



LOWER ZAMBEZI REDD+ PROJECT

NON-PERMANENCE RISK REPORT



Document Prepared by BioCarbon Partners

Contact Information www.biocarbonpartners.com

Project Title	Lower Zambezi REDD+ Project
Version	1.1
Date of Issue	05-02-2021
Project ID	PL1202
Monitoring Period	01-01-2020 - 31-12-2020
Prepared By	BioCarbon Partners
Contact	5th Floor, Barkly Wharf, Le Caudan Waterfront, Port Louis, Republic of Mauritius, Telephone: +260 211 290 051, Email: info@biocarbonpartners.com , Website: www.biocarbonpartners.com

CONTENTS

1	INTERNAL RISK	3
1.1	Project Management	3
1.2	Financial Viability	3
1.3	Opportunity Cost	4
1.4	Project Longevity	4
2	EXTERNAL RISKS	8
2.1	Land Tenure and Resource Access Impacts	8
2.2	Community Engagement	8
2.3	Political Risk	9
3	NATURAL RISKS	11
3.1	Fire	11
3.2	Pest and Disease	13
3.3	Extreme Weather	13
3.4	Geological Risks	13
3.5	Other – Elephant Impacts	13
4	OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION..	16
4.1	Overall Risk Rating	16
4.2	Calculation of Total VCUs	16

1 INTERNAL RISK

1.1 Project Management

BioCarbon Partners has its head office based in Lusaka, less than three hours' drive from the project area and there are well trained, experienced staff based at the conservancy, responsible for day to day management plus a Community Engagement Team living within the neighbouring communities. The Chief Executive Officer, Dr. Hassan Sachedina, has a proven track record in REDD+ verification, having been involved in three of the first VCS REDD+ projects in Africa, other than LZRP. Other staff members Theron Morgan Brown, David Gwenzi, Besa Kalinda, and Elvin Muchimba were all part of the team responsible for verifying the LZRP in the past years, including the baseline reevaluation in 2020. The LZRP has an overall Environmental Management Plan in place that has been submitted to the relevant authorities (Appendix A) that outlines the basic adaptive management strategy followed by BCP to ensure successful management of the project. The plan outlines monitoring basics for all the major activities and the feedback system that is in place to ensure corrective actions are taken. Management holds regular meetings (at least every quarter) to review the impact of project activities. There are several other SOPs for specific components such as forest monitoring and community engagement (referenced as Appendices in the monitoring report and submitted to the VVB), all of which describe monitoring feedback systems that ensure corrective actions are taken (Appendix A and Appendix B).

The project is implemented in natural forests on a private conservancy and no planted trees are used for GHG credits generation. For *M1-M8* monitoring periods, the cumulative encroachment in the project area has been under 1 %, thus enforcement is only required to minimize further encroachment but not to protect more than 50% of stocks on which GHG credits have previously been issued.

1.2 Financial Viability

The financial breakeven point calculations are included in Appendix C. The project passed its breakeven point in 2018 and cashflow in the future is predicted to remain positive.

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 has leveraged donor funds specifically to support and build upon community benefits.

To date, the Trust has benefited from the support of local donors such as USAID, Mills Foundation, CSEF and Musika.

The project is also diversifying revenues into other enterprises (namely Eco-Charcoal) to mitigate the risk of low carbon prices. In addition, the project invests in marketing the project

and its strategic conservation and poverty reduction benefits in order to seek higher credit prices.

1.3 Opportunity Cost

The baseline activities of LZRP are subsistence driven and therefore do not require a Net Present Value Analysis (NPV) as per the VCS Non-Permanence Risk Tool Version 4.0.

The Monitoring report covering this monitoring period lists all activities that are having positive community impacts and 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 and beneficial projects. The project certainly has positive socio-economic benefits and has been formerly certified under the CCBA Standard (<http://www.climate-standards.org/>) and received Gold validation for community benefits. 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 (Please see monitoring report). 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.

All project activities are monitored continuously to ensure they have positive benefits for communities and 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.

The LZRP project area is a private conservancy bordering the Lower Zambezi National Park, a strategic protected area in Zambia in a globally significant trans-frontier conservation area. Both areas, therefore, have provisions for management and conservation of wildlife habitat, guided by the Wildlife Act of Zambia.

1.4 Project Longevity

The project is being implemented on private land with a 99 year lease, signed in 2011 (Appendix D), and the project proponent has a long term carbon rights agreement in place with the title deed holder. The contractual agreement is for a 30 year project. Activities will be carried out initially for 30 years.

A long term active adaptive management plan covering the project period is in place for LZRP and has been submitted to the Zambian Forestry Department (Appendix E) and the Climate, Community and Biodiversity Alliance (CCBA). The long term financial plan has been submitted

to a financial institution in Zambia, AMOCPA Certified Public Accountants (Appendix E) in agreement with requirements of the VCS.

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Not applicable	
c)	Not applicable	
d)	Not applicable	
e)	Mitigation: Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (e.g., individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.	-2
f)	Mitigation: Adaptive management plan in place.	-2
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-4
Total may be less than zero.		

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Not applicable	
c)	Not applicable	
d)	Not applicable	
e)	Not applicable	
f)	Not applicable	
g)	Not applicable	
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	0
i)	Mitigation: Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven	-2
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		0
Total may not be less than zero.		

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Not applicable	
c)	Not applicable	
d)	Baseline activities are subsistence-driven, net positive community impacts are demonstrated	0
e)	Not applicable	
f)	Not applicable	
g)	Not applicable	
h)	Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over the length of the project crediting period (see project longevity)	-2
i)	Not applicable	
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)]		-2
Total may be less than 0.		

Project Longevity		
a)	Not applicable	
b)	With legal agreement or requirement to continue the management practice	15
Total Project Longevity (PL)		15
May not be less than zero		

Internal Risk	
Total Internal Risk (PM + FV + OC + PL)	9
Total may not be less than zero.	

2 EXTERNAL RISKS

2.1 Land Tenure and Resource Access Impacts

Although some people had settled on the property due to a confusion of the boundary position, the issue has been resolved and the area settled has been excluded from the project area.

The Rufunsa Conservancy has a free and clear title deed (Appendix D). 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. Through BCP, the property is also covered by BCP's Investment Protection Certificate which further reduces the risk of appropriation. It is highly unlikely that this land risks expropriation again. In addition, the project invests 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 REDD+ project. 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.

2.2 Community Engagement

In an initial survey of people in the project zone in 2012, a very high proportion of households bordering the project area were consulted in an area extending 20 km north of the project boundary and 95% have agreed to the implementation of the LZRP (please see Appendix F).

None of the households were dependent on the conservancy, bar the few that illegally settled within the conservancy boundary prior to the project start and have been consulted about the project. The survey was redone in 2017 and 91% of the respondents were aware that the project is protecting the conservancy (also see Appendix F) and 96% said they supported the project.

Direct dependency on the project accounting area is too low to show up in survey data. It mostly consists of illegal poaching and illegal timber felling. Community scouts patrol the conservancy to prevent such activities. While patrol records show that the number of man days used for conservation activities in the conservancy has greatly increased, the poaching of wild animals and illegal logging has not increased. For instance, the LZRP dashboard data shows that there were 11 animals detected as poached in 2014, but only 4 in 2018 even though the number of conservation man power days used in 2014 was only 298 compared to 4048 in 2018. This suggests that the number of people depending on the project area is not increasing and that there is increased awareness among those that used to depend on the area for these illegal activities. This shows that certainly more than 20 % of people reliant on the project area have been consulted and are aware of the project.

As stated earlier, the project received Gold Community benefits validation from the CCBA and is benefiting the poorest of the poor community members.

2.3 Political Risk

Zambia is a stable and peaceful country with a well-established democracy, although it does not get a high international governance score. 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 REDD+ 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. 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.

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Ownership and resource access/use rights are held by different entity(s) (e.g., land is government owned and the project proponent holds a lease or concession)	2
c)	Not applicable	
d)	Not applicable	
e)	Not applicable	
f)	Mitigation: Project area is protected by legally binding commitment (e.g., a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period	-2
g)	Not applicable	
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]		0
Total may not be less than zero.		

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Not applicable	
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area	-5
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5
Total may be less than zero.		

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable	
b)	Not applicable	
c)	Governance score of -0.32 to less than 0.19	2
d)	Not applicable	
e)	Not applicable	
f)	Mitigation: Country is implementing REDD+ Readiness or other activities, UN REDD Country.	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		0
Total may not be less than zero.		

External Risk	
Total External Risk (LT + CE + PC)	0
Total may not be less than zero.	

3 NATURAL RISKS

3.1 Fire

Fire is a natural phenomenon in all the higher rainfall African savannahs and is essential for the maintenance of the ecosystem, however, most fires are anthropogenic in origin and natural fires caused by lightning strikes are estimated to contribute to as little as 10 % of fires (Trollope 1993). Studies on fire impacts in African savannahs generally don't distinguish between the impacts of anthropogenic and natural fires, thus the literature review below discussing the impacts of fire should be read in the context that natural fires make up as little as 10 % of fires.

Furthermore, 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 1000 mm, 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 rainfall 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 447-737 mm/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.

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. A remote sensing fire incidence study spanning eight years (Archibald et al. 2010) found that 33 % of Zambian uncultivated Savannah Woodlands (such as Rufunsa Conservancy) with a median fire return interval of 2.2 years with a peak of fires in August. 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 Cumulative Deforestation Model, indicating that fires are most likely of a low intensity.

Extrapolating over a 100 years, there could thus possibly be 45 fires of which approximately 5 could be of natural origin. As no data is available on the intensity of fires, or reliable data for more than 20 years on frequency, the VCS Non-Permanence Risk guidelines will be followed and it is assumed that some of the five natural fires occurring within a 100-year period may well be intense. This is not unlikely as thunderstorms only start at the end of the dry season which have conditions conducive to high intensity fires as opposed to cool fires early in the dry season. Mapaure (2013a) found a stem mortality rate of only 4 % in late burnt, un-thinned miombo treatment plots. Chidumayo (1997) states that in old growth such as those found in the project area, there is little to be achieved by fire control and in his re-analysis of the 11 year Ndola fire trials in Zambia (Trapnell 1959) that in the case of annual consecutive late season fires the mortality of trees is 1.58 %. If the average of these studies are taken then the impact is 6% and if such an event then occurred across 33 % of the project area it could potentially impact 0.02 % of carbon stocks. Based on this, the likelihood of a natural fire is every 10-25 years affecting less than 5 % of carbon stocks.

In order to mitigate fire risks, BCP runs a fire management system on Rufunsa Conservancy, in partnership with neighbouring communities, with the specific aim of preventing potentially damaging, hot, late season fires. Fire management is done through introducing a system of firebreaks and controlled, rotational early burns. BCP also encourages 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. BCP monitors fire

hot spots detected by VIIRS and MODIS satellites and beginning 2020 BCP is targeting an annual 20 % reduction in the number of late dry season fires.

3.2 Pest and Disease

This risk is considered unlikely, there are no records of disease or pest outbreaks causing any significant impacts (>5%) to carbon stocks in Miombo woodlands. No known literature has documented forest disturbance from pests and diseases in the project area.

3.3 Extreme Weather

Zambia is not impacted by hurricanes. Droughts could possibly be considered an extreme weather phenomenon. However, this risk is considered unlikely and there are no records of drought causing any significant impacts (>5 %) to carbon stocks in Miombo woodlands. No known literature has documented forest disturbance from extreme weather conditions in the project area.

3.4 Geological Risks

Zambia is geologically stable and the risk of earthquakes and volcanoes occurring is unlikely. There is therefore, no risk of significant (>5 %) impacts on carbon stocks in the project area due to geological phenomena.

3.5 Other – Elephant Impacts

There are elephants in the project area. The impact of elephants on woody vegetation is a hotly debated topic in African conservation. Elephants do have some impact on woody species density (Guldemon & Van Aarde 2008). 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. A simulation model based on studies of Miombo in Zimbabwe has found that elephants at a density of >2 per km² can convert woodland to shrubland in a 10-year period and at densities around 0.27 per km² it will take 120 years to convert to shrubland (Mapaure 2013). Elephants do not occur at such densities in the project area.

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

Natural Risk (Fire)	
Significance	Insignificant (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)
Likelihood	Every 10 to less than 25 years
Score (LS)	1
Mitigation	0.25

Natural Risk (Pest and disease outbreaks)	
Significance	No Loss
Likelihood	Once every 100 years or more, or risk is not applicable to the project area
Score (LS)	0
Mitigation	Not applicable

Natural Risk (Extreme weather)	
Significance	No Loss
Likelihood	Once every 100 years or more, or risk is not applicable to the project area
Score (LS)	0
Mitigation	Not applicable

Natural Risk (Geological risks)	
Significance	No Loss
Likelihood	Once every 100 years or more, or risk is not applicable to the project area
Score (LS)	0
Mitigation	Not applicable

Natural Risk (Other - Elephants)	
Significance	Insignificant (less than 5% loss of carbon stocks) or transient (full recovery of lost carbon stocks expected within 10 years of any event)
Likelihood	Every 50 to less than 100 years
Score (LS)	0
Mitigation	0.5

Score for each natural risk applicable to the project (Determined by $LS \times M$)	
Fire (F)	0.25
Pest and Disease Outbreaks (PD)	0
Extreme Weather (W)	0
Geological Risk (G)	0
Other natural risk (ON)	0
Total Natural Risk (as applicable, $F + PD + W + G + ON$)	0.25

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	9
External Risk	0
Natural Risk	0.25
Overall Risk Rating (a + b + c)	10

4.2 Calculation of Total VCUs

Year	Current Baseline Emissions (tCO ₂ e)	Current Project Emissions (tCO ₂ e)	Current Leakage (tCO ₂ e)	NERs (tCO ₂ e)	Buffer account (tCO ₂ e)	VCUs (tCO ₂ e)
2020	210,737	0	0	210,737	-21,074	189,663

5 APPENDICES

Appendix A	Rufunsa Conservancy Management Plan. Confidential.
Appendix B	Community Engagement. Confidential
Appendix C	Financial Viability Breakeven Analysis. Confidential
Appendix D	Carbon Rights Covenant between BioCarbon Partners and Land Owner. Confidential
Appendix E	Project Support Documents. Confidential
Appendix F	Social Monitoring Surveys. Public

6 REFERENCES

- Archibald, S., D. P. Roy, B. W. Van Wilgen, and R. J. Scholes. 2009. What limits fire? An examination of drivers of burnt area in Southern Africa. *Global Change Biology* 15:613-630.
- Archibald, S., R. J. Scholes, D. P. Roy, G. Roberts, and L. Boschetti. 2010. Southern African fire regimes as revealed by remote sensing. *International Journal of Wildland Fire* 19:861-878. Available: <http://www.unicef.org/infobycountry/>.
- Bond, W. J. and S. Archibald. 2003. Confronting complexity: fire policy choices in South African savannah parks. *International Journal of Wildland Fire* 12:381-389.
- Chidumayo, E. N. 1997. Miombo ecology and management: an introduction. Stockholm, Stockholm Environmental Institute.
- Chidumayo, E. N. 1988. A re-assessment of effects of fire on miombo regeneration in the Zambian Copperbelt. *Journal of Tropical Ecology* 4:361-372.
- Guldemon, R. and R. Van Aarde 2008. A Meta-Analysis of the Impact of African Elephants on Savanna Vegetation. *The Journal of Wildlife Management* 72(4): 892-899.
- Higgins, S. I., W. J. Bond, E. C. February, A. Bronn, D. I. W. Euston-Brown, B. Enslin, N. Govender, L. Rademan, S. O'Regan, A. L. F. Potgieter, S. Scheiter, R. Sowry, L. Trollope, and W. S. W. Trollope. 2007. Effects of four decades of fire manipulation on woody vegetation structure in savannah. *Ecology* 88:1119-1125.
- Mapaure, I. 2013a. Short-term responses of shrub layer communities to dry season fires and tree thinning in semi-arid miombo woodlands of north-western Zimbabwe. *Afr. J. Plant Sci.* 7(9): 414-425
- Mapaure, I. 2013b. A preliminary simulation model of individual and synergistic impacts of elephants and fire on the structure of semi-arid miombo woodlands in northwestern Zimbabwe. *Journal of Environmental Microbiology* 1(1): 76-93.
- Ribeiro, N, Herman H. Shugart, H.H, and Washington-Allen, R.A. (2008). The effects of fire and elephants on species composition and structure of the Niassa Reserve, Northern Mozambique. *Forest Ecology and Management* 255(5):1626-1636.
- Staver, A. C., S. Archibald, and S. Levin. 2011a. Tree cover in sub-Saharan Africa: Rainfall and fire constrain forest and savannah as alternative stable states. *Ecology* 92:1063-1072.
- Staver, A. C., S. Archibald, and S. A. Levin. 2011b. The global extent and determinants of savannah and forest as alternative biome states. *Science* 334:230-232.
- Trapnell, C. G. 1959. Ecological Results of Woodland and Burning Experiments in Northern Rhodesia. *Journal of Ecology* 47(1): 129-168.

Trollope, W.S.W., 1993. Fire regime of the Kruger National Park for the period 1980 – 1992. Koedoe, 36, 2: 45-52.