if project activities are not implemented in due course, communities will remain vulnerable to climate change and will continue to exploit the Miombo woodlands found in the project area.

The project activities designed as part of the Lower Zambezi REDD+ project will seek to improve the livelihoods of people living within the project zone. These activities seek to enhance the resilience of local communities through diversification of both subsistence and cash crops, as well as giving communities access to markets in regional centres such as Lusaka and Chongwe. In addition to these project activities, the project proponent will also refurbish boreholes in local areas, giving farmers access to water during dry periods. These activities seek to enhance the communities' ability to respond and adapt to both natural variability and climate change.

This adaptation will help local communities to move away from unsustainable agricultural practices currently employed. In particular, the project seeks to minimise the devastating effects of charcoaling in the project area, which is identified as a precursor to subsistence agricultural practices. Below is a brief outline of project activities as well as a brief explanation with regards to how each of these activities will promote diversification, adaptation and improve resilience.

Eco-charcoal

This is currently a flagship project activity. Project proponents acknowledge that complete cessation of charcoaling activities within the project zone will be difficult to achieve in the absence of viable alternative energy sources, or sources of income for producers. As such, the eco-charcoal project aims to establish a sustainable charcoal production system based on community forests. An in-depth consultation process has been undertaken with local village Headmen and Headwomen whereby, forests have been identified for sustainable charcoal harvesting. Forests are currently being identified and delineated using participatory mapping techniques. Once clearly delineated, the amount of biomass within the forest will be determined using field sampling procedures. Improved kiln design will increase the efficiency of production, resulting in a higher-grade charcoal that will be sold in major cities at a premium price. The activity will provide work as well as additional income for community members. In addition, the activity will focus charcoal production away from the project area.

Eco-Tourism

Once conservation management of the ranch is in full swing, it is envisaged that low-key eco-tourism activities such as tented safaris, game walks and mountain biking will be explored to supplement income from carbon markets. The target market will be the resident market in Lusaka with a focus on the proximity of the ranch to Lusaka. A biodiversity banking scheme will reward communities who contribute to increasing wildlife populations. This funding will be channelled towards projects that enhance community livelihoods, and resilience. Intertwined with eco-tourism, resources permitting the project will rehabilitate water points in the Conservancy to provide wildlife with appropriate and improved water supplies, in the event of a drought.

Fire Management

The project's fire management strategy will assist biodiversity to adapt to possible negative drought situations by reducing the risk of destructive late season hot fires. Longer, hotter dry seasons or possible increasing frequency of drought might make miombo forests more prone to late season fires.

Conservation agriculture

Current agricultural practices in the area focus on subsistence farming with few farmers actually able to sell surplus produce. Improved agriculture will seek to diversify the crop types grown and implement moisture and soil conservation practices that will increase yields. A key facet of conservation agriculture is more efficient use of existing moisture through precision tilling; an important adaptation mechanism when faced with more erratic rainfall. Additional crops such as vegetables and other cash crops will help to diversify crop production and enhance the income of farmers.

Reforestation will be enabled through the establishment of a tree nursery owned and run by communities within the project zone. Access to seedlings will be facilitated through the project proponent, who will also promote skills development in terms of caring for the trees. The project activity is designed as a means of diversifying the income of communities within the project zone, as well as to provide new trees for reforestation initiatives within the project zone.

Social services

Education is vitally important for the uplifting of the local communities. Education will provide opportunities for climate change adaptation by providing opportunities to community members that go beyond subsistence agriculture. As such, the project proponents will use carbon financing to refurbish at least one local school that has fallen into disrepair. In addition to the school refurbishment, the project proponent will also refurbish a disused borehole that will provide much-needed water to and local community and a tree nursery.

Improved small livestock production

Livestock production in the project zone is limited to some cattle, goats, pigs and chickens. Unfortunately, due to the presence of Tsetse fly, cattle are limited. Improved livestock projects aim to diversify the income stream available to communities within the project zone, by introducing improved chickens to the communities and giving these communities access to markets to sell their surplus stock at premium prices. This activity will diversify household incomes and provide a buffer in case of climate induced agricultural shocks.

Honey Production

Beekeeping has been undertaken in the past but due to a lack of support is no longer practised. Community members in Ndubulula zone have had training and are able to produce honey; all they require are hives and a market to sell their products. The project proponent will support the establishment of a honey project by providing support to these communities. In addition, proponents will also provide access to both local and regional markets using transport networks established to support the eco-charcoal business. This activity will diversify household incomes and provide a buffer in case of climate induced agricultural shocks.

GL2. EXCEPTIONAL COMMUNITY BENEFITS

GL2.1 – LOCATION OF THE PROJECT ZONE WITH RESPECT TO DEVELOPMENT STATUS

Zambia is a “least developed country,” according to the World Trade Organization (WTO, 2013). As Section G1.5 described, although reliable, accurate and updated national census statistics are difficult to obtain, international organizations estimate that approximately 68.5% of Zambia’s population of nearly 14 million lives below the poverty line of US \$1.25 per person per day³⁴. In recent years, Zambia has faced economic decline due to reductions in copper prices, rising oil costs and a high level of dependency on imported goods. In 2000, Zambia was granted debt relief as part of the Highly Indebted Poor Countries (HIPC) Initiative, and the country continues to receive a high amount of donor support (UN-REDD, 2010, with reference to Jorgensen & Loudjeva, 2005).

According to the Zambian UN-REDD Programme (UN-REDD 2010), Zambia holds one of the most urbanized populations within the Southern African Development Community (SADC) region, and areas of urbanization coincide with areas of significant deforestation. Zambia’s deforestation rate is extremely high, estimated at approximately 250,000 – 300,000 hectares per year (ILUA, 2008). This high rate of deforestation is attributed to a complex set of drivers and causes, including: charcoal production, development processes (high levels of poverty), and unsustainable agricultural practices (UN-REDD 2010).

Data that was collected through the Baseline Survey helps to illustrate how cross-cutting issues of extreme poverty, land degradation and high deforestation rates come into play within the project zone for the Lower Zambezi REDD+ Project. Using an overall per capita income of US \$1.25 per person per day as an international benchmark for the poverty line. It was found that approximately 88% of households living within the Project Zone live in extreme poverty. Households within the project zone also reported high rates of income dependency upon charcoal production: approximately 70% of households surveyed were involved in charcoal production, and households reported an average 37% income dependency upon charcoal.

Although Section G1.5 describes conditions within the project zone as “rural,” communities in close proximity to the tarmac road that leads to Zambia’s highly urbanized capital city Lusaka has been identified as a major driver of local deforestation. As this document stated earlier, charcoal and firewood account for approximately 75% of Zambia’s energy supply.

³⁴ Source: <http://data.worldbank.org/indicator/SI.POV.DDAY?page=1>

Lusaka's annual charcoal demand is estimated at 45,000 tons and physical counts of charcoal trucks going through the nearest town of Chongwe suggest that 24,000 tons per year (53% of Lusaka's supply) come through Chongwe and Rufunsa Districts. This could help to explain why BCP has calculated the deforestation rate in the area of the project zone to be eleven times higher than the national average deforestation rate. This could also help to explain the high rates of income dependency upon charcoal production that local households reported: faced with such high demand for charcoal, and with so few alternative economic activities available, rural producers living within the project zone have become extremely dependent upon charcoal production as a source of income.

GL2.2 – PROJECT BENEFITS TO POOREST QUARTILE OF THE COMMUNITY

As Sections G1.5 and GL2.1 describe, 88% of households living within the project zone live below the poverty line, in extreme poverty. This is 29% higher than the national average poverty rate of 68% stated in Section GL2.1 above.

Given that the predominant socio-economic status of residents of the project zone is well below that of the national average, BCP is safely assured that our project benefits will flow to the poorest of the poor. By these calculations, even if we engaged with the “richest” quartile of the community, we would still be guaranteed to benefit households living below the poverty line, since only 12% of households reported living above the poverty line.

Section G3.2 outlines the planned project activities, and sections CM1.1 and CM3.1 discuss the anticipated impacts of these projects on local communities and our methodology for evaluating them. As these sections describe, all of our community project activities are designed to improve local livelihoods, and to provide alternatives and incentives for local communities to reduce deforestation. Our main deforestation mitigation activities—including our Sustainable Eco-Charcoal Project and our Conservation Farming Training Program, are specifically designed to reduce the pressures that desperate households face to engage in activities that contribute to deforestation (such as additional clearing of lands for farming, or charcoal production), as a means of improving their food security or generating supplementary income.

In order to achieve our aim of sustainably reducing deforestation within the project zone, it is essential that BCP engages with the drivers and causes of such unsustainably high rates of deforestation. Poverty is one of the primary factors of life within the project zone that has contributed to such unsustainably high rates of deforestation. By addressing and reducing poverty, households will no longer feel such significant pressures to engage in deforestation as a means of securing income or food security. As such, BCP understands that in order for the Lower Zambezi REDD+ Project to be successful, we *must* reduce poverty among households living within the project zone. It is therefore essential that our project activities bring benefits to the poorest members of the community.

The aims and intentions of the Lower Zambezi REDD+ project have been made clear to local communities. As the project proceeds through the processes of project identification, design and implementation, in partnership with local community leaders and institutions, we will ensure that our projects target the poorest households, and that they are designed so as to achieve optimum positive benefits for participants.

Already, the Sustainable Eco-Charcoal Project and Conservation Farming Training Program (CFTP) are set to bring significant benefits to community participants. For example, the eco-charcoal project is already paying reformed unsustainable charcoal producers more than 50% more than they would normally make, and have equipped these producers with improved efficiency kilns that almost quadruple production amounts (with less labour). This model is expected to generate significant community benefits for local participants, and is also anticipated to provide a serious incentive for producers to switch to sustainable production methods and forest management, so as to receive a better price for their labour. Similarly, successful conservation farmers from other projects report more than a ten-fold increase in their crop yields, as a result of their adoption of conservation farming techniques. If similar results can be achieved through BCP's CFTP, this will generate significant benefits for participants—including increased income and improved food security. This will also reduce the pressures they may currently face to expand their fields so as to improve their agricultural production.

BCP's Social Monitoring Program requires that we complete regular overall (baseline) surveys of the stakeholders living within the project zone, as well as project-specific surveys for all participants (see BCP's Social Monitoring Program SOP, for more information).

This data will allow us to assess how participating households compare with the rest of the overall stakeholder community—ie: we will be able to identify whether or not participating households fall within the poorest 50% of the community, based on the extensive social data that we regularly collect.

Projects supported by BCP are designed to address the local drivers of deforestation, which include high levels of poverty and high dependency on charcoal production as a source of income. As such, BCP's livelihood improvement projects—such as the Eco-Charcoal Project, Village Chicken Project, and other alternative livelihood projects—will be automatically geared toward uplifting the poorest households and reducing dependency on unsustainable deforestation for charcoal production. Our baseline survey has clearly identified charcoal production as an activity undertaken by the poorest households in the community; this finding has been confirmed by numerous interviews with local charcoal producers, who argue that they dislike charcoal production because it involves hard labor and there is very minimal income, and claim they would stop producing charcoal if they only had a viable alternative.

Since all community projects are designed as deforestation mitigation activities (as opposed to “mere” community development or livelihood improvement projects), this link between reducing deforestation and participant benefits from BCP projects must be made clear, for example, through our use of innovative community covenants. As such, our community projects are specifically targeted at involving, providing alternatives to, and improving the condition of those households that are currently the poorest and most dependent on charcoal production in the stakeholder community living within the project zone for the Lower Zambezi REDD+ Project. Data collected through our Social Monitoring Program will be used to demonstrate that we are achieving our aims to do so, and that we are thereby complying with the criteria listed under Indicator GL2.2.

BCP's Community Engagement Strategy SOP clearly describes how BCP's projects are designed to benefit entire communities, and to address the related problems of poverty and deforestation in a holistic way. In so doing, our projects are specifically designed to include and benefit the poorest members of communities, as these are precisely the households that have been identified as ‘most dependent’ upon deforestation-dependent livelihoods.

Participatory Rural Appraisal (PRA) techniques identified that households that engage in charcoal production are in the 50% of households within the lowest category of well-being. Because our projects are designed to provide viable alternatives to households that are currently dependent upon livelihood activities that result in deforestation, our projects are targeted to inherently benefit “the poorest of the poor” in our stakeholder communities, since deforestation-dependent activities are most commonly and most seriously undertaken by those who are in the lowest category of well-being. For example, charcoal production is uniquely undertaken by the absolute poorest of the poor: charcoal production involves backbreaking labor and results in minimal payment (in some cases, producers must accept “payment in kind,” which is often paid in local brew). As numerous stakeholders have explained to us, charcoal production is a “last resort” activity; no one who has a viable option or alternative will engage in charcoal production. Since BCP’s projects are designed to address and reduce such activities, specifically unsustainable charcoal production within the Project Zone for the Lower Zambezi REDD+ Project, our projects are de-facto designed to include and benefit those households that are in the lowest category of wellbeing; certainly those that are among the poorest 50% of the community, since those are the households that have no other options, financially or socially.

As part of BCP’s Social Monitoring Program, BCP’s Baseline Survey gathered critical socio-economic data from a representative sample of the community stakeholders living within the Project Zone. From the data that was collected, BCP has calculated that an estimated 88% of community stakeholders live below the international poverty line (of \$1.25 USD per day). The median household income according to Baseline Survey data was 3,240 KR (\$632 USD), meaning that from a purely financial definition of poverty, the ‘lowest 50%’ of households could be identified as those who report income lower than this amount. As BCP’s Social Monitoring Program SOP describes data collected through our rigorous on-going Social Monitoring Program will easily allow us to identify those poorest households living within our Project Zone, and to track and monitor their involvement in BCP projects and the impacts that these projects have on their livelihoods.

However, it is certainly more accurate and reflective to define “poverty” in a more holistic way than purely financial terms. As the results of our Baseline Survey demonstrated, income was not necessarily an accurate indicator of household “wealth” or wellbeing, especially due to the high levels of subsistence agriculture taking place among stakeholders living within local communities. As such, taking a more holistic (and realistically reflective) view of poverty, BCP has defined poverty within the Project Zone using a number of important indicators:

1. Financial: income-based
 - Poorest (50%) do not generate income, or generate income below the median for households in the Project Zone
2. Access to education
 - Poorest (50%) of households do not have access to basic primary education
3. Access to healthcare
 - Poorest (50%) of households do not have access to basic healthcare
4. Access to clean water
 - Poorest (50%) of households do not have access to clean drinking water
5. Access to alternative energy
 - Poorest (50%) of households use charcoal for fuel and firewood for light, heat and cooking. These fuel sources contribute to deforestation, and also do not allow for additional promotion of ‘development technology’ such as the charging/powering of cell phones, radios or televisions [communication technology]
6. Access to markets
 - Poorest (50%) do not engage in commercial production activities other than charcoal, due to lack of access to transportation and/or markets. As such, and given the lack of alternative activities in the Project Zone, they exist purely on subsistence (agriculture) activities

Including all of these indicators in a more holistic understanding of poverty allows BCP to *confidently* state that we anticipate to benefit *at least* the poorest 50% of the community in our projects. We can demonstrate this in the following ways:

Education:

BCP has identified households without access to basic (primary) education as falling within the lowest category of wellbeing. As such, these poorest households are specifically addressed through the School Support Program of the BCP Trust, which is providing critical educational support to community schools in two zones—Chilimba and Mweeshang’ombe—which are also the poorest zones in the Project Zone (including in purely financial terms) according to our Baseline Survey³⁵. Currently, the **485 households** (42% of total household

³⁵ Nearly 70% of respondents from Chilimba and Mweeshang’ombe reported annual incomes of between 0 and 5 thousand KR—the lowest income category recorded by our Baseline Survey. This

population in the project zone) living within these two poorest zones have minimal or no feasible access to government-recognized primary education facilities. In Mweeshang'ombe, for example, students who wish to continue past Grade 3 must walk 30 km round-trip *daily* to attend the Namanongo Basic School, where additional school fees are often prohibitive for the majority of impoverished households. Attendance at these community schools is inconsistent—by both community teachers and students. The reasons for this are that these two communities struggle to mobilize the resources to pay community teachers who in turn are erratic. The poorest of the poor households also struggle to equip their children with school supplies. BCP is addressing this by co-funding community teacher salaries on condition of performance metrics, such as consistent teacher attendance. BCP is also assisting schools with school supplies so that children from the poorest households have equal access to learning materials.

The purpose of the BCP School Support Program is to ensure that children have access to quality primary education facilities—a critical indicator of improved livelihood among the absolute poorest of the poor. The BCP Trust School Support Program aims to improve access to primary education by providing key interventions designed to promote student attendance, teacher attendance, quality of curriculum and availability of school supplies to students. For example, our School Support Program has already doubled the number of teachers at the Chilimba Community School (from two to four teachers), where there are seven grade levels taught. Ultimately, the project is designed to convert current community (informal) schools into government-recognized “District” schools, within the next five years. Government recognition as a District School results in a flow of resources from the State, including Government trained teachers. This would greatly improve the access to quality education among the poorest of the poorest households living within the Project Zone for the Lower Zambezi REDD+ Project. A proposed scholarship program termed the “Forest Heroes” program will seek candidates through the Parent-Teacher Association who are from the poorest households within these two communities.

By aiming to improve access to basic primary education facilities for the 485 households in the two poorest zones of our Project Zone, BCP is confident that our School Support Program will be one of the multiple ways that we can ensure that our projects reach the poorest of the poor—the poorest 50% of households in an area where 88% of the overall population is anticipated to live below the international poverty line, already.

compares to approximately 65% of respondents from Namanongo, 35% from Ndubulula, and 60% of respondents, overall.

Access to Clean Water:

In addition to the educational support that BCP is providing to 485 households through our School Support Program, our Borehole Refurbishment Project is benefitting an *additional 115 households* (minimum estimate) from within the lowest category of wellbeing, by providing them with free access to clean drinking water. BCP identifies “access to clean drinking water” to be a critical indicator of health (and therefore “wealth”), and it seems safe to assume that those households that did not previously have access to clean drinking water could be considered among the lowest category of wellbeing. According to 2010 statistics listed on the CIA World Factbook page, only 46% of Zambians living in rural areas have access to clean drinking water. As such, this project is identified as a critical intervention that is confidently anticipated to improve wellbeing among those households within the lowest category of wellbeing, in an already impoverished and under-developed area.

Access to healthcare:

In addition to the support that BCP is providing in terms of education and access to clean drinking water, BCP is also making strategic investments in local healthcare, by providing support to the Namanongo Rural Health Centre. This support is designed to improve the nature and quality of healthcare available to residents living within the Project Zone, and is ultimately intended to transform the clinic into a more effective health centre where patients will be able to receive treatment for a variety of conditions. Currently, the clinic is severely under-staffed and under-resourced: there is only one full-time health worker on-site, and due to resource constraints, he is unable to perform many tests and medical procedures, and is mostly limited to making diagnoses and sending patients with “referrals” to other, more distant clinics where they can receive treatment. A recent visit to the clinic showed that there was no medication available for malaria patients, which is one of the most common diseases in the area. As such, patients suffering from even malaria would have to transport themselves to more distant health centers.

The Namanongo Rural Health Centre is the only healthcare facility in the Project Zone; otherwise, the nearest clinics are located in Sinjela and Chongwe—anywhere from 17 to 98 km away for rural households in the Project Zone. As such, the support that BCP Trust provides to the Namanongo Rural Health Centre has the potential to benefit all 1,167 households from our Project Zone, since this is the closest (and only) healthcare facility in the area. In order to be conservative, for quantification purposes, we have estimated that only the 344 households in Namanongo benefit from the health support program. We know however that more households in other zones use this specific clinic.

Furthermore, this support is guaranteed to go to those households living within the lowest category of wellbeing, as it will benefit those households who could otherwise not afford to access healthcare—due to the long distances and expensive fees related to transportation and medical services at private facilities or government facilities where a patient has not been referred by a local healthcare provider. Households in the lowest category of wellbeing (certainly within the poorest 50%) are therefore currently limited to the minimal services that are available at the Namanongo Rural Health Centre, as they are unable to access alternative sources of healthcare. As such, BCP support to the Namanongo Rural Health Centre is confidently anticipated to improve wellbeing among the poorest 50% of households within the Project Zone, as this support will improve the nature and quality of healthcare services that are available to those households that cannot feasibly access alternatives.

Access to tools of development and technology:

As BCP's Baseline Survey indicated, some households—those in higher categories of wellbeing—have been able to purchase solar panels and other technology, which allows them to charge cell phones, power radios and/or televisions (according to the baseline survey, approximately 50% of households own a solar panel—indicating potentially that the poorer 50% of households are those that do not possess solar panels). These technologies are critical development tools that allow for communication, access to news and information sharing. However, unfortunately, for the majority of households—especially those in the lowest category of wellbeing—access to solar and other forms of alternative technology is difficult and expensive. There is no access or connection to electrical grids available in the Project Zone. From BCP's experiences and PRA experience, many households—particularly the poorest of the poor—continue to use firewood for heat, cooking and light. As such, lack of access to electrical energy or viable sources of alternative energy are not only indicators of poverty, but also drivers of forest degradation.

In order to address (and improve) these development conditions and to reduce deforestation in the Project Zone, BCP has formed a strategic partnership with SunnyMoney—a Lusaka-based social enterprise—in an effort to promote the availability and access to solar technology among the poorest of the poor households; those who are most likely to be involved in cutting firewood for energy (including light and heat), and who are too poor to afford other alternative sources of energy.

Our Solar Empowerment Project is set to engage 4 local community members in this small-business opportunity to work as Solar Extension Agents, who will promote solar technology among those households in the lowest category of wellbeing. This project will be specifically targeted at providing solar technology to those households that are in the lowest category of wellbeing, who would otherwise lack access to viable alternatives and who would most likely continue to engage in deforestation in order to access fuel and energy sources. An initial Solar Empowerment Project launch event, scheduled for early June, is anticipated to provide a minimum of 100 households in Mweeshang'ombe with access to solar technology units and information. This launch would then be repeated across all four community zones, so as to target the poorest 100 households in each zone (a total of 400 households from the lowest category of wellbeing) for inclusion in the Solar Empowerment Project.

Food Security and Commercial Agriculture:

BCP's Baseline Survey demonstrated that while the majority of households are engaged in agriculture, for the poorest households, commercial agriculture is not an option due to the high cost of inputs and transportation, and lack of access to commercial agricultural markets. Through partner organizations such as Musika and the Zambian Conservation Farming Unit (CFU), BCP has launched a "Conservation Farming Training Program" (CFTP) that is specifically designed to include poor households in trainings about improved farming techniques, and access to agricultural markets. Through this program, those houses within the lowest category of wellbeing will be exposed to practices and opportunities that will allow them to produce agricultural products at a commercial scale, so as to allow them to generate income from agriculture, as opposed to activities such as unsustainable, illegal charcoal production.

BCP's CFTP, Sustainable Eco-Charcoal Project and Village Chicken Projects are all designed to improve rural producer livelihoods by providing producers with critical training (for improved, higher-quality products), linking producers to urban markets, and ensuring that producers are paid higher prices for their goods. All of these *improved livelihood alternative projects* are specifically targeted at those households within the lowest category of wellbeing, those that are among the poorest 50%, in an effort to improve their livelihoods and food security, and to thereby reduce their need to engage in activities that contribute to deforestation, such as the clearing of new areas for farming or engaging in unsustainable charcoal production. Currently, there are approximately 349 households **directly** benefitting from these projects and project-level employment (30 percent of total households). Within 2013, the number of participating households is anticipated to surpass 450.

Summary: BCP is already able to demonstrate that a significant percentage of community stakeholders are directly benefitting from BCP supported projects. The number of estimated households that are **indirect** beneficiaries of BCP’s Health, Education and Clean Water Programs are 944 households (approximately 81% of all households within the project zone) within the Project Zone, and this number is expected to increase significantly within the upcoming year. Given that our projects are specifically designed to target the root causes of high rates of deforestation, which especially includes poverty, BCP is specifically targeting “the poorest of the poor” (the poorest 50% of households living in our Project Zone, where 88% of households are already expected to live below the poverty line). As such, it is clear that BCP’s community-based deforestation mitigation and social services projects are confidently expected to impact the poorest 50% of households within our Project Zone, according to a variety of conceptions of poverty—including purely financially defined poverty—and certainly according to a holistic conception of poverty. BCP has specifically-designed interventions that are targeted at making critical improvements in the education, health and economic sectors of our community stakeholders’ lives.

GL2.3 – BARRIERS TO THE FLOW OF BENEFITS TO THE POOR

As GL2.2 describes, BCP's projects are designed and anticipated to be targeted towards the poorest of the poor: our SOP's concerning Community Engagement and BCP's Social Monitoring program outline these expectations, and describe how BCP intends to achieve, monitor and document these outcomes, and to identify barriers to benefit flows to the poor.

As BCP's PDD and SOP concerning Community Engagement describe, BCP has worked closely with local stakeholders to support and develop community-based institutions ("Zone Development Committees") that will be highly involved in decision-making about project design and implementation. BCP will work through these Zone Development Committees, which involve traditional leadership authorities, to explain the overall aims of each project and to identify the most suitable households for pilot-project participation and project implementation. As such, all decisions about project participants should be led and supported by local decision-making bodies, who will be instrumental in helping to describe, defend and legitimize such decisions to members of the local community. If any barriers become apparent, the project team will implement adaptive management to address barriers. This adaptive management approach will be implemented under the aegis of Molly Crystal, BCP's Human Rights Officer and BCP Trust Director. In the event that there is ever a perception of "unfairness," BCP anticipates that the local leaders and ZDC members who were involved in the decision-making process will be able to describe and defend the choices that were made to members of the local community. Their support and involvement in this process is intended to grant significant legitimacy to decisions made about BCP projects and participants, to avoid such accusations in the first place, and to appropriately respond in the event that any such perceptions arise.

Furthermore, given the high levels of overall need and poverty in the community, many of BCP's projects will be intended to benefit as many stakeholders as possible/as interested. For example, although our Conservation Farming Training Program began with a small pilot, in 2013, we are in the process of expanding this project to any and all interested participants in all community zones. As such, all community members are anticipated to at least have the opportunity to benefit from a number of "open participation" projects available to stakeholders within the project zone. Ideally, the majority of all community stakeholders will ultimately be receiving benefits from BCP projects, further helping to reduce the risk of any perceptions of "unfairness".

Our comprehensive Community Engagement Strategy was described in great detail in Section G3.8. All of our project activities have been designed and implemented through extensive consultation and engagement processes that have been undertaken with local community stakeholders, traditional leadership structures and hybridized community institutions. Our strategy relies heavily on promoting local ownership of projects; this has been done intentionally so as to reduce the threat that community politics or corruption could pose to the success of a project.

By ensuring that community participants perceive benefits from these projects, we have created a powerful incentive for these same participants to protect and support the projects on their own. As section G3.5 described, BCP has gone to great lengths to build capacity among local community stakeholders, project staff and project implementers. We have endeavoured to create strong systems that will minimize the risk of corruption in our projects. We have also made clear to the local communities that our support for projects is performance-based, and is therefore contingent upon community cooperation towards achieving BCP's overall aims of improving community livelihoods and reducing deforestation. As Section GL2.2 just described, the success of the projects will be contingent upon our ability to reduce poverty and bring benefits to the poorest of the poor in the communities that we work with. As such, it will be essential for BCP and local communities to cooperate together so as to ensure that project benefits reach the poor.

Based on our history of interactions with the communities living within the project zone, no barriers are anticipated preventing the flow of benefits to the poor. Our biggest concern with regard to this matter will be our ability to ensure that project benefits are perceived by the local community as being "fair," and to ensure that our projects do not raise issues such as jealousy among local community groups. To do this, we have engaged in an extensive consultation and involvement process with local communities. We will work closely with community-based representatives, traditional leaders and Zone Development Committees to develop the most effective projects and to identify the most appropriate project beneficiaries. Understanding and respecting the importance of involving all community groups in project activities, BCP will ensure to target under-represented groups (such as women and minorities) for project activities and benefits. Since all decisions about project implementation will be made in partnership with local communities, BCP will ensure to secure community support for the projects that we launch, including those that target under-represented groups and very poor households.

BCP staff have already demonstrated serious commitment to involve and include under-represented groups in our activities. Members of our Community Engagement Team have been known to walk long distances so as to access remote villages that may have difficulty attending other community meetings or events. We have specifically targeted youth through our School Support and Environmental Education outreach activities. We have also ensured to include members of multiple ethnic groups, marginalized poorest of the poor charcoal producers, and women in our Sustainable Eco-Charcoal and Conservation Farming activities, and we will continue to do the same for all other projects that we launch.

GL2.4 – POTENTIAL NEGATIVE IMPACTS ON POOR OR MORE VULNERABLE HOUSEHOLDS OR INDIVIDUALS

As was already highlighted in Section CM1, BCP does not anticipate any negative impacts from our project activities. The project design is specifically geared towards avoiding any negative impacts on poor and vulnerable households.

GL2.5 – EXCEPTIONAL COMMUNITY BENEFITS IMPACT MONITORING

Section CM3.1 outlines BCP's community impact monitoring strategy in great detail. As the section describes, our strategy has two main components: first, general socio-economic impact evaluations as part of BCP's Social Monitoring Program, and second, specific project impact evaluations. Women and poorer households are involved in project activities already, and female-headed households were surveyed in the baseline survey so the combination of these two approaches will be able to identify positive and negative impacts on poorer households and women.

Our project impact evaluations will be conducted in two, complementary ways, so as to allow for identification of impacts on individual participants as well as communities as a whole. As section CM3.1 describes, specialized impact surveys will be developed for each project, allowing BCP to assess the impacts that each project has on anticipated aspects of participant well being. Specifically anticipated impacts for each project are listed in Table 16 and it should be noted that such surveys will be designed so as to be capable of capturing both positive and negative impacts on participants. For example, participants could report a reduction in income or crop yields, if that were the case as a result of their participation in a project.

Additionally, Table 18 outlines the indicators that will be regularly assessed so as to track and monitor project impacts, insofar as they relate to BCP's broader aims of improving community livelihoods and reducing deforestation. These indicators will allow BCP to track community impacts from these projects, including: employment created, producer prices increased, additional revenue generated, crop yields increased, hectares under agriculture and school attendance. By also assessing potentially negative indicators (such as incidences of arrests of community members caught poaching or illegally deforesting within the Conservancy), BCP will be able to assess whether its projects are meaningfully improving community livelihoods and reducing deforestation, or whether they are having no, minimal or negative impacts towards these efforts.

Throughout all of our social and project monitoring efforts, BCP will remain mindful of the differentiated needs and experiences that certain community groups face. For example, when assessing the impacts that projects have on women, evaluations must be mindful of the broader social context in which these projects, and these benefits are taking place. In some instances, a woman receiving additional income may be viewed as a challenge by an abusive husband, and such complex individual and social dynamics must be taken into consideration when assessing the overall impacts that these projects have on participants. This is precisely why there is a comprehensive approach to our project impact evaluation efforts. In addition to collecting useful aggregate or community-level data, there is also value placed on conducting more specific surveys that more accurately capture the true impacts that our projects have on individuals within the community.

GL3. EXCEPTIONAL BIODIVERSITY BENEFITS

GL3.1 VULNERABILITY

The project area of the Lower Zambezi REDD+ Project fulfils vulnerability criteria GL3.1.2. The area is in the range of African wild dogs (*Lycaon pictus*), which are an endangered species according to the IUCN. Other endangered species in the project area include white backed (*Gyps africanus*) and hooded vultures (*Necrosyrtes monachus*).

Furthermore, the project area is utilized by vulnerable (VU) species, such as elephant (*Loxodonta Africana*) and lion (*Panthera leo*). Adjacent Lower Zambezi NP is occupied by approximately 2,150 elephant, which comprise part of an overall landscape estimate of 23,000 elephants in the Lower Zambezi-Mana Pools TFCA. Other vulnerable species in the project area include the greater spotted eagle (*Aquila clanga*), lappet faced vulture (*Torgos tracheliotos*) and white headed vulture (*Trigonoceps occipitalis*). There are numerous vulnerable southern ground hornbill (*Bucorvus leadbeateri*) in the project area.

The presence of these species has been proven by literature, direct sightings, observance of signs and experts, as well as by partners of the Lower Zambezi REDD+ Project, which have a long track record of working with wildlife in the area³⁶. A 2005 Aerial Survey illustrates estimated populations of elephants and other large mammals in the ecosystem (Simwanza 2005). Conservation Lower Zambezi have also provided a written testimonial regarding HCV sightings in the ecosystem. HCVs, such as lion and wild dog, have been reported in signed scout reports since 2002. Copies of these signed scout patrol reports have been provided to the Validator.

The project fulfils important and strategic landscape connectivity functions in a globally significant TFCA. The project area is a dispersal area for wildlife that is 21 km from Mana Pools NP which is a UNESCO World Heritage Site. This additional secure habitat that is contiguous with Lower Zambezi NP (which is contiguous to Mana Pools NP) is especially important given encroachment into the northern section of the Lower Zambezi NP, and a projected decline in conservation resources in adjacent GMAs such as Chiawa due to the tourism hunting ban of 2013.

³⁶www.conservationlowerzambezi.org

Standardized monitoring of the occurrence of the biodiversity will be implemented as part of the biodiversity monitoring procedures (see section B3.1). A special focus will be placed on HCV species, as conservation of those species is perceived as a major biodiversity benefit of the Lower Zambezi REDD+ Project.

The project thus qualifies under GL3.1.1 for both Vulnerability indicators: 1) presence of endangered species; and 2) presence of vulnerable species.

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LIST OF APPENDICES

Appendix A: Plant Species encountered during viability biomass assessment and observed by Mr. Mike Bingham.

Appendix B: Letter of request from Department of Education to upgrade Chilimba school

Appendix C: Letter of Support from the Chongwe District Council

Appendix D: Letters of support from Chief Unda Unda

Appendix E: Letters of support from village headman in the Project Zone

Appendix F: Letter from ZEMA exempting the project from EIA

Appendix G: Mineral prospecting license map

Appendix H: Letter of support from the Department of Forestry