



LUANGWA COMMUNITY FORESTS PROJECT



Document Prepared by BioCarbon Partners

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Luangwa Community Forests Project is a large-scale REDD+ grouped project implemented on communal land and private ranches across Eastern, Lusaka, Central and Muchinga Provinces, Zambia. It includes four project activity instances: PA1 - 943,646ha (AA - 485,495ha), PA2 - 92,990ha (AA- 50,730 ha), PA3-199,622 ha (AA- 122,856 ha) and PA4 - 901,147 ha (AA- 513,011 ha, pending validation). By the end of this monitoring period the total project area and accounting area are 2,137,405 ha and 1,172,092 ha respectively. The project implementation is in partnership with the communities, their respective traditional authorities and the Government of Zambia. Emissions reductions are achieved by avoiding deforestation through direct conservation support, engagement and capacity building with key Government and community stakeholders. The baseline scenario is unplanned deforestation mainly driven from subsistence agriculture, contributing to poverty, biodiversity loss and increased poaching. The project's community objective aims to alleviate poverty to at least 20,000 households, with a focus on poor and vulnerable groups. Its biodiversity goals includes preserving a wildlife corridor linking several national parks in Zambia's 4th largest river system, and protecting endangered species by reducing poaching. Climate objectives focus on avoiding deforestation and helping communities and biodiversity adapt to climate change through income diversification, improved farming, crop diversification, and habitat corridors maintenance. Project area boundaries were defined at validation with regular aerial and ground patrols to ensure compliance. Each monitoring period includes inventorying 20% of accounting and proxy area biomass plots and 100% of leakage area plots; for the current monitoring period (M6), the biomass dataset was updated as per the monitoring plan. Remote sensing tracks disturbance and fires, while wildlife and biodiversity are monitored through annual transects surveys and random ground patrols.

During this monitoring period, a CDM update was conducted in response to a FAR raised during previous verification (M5). The project's implementation and crediting period began on 1 May 2015 and runs until 30 April 2045. The second, third and fourth project activity instances started on the 11th of August 2021, 1st January 2022 and 1st January 2023, respectively, and will also continue through the 30th April 2045. Over the 30-year project period the total estimated gross emissions reductions from all four project instances amounts to 148,030,169 tCO₂e, averaging 4,934,33 9tCO₂e/yr. The combined estimated gross emissions reduction of the four project activity instances for the current monitoring period (1 January 2023 to 31 December 2023) is 3,004,873 tCO₂e. In the current monitoring period, there was NPRR¹ risk factor deduction of 21% -631,023 tCO₂e), resulting in the total final Issuance of 2,373,847 tCO₂e VCUs.

¹ Check the Non-Performance Risk Report for M6.

1.2 Audit History

Table 1. Summary of the audit history of the LCFP

Audit Type	Period	Program	VVB Name	Number of years
Validation	14 October 2019	VCS	SCS Global Services (SCS)	-
Verification	1-May-2015 to 31-Dec-2018	VCS	SCS Global Services (SCS)	3.8
Verification	1-January-2019 to 31-December-2019	VCS	Aenor International S.A.U.	1
Verification	1-January-2020 to 31-December-2020	VCS	Aenor International S.A.U.	1
Verification	1-January-2021 to 31-December-2021	VCS	Aenor International S.A.U.	1
Verification	1-January-2022 to 31-December-2022	VCS	Aenor International S.A.U	1
Verification ²	1-January-2023 to 31-December-2023	VCS	Aenor International S.A.U	1
Total				8.8

² Current active verification

1.3 Sectoral Scope and Project Type

Sectoral scope	Agriculture, Forestry, and Other Land Use (AFOLU)
AFOLU project category	Reduced Emissions from Deforestation and Degradation (REDD)
Project activity type	Avoiding Unplanned Deforestation and/or Degradation (AUDD)

1.4 Project Proponent

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Title	Board Chairperson
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Organization name	Mpanshya Community Forest Management Group
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Organization name	Shikabeta Community Forest Management Group
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Organization name	Sandwe Community Forest Management Group
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Email	
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Email	

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Organization name	Mwape Community Forest Management Group
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Organization name	Nabwalya Community Forest Management Group
Contact person	Mathews Mwansa

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Organization name	Kakoko Community Forest Management Group
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Organization name	Chibulika Community Forest Management Group
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Organization name	Chifunda Community Forest Management Group
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Organization name	Chisomo Community Forest Management Group
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Organization name	Kasumba Community Forest Management Group
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1.5 Other Entities Involved in the Project

Organization name	Munyamadzi Game Ranch
Role in the Project	Landowner of Munyamadzi project area
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Organization name	Nyakolwe Game Ranch
Role in the project	Landowner of Nyakolwe project area
Contact person	Iqbal Aloo
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Organization name	Nyamvu Game Ranch
Role in the project	Landowner of Nyamvu project area
Contact person	Zaid Patel
Title	Director
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Email	Zaid137@hotmail.com

Organization name	Kazumba Game Ranch
Role in the project	Landowner of Kazumba project area
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Title	Director
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Organization name	United States Agency for International Development (USAID)
Role in the project	Initial Funder
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Organization name	Forestry Department (FD)
Role in the project	National Government Regulatory Authority
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Organization name	Department of National Parks and Wildlife (DNPW)
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Role in the project	National Government Regulatory Authority
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Organization name	Ministry of Chiefs and Traditional Affairs Provincial Office
Role in the project	National Government Regulatory Authority
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Organization name	Pia Manzi Wildlife Limited and Luansemfwa Safaris Limited
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Organization name	Bee Sweet
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Role in the project	Agricultural Extension Support
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Organization name	Ministry of Agriculture
Role in the project	Agricultural Extension Support
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Organization name	Ministry of Agriculture
Role in the project	Agricultural Extension Support
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Organization name	Ministry of Agriculture
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Organization name	Ministry of Agriculture
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Organization name	Ministry of Agriculture
Role in the project	Agricultural Extension Support
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1.6 Project Start Date

MR.2

Project start date	1-05-2015
Justification	Project area boundary demarcation works and activity that lead to emissions reductions in 5 of the initial 12 chiefdoms participating in the project commenced in April 2015. Consequently, May 1, 2015, was selected as the project start date.

The first activity instance start date coincides with the project start date while the second and third and fourth project activity instances start dates August 11th 2021, January 1st 2022 and 1st January 2023 respectively.

For all newly included Instance 4 chiefdoms, in the current monitoring period, community engagement and forest area delineation commenced in 2021/2022. By the third quarter of 2022, all participating communities had successfully established their project boundaries. By the last quarter of the same year, 80% of these communities had been officially recognized by the Government as Community Forest Management Groups (CFMGs), granting them legal rights to use, control, and manage their forest areas.

The delineation of forest areas and the official recognition of new communities as CFMGs by government represent critical milestones, as they provide communities legal authority to manage their forests, a key step toward securing emission reductions (ERs). Since project area delineation and official CFMG recognition are fundamental activities leading to the generation of ER's and both were completed by the last quarter of 2022, the project officially set January 1, 2023 as the start date for the new 4th instance (supporting documentation has been provided to the VVB).

Although two of the new instances (Chembe and Mboloma) received CFMG recognition in the first quarter of 2023, the selection and delineation of project areas, a key activity that contributed to the ER generation, were completed in 2022. In addition, project activities like enhancing good natural resources governance through Community Resource Board formation/ elections support and community scouts recruitment commenced in 2022 (supporting documentation has been provided to the VVB), Therefore, meeting the necessary requirements for the start date of 1st January 2023.

1.7 Project Crediting Period

MR.3

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other (The project has a 30 years Crediting period which is in line with section 3.9.3 of the VCS-standard-v4.7 (i.e. For all AFOLU projects other than such ALM projects described in 3.9.2, the initial project crediting period shall be a minimum of 20 years up to a maximum of 100 years, which may be renewed at most four times, with a total project crediting period not to exceed 100 years.)
Start and end date of first or fixed crediting period	01-05-2015 to 30-04-2045

The second, third and fourth project activity instances crediting period start dates are August 11th, 2021, January 1st, 2022 and January 1st, 2023, all lasting up to April 30th, 2045 for a period of 23.7, 23.3 and 22.3 years respectively.

1.8 Project Location

All the areas identified under the first, second, third and fourth project activity instances (Table 2 and Table 3), lie in the Eastern, Lusaka, Central and Muchinga Provinces of Zambia and fall into the Luangwa Zambezi River ecological zone and the Central Southern and Eastern Plateau Zone (Figure 1). In addition, all activity instances are situated in the Game Management Areas (GMA) within the respective Chiefdom areas. The project sites in Eastern Province are bordered by the South and North Luangwa National Park and Luangwa River on the North-Western border. The project area consists of five sites in Lusaka Province in Rufunsa, Luangwa and Kafue Districts, one on each side of the great east road in Shikabeta and Mpanshya chiefdoms, two sharing the Lower Zambezi National Park's (LZNP) Eastern boundary in Mburuma and Mphuka chiefdoms and one sharing a portion of the LZNP's western boundary in Chiawa Chiefdom. The second instance also includes the Mpanshya Wildlife Corridor, an area identified to function as an ecological corridor between two disconnected project areas of Mpanshya and with Shikabeta, in addition it acts as a link to two ecologically significant ecosystems, i.e. the Luangwa and Lower Zambezi ecosystems. The project also includes 6 project chiefdoms in Chama, namely Chifunda, Chikwa, Tembwe, Kambombo, Mululo and Lundu. Two chiefdoms in Mpika district i.e. Mukungule and Nabwaliya and 3 chiefdoms in Luano Districts, namely, Chisomo, Chembe and Mboroma Chiefdom.

The other nine first instance project sites lie in the eastern province of Zambia in Mambwe, Lundazi, and Nyimba Districts. Project sites in Mambwe Districts are Mnkhangya, Jumbe, Nsefu, Malama, and Msoro. In Lundazi District there is one project site in Mwanya Chiefdom. The project area in Mwanya is bordered by Lukusuzi National Park and Luambe National Park area. There are two sites in Nyimba District one each in Nyalugwe and Luembe chiefdom. The geographic boundaries of the project area and a full description of the boundaries of each site can be found in the shapefiles and narratives in Appendix I. Below is the location map of the project area.

MR.4

Table 2. Summary of Project Area: REDD+ Project Zones under communal tenure, for all four project activity instances.

Project Activity Instance	Community Resource Board	Game Management Area	Chiefdom	Project Area (ha)	Forest Area (ha)
1	Mpanshya	Rufunsa	Mpanshya	84,530	82,183
1	Shikabeta	South Luano	Shikabeta	118,102	111,968
1	Mwanya	Lower Lumimba	Mwanya	81,668	59,030
1	Luembe	West Petauke	Luembe	288,726	254,582
1	Nyalugwe	West Petauke	Nyalugwe	60,893	58,809
1	Msoro	Lower Lupande	Msoro	24,688	23,523
1	Malama	Lower Lupande	Malama	21,577	17,220
1	Mnkhangya	Upper Lupande	Mnkhangya	33,623	29,081
1	Jumbe	Upper Lupande	Jumbe	15,443	11,066
1	Nsefu	Upper Lupande	Nsefu	39,801	25,341
1	Chitungulu	Lumimba	Chitungulu	38,764	28,681
1	Sandwe	Sandwe	Sandwe	92,362	85,767
2	Mpanshya Corridor	Rufunsa & Luano	Mpanshya & Shikabeta	15,271	13,430
3	Kazembe	Upper Lumimba	Kazembe	18,515	13,241
3	Mwape	Chisomo	Mwape	20,500	18,845
3	Chiawa	Rufunsa	Chiawa	68,206	64,343
3	Mphuka	Rufunsa	Mphuka	25,881	24,541
3	Mburuma	Rufunsa	Mburuma	66,520	62,537

4	Kambombo	Musalangu	Kambombo	77,182	60,081
4	Chikwa	Musalangu	Chikwa	81,691	73,541
4	Chifunda	Musalangu	Chifunda	37,197	30,734
4	Mukungule	Mukungule	Mukungule	31,469	30,380
4	Nabwalya	Musalangu	Nabwalya	67,047	22,706
4	Lundu	Musalangu	Lundu	30,490	29,934
4	Kasumba	Open Area	Bundabunda	739	666
4	Luembe Corridor	West Petauke	Luembe	4,727	4,581
4	Chibulika	Musalangu	Lundu	43,728	41,649
4	Tiyeseke	Musalangu	Mulilo	17,526	13,677
4	Chisomo	Chisomo	Chisomo	157,802	128,062
4	Shikabeta Expansion	South Luano	Shikabeta	30,412	28,327
4	Kazembe Expansion	Upper Lumimba	Kazembe	12,965	10,298
4	Mboshya	North Luano	Mboshya	45,660	38,217
4	Kakoko	Musalangu	Mukungule	16,189	15,310
4	Tembwe	Musalangu	Tembwe	23,279	22,073
4	Chembe	North Luano	Chembe	107,254	84,729
4	Mboroma	North Luano	Mboroma	115,790	108,819
	Total			2,016,217	1,714,542

Table 3. Summary of Project Area: REDD+ Project Zones on Private Land for both project activity instances.

Project Activity Instance	Game Ranch	Chiefdom	Project Area (ha)	Forest Area (ha)
1	Munyamadzi	Luembe	18,671	16,449
1	Pia Manzi	Nyalugwe	24,798	22,393
2	Nyakolwe	Luembe	57,706	32,013
2	Nyamvu	Luembe	15,238	7,176
2	Kazumba	Luembe	4,775	2,732
	Total		121,188	80,763

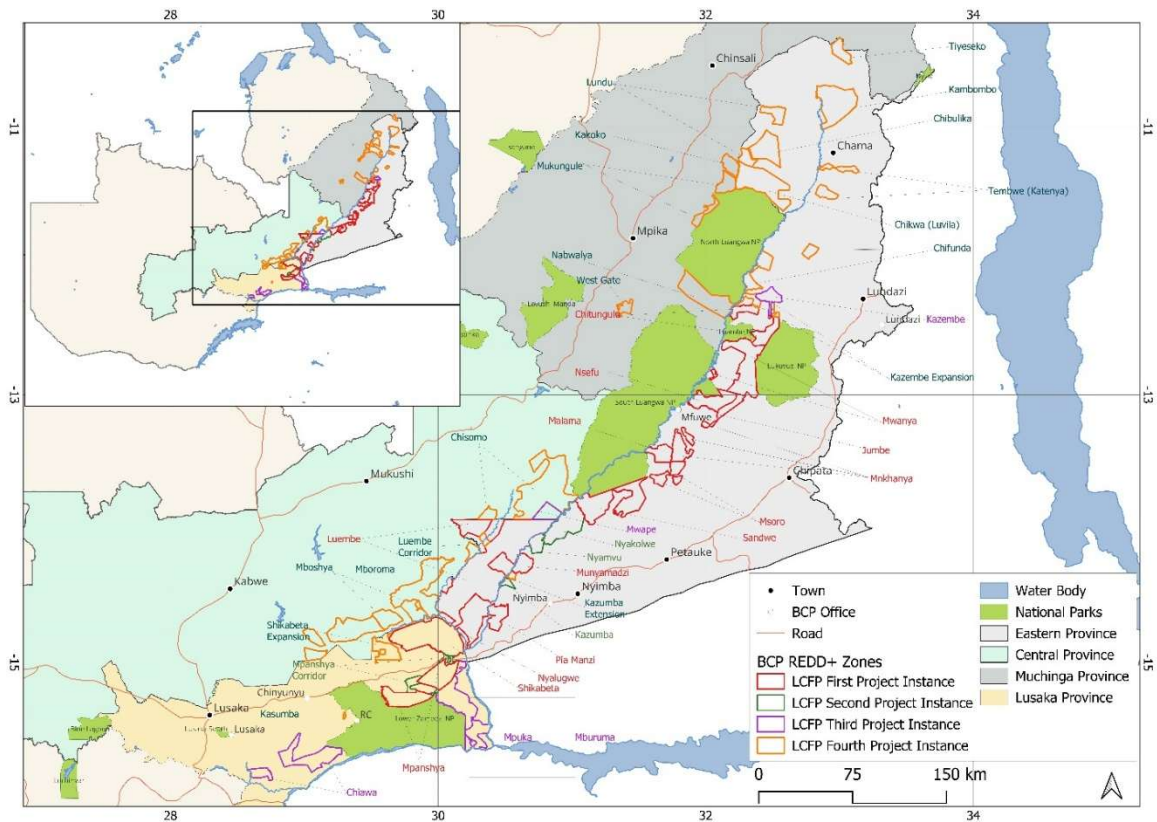


Figure 1. LCFP First, Second, Third and Fourth Project Activity Instances (MR.1, MR.5).

MR.6

As described in detail in section 1.1.2 of the PD, a GIS analysis of deforestation map from 2007 to 2017 was used to identify key constraints to conversion. The two factors that stood out most prominently are distance from roads and slope. These factors make sense since roads provide access to forested areas for farmers and charcoal makers. Farmers who are responsible for most deforestation prefer to cultivate on relatively flat ground which will better hold soil moisture and is easier to work with oxen (which some farmers have). The analysis found constraints to conversion at greater than 45% slope and greater than 6.5 km distance from a road. Therefore, to calculate the project accounting area, a polygon buffer covering 6.5 km from roads was clipped from the project area. Then, areas of high slope and areas that were not forest at each project instance start date, were also removed from the accounting area polygon.

Maps of the accounting area with topography (areas greater than 45% slope), roads, major rivers and perennial streams, land-use (forest map), and accounting area boundaries are shown in Figure 2, Figure 3, Figure 4, and Figure 5.

The project is bound between Lat: 10°19'12.78"S, Long: 28°30'23.64"E(NW Corner), Lat: 10°19'12.78"S,Long: 33° 8'59.41"E (NE Corner), Lat: 15°55'58.80"S,Long: 33° 8'59.41"E (SE Corner), and Lat: 15°55'58.80"S,Long=28°30'23.64"E) (SW corner).

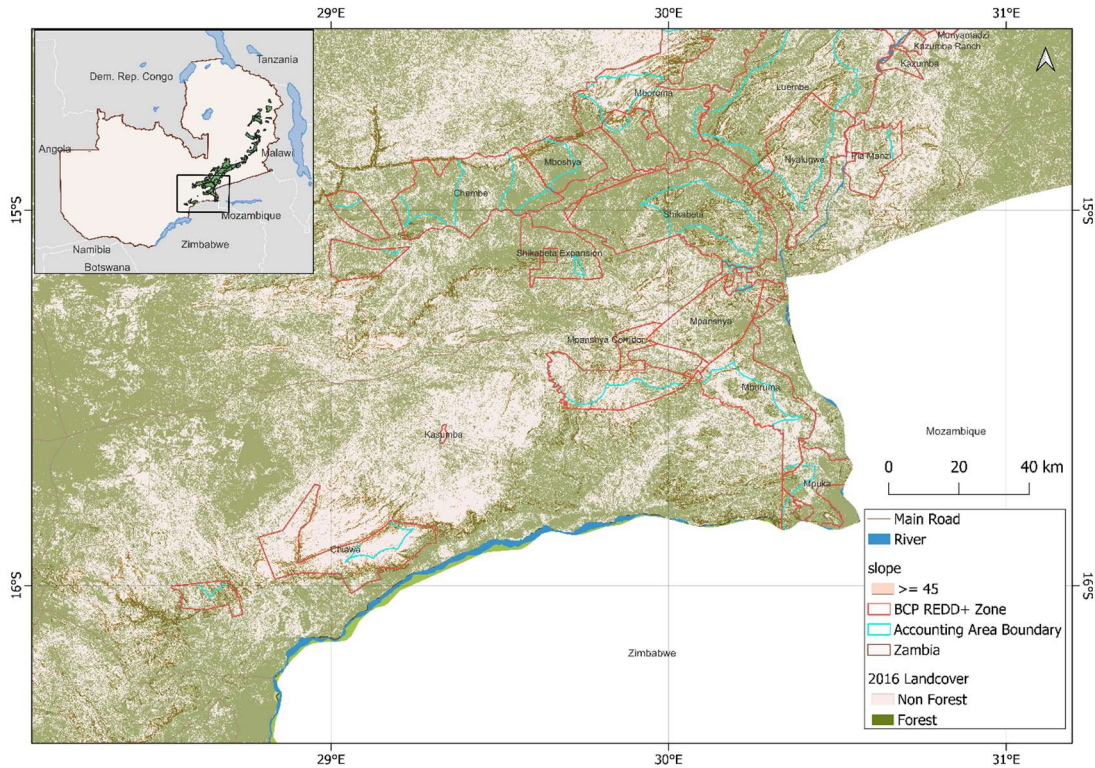


Figure 2. Shikabeta, Mpanshya, Mpanshya Wildlife Corridor, Mburuma, Mphuka, Chiawa and Kasumba Accounting Areas

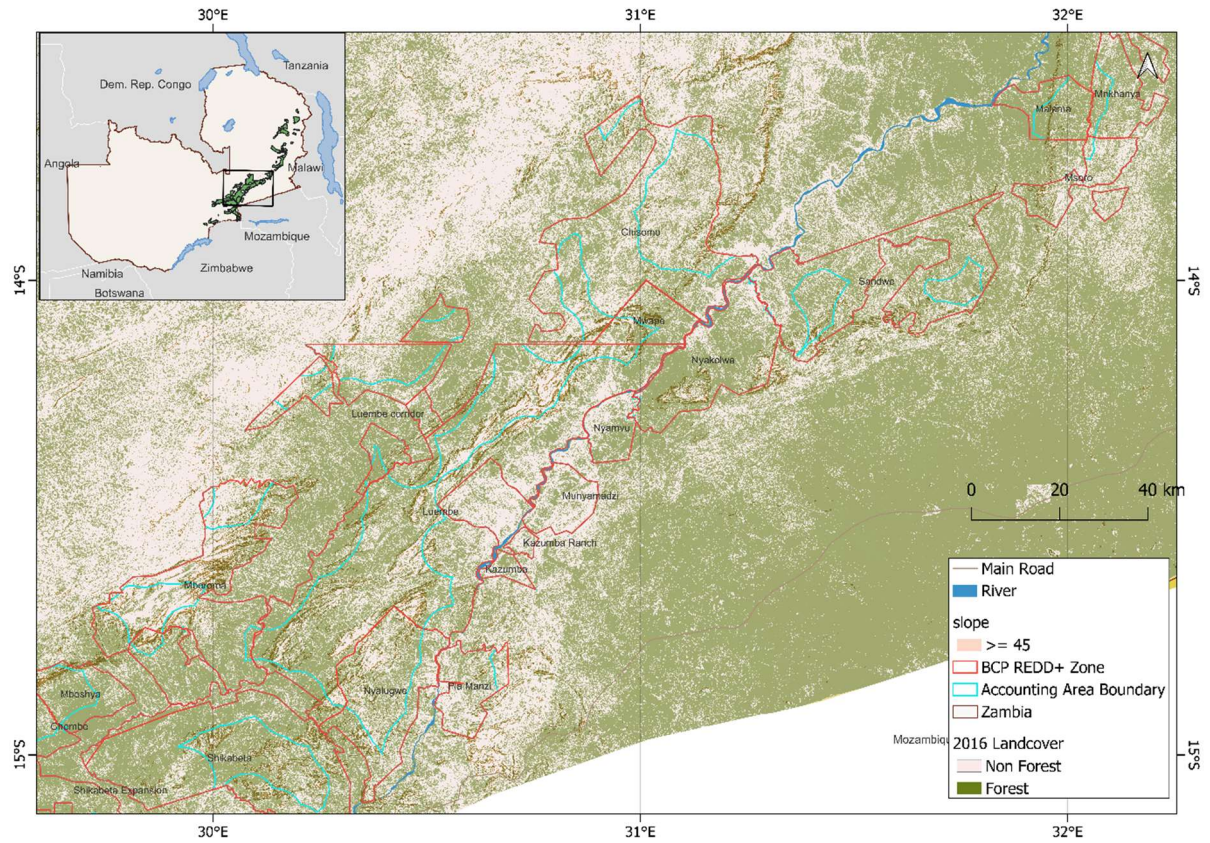


Figure 3. Luembe, Luembe Corridor, Kazumba, Nyamvu, Nyakolwe, Munyamadzi and Sandwe Accounting Areas

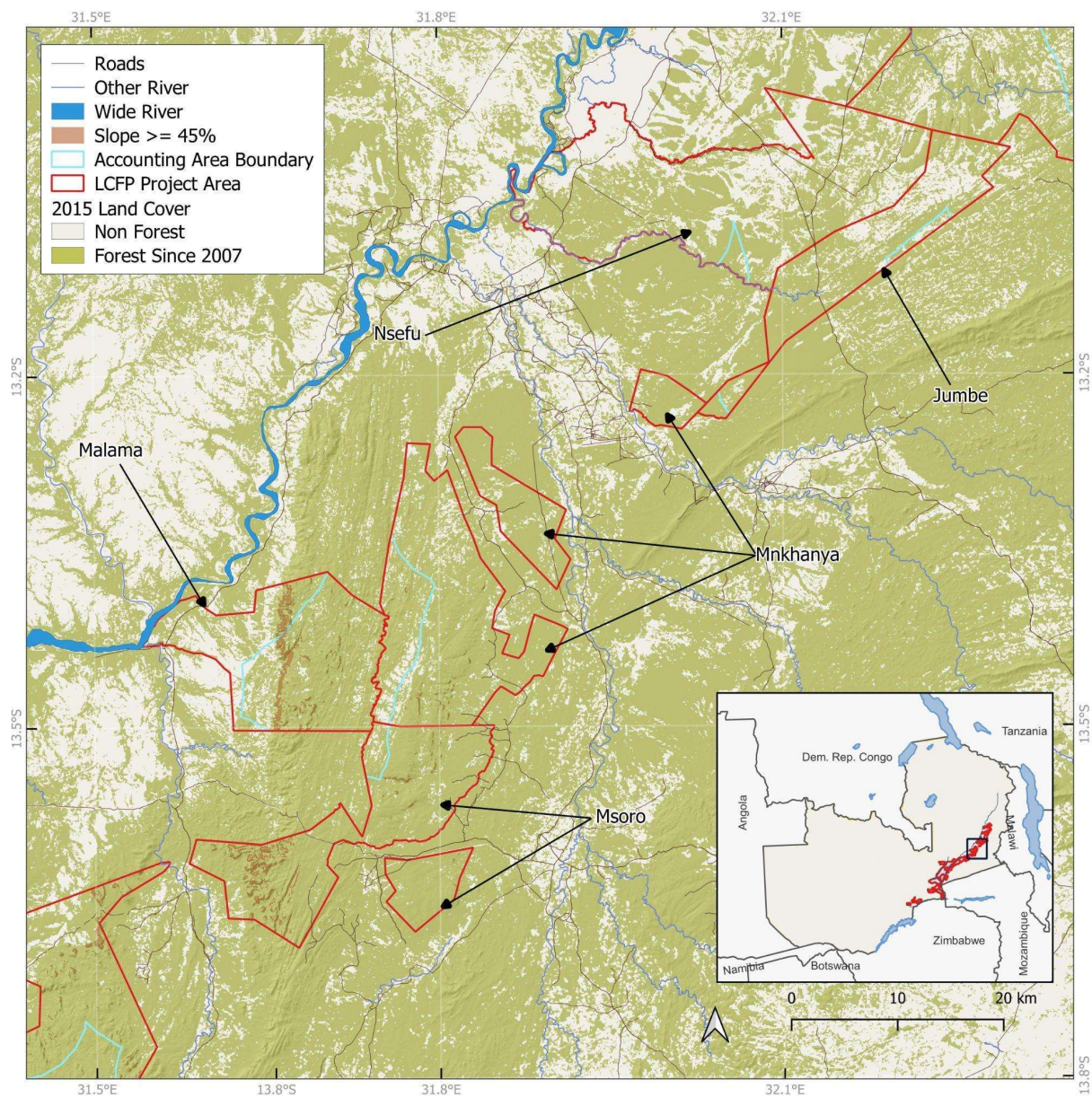


Figure 4. Malama, Msoro, Mnkhangya, Jumbe and Nsefu Accounting Areas

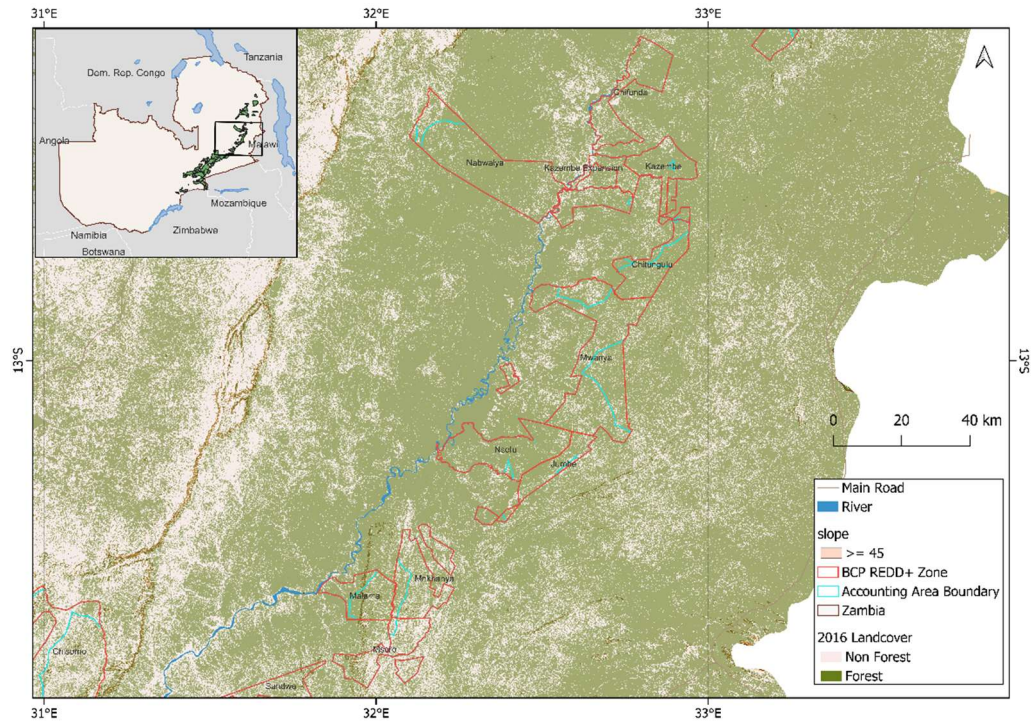


Figure 5. Mwanya, Chitungulu, Mnkhangya, Msoro, Nsefu and Kazembe Accounting Area

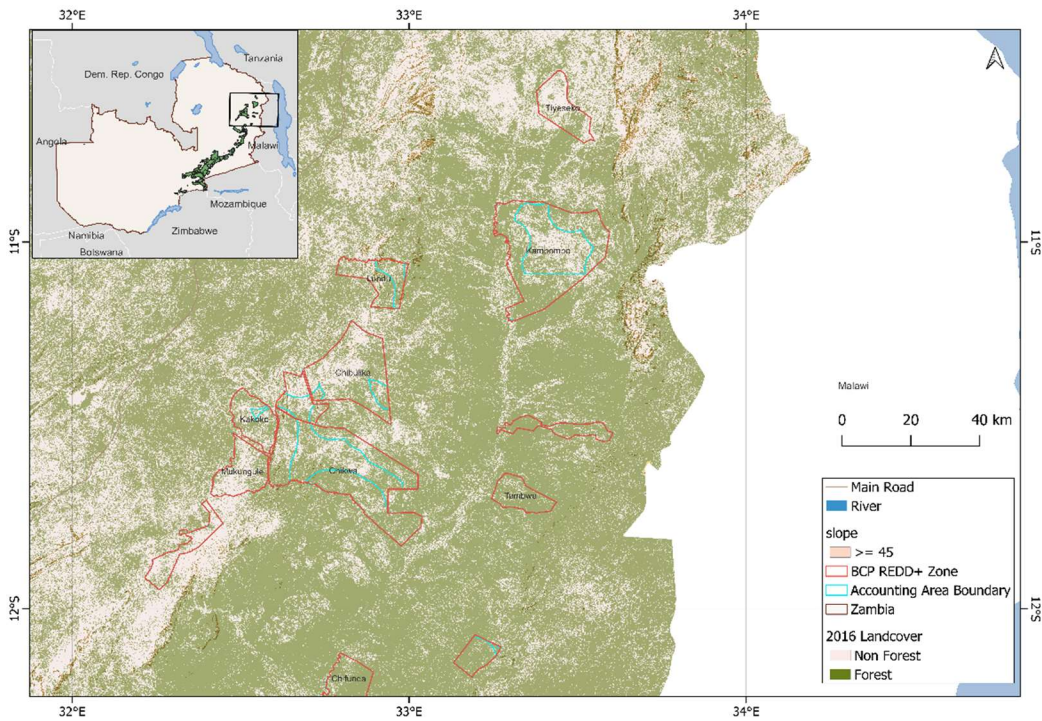


Figure 5.1. Tembwe, Chikwa, Mukungule, Lundu, Kambombo, Kakoko Accounting Area

1.9 Title and Reference of Methodology

The reference methodologies and tools applied to the project are the following:

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0009	Methodology for Avoided Ecosystem Conversion.	3.0
Tool	VCS VT0001	Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry, and Other Land Use (AFOLU) Project Activities	3.0
Tool		VCS AFOLU Non-Permanence Risk Tool	4.2

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes

☒ No

It is important to note that a significant portion of the LCFP falls within Zambia's Eastern Province, which, as of January 2024³, was officially declared the Eastern Province Jurisdictional Sustainable Landscape Programme (EP-JSLP). This jurisdictional, performance-based program is set to run from 2024 to 2030 as a long-term, results-based initiative succeeding the Zambia Integrated Forest Landscape Project (ZIFLP)⁴, which ended in February 2024. No ERs were claimed under the ZIFLP, nor will be claimed in the future due to the absence of a legal jurisdictional framework in Eastern Province during its implementation period. Additionally, official communication regarding the declaration of the jurisdiction explicitly states that the program start date is January 1st, 2024. The communication also clarifies that the jurisdictional program does not affect ER generated by

³ <https://www.zambiamonitor.com/zambia-launches-63-9-million-programme-to-boost-climate-action-in-eastern-province/#:~:text=The%20Zambian%20Government%20has%20launched,forestry%20and%20land%20use%20sectors.>

⁴ <https://ziflp.org.zm/ep-jslp/>

existing projects prior this date (The Government's communication letter has been provided as evidence to the VVB).

The EP-JSLP serves as a comprehensive framework for climate-positive interventions, aiming to reduce GHG emissions from the land sector, while enhancing rural livelihoods, wildlife conservation, and habitat management. Its core strategies focus on preventing deforestation, reducing forest degradation, and cutting emissions from agriculture and is under the Initiative for Sustainable Forest Landscapes (ISFL)⁵

It is important to emphasize that the EP-JSLP only came into effect on January 1, 2024. Therefore, its project start, and crediting period fall outside the previous monitoring periods i.e. 1st May 2015 to 31st December 2022 and current monitoring period under review for the LCFP i.e. January 1, 2023 – December 31, 2023. This eliminate the risk of double counting or double claiming.

As a result of the EP-JSLP declaration, to avoid double counting, the LCFP will no longer generate ERs from Eastern Province project areas starting January 1, 2024. This decision is based on the project not being granted a three-year grandfathering period by the Government of Zambia to independently generate and trade ERs.

However it is important to note that BCP (project Proponent) is yet to sign a NEPA (Nested Projects Agreement) with the Jurisdiction to continue implementing ER activities in the Eastern Province portion of the project under the Jurisdiction program. Once signed, any resulting ER's will belong to the jurisdictional program rather than LCFP.

Furthermore, the EP-JSLP has not yet been verified, and the LCFP has applied for a three-year grace period (grand parenting period) to independently generate and ERs under the provisions of the law, even with the jurisdictional program in effect. At the time of writing this monitoring report, the application is still under consideration by the Ministry of Green Economy and Environment (The application has been shared with the VVB).

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes

☒ No

⁵ www.biocarbonfund-isfl.org/sites/default/files/2020-04/ISFL%20ER%20Program%20Requirements%20Booklet.pdf

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the VCS Program Definitions for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the VCS Program Definitions for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

The LCFP contributes to 16 of the 17 UN Sustainable Development Goals (Table 4) or SDGs Priorities set by the Zambian Government⁶. There is no requirement for any formal monitoring and reporting of activities that pertain to these goals.

SDG 1. No Poverty: Disbursement of conservation fees, livelihood investments, local employment

SDG 2. Zero Hunger - Improvement of honey, climate smart agriculture and horticulture production

SDG 3. Good Health and Well-being - Support to Health Care facilities and services

SDG 4. Quality Education - Support to Education facilities and services

⁶ <https://zambia.un.org/en/sdgs>

SDG 5. Gender Equality - Empowering of local women.

SDG 6. Clean Water and Sanitation - Borehole drilling

SDG 7. Affordable and Clean Energy - Provision of solar equipment

SDG 8. Decent Work and Economic Growth - Small business development and income diversification

SDG 9. Industry, Innovation and Infrastructure - Forest carbon science innovation supports technology and industry development within developing countries such as Zambia and supports rural communities gaining access to global markets through various livelihood initiatives such as bee keeping.

SDG 10. Reduced Inequalities - Carbon Fees disbursement to local communities

SDG 11. Sustainable Cities and Communities - Watershed Protection and Climate SMART Agriculture development

SDG 12. Responsible Consumption and Production - Sustainable farming development

SDG 13. Climate Action – Reduced Deforestation and Degradation

SDG 15. Life on Land - Reduced deforestation and degradation

SDG 16. Peace, Justice and Strong Institutions - Support good governance of local institutions

SDG 17. Partnerships for the Goals - Partnership with Forest Department and CFMGs

Table 4. Contributions of the LCFP to the Sustainable Development Goals⁷

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1	1.1	1.1.1 Proportion of population below the international poverty line	Implemented activities to decrease	At least 49,379 households benefited directly from Carbon and livelihood funds. A total of USD 500,315 were paid in livelihood investments in LCFP during 2023	The LCFP indicated a 220% change in household income since inception in ZMW. \$2,491,966+ paid to LCFP communities where 49,379 Households benefit directly from carbon and livelihood fees for at least 232,530 community beneficiaries. Since project inception, more than 346 community impact projects have been implemented or initiated.

⁷ Evidence for the current monitoring period is spread across all the folders within the Appendix B.

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
2	2.3 2.4	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size 2.3.2 Average income of small-scale food producers, by sex and indigenous status 2.4.1 Proportion of agricultural area under productive and sustainable agriculture	Implemented activities to increase	3,000 beehives have been delivered. 3,035.94 kg of honey was harvested. Average maize grain yield recorded from 4.0 ton/ha in 2022 to 6.5 ton/ha in 2023. Number of lead farmers increased by 322 and the total area under climate smart agriculture came to 983.5ha. 800 Lead farmers were trained, including the previously trained. Total # of farmers enrolled under conservation farming in 2023 was 10,332 (4,712 Males, 5,620 Females). 12 Honey harvesters were trained.	Cumulatively 800 (498 Males, 302 Females) Lead Farmers have been trained in CSA technologies, and 10,332 (4,712 Males, 5,620 Females) follower farmers; and provided with farming inputs. 4 Agroforestry Chiefdom nursery has been established in 4 Chiefdoms. 11,045 beehives were deployed at the end of 2023 for honey production. Total # Follower farmers enrolled under conservation farming increased to 17,841 from project start.
3	3.8	3.8.1 Coverage of essential health services	Implemented activities to increase	Construction of Staff House at Chikwasha Health Post	26 Clinics or health initiatives have been improved/constructed implemented since inception of LCFF

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
4	4.6	Access to education services (BCP defined indicator) Or 4.6.1 Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex	Implemented activities to increase	24 social projects were implemented in 2023 across the chiefdoms Currently students are being supported with Tertiary education. 5 teachers supported with salaries	Cumulatively, 82 social initiatives have been implemented since project inception. ongoing Scholarship with Tertiary education and Teacher's support programs in Shikabeta Cumulatively initiated 65 education including constructions(e.g classroom blocks, teacher houses), improvements, installations and sponsorships.
5	5.5	5.5.2 Proportion of women in managerial positions	Implemented activities to increase	33.3% of the BCP Senior management team were female.	29.5 % female representation on BCP payroll.
6	6.6	6.1.1 Proportion of population using safely managed drinking water services	Implemented activities to increase	In LCFP 26 boreholes were drilled and completed	173 WASH and boreholes projects completed or initiated since inception of LCFP
7	7.1 7.2	7.1.2 Proportion of population with primary reliance on clean fuels and technology 7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	Installation of the solar fence to mitigate Human wildlife interaction in Chitilila village of Katemo VAG Mnkhanya chiefdom. Installation of solar lights at Chiwale Healthpost and chiwale school in Sandwe chiefdom.	Continued collaboration with the Forestry Department to ensure the community rights to sustainable production empowering communities, avoiding deforestation. Provided solar lighting and solar fencing in various schools, health posts and villages

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
				Installation of Solar Fence in Chisanga in Luembe chiefdom. Procurement and installation of Solar fence in Kalongo Mwape VAg in Mwape chiefdom	
8	8.1 8.3 8.5	8.1.1 Annual growth rate of real GDP per capita 8.3.1 Proportion of informal employment in non-agriculture employment, by sex 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	Implemented activities to increase	Support at least 49,379 households who benefited directly from carbon and livelihood fees A total of USD 500,315 were paid in livelihood investments in LCFP 3,000 beehives have been provided Mean maize grain yields increased from 1.8 tons/ha under conventional agriculture during the baseline year to 4.9 tons/ha, 4.0 tons/ha and 6.5 tons/ha under CSA in 2020/2021, 2021/2022 and 2022/2023 farming seasons respectively.	The 2022 data showed that average household income increased 220% over the five-year period with agricultural production, alternative sources and forest-based products being the key sources of income for the households

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
9	8.8	8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status	Implemented activities to decrease	Project functions under the BCP HR manual which ensures correct policies at the workplace and protects the health and safety of all employees. 2023 had no incidents reported.	Project functions under the BCP HR manual which ensures correct policies at the workplace and protects the health and safety of all employees.
10	9.1 9.4	9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure	Implemented activities to increase	Continuous support to CFMG with Annual Work Plan development and Needs Assessments	Completed 16 Stakeholder Facility improvement projects. In LCFP the project constructed for partnership stakeholders CFMG office blocks x 4 (Luembe, Nsefu, Sandwe, Shikabeta); police post x 2 (Mwanya, Shikabeta); scout houses x 4 (Luembe), guest house completion (Mnkhanya).
11	10.1	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 percent of the population and the total population	Implemented activities to increase	49,379 households benefited directly from carbon and conservation fees A total of USD 500,315 were paid in livelihood investments in LCFP in 2023.	The 2022 data showed that average household income increased 220% over the five-year period with agricultural production, alternative sources and forest-based products being the key sources of income for the households More than USD 2,471,437 has been invested in the communities of LCFP since inception.

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
12	11.1 11.5	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing 11.5 (own indicator) Number of hectares of watershed forests protected to protect ecological system, and as such reduce impact of natural disaster 11.5 (own indicator) Number of community members partaking in Climate Smart Agriculture techniques to limit drought disaster impact	Implemented activities to increase	A total of 60,302 females and 6,752 vulnerable groups have self-reported to have been receiving benefits from different projects 51.43% of community members are female. LCFP protects 2,137,405 ha of forest.(Project Area) Total # of farmers enrolled under conservation farming in 2023 was 11,122 (800 LFs and 10,332 FFs).	USD 12,559,902.75, has been invested into communities via carbon and livelihood funds, to develop infrastructure and improve sustainability of community member's livelihoods.
13	12.2	Proportion of land with sustainable management of natural resources (BCP defined indicator)	Implemented activities to increase	Sustainable forest management and use of ecological services remain primary topics during community engagement meetings.	9 years of agreeable sustainable management and efficient use of natural resources with partnership communities Collaborated with the Forestry Department to ensure the community rights to sustainable production empowering communities, avoiding deforestation.
14	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By conserving hectares of forest, LCFP has reduced carbon dioxide emission by 3 million tons in 2023	Obtained 12 million tCO2 VCUs under LCFP.

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
				REDD+ topics and explanations to community members at VAG level meetings	
15	15.1 15.2	15.1.1 Forest area as a proportion of total land area 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type 15.2.1 Progress towards sustainable forest management 15.5.1 Red List Index of species survival 15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	Implemented activities to increase	In 2023, community scouts achieved 26,274 km distance patrol, which resulted in 9 people apprehended, 50 snares and 7 firearms confiscated. Three line transect biodiversity surveys (Nsefu, Mwanya and Munyamadzi) were completed in conjunction with camera trapping surveys in two of them in Mwanya and Munyamadzi. Five critically endangered white-backed vultures and one critically endangered white-headed vulture have been equipped with GPS transmitters in order to monitor their movement and be notified through immobility alerts which can indicate a poisoning incident. In Chiawa GMA and Lower Zambezi national park	The systematic data collection system using Spatial Monitoring and Reporting Tool (SMART) was implemented in June 2020, as well as the camera trap surveys, whereas the transect survey started in 2016 in Munyamadzi and 2022 in Shikabeta and Mwanya and continued into 2023. BCP partners with Oxford affiliate, Lion Landscapes, in order to support biodiversity monitoring efforts within our project zones through the development of a monitoring plan that is scientifically sound and provides statistically robust results. The trends in wildlife abundance are showing positive trends.

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
16	16.6 16.7	16.6.1 Primary expenditures as a proportion of original approved budget 16.6.2 Proportion of population satisfied with their last experience of public services 16.7.1 Proportions of positions in local institutions by sex, age, persons with disabilities and population groups 16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group	Implemented activities to increase	Capacity building of CFMGs in regards to Needs Assessment, Annual Work Planning and performance review, funds management, Monitoring, Evaluation and Reporting, Accountability, Gender Equality. Community needs assessments conducted to ensure community inclusion / participation in decision making at community level inclusive of marginalized groups	Contribution to the good governance of the CFMG and inclusivity in decision-making at community level in all partnering chiefdoms.

Row number	SDG	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
17	17.3 17.9 17.11 17.15	17.3.1 Foreign direct investments (FDI), official development assistance and South-South Cooperation as a proportion of total domestic budget 17.9.1 Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries 17.11.1 Developing countries' and least developed countries' share of global exports 17.15.1 Extent of use of country-owned results frameworks and planning tools by providers of development cooperation	Implemented activities to increase	Sale of carbon credits contributes to the exports of the country, ensuring inbound flow of financial resources Supports through various meetings the jurisdictional process towards national REDD+ Supported DNPW with a Fuel and rations for deployments. Supported DNPW with data collection training, 18 (17 males, 1 female) DNPW Officers were trained.	Total funds paid to communities during the years 2020 and 2023 amounts to USD 10,168,000 Donated a full GIS system to the Forestry Department, and provided related training. Supported DNPW with donation of a Vehicle and Firearms. Supported DNPW with Fuel, rations and data collection training. Supported DNPW with donation of camera traps and GPSs

1.13 Commercially Sensitive Information

This Monitoring Report does not contain any commercially sensitive information.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification

Stakeholder identification took place as part of the initial REDD+ viability assessment process that BCP undertook to identify new/potential REDD+ sites for the LCFP, beginning in 2014. The process followed can be broadly outlined as follows:

- Workshops / Meetings with key Government and Community Authorities

BCP held workshops and meetings at national, provincial, district, and Chiefdom levels to explain the REDD+ viability assessment process. Selecting viable forest areas for protection and obtaining documented consent from stakeholders was the focus. Authorities granted permission for on-the-ground assessments, including participatory forest identification and stakeholder engagement following the FPIC protocol (see Appendix E for the protocol)

- Initial “high level” stakeholder identification and mapping

During initial workshops and meetings at the District and Chiefdom levels, BCP gathered input from government and community authorities, including traditional leaders and Community Resource Boards (CRBs), to identify potential stakeholders for the REDD+ project and their locations relative to proposed forest areas. The process emphasized the importance of stakeholder consultation for project sustainability, defining stakeholders as anyone potentially impacted by or with decision-making power over forest conservation. Authorities agreed that all community members within a Chiefdom are stakeholders since community forests are collectively owned. Initial maps created with stakeholder input, supplemented by satellite imagery, confirmed the locations of villages and settlements near proposed forest areas.

- Detailed Chiefdom/Village level stakeholder mapping - PRA/PLA FPIC activities

During 2015-2017, detailed stakeholder identification and mapping were conducted in 12 partner Chiefdoms using PRA/PLA techniques as part of the FPIC process. Meetings included representatives from all 62 registered Village Action Groups (VAGs) and involved local government officers, Chiefdom institutions, and village representatives. Community inputs refined stakeholder maps, confirming that all Chiefdom inhabitants were stakeholders due to their collective ownership of community forests. Initial village lists provided by Headmen informed data collection, leading to a comprehensive stakeholder registry. Community consent letters were obtained, and a "Stakeholder Household Registry" was created to document and map stakeholders. Regular sensitization programs and informational materials ensured ongoing community engagement and understanding of REDD+ activities. Continuous communication and capacity-building efforts were maintained to disseminate information and address concerns, ensuring transparency and participation throughout the project.

Identified Key Stakeholders

- All community Members in the participating Chiefdoms
- CRBs/VAGs
- Government (Key DNPW and FD)
- Traditional Leadership

Just Like previous project areas, in between 2021- 2023, BCP conducted thorough Free, Prior, and Informed Consent (FPIC) process and consultative mapping across the fourth project activity instance chiefdoms that have been included in the current monitoring period. The FPIC process involved.

National-Level Engagement

- Consultative meetings in Lusaka secured initial consent, involving the Forestry Department and Department of National Parks and Wildlife (DNPW).
- The project's alignment with Zambia's conservation and climate objectives was emphasized, laying the groundwork for broader stakeholder engagements.

Provincial and District-Level Engagement

- Provincial consultations were coordinated with Permanent Secretaries and line ministries, aligning REDD+ objectives with regional priorities.
- District Commissioners led workshops focused on deforestation, climate change, and sustainable development, involving key departments like forestry, agriculture, and wildlife.

Traditional Leadership and Community Engagement

- Progressive consent was obtained from traditional leaders through chiefdom-level inception meetings.
- Participatory community sessions explained REDD+ benefits, formalized through signed FPIC agreements.

Stakeholder Workshops

- Topics included the REDD+ model, deforestation issues, sustainable livelihoods, and feedback collection to ensure effective mobilization.

Outcomes

- Strategic engagement across administrative levels fostered stakeholder participation.
- The process integrated REDD+ with national policies and empowered communities through transparent consultations.

Zone/Village Action Group (VAG) Consultations

- Collaborations
 - Consultations were organized in collaboration with Community Resource Board (CRB) committees, presenting the REDD+ legal framework, opportunities, and challenges.
- Stakeholder Analysis
 - Workshops identified local forest user groups (e.g., charcoal producers, farmers) and critical stakeholders.
 - Sustainable forest management practices were discussed to align with REDD+ goals.
- Communication Strategies
 - Meeting schedules and invitations were disseminated via CRB and community networks for inclusive participation.
- Chiefdoms by District
- Engagements spanned districts like Chama, Mpika, Serenje, Luano, Rufunsa, and Lumezi, mapping VAGs and villages such as Lundu, Kambombo, and Chifunda.

	- Approach - Detailed mapping of stakeholders and forest-dependent groups aimed to integrate local efforts into REDD+ sustainable forest management objectives. This structured FPIC process and detailed VAG consultations established a strong foundation for the REDD+ initiative, ensuring broad participation, alignment with national strategies, and community empowerment for long-term conservation and sustainable development A sample of evidence of these FPIC and consultative meetings area is provided in Appendix B. Communities in the fourth instance chiefdoms voluntarily designated REDD+ Zones and began complying with the community forest regulations under Statutory Instrument (SI) number 11 of 2018. At the start of this fourth activity, all local natural resource governance institutions, such as Community Resource Boards (CRBs), were recognized as Community Forest Management Groups (CFMGs) and had entered into Community Forest Management Agreements with the Government of Zambia, in line with SI 11 of 2018(See Appendix A)
Legal or customary tenure/access rights	The land tenure has not changed as a result of the project. As described above, the project undertook an extensive consultation process with all the relevant local stakeholders. The land was previously in GMAs managed by community resources boards (CRBs). The project has helped the CRBs gain additional status as community forest management groups (CFMGs) and helped them create community forest management agreements (CFMAs) with the government that gives them rights to new resources in the area (carbon).
Stakeholder diversity and changes over time	Stakeholders in the four provinces overlapping with the project area share notable socio-cultural and socio-economic characteristics, deeply rooted in their dependency on natural resources for livelihoods. The rural areas of Lusaka, Muchinga, Eastern, and Central Provinces share commonalities in their reliance on agriculture, traditional family systems, and Christian-influenced cultural practices. Communities in these provinces are deeply tied to traditional land-use practices such as small-scale agriculture, firewood collection, and charcoal production. These activities, often governed by customary norms and communal resource management systems, are integral to cultural identity and survival, particularly in rural settings. Socio-economically, stakeholders are defined by their dependence on natural resources for livelihoods, with subsistence farming, charcoal production, and firewood as primary income sources or energy supplies. Poverty and limited access to alternative livelihoods remain recurring themes across the provinces. Infrastructure challenges, such as inadequate access to modern

	farming inputs and affordable electricity, further entrench reliance on forest resources. Population growth exacerbates this pressure, intensifying cycles of deforestation and resource depletion. Despite differences in crop preferences, language diversity, and specific economic opportunities, the provinces face similar challenges, including migration, resource disparities, and weak infrastructure. Migration trends, particularly among youth, have shifted rural demographics, leaving an aging population to sustain traditional practices. Over time, government and NGO interventions have introduced new roles, such as cooperative members and rural entrepreneurs, reshaping stakeholder dynamics and encouraging social and economic diversification. These changes have gradually integrated rural areas into broader regional economies. While cooperatives, agri-business initiatives, and infrastructure improvements have brought new opportunities, their impact remains uneven. Ultimately, the stakeholders in the project area share vulnerabilities shaped by their dependency on natural resources and limited economic alternatives, making their situations comparable and highlighting the need for sustainable development interventions.
Expected changes in well-being	The project aims to enhance community well-being by targeting at least 20,000 households, focusing on poverty reduction through employment creation and alternative income sources like beekeeping and climate-smart agriculture. The project fosters economic resilience by increasing household incomes and promoting diversified, sustainable livelihoods. Access to clean and safe drinking water is improved through borehole drilling, while healthcare infrastructure and services are strengthened to support better health and sanitation outcomes. Education development is prioritized by constructing and improving infrastructure, providing scholarships, and supporting teachers, ensuring long-term literacy and skills growth. The project promotes gender equality by empowering women in leadership and decision-making roles and ensures inclusivity by engaging marginalized and vulnerable groups
Location of stakeholders	Stakeholders are in Eastern, Lusaka, Central and Machinga Provinces of Zambia (see Figure 6) and Tables 2 for details.

Location of resources

The forest resources are in their respective community forest areas. See Table 2 community names and figure 1 for the locations.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation

In 2023 (M6), an extensive stakeholder consultation process was undertaken through a series of community meetings aimed at promoting awareness and inclusive participation in the BCP-REDD+ Model. These consultations served multiple purposes: educating communities on the project framework, clarifying the role of local stakeholders in ensuring successful implementation, and providing information on the VCS/CCB verification process and how communities contribute to its success. Additionally, several meetings were dedicated to updating communities on the status of project activities.

As a core part of the consultation process, these meetings created a two-way platform for dialogue—allowing community members not only to receive project updates but also to voice concerns, raise grievances, and seek clarification, with many of these issues being addressed and resolved in real time. Over 1,200 community consultative meetings were conducted during the current monitoring period, reflecting the project's commitment to transparency, inclusivity, and accountability. Further details, including meeting dates, locations, and topics discussed, are provided in the Engagement Trackers in Appendix E.

Date(s) of stakeholder consultation

See community engagement tracker in appendix E

Communication of monitored results

Communication of monitoring results was carried out as part of a broader stakeholder consultation process during community meetings (See Appendix E). These meetings were designed not only to disseminate information but also to actively engage stakeholders in the review and discussion of monitoring outcomes.

Held between March and November across the project area, the site-level meetings followed a participatory and inclusive approach, fostering two-way dialogue between project implementers and community members. Stakeholders were given the opportunity to ask questions, provide feedback, and express concerns or suggestions related to the monitoring results and their implications for project implementation.

	Key topics of discussion included encroachment trends, progress on community development projects, updates on the Local Community Forest Project (LCFP), and the implications of these findings for both conservation efforts and community benefits. This consultative approach helped ensure transparency, enhanced local ownership of the monitoring outcomes, and informed subsequent decision-making. Details of the meetings conducted during the current monitoring period are as follows: - Sandwe – 09/12/2023 – Stakeholder consultation focused on updates to community projects (see Appendix E for detailed information). - Luembe – 24/03/2023 – Feedback meeting to discuss monitoring findings and gather community perspectives (see Appendix E). - Sandwe – 09/07/2023 – Participatory discussion on the impacts of encroachment on forest conservation and community revenues (see Appendix E). - Mnkhanya – 21/03/2023 – Consultation session to share and refine the climate monitoring plan with community input (see Appendix E).
Consultation records	Each community meeting forms part of the broader stakeholder consultation process and is documented in a report that includes details on the meeting's content, outcomes, and the nature of local community participation. These reports serve as evidence of meaningful engagement and are linked in the Community Engagement Tracker in Appendix E
Stakeholder input	As part of the project's stakeholder consultation process, all inputs, contributions, and grievances from the local community and other stakeholders are systematically captured and documented. These are either recorded in meeting reports or minutes, or entered into the grievance register (refer to the Community Tracker and Grievance Register in Appendix E). The consultation process ensures that stakeholders are given an opportunity to voice their opinions and concerns in a transparent and inclusive manner.

	Issues or inputs that require immediate attention are addressed and resolved on the spot during stakeholder engagements. For matters requiring more time or further deliberation, resolutions are pursued through follow-up meetings or formal written correspondence. This participatory process helps strengthen stakeholder engagement, build trust, and ensure that community voices are reflected in project implementation. During the current monitoring period, no inputs or concerns were received from local stakeholders that would necessitate changes to the existing project design..
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2.1.3 Free, Prior, and Informed Consent

Consent	Consent to participate in the program from stakeholders was gotten through intensive FPIC meetings and stakeholder consultation meetings at the national, provincial district and Local levels(see section 2.1.1 for details). At the local level, traditional leaders , CRB's/CFMG and local community members were engaged. Program pros and cons, community roles and responsibilities, community benefits, grievance resolution mechanisms were also explained to the stakeholders.
Outcome of FPIC	Outcomes of the FPIC process included sketch maps/final project area boundary that communities freely proposed to be put under REDD+ after the FPIC process , Form 1 Applications to Government under SI #11 of 2018 and Community agreements with BCP.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
On 28/03/2023, HRH Chief Malama raised a grievance via letter, expressing concern that a Malama resident was excluded from the recruitment process for the Malama Chiefdom Assistant position by BCP.	This grievance was closed on 03/05/2023 though a grievance resolution meeting with HRH Chief Malama held in Mfuwe at the BCP office where the recruitment process for the Malama chiefdom assistant was explained and the reasons as to why a Mnkhanya resident was selected and employed as a Malama Chiefdom assistant given (See Appendix E for details)
Malama Community raised a grievance on 25/10/2023 concerning the Malama CFMGs	The grievance was closed in a grievance resolution meeting, where the CFMG

selecting their relatives as Lead Farmers which was not right.	acknowledged their wrong doing, but considering that the lead farmers selected were already trained, they could not redo the selection rather promised the community that they do better moving forward.(See Appendix E for details)
Chieftainess Msoro raised a grievance on the 02/03/2023 pertaining to the Msoro_Hectorage_Chiponga Encroachment Carbon Credit_Dollar Rate Final Disbursement	A grievance resolution meeting was held at Msoro Palace which resulted in the grievance closure on 09/03/2023 (See Appendix E for details)
Late Disbursement of Carbon Funds grievance from Snr Chief Nsefu and the Nsefu CFMG	This grievance was resolved through a grievance resolution meeting held at Snr Chief Nsefu's Palace on 06/02/2023. (See Appendix E for details)
A grievance was raised by COMACO claiming that the Jumbe 1x1 classroom block was constructed using their funds and not BCP.	Grievance investigations were conducted and response letters from CFMGs and GRZ were shared with COMACO.
Chisangu community in Luembe raised a grievance of Project impact to VAGs closer to REDD+ Zone.	This grievance was closed out through a community stakeholder engagement meeting with the whole community in Chisanga VAG. The meeting was led by BCP sector manager, Chiefdom lead and the IM Department supported by DNPW CLA and FD officer. This was also followed by a separate meeting addressed by the Senior Chief Luembe as it was established that some issues were internal to the community. To cement closure of the grievance, a Chiefdom football tournament supported by BCP was conducted within the VAG and prizes worth K4000 directly given to the community of Chisanaga through the sports participants.
A grievance was raised by Nyalugwe CFMG ; - The CFMG has observed that the Agric Department does not regard any CFMG structure as stipulated in the agreements. - The CFMG has observed that the Agric Department runs its programs as an indepei9ndent entity which has caused Lead Famers not to cooperate with local Structures (VAG & CFMG). - The 2023 Agriculture Field days were held without any official notice	A Grievance Resolution Meeting was held on 18/05/2023,where both parties (aggrieved and respondents) resolved the matter amicably.

to Board or VAGs where field days took place. The Board has no record of the activities done under the BCP Agric Department.	
Chitungulu CFMG Chairperson raised a grievance over Reduction in Carbon Funds received.	This grievance was resolved through the submission of a response letter to the CFMG. (See Appendix E for details)
Mburuma CFMGs raised a grievance where the Community Members in Mburuma Chiefdom complained about the boundary being too close to the community members, this was after the team Comprising of BCP CFMG, Forest Department, DNPW and Ministry of Chiefs Traditional Affairs with BCP conducted boundary Painting in Mburuma Chiefdom. The community members felt that the boundary was too close to them, this was in Kaunga VAG and Chauluma VAGs.	This grievance was resolved through meetings with the Chief and the Headmen and community members to ensure that they understood the boundary of the community forest, after the meetings it was collectively agreed that the existing boundaries should be maintained and residents within the boundaries would be allowed to remain, but they should not expand any further. Chief Mburuma expressed his support for the boundary and urged his subjects to protect the forest to ensure the success of the REDD+ project and the sale of Carbon Offsets. (See Appendix E for details)
Malama Chiefdom raised a grievance pertaining to a Mr. Lowell Munadimbwe (Livestock and Fisheries Officer) failing to deliver chickens & goats as part of the livelihood activity, after Malama CFMG paid him for the supply of the livestock.	Grievance resolution meetings were held with both Malama CFMG and Mr. Lowell Munadimbwe in Malama and Mfuwe BCP office. (See Appendix E for details)

To build trust with local communities, the project implements a Grievance Mechanism designed to provide a timely, responsive, and effective system for resolving concerns raised by individuals or communities within the project areas. This mechanism is embedded within the Sourcing Protocols under Community Stakeholder Engagement, ensuring that grievance resolution is not only a fundamental part of project development but also a continuous commitment thorough the implementation. As part of the new PAI#4 inclusion to the project in the current monitoring period, the grievance mechanism was introduced to community members through community forestry introductory meetings. Additionally, dedicated grievance sessions were conducted, where detailed explanations were provided, and relevant documents were shared as part of the Community Forest Management Partnership Agreement (CFMPA).

During the Free, Prior, and Informed Consent (FPIC) process, the grievance mechanism was presented as a structured and transparent framework for addressing concerns, reinforcing traditional grievance reporting and resolution structures. To ensure clarity, the process began with a locally relevant definition of what constitutes grievance, providing real-life examples

to enhance comprehension. Participants were then guided through the formal steps of the grievance process, which includes direct or indirect reporting, formal documentation and mediation, and finally resolution (a sample of supporting documentation has been share with the VVB in the supporting documentation folder).

2.1.5 Public Comments

Summary of comments received	Actions taken
N/A (The project did not undergo any public comment period during the current Monitoring period)	N/A (The project did not undergo any public comment period during the current Monitoring period)

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The management team of LCFP possesses extensive and specialized expertise in executing large-scale land management and carbon projects in Africa. Specifically, since 2012, the management team of BCP has been instrumental in developing and executing the Lower Zambezi REDD+ Project (LZRP) in Zambia. This project holds significant distinctions, being the first verified REDD+ initiative in Zambia and the first of its kind in Africa, and the third globally to achieve gold-level validation across all three criteria of the Climate, Community, and Biodiversity (CCB) standard.

Continuing their success, the BCP management team has effectively overseen the LZRP since its inception, consistently achieving VCS (Verified Carbon Standard) verifications annually since 2013. Notably, this makes it the first REDD+ project in Africa and the second globally to reach this milestone. As of 2023, BCP has successfully undergone 18 validations and verifications under VCS and CCB standards, encompassing both the LZRP and LCFP projects.

Moreover, the BCP management team boasts over 30 years of combined experience dedicated to REDD+ implementation in Zambia, conservation efforts, and carbon-related activities. The core managerial team comprises experts in various fields including conservation, ecology, Carbon, GIS/RS, community engagement, business administration, aviation, and sales and marketing. Additionally, BCP receives support from implementing partners within government institutions, possessing relevant authority and skills to aid in forest and biodiversity management as well as community engagement

2.2.2 Risk assessment.

	Risk identified	litigation or preventative measure taken
Natural and human-induced risks to stakeholders' wellbeing	No Risk Identified (The project works towards improving stakeholder wellbeing through poverty reduction at household level, improved WASH, Education and Health)	No Risk Identified (The project works towards improving stakeholder wellbeing through poverty reduction at household level, improved WASH, Education and Health). For example, <i>Provision of Sustainable Livelihoods</i>: To reduce potential risks faced by local stakeholders due to project implementation and further create a sense of project ownership, the project ensures active participation of local communities, small-scale farmers, and Indigenous peoples in decision-making processes through ongoing community sensitization/community engagement. The project supports initiatives aimed at enhancing knowledge and skills in areas such as effective governance, Agroforestry, climate-smart agriculture (Minimum soil disturbance, residue retention, crop rotation and crop diversification), horticulture, and beekeeping. This is accomplished by

		facilitating access, as well as providing training and distribution of Climate smart agricultural, Agroforestry, beekeeping, and horticultural resources. The project further supports extension services through collaborations with the Ministry of Agriculture and Natures Nectar. This provides an alternative to traditional charcoal production and traditional agricultural methods that are detrimental to the environment. The ultimate goal is to promote diverse livelihood opportunities, enhance resilience, and enable local communities within the project area to better adapt to the impacts of climate change.
Risks to stakeholder participation	- Risk of elite capture of benefits. This will hinder the participation of local stakeholders if they perceive that a small group is benefiting more from the project, i.e. Households may not benefit enough from REDD+ to halt deforestation. - Stakeholders may not fully comprehend the objectives, benefits, and processes involved in REDD+ projects. This lack of awareness can hinder their active participation and support.	- The very first preventative measure to low stakeholder participation is the implementation of a robust stakeholder and sensitization strategy, with a constant presence of BCP staff within communities, to ensure that stakeholders understand and support the project. Clear and consistent communication is crucial for maintaining stakeholder interest.

	i.e. Households may “cheat” and take benefits while continuing to deforest. - Poor communication between project proponents and local stakeholders can lead to misunderstandings, mistrust, and reduced engagement. i.e. Communities may not grasp the connection between performance (REDD forest conservation) and the benefits they receive which may affect the participation. - Stakeholders may fear economic repercussions, such as loss of livelihoods or reduced access to resources. If the economic benefits of REDD+ projects are not communicated effectively, stakeholders might resist participation, or Households may “cheat” and take benefits while continuing to deforest	- To increase buy-in from communities, BCP promotes the development and support of local institutions, such as CFMGs, which are being trained and empowered to manage projects and community natural resources more effectively on their own. - Annual Work Plans and Needs Assessments are completed for each CFMG and signed off by Government Partners, ensuring Communities are included in the Governance and Implementation of the Project. As part of this process, BCP, the committees and representatives from other stakeholders visit all chiefdoms to share progress on community projects and solicit feedback and inputs on projects for the following year. Through this participatory planning process, projects are evaluated and selected for the upcoming year and progress checks with communities planned to ensure a transparent implementation process, and as such to reduce “elite capture”. - The project has created tight systems that do not
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		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. - The selection of community projects and incentives occurs through a participatory process involving representatives from all VAGs within the chiefdoms. This approach serves to uphold accountability in project execution. - <i>Community Jobs Creation:</i> Over 60 jobs have been created, mainly for Community Scouts (CS), who protect wildlife habitats. Poachers are particularly suited for these roles due to their skills and physical endurance, allowing them to transition to legal, income-generating activities. - <i>Community Well-being Investments:</i> The project invests in water, education, health services, and community transport, improving overall quality of life. Direct benefits also come from food security and income diversification programs like honey
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		production and conservation farming. - Finally, BCP enforces transparent monitoring and reporting protocols to promptly identify and address instances of corruption or misconduct (grievance mechanism). Another key risk mitigation strategy is the development of substantial community benefit projects and systems such as conservation community covenants
Working conditions	- <i>Health and Safety:</i> The LCFP implements project activities like fire management and forest and biodiversity monitoring which exposes project workers to risks of injury and accidents from equipment/tools and the rough terrain. - <i>Land Tenure and Rights/Community Engagement and Participation:</i> If no proper land tenure and rights are in place/unresolved boundary issues or Lack of meaningful participation and consultation with local communities and indigenous peoples, conflicts in REDD+ project areas may arise , leading to disputes	Compliance at the highest level to national and international laws, regulations and standards related to working conditions (see 2.3.1 below) Personal Protective Equipment(PPE) is procured and given to all project workers that are involved in project activities that may expose them to injury. In addition, Training is conducted before any project activity like fire management is done, that incorporates the proper use of equipment to avoid any injuries during the exercise. Development and effective implementation of robust community engagement system to ensure total participation and buy-in of all stakeholders including IPs and LCs Development and effective implementation of the robust grievance resolution mechanism where local stakeholders e.g. IPs and LCs are encouraged to submit

	between local communities, indigenous peoples, and project developers which has potential can lead to resentment and mistrust. This can impact the working conditions of individuals involved in the project, as well as their access to resources. - <i>Security Risks:</i> The project area shares a boundary with a 5 National Parks and are located in Game management areas, which exposes project workers especially scouts and forest and biodiversity teams to security risks associated with REDD+ projects, including threats from wild animals, illegal loggers, illegal miners and poachers, groups are usually armed. These security risks can jeopardize the safety and well-being of project workers and communities.	any grievances they may have, and grievances. The project ensures that these grievances are resolved within a 30-day period. All scouts that conduct patrols in the project area undergo scout training that includes firearm handling, wild animal behavior etc. This training equips them to handle any armed groups they may come across or aggressive wild animals they may come across during patrols. All personal/project workers that are involved in project activities like forest and biodiversity monitoring (not trained scouts) are not allowed to go in the field without a trained scout(armed) or wildlife police officer(armed) from the department of national parks and wildlife.
Safety of women and girls	No Risk Identified	No Risk Identified
Safety of minority and marginalized groups, including children	No Risk Identified	No Risk Identified
Pollutants (air, noise, discharges to water, generation of waste, release of	N/A- (The project does not use any chemicals or conduct any activity releasing elements that have adverse effect on the environment)	N/A-(The project does not use any chemicals or conduct any activity releasing elements that have adverse effect on the environment)

hazardous
materials and
chemical
pesticides and
fertilizers))

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

To demonstrate that the project respects human rights and related to work and labor during the current monitoring period.

	Risks identified	Mitigation or preventative measure(s) taken
Discrimination	- Potential discrimination in Employment and Hiring Practices - Potential discrimination in project implementation activities and Allocation of project benefits.	BCP has an HR Policy that has been approved by Ministry of Labour. It follows Zambian labour laws and international standards. BCP does not allow any form of discrimination or abuse such as sexual harassment by any employees or project participants while participating in project activities. This is accomplished through; Clear Policies and Procedures. BCP has a policy entitled “Workplace Harassment, Discrimination and Bullying Policy”,(See Appendix E) and extends to contractors. The HR Policy is thoroughly explained to each BCP staff during the onboarding process. After the onboarding, BCP staff are required to formally acknowledge receipt and understanding of the organization's anti-discrimination and anti-harassment policies.

BCP supports the employment of female Community Scouts. Community Scouts are all held to strict DNPW and CRB codes of conduct as they are required to work under the supervision of Government Wildlife Police Officers, who are also governed by strict uniformed services policies against discrimination and sexual harassment.

Therefore, organizations from the Government involved in this project (DNPW and Forestry Department) are governed by set Government policies within the laws of Zambia to ensure that civil servants are not complicit in discrimination and sexual harassment. This also applies to CRBs which fall under the Wildlife Act of 2015.

In order to mitigate against possible discrimination to project staff and partners, BCP's agreements with communities consistently declare that the definition of non-performance is; 'threats, violence towards or blocking of access of BCP staff and partners to areas of work'.

In the event of unethical behavior performed by BCP staff members or local stakeholders, the grievance mechanism provides the right channel for community members to report such behavior.

In addition, BCP has a Whistleblower service where misconduct can be reported. This Whistleblower Policy enables all employees and other stakeholders to raise their concerns in

		a responsible and effective manner if and when they discover information which they believe shows serious malpractice. Any deviation from the key policies - significant or not, will be a cause of serious concern to the Company and should be reported to the authorized officials immediately. This Whistleblower Policy aims to provide a method of properly addressing genuine concerns that individuals within and outside the Company might have and offers appropriate protection to the whistle blowers from victimization, harassment, or disciplinary proceedings.
Sexual harassment	- Potential sexual harassment in the workplace - Potential Sexual harassment in project implementation activities i.e. patrols, forest monitoring etc. (Both have potential to bring Legal Liability to the project, Reputational Damage for the project, Workplace Morale and Productivity because of Emotional and Psychological Impact on victims,)	Development and Implementation of the following policies. - Workplace Harassment, Discrimination and Bullying Policy - Fraternization Policy - Whistleblower policy See Mitigation or preventative measure(s) taken for Discrimination above for more details.

Gender equity in labor and work	Gender Discrimination	BCP has equal Opportunity Policies that clearly articulate and communicate policies that emphasize equal opportunities, gender equity, and fair pay. These policies are accessible to all employees upon joining the organization addition. All job opening in the current monitoring period were advertised on public media and selection was based of qualifications and encouraged qualified women to apply for the roles. BCP has a strong emphasis on gender equity. BCP recognizes the importance of mainstreaming gender in the promotion of sustainable use and management of natural resources under a REDD+ project. The project ensures that men and women are equally able to access, participate, and benefit from natural resource management projects, and that gender inequalities are reduced or eliminated. BCP implements activities to challenge gender stereotypes, support women to take leadership roles in natural resources, Economic opportunities for women are encouraged, through livelihood
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		empowerment support and linkages to stable markets. BCP supports the employment of female Community Scouts who have passed shortlisting, selection, basic, advanced, and in service training. As a result, around 30% of BCP-supported Community Scouts are women. Likewise, BCP is supporting the enrollment of women in the Conservation Farming/Climate Smart Agriculture program, with approximately 30% of Lead Farmers being women.
Forced labor	NO Risk Identified	BCP adheres to local laws and international standards that are further reinforced by internal policies preventing all sort of unethical behavior.
Child labor	No Risk Identified	BCP based on the HR manual, implement procedures to verify the age of workers to ensure compliance with child labor laws to ensure that they are not under age. In addition, BCP adheres to local laws and international standards that are further reinforced by internal policies preventing all sort of unethical behavior.

Human trafficking	<i>Forced Labor in Forest Management</i>	BCP adheres to local laws and international standards that are further reinforced by internal policies preventing all sort of unethical behavior.
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2.3.2 Human Rights

To continue recognizing, respect, and promote the protection of the rights of IPs, LCs, and customary rights holders in line with applicable international human rights law, and the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples. The project has identified several risks and is currently implementing activities to mitigate and prevent. See table below.

Risks identified	Mitigation or preventative measure(s) taken
Potential Inadequate respect for the rights of IPs and LCs in the projects can lead to human rights violations, including forced evictions, harassment, and violence.	- <i>Community Consultation and Free, Prior, and Informed Consent (FPIC)</i>: Before any project is implemented, IPS and LCs are consulted by conducting a needs assessment to obtain FPIC before initiating any project activities that may affect their lands, resources, or livelihoods. - <i>Capacity Building Initiatives</i>: The project support/conducts capacity building initiatives within IPs and LCs to empower them economically, socially, and environmentally. This includes initiatives in the education, training, and skills development sectors. In the current monitoring period, supported teachers and tertiary school community members with school fees and Tuition fees. (See appendix B) - <i>Conflict Resolution Mechanisms</i>: The project has a robust Conflict resolution mechanism assigned with the communities that allows the communities (IPs and LCs) to raise grievances in cases where they are not happy project implementation. See Appendix E for

	the grievance mechanism document and grievance register for the current monitoring period(M6). IPs and LCs are also encouraged to raise grievances and seek resolution during community meetings (Transparent and accessible mechanism) and based on the Grievance mechanism, grievance raised are supposed to be resolved in 30 days
Potential infringement on the land and resource rights of IPs, LCs, and customary rights holders	- <i>Community Consultation and Free, Prior, and Informed Consent (FPIC):</i> Before any project is implemented, IPS and LCs are consulted by conducting a needs assessment to obtain FPIC before initiating any project activities that may affect their lands, resources, or livelihoods. - <i>Conflict Resolution Mechanisms:</i> The project has a robust Conflict resolution mechanism assigned with the communities that allows the communities (IPs and LCs) to raise grievances in cases where they are not happy project implementation. See Appendix E for the grievance mechanism document and appendix E for the grievance register for the current monitoring period(M6). IPs and LCs are also encouraged to raise grievances and seek resolution during community meetings(Transparent and accessible mechanism) and based on the Grievance mechanism, grievance raised are supposed to be resolved in 30 days - <i>Benefit sharing Agreements :</i> The project has signed community forest management agreements with all the community's participation in the project and in there it explicitly defines the benefit sharing. <i>Legal Recognition of Land Rights :</i> The project has facilitated the implementation of Community Forest Management SI #11 of 2011 where all the communities in the project have been recognized by government as community forest management groups(CFMGs) and have signed community forest management agreements with

	<i>government for the transfer of forest user right from government to the communities.</i>
Potential to overlook or undervalue the traditional knowledge, cultural heritage, and customary practices of IPs and LCs, risking their loss, appropriation, or misappropriation	The project Recognizes and respect local/traditional knowledge held by IPs and LCs and ensures that project activities do not exploit or appropriate this knowledge without proper consent(See section 2.3.3 for additional information)
Potential Failure to obtain FPIC from IPs and affected communities before implementing REDD+ activities	- <i>Community Consultation and Free, Prior, and Informed Consent (FPIC):</i> At the project start the project conducted a comprehensive FPIC process for all instance 1 chiefdoms and continues to do the same for all new instances. See appendix B for all FPIC related supporting documentation for instance 4 chiefdoms included to the project in the current monitoring period. In addition, FPIC for the project is a never-ending process, for example Before any project is implemented, IPs and LCs are consulted by conducting a needs assessment to obtain FPIC before initiating any project activities that may affect their lands, resources, or livelihoods.(See appendix B for supporting documentation related to participatory needs assessment conducted in the current monitoring period)
Potential excluding or marginalizing IPs and LCs from meaningful participation in the design, planning, implementation, and monitoring of the projects	<i>Participatory needs assessment :</i> Before any project is implemented, IPs and LCs are consulted by conducting participatory needs assessment to obtain FPIC before initiating any project activities that may affect their lands, resources, or livelihoods. This is done to ensure that no one is excluded as far as project implementation is concerned.(See appendix B for supporting documentation related to participatory needs assessment conducted in the current monitoring period) <i>Partnership with Indigenous Representatives:</i> The project collaborates with local natural resource governance institutions (CFMG) as the project has signed community forest management agreements.

	Been patrons to the CFMGs, the project also collaborates with Traditional leadership i.e. the chiefs. The project Involves them in decision-making processes and seek their input on matters that affect their rights and interests through community meetings and CFMG meetings for CFMG and Community Meetings Trackers for the current monitoring period(M6). <i>Capacity Building Initiatives:</i> The project support/conducts capacity building initiatives within IPs and LCs to empower them economically, socially, and environmentally. This includes initiatives in the education, training, and skills development sectors. In the current monitoring period, supported teachers and tertiary school community members with school fees and Tuition fees. <i>Equitable Benefit Sharing:</i> The project signs community forest management agreements with the respective communities where benefit sharing mechanisms are highlighted. By working with the CFMGs, the project ensures that economic, social, and environmental benefits generated by the project are shared fairly and contribute to the well-being of these communities.
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2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified.	Mitigation(s) or preventative measure taken
Potential to overlook or undervalue the cultural heritage, traditional knowledge, and customary practices of IPs.	BCP preserves the cultural heritage of the communities involved in the LCFP through the respect of traditional leadership and customary practices in all aspects of project implementation. For instance, communication and consultations are done during collective gathering announced few days in advance to traditional leaders that are spreading the information orally across the entire community. The project interventions were also built upon the local knowledge and know-how.

	It was evident in the project's agents and drivers' study that the local communities had a high reliance on agriculture and was projecting to expand their "farms" substantially in the future. This indicates that in the interest of reducing the pressure faced by local communities to engage in deforestation. The project could potentially achieve a positive degree of success by introducing improved farming techniques, to local communities, while respecting their cultural heritage. Furthermore, the investment in honey production as a sustainable source of income for the local communities built on the traditional beekeeping practices that is widespread within rural communities of Zambia. Beekeeping in Zambia has been a livelihood for centuries and has been practices traditionally by removing the bark from trees to make cylindrical beehives. However, that technique results in short-lived hives, lasting no longer than 3 years, and moreover induces the death of the tree from which the bark has been taken out. It is therefore not sustainable and BCP partnered with experts in beekeeping to provide sustainable, long-lasting hives.
Potential Failure to recognize and protect cultural sites, sacred places, and traditional ecological knowledge can lead to the erosion and loss of cultural identity and heritage for IP communities.	To continue preserving and protecting cultural heritage, the project in the current monitoring period (M6), completed developing a BCP High Conservation Values(HCV) Protocol and Conducted an HCV assessment based on the HCV- Resource Network. This was done for all chiefdom under LCFP (See appendixB for Protocol and the Assessment report). This is the first step that will lead to Monitoring that is planned for (2024) M7. The next step planned for the next monitoring period(M7) is community consultation and awareness which will lead to documentation of these HCVs (Social HCVs) and monitoring of the social SCVs that include Burial sites, Grave yields and Shrines and consequently a strategy on how to protect and preserve them.

2.3.4 Property Rights

Risks identified.	Mitigation or preventative measure(s) taken
No risk identified	The project neither owns the land nor takes it from local communities. Instead, the land and forests remain under the stewardship of the communities. This is clearly outlined in the Forest Management Agreements signed between BCP and the communities, which acknowledge the communities and their traditional leadership as the rightful owners of the forest resources. Moreover, the project supports the implementation of Statutory Instrument (SI) 11 of 2018 by assisting communities in applying to the government for recognition as Community Forest Management Groups. Through this process, communities enter into agreements with the government, transferring forest user rights from the government to the local communities involved in the project. Consequently, under the law, the forest resources legally belong to the community

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	The LCFPs benefit-sharing plan was strategically designed to ensure the equitable and transparent distribution of both monetary and non-monetary benefits among key stakeholders of the project. Co-developed with community stakeholders, the plan emphasizes transparency, participation, equity/equality, and sustainability, contributing to the project's success and longevity. Key Stakeholders: - Participating Communities (Chiefdoms): Forest resource owners and user rights holders. - Government (DNPW, FD): Provides facilitation and policy direction. - BCP: Project developer. Types of Benefits: <i>Monetary Benefits:</i> - Performance-Based Payments: Annual direct financial payments to participating communities through their Community Forest Management Groups (CFMGs), contingent on successful verification. - Financial Support to Government: To facilitate project implementation.
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Non-Monetary Benefits:

- Sustainable Agriculture and Alternative Livelihood Initiatives: Capacity building and training.
- Improved Infrastructure: Development in education, health, and water and sanitation sectors.
- Enhanced Ecosystem Services: Improved water regulation and biodiversity conservation through forest protection initiatives.
- Capacity Building for Government (Provision of Biodiversity and GIS equipment, Procurement of Vehicles , Trainings in GIS/RS and Carbon Markets etc.)

Benefit Allocation Criteria:

- Benefits are allocated to participating communities, the legal forest right holders, based on performance in reducing deforestation and the extent of forest contributed.
- Funds are allocated to GRZ for project facilitation and to BCP for management, operational costs, and business administration.

Mechanisms for Distribution:

- Annual Fund Disbursement: To participating communities through CFMGs contingent to successful project verifications (24% gross revenue)
- Implementation of Livelihood Activities and Resource protection: Climate-smart agriculture and beekeeping in all participating communities (3% is invested by BCP). Another 3% of discretionary fund is put aside and used to invest into critical livelihoods that need support but is not necessarily Chiefdom specific.
- Infrastructure Development: In education, social, health, and water and sanitation sectors, managed by community funds.
- Government Fund Provision: To facilitate project activities in participating communities. (3% is put aside to support government)
- BCP Operational Costs and Business Administration (Direct Project Support and Expenditure) – 47%
- 20% is BCPs Management fee (used for capital repayments, Debt financing, Project expansion and Profit share)

It should be noted that that this revenue distribution arrangement at gross is the most updated and used in the new chiefdoms(instance 3 and 40, however the old chiefdoms , especially instance 1 chiefdom agreements, have sharing mechanism at Net Revenue, Community share consist of 40% Directly disbursed to communities i.e. CFMGs and

	5% dedicated towards Livelihood implementation and resource protection. Governance and Institutional Arrangements: - <i>Community Fund Management:</i> Managed by CRBs/CFMGs on behalf of their communities. - <i>Participatory Allocation:</i> Community meetings determine fund allocation, agreed upon by the community. - <i>Support from BCP and Government:</i> Assistance in community needs assessments contributing to Annual Work Plans (AWP) and budgets. Monitoring and Evaluation: - <i>Ongoing Monitoring:</i> By BCP and relevant government departments (DNPW and FD) to evaluate community benefits from the project. - <i>Annual Audits:</i> Conducted by the Department of National Parks and Wildlife (DNPW) for CRBs/CFMGs.
Benefit sharing during the monitoring period	- Because M5 (2022) Monitoring period was not yet verified by the end of the monitoring period under review (31/05/2023), the project did not disburse any funds to communities in 2023. - Alternative Livelihood activities continued in the participating communities. - The Government was supported to help facilitate project implementation

2.4 Ecosystem Health

	Risk identified.	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified	No negative biodiversity impacts have been identified at validation. By enhancing landscape connectivity, and a corridor between the 5 national parks (North Luangwa, Luambe, Lukusuzi, South Luangwa and Lower Zambezi national parks), The project also connects two ecologically significant ecosystems i.e Luangwa and Lower Zambezi ecosystems. The project is designed to have a positive impact on biodiversity. Enhanced conservation management in the project areas will likely improve habitat conditions for the wildlife. It is envisaged that the ongoing and future rehabilitation of animal populations in the project areas through better funded and managed

		protection has a positive impact on other depleted areas, as the project could act as a source from where individuals could migrate to re-populate depleted areas.
Soil degradation and soil erosion	No risk identified	The project does not conduct any activity disrupting the pedology of the area such as the extensive use of agricultural inputs.
Water consumption and stress	No risk identified	The project does not conduct any activity disrupting the hydrology of the area such as dam construction or irrigation
Usage of fertilizers	No risk identified	The project does not use fertilizers in the project areas/accounting area. However, fertilizers in the project zone is used in livelihood project implementation. In the project zone, D-Compound (10% Nitrate (N), 20% Phosphorus Oxide (P_2O_5), 10% Potassium (K_2O), Sulfur (S) + Zinc (Zn)) and Urea (carbon, nitrogen, oxygen, and hydrogen. Feed-grade urea contains about 42-46% nitrogen, which corresponds to 260 to 288% crude protein equivalent) as synthetic fertilizers to support the local farmers enrolled in the Conservation farming program. Both fertilizers are employed in hand hoe basin and or animal draught power rip lines (tram line) minimal tillage practices. The permanent hand hoe basins and or animal draught power rip lines, unlike overall tillage practices enables a farmer to better place and protect both products from the effects of rain and wind-borne erosion effects as well as mitigating third party direct contact with humans, livestock and or wildlife unlike can be the case with traditional overall tillage practices, With the minimal tillage practices, the D compound product is placed directly towards or on the bottom of the 15 cm deep planting basin or rip line. Once placed in the basin or rip line, the product remains in a sedentary state at the bottom of the planting basin or rip line. The product is then immediately backfilled and covered with approximately 3-5 kg of top soil that is placed directly on top and across the product once the application operation is done and prior to the first planting rains and the sowing operation that follows. Seeding is done directly in the basin and or rip, directly over the product so emerging tap roots can quickly access the product

		before dissipation quickly occurs from rainwater soak into the soil. In the case of Urea, farmers ensure that the product is also covered up with topsoil and is placed adjacent to the knee-high (50-55 cm high) maize crop. Covering the product with topsoil coupled with the physiological stage of the maize and or soya crop at the time of product application further mitigates potential negative run offs and direct contact with humans, livestock, and wildlife. Further, covering urea with topsoil reduces the Nitrogen Oxidation process which can lead to the production of Nitrous Oxide. This, in turn significantly reduces the emission of Nitrous Oxide from urea application. While the range of organic fertilizer products has both improved in quality and availability, D Compound and Urea are still price competitive, and when used properly, tend to outperform organic fertilizer products. Like organic products when employed in traditional tillage practices are not without their environmental impact. BCP is exploring, with a local company, are testing two of their bio-fertilizer (maize and soya) products with fifty interested and capable Lead Farmers this coming season (2022/2023 farming season). BCP is exploring a potential transition from chemical fertilizers to comparable bio- fertilizers. To facilitate this transition, the project has begun implementing trials of organic fertilizers to assess their efficacy with selected farmers. In the current monitoring period, the project has distributed organic fertilizers to 43 farmers. Each season, Lead Farmers, who in turn train follower farmers are required to attend a whole gamut of refresher training, including the correct and safe application of both products into their planting basins and or rip lines. In-field and real time auditing and monitoring of fertilizer application operations is done by Lead Farmers, BCP agricultural staff and front line Ministry of Agriculture camp and block extension staff
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2.4.1 Rare, Threatened, and Endangered species

Species or habitat	The LCFP is directly adjacent to the North Luangwa, South Luangwa, Lower Zambezi, Luambe and Lukusuzu National Parks which contains several RTE species which includes elephants, lions, leopard, wild dogs, vultures and southern ground-hornbill among others. These species can also be found permanently or occasionally within the LCFP project areas. In addition, these 5 National Park are part of a landscape-level complex of land where viable populations of naturally occurring species exist in natural patterns of distribution and abundance. The project activities are specifically designed to reduce the pressure on the environment which would ultimately impact the RTE species and their habitat of this landscape. Indeed, the project is securing an important buffer zone by reducing the threat and impact of habitat loss and poaching. The potential displacement of these activities into other part of this landscape is mitigated through surveillance and law enforcement patrols taking place beyond the boundaries of the LCFP.
Areas needed for habitat connectivity.	The project aims and has successfully established significant wildlife corridors connecting two Trans frontier Conservation Areas (Zambia-Malawi and Zimbabwe, Mozambique, Zambia) as well as five National Parks: North Luangwa, South Luangwa, Lower Zambezi, Luambe, and Lukusuzi. Additionally, the inclusion of the Mpanshya wildlife corridor in M4 further enhances connectivity between the Luangwa and Lower Zambezi ecosystems, both of which hold considerable ecological importance in Zambia.

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No Risk Identified	The project activities are specifically designed to reduce the pressure on the environment which would ultimately impact the RTE species and their habitat of this landscape. Indeed, the project is securing an important buffer zone by reducing the threat and impact of habitat loss and poaching.
Areas for habitat connectivity	No Risk Identified	The project creates and enhances wildlife connectivity by connecting TFCAs, National Parks and ecologically significant ecosystems

2.4.2 Introduction of Species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Zea mays (Maize)	Non-native Species	Sorghum spp. is a potential alternative and has been replaced in favor of maize as it produces bigger yields and is not prone to bird predation.	No negative evidence documented. It is used extensively in Zambia
Cajanus cajan (Pigeon pea)	Non-native Species	No known local alternative within native species. It is a nutritious legume.	No negative evidence documented. It is used extensively in Zambia.
Mangifera indica (Mango)	Non-native Species	Parinari curatellifolia is a potential alternative and is locally utilized but does not have the same production and fruit size and is slow growing.	No negative evidence documented. It is used extensively in Zambia
Carica papaya (Papaya/Pawpaw)	Non-native Species	No known local alternative within native species with fruit that size	No negative evidence documented. It is used extensively in Zambia
Moringa oleifera (Moringa)	Non-native Species	There are possibly alternative local species that have the same nutritional values, but Moringa oleifera is particularly fast growing.	No negative evidence documented. It is used extensively in Zambia
Faidherbia Albida (Formerly Acacia Albida)	Native Species	This species is indigenous in Zambia although it may not naturally occur in all project areas. It is valuable for its nitrogen fixing and soil stabilizing functions and therefore contributes to soil fertility improvement. Faidherbia Albida can be used for fodder.	No negative evidence documented, it is used extensively in Zambia
Gliricidia sepium	Non-native Species	This species is a multi-purpose nitrogen fixing tree which is a valuable asset to agroforestry and conservation agriculture while aiding soil stabilization, providing fodder for livestock. It is fast growing, produces a lot of biomass which contributes to soil organic matter thereby improving soil fertility. It tolerates repeated cutting or harvesting. The stems of Gliricidia sepium can be used as firewood thereby reducing pressure on fuel wood extraction from the forests.	Whilst the species is considered a weed in Jamaica, this is not the case in any other area, including Zambia, and is not listed as invasive on the Global Invasive Species Database. The trees generally show limited seed production outside their native range due to a lack of pollinators and poor conditions for seed germination meaning this risk is extremely low.

Tephrosia candida and Tephrosia vogelii	Non-native Species	These are particularly useful drought-tolerant nitrogen fixing species as the rate at which they release nitrogen closely matches crop uptake and reduces loss of nitrogen. Tephrosia is rich in bioactive phytochemicals which have strong insecticidal activities against a wider range of pests – the leaves of Tephrosia are widely used for pest control	In Zambia, no negative effects have been documented.
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Existing invasive species	Mitigation measures to prevent spread or continued existence of invasive species
- Not Applicable (There is no evidence of any spread of invasive species in the project area as well as the project zone)	- Not Applicable (There is no evidence of any spread of invasive species in the project area as well as the project zone)

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No Risk Identified	The project does not bring in any new species to the project area. However, for species introduced within the project zone to support our climate-smart agricultural activities, only non-invasive species are permitted.

2.4.3 Ecosystem Conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No Risk Identified	This is a REDD+ project and not an ARR, ALM, WRC or ACoGS projects.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The LCFP has developed a wide range of deforestation mitigation and benefit-sharing activities with local stakeholders. These activities fit broadly into three different categories namely infrastructure support and development, improved livelihoods, and income diversification through value addition to non-timber forest products, and thirdly forest encroachment and wildlife monitoring and poaching reduction. Project activities happen in the project area, project zone, and leakage areas shown in Figure 6.

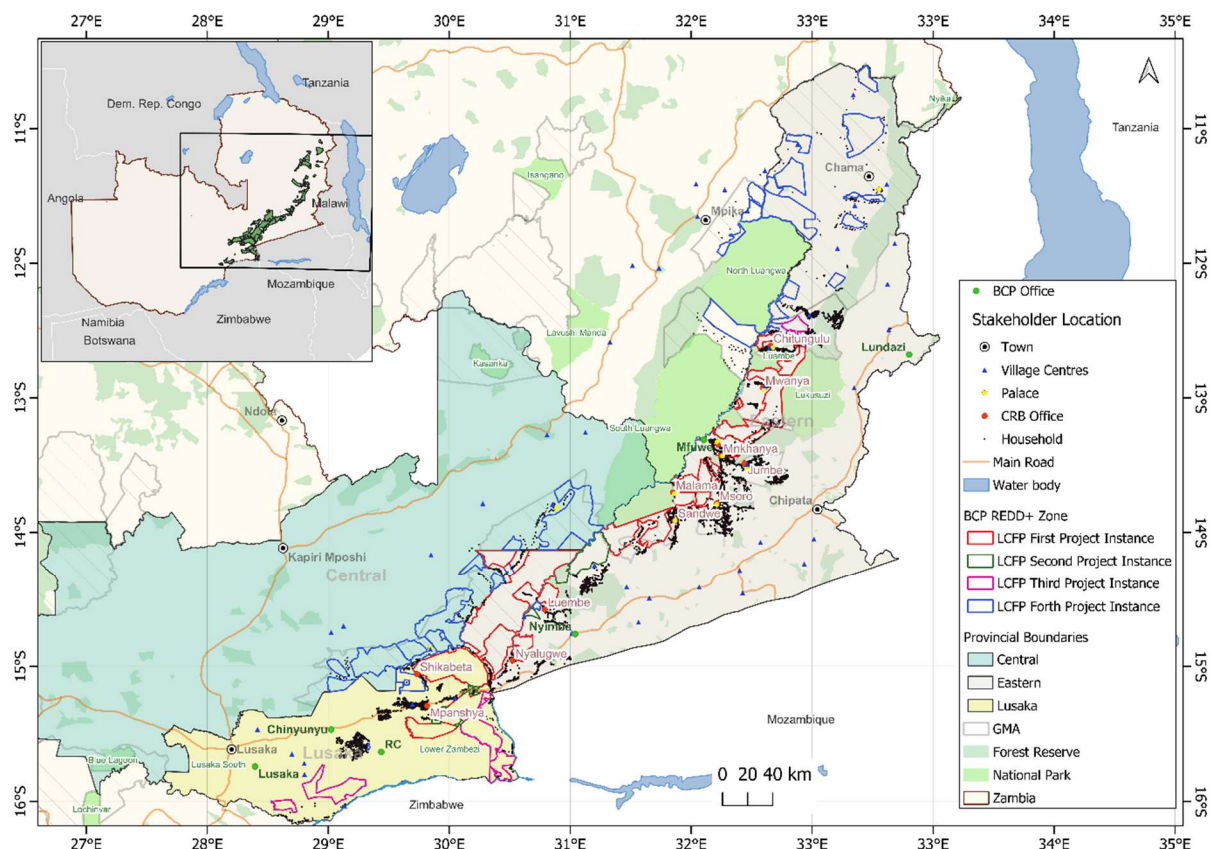


Figure 6. Project area, project zone, and leakage areas where project activities take place

Activity Area 1: Infrastructure Development, Social Service Delivery

Defined Activities:

- Construction and rehabilitation of school infrastructure; classroom blocks and latrines,
- Provision of safe drinking water; through the drilling of new boreholes, rehabilitation of existing boreholes, and improvement of existing wells.
- Provision of boats to facilitate safe river crossing
- Support the delivery of health care services through the provision of clinic furniture and fittings
- Provision of hammer mills, maize and rice sellers

Additional Activities Undergoing Investigation and Further Consultation:

- Roof-based water collection (Self Supply)
- Micro-credit project(s)

- Construction and rehabilitation of health care centers,
- Construction of culverts, drifts

Support to Infrastructure Development and Social Service Delivery

- Support to delivery of Community Social Services:

During the monitoring period of 2023 (M6), the project has successfully implemented several impactful social service initiatives through various Community-Based Forest Management Groups (CFMGs). Here is a detailed breakdown of the key accomplished initiatives:

Initiative	CFMG	Details
CFMG Capacity Building	Mnkhanya	• Utilized conservation fees to procure office furniture for the CRB Office. • Procured 12 bicycles for CFMG members to facilitate easy mobility. • Construction of the washrooms at the CRB office
	Sandwe	• Procured conference hall furniture (conference chairs) in Sandwe VAG
	Luembe	• Procured 1 motorbike for a board member (Chalubilo VAG)
Installation of the solar fence to mitigate Human wildlife interaction,	Mnkhanya	• All the materials were procured awaiting installation in the next monitoring period i.e M7 (Katemo VAG):
	Luembe	• Procured solar fences, to be installed in the next monitoring period(M7)
Procurement of Boats	Mnkhanya	• Procured a Boat for Matula VAG to help the VAG to cross to the other side during Rainy season to benefit a total of 58 people
	Mwape	• Chili blasting project
Solar Lights Installation	Sandwe	• Procured and installed solar lights at Chiwale Health post and Chiwale school in Chibale VAG to provide lighting for studying at night and for patients.
Procurement and Distribution	Nyalugwe	• Procured and distributed iron sheets to Mombe, Ucha, Mvuwa, and Fundo VAGs

of Building Materials	Mburuma	Procured and distributed 4,184 iron sheets benefiting households in various VAGs.
	Shikabeta	- Procured and distributed iron sheets to Shimunguwo, Mwateshi, Chomba, and Lusemfwa VAGs - Procured and distributed 1300 pockets of cement benefiting Lubalashi and Chomba VAGs.
Road Maintenance	Kazembe	Due to a poor road network in the chiefdom, the Kazembe community used part of their conservation fees for road clearing on the Kazembe-Mbuzi road, benefiting approximately 1000 community members.
Education Support	Shikabeta	- School Scholarship Program: Assisted 3 tertiary students. - Teachers' Support Program: Benefited 5 teachers in 4 schools with allowances

These initiatives showcase the project's commitment to enhancing community well-being, environmental sustainability, and educational opportunities, contributing to positive and lasting impacts in the monitored period of 2023 and beyond.

- Improved water supply:

To improve water and sanitation in the communities that we work with, the project through the respective CFMGs improved access to clean and safe drinking water. The table below shows the completed and ongoing water and sanitation initiatives implemented in the current monitoring period(M6)

Project Description	Community/CFMG	Status
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Implemented WASH projects in 8 VAGs (Village Action Groups). - Installed 7 boreholes in Sandwe, Mileka, Chibale, Sengevwa, Chikoma, Chinkhombe, and Lumbuka VAGs - Constructed 6 Water reservoirs in Sandwe VAG.	Sandwe chiefdom/Sandwe	Project Completed
Implemented WASH projects in 2 VAGs - Drilled and installed a borehole in Mchimazi VAG. - Installed a mechanized water system in Nyalugwe VAG.	Nyalugwe Chiefdom/Nyalugwe	Project Completed
Installation of a 10,000-liter water tank at Kawaza School and extension of water taps from the school to nearby villages within Kawaza VAG.	Nsefu Chiefdom/Nsefu	Project still in progress.
Installation of water supply to the CFMG office and housing unit in Chinambi VAG	Luembe Chiefdom/Luembe	Project still in Progress(Materials procured, pending installation)
Drilled 10 boreholes in Chifukudzi (3), Kalongo Mwape (2), Misebe (3), and Chinsimbwe (2) VAGs.	Mwape Chiefdom/Mwape	Completed, however out of the 10 were dry boreholes)
Implemented 8 Wash projects in Rufunsa VAG Drilled and installed 8 boreholes in Kashika, Steven, Kweleko, RR, Chipindani, Nkholoma,	Mpanshya Chiefdom/Mpanshya	Project Completed

Kamutowo, and Chakufola villages.		
Borehole at the community guest house	Mnkhanya Chiefdom/Katemo Area	Project Completed

The WASH initiative efforts in various chiefdoms demonstrate the projects commitment to enhancing water accessibility and sanitation within the communities we work.

- Construction/Infrastructure Development

Infrastructure development in sectors like education and health, is one of the key initiatives that the project through the CFMGs implement to improve the access to good health, access to education and improvement of the social economic status of the communities we work with.

Infrastructure Projects that were initiated in the previous monitoring periods(M5) and are still ongoing or were completed in the current monitoring(M6) are shown in Table 6a below, whereas Table 6b presents the new projects that were initiated in the current monitoring period.

Table 6a. Infrastructure projects in the project zone (In progress /Completed in 2023).

Location (Chiefdom)	Description	Year started	Status/Date Completed
Malama	Construction of 1X 2 classroom block	2021	In Progress
Mnkhanya	Improvement CRB office and 1x2 Toilet	2021	In Progress
Jumbe	Construction of Chasera Post Health Centre	2020	In progress

Jumbe	Construction of a 2 in 1 staff house at the Health facility in Mphata VAG	2021	In Progress
Nsefu	Construction of 1 x 3 classroom block in Chitunda VAG		
Chitungulu	Construction of CRB Offices	2022	Completed
	Construction of incinerator at Nthumbe Health Post	2022	Completed
Sandwe	Construction of CFMG/CRB Office (Sandwe VAG)	2021	In progress
	Rehabilitation of 1x3 Classroom Block	2022	
Mwanya	Construction of Rural health post for Lukusuzi area	2022	In progress
Luembe	Completion of 1 by 3 classroom block at Mulamba school	2021	Completed(2023)
	Construction of 5 Housing unit ,Chinambi VAG	2021	In Progress
	Construction of Toilets at Mshalila Primary School, Chisanga VAG	2022	In Progress
	Construction of Maternity Annex, Luangazi VAG	2022	In Progress
	Completion of Market Shelter at Chinambi	2022	In Progress
	Completion of Market Shelter at Chalubilo	2022	In Progress
	Construction of Staff House at Ng'ambwa school, Ng'ambwa VAG	2022	In Progress
Nyalugwe	Construction of Maternity Annex, Mchimadzi VAG	2021	In Progress
	Construction of 1x3 classroom blocks In Kasansamula VAG	2021	In Progress
	Construction of 2 scout houses at Kasolo Camp	2022	In Progress

	Rehabilitation of the Nyalugwe Rural Health Clinic roof	2022	Completed(2023)
Mwape	Rehabilitation of 1x3 Classroom Block	2022	Completed(2023)
Rufunsa (Mpanshya)	Construction of a 1x 2 Classroom block in Chalunda, Nyampande VAG	2021	In Progress
Rufunsa (Mpanshya)	Construction of a 1x 2 Classroom block in Musukambale (Chansanje, Lukwipa Area)	2021	In Progress
Shikabeta	CFMG office, Mweteshi VAG	2021	In Progress

Table 6b. Infrastructural projects initiated in the current monitoring period (2023; M6).

Chiefdom	Project	Sector	Status
Sandwe	Construction of 6 water reservoirs in Sandwe VAG	WASH	Completed
Luembe	Completion of Community Storage Shed	Social	In progress
	Completion of 1x 2 classroom Block at Malopa Primary school	Education	In Progress
	Completion of 1 staff house at Mbilisao primary school	Education	In Progress
	Construction of staff house at chikwasha health post	Health	In Progress
Mwape	Construction of hummer mill shelter in Kalonga Mwape VAG	Social	In Progress
	Construction of hammer mill shelter in Chisimbwe VAG VAG	Social	In Progress
	Construction of CFMG Office	Social	In Progress

Activity Area 2: Apiculture, Agricultural Improvement, Diversification, and Economic Opportunities

Defined Activities:

- Development of agroforestry demonstration plots to test and demonstrate agricultural multi-cropping, diversification, and intensification.

- Training Lead farmers in conservation farming techniques to support follower farmers through the farmer-to-farmer model.
- Hosting of farmer field schools to teach farmers about climate-smart agriculture
- Development of apiary demonstration plots, and training of beekeeping farmers (mentors) in hive construction, maintenance, and appropriate apiary and beekeeping techniques.
- Distribution of beehives to participating households within the project area.
- Supporting poultry and animal husbandry and facilitating the construction of animal enclosures to prevent the spread of diseases and damage to crops

Additional Activities Undergoing Investigation and Further Consultation:

- Supporting the development of horticulture production
- Assistance with the commercialization of agricultural products and Support in crop aggregation for easy access to markets outside the project area
- Land-based aquaculture

Expected Positive Impacts:

- Increased quantity, diversification, and value of crops
- Improved nutritional value of crops
- More sustainable practices (Conservation farming, Beekeeping, and forest management training)
- Reduced pressure on the ecosystem
- Improved resilience to crop failure and market fluctuations
- Increased employment opportunities (Lead Farmers)
- Improved well-being
- Guaranteed market for honey

Potential Negative Impacts:

- Increased cost of living if the value of crops increases
- Conflict related to unequal distribution of benefits and workload

Support to improved agriculture techniques through Conservation Farming

In 2017, LCFP began its conservation farming activities by supporting the work of the Ministry of Agriculture, specifically through the provision of conservation farming extension services. Agreements were signed in 2017 with the respective territorial Ministry of Agriculture offices within the project zone in the districts listed in Table 7. These signed Agreements were renewed and signed in 2020 (M3) in form of the terms of references.

To be noted that the Lundazi district has not been renewed due to the absence of project areas within the Lundazi district itself. As a direct consequence of changes in district administrative boundary that occurred in 2020 (i.e creation of new districts and therefore modification of previous boundary extents), project areas that were initially located in Lundazi district were relocated to newly created districts named Lumezi district.

Table 7. District agreements with the Department of Agriculture.

Location (Districts)	Instance	Initial Agreement Date	Agreement Renewal Date
Mambwe	1	21/11/2016	08/05/2020
Nyimba	1,2,3 and 4	15/03/2017	20/04/2020
Lundazi	1	21/01/2017	-
Lusangazi	1	15/04/2020	-
Rufunsa	1 and 4	29/05/2017	21/05/2020
Lumezi	1 and 4	17/04/2020	-
Mpika	4	11/09/2023	
Chama	4	17/11/2023	

Arising from the FPIC community consultative meeting; forests are one of the main sources of livelihood for the local communities with illegal charcoal production, illegal logging, and unsustainable farming methods such as shifting cultivation (“slash and burn”) being the major activities conducted. These activities coupled with the increased in-migration of farmers from the plateau to the valleys, where soils are still fertile, has increased the demand for opening up new farmland within the project area. Conservation Farming was thus one of the activities identified during the needs assessment process as an intervention that would complement LCFP’s conservation activities. This intervention targeted 1,260 households with conservation farming training and extension services within the first year of implementation.

During the current monitoring period (2023), a total of 322 new lead farmers were enrolled across 12 instance 1,2 and 3 chiefdoms, and 7 in the new project instance 4 chiefdoms, bringing the total number of lead farmers under climate smart agriculture in 2023 to 800 from 478 lead farmers in 2022. Currently the project also tracks land under Conservation farming for Lead farmers and in 2023 (M6) alone, the project increased the area under conservation farming by 158 ha, bringing the total area under conservation farming to 566.5 ha since

2020. Table 8 shows summarized numbers of Lead Farmers enrolled per chiefdom. See appendix B for lead farmer registers.

Table 8. Current status of Conservation Lead farmers enrolled in the project zone.

	Old				New(2023)				Instance
No.	Chiefdom	Male	Female	Total(Old)	Male	Female	Total (New)	Total Overall	
1	Msoro	12	5	17	3	7	10	27	1
2	Nsefu	10	7	17	7	3	10	27	1
3	Mkhnanya	11	6	17	4	6	10	27	1
4	Malama	7	10	17	3	7	10	27	1
5	Jumbe	9	8	17	5	5	10	27	1
6	Chitungulu	17	15	32	0	0	0	32	1
7	Kazembe	18	7	25	5	2	7	32	3 and 4
8	Mwanya	21	11	32	0	0	0	32	1
9	Mpashya	22	17	39	0	0	0	39	1 and 2
10	Shikabeta	17	16	33	6	2	8	41	1 and 4
11	Chiawa	17	8	25	6	1	7	32	3
12	Mburuma	14	12	26	5	2	7	33	3
13	Mpuka	12	14	26	3	3	6	32	3
14	Luembe	30	12	42	4	3	7	49	1 and 4
15	Nyalugwe	24	11	35	0	0	0	35	1
16	Sandwe	33	20	53	0	0	0	53	1
17	Mwape	18	7	25	2	6	8	33	3
18	Nabwalya	-	-	-	21	10	31	31	4
19	Mukungule	-	-	-	24	17	41	41	4
20	Lundu	-	-	-	22	13	35	35	4
21	Kambombo	-	-	-	21	10	31	31	4
22	Chifunda	-	-	-	18	10	28	28	4
23	Chikwa	-	-	-	21	7	28	28	4
24	Tembwe	-	-	-	26	2	28	28	4
	Total	292	186	478	206	116	322	800	

In 2023 (M6) BCP together with the Ministry of Agriculture/The Zambia Agriculture Research Institute - Msekera Research conducted Climate Smart Agriculture and Farmer Field Schools trainings; below is a table showing all lead farmer trainings conducted in the current monitoring period;

Table 8a. Lead Farmer Trainings - M6

Lead farmers training 2023						
No.	Chiefdom/Training	Dates	Male	Female	Total	Instance
1	Msoro - Lead farmer training	17/9/2023	15	12	27	1
2	Nsefu - Lead farmer training	20/9/2023	17	10	27	1
3	Mkhnanya - Lead farmer training	15/9/2023	15	12	27	1
4	Malama - Lead farmer training	17/9/2023	10	17	27	1
5	Jumbe - Lead farmer training	23/9/2023	14	13	27	1
6	Chitungulu - Lead farmer training	14/9/2023	17	15	32	1
7	Kazembe - Lead farmer training	11/9/2023	23	9	32	3 and 4
8	Mwanya - Lead farmer training	26/9/2023	21	11	32	1
9	Mpashya - Lead farmer training	17/8/2023	22	17	39	1 and 2
10	Shikabeta - Lead farmer training	23-24/09/2023	23	18	41	1 and 4
11	Chiawa - Lead farmer training	16/8/2023	23	9	32	3
12	Mburuma - Lead farmer training	22/8/2023	19	14	33	3
13	Mpuka - Lead farmer training	22/8/2023	15	17	32	3
14	Luembe - Lead farmer training	01-03/09/2023	34	15	49	1 and 4
15	Nyalugwe - Lead farmer training	28/8/2023	24	11	35	1
16	Sandwe - Lead farmer training	28/8/2023	33	20	53	1
17	Mwape - Lead farmer training	28/8/2023	20	13	33	3
18	Nabwalya - Lead farmer training	20/7/2023	21	10	31	4
19	Mukungule - Lead farmer training	20/7/2023	24	17	41	4
20	Lundu - Lead farmer training	26/7/2023	22	13	35	4
21	Kambombo - Lead farmer training	27/7/2023	21	10	31	4
22	Chifunda - Lead farmer training	10/8/2023	18	10	28	4
23	Chikwa - Lead farmer training	4/8/2023	21	7	28	4
24	Tembwe - Lead farmer training	27/7/2023	26	2	28	4
Total			498	302	800	

In total, the project provided training in climate smart agriculture techniques to 800 participants. The main objective of these trainings was to teach farmers the different Climate smart agricultural technologies that are being implemented at the moment. The technologies included agroforestry, Integrated Soil Fertility Management, Conservation Agriculture, Conservation farming and other unique agricultural models like Evergreen Maize for Africa and SILMS. The other objective of the training was to teach farmers the importance of the Farmer Field Schools and how to establish Farmer Fields Schools within their communities (See Appendix B for training reports).

To support farmer field school demonstration plots, a total of 664 conservation farming demonstration packs were distributed to lead farmers in the participating chiefdoms (Table 9), including in the newly added 7 project activity instances in M6.

Table 9. Starter packs distribution during the current monitoring period.

No.	Chiefdom	Number of Starter Packs Distributed	Instance
1	Msoro	27	1
2	Nsefu	27	1
3	Mkhanya	-	1
4	Malama	27	1
5	Jumbe	27	1
6	Chitungulu	32	1
7	Kazembe	32	3 and 4
8	Mwanya	32	1
9	Mpashya	39	1 and 2
10	Shikabeta	40	1 and 4
11	Chiawa	-	
12	Mburuma	33	3
13	Mpuka	33	3
14	Luembe	49	1 and 4
15	Nyalugwe	35	1
16	Sandwe	53	1
17	Mwape	33	3
18	Nabwalya	-	
19	Mukungule	-	
20	Lundu	32	4
21	Kambombo	29	4
22	Chifunda	28	4
23	Chikwa	28	4
24	Tembwe	28	4
	Total	664	

Demonstration inputs packs included the following:

- i. Maize seed 5kg
- ii. Soya beans seed 20kg/ Groundnuts
- iii. Basal dressing fertilizer 2 X 50kgs
- iv. Top dressing fertilizer 1 x 50kgs

Support of Diversification and Economic Opportunities

- Horticulture

Horticulture is important in creating employment, enhancing profits, and providing nutritional and economic security for the farmers. In 2023 (M6), the project did not recruit any new farmers but continued monitoring the existing 130 horticulture farmers. However through the

Jumbe, Nsefu, Malama and Chitungulu CFMGs, the project implemented horticulture initiatives in their respective chiefdoms, ranging from trainings in gardening to distribution of seed and treadle pumps.

Support for the development of Value Chains in Non- timber forest Products

- Improved Apiculture techniques:

Whilst beekeeping is regarded as a cottage industry in Zambia, that is well suited for individuals and companies with limited resources for investment, its potential to contribute to the reduction of rural poverty cannot be ignored. According to the Central Statistics Office (2010), the incidence of rural poverty in Zambia is about 80 %. If well organized, beekeeping can contribute to poverty reduction as it increases people's income.

Although honey hunting and beekeeping have been practiced for a long time by almost all communities in Zambia, beekeeping is only now being promoted as an alternative livelihood for those people that are involved in charcoal production and illegal game hunting, and for those that want an extra income.

Against this background, LCFP conducted a viability assessment in 2016, on the potential to establish honey production value chains within the LCFP project area. Based on the findings of this viability assessment, an agreement was signed with Bee Sweet, to expand honey production to cover the LCFP project zone. Through this intervention, 12 from a target of 11 honey producer- lead farmers (Mentors), received training from Bee Sweet in hive construction and maintenance and apiary management (Table 10).

In addition, through this intervention, 4050 Kenya top bar beehives were distributed within the LCFP project area to 1,100 beneficiary households (Table 10).

Table 10. Beehive distribution by BeeSweet in the project zone.

District	Chiefdom	Target No. of hives to be distributed	Actual No. distributed	Date of last beehive delivery
Mambwe	Jumbe	2000	1318	Aug-17
	Mnkhanya	1000	388	Feb-18
	Msoro	2000	1515	May-18
	Malama	1000	264	May-18
	Nsefu	1000	375	May-18

	Mwanya	1000	681	May-18
Lumezi	Chitungulu	200	190	May-18
Total		6,200	4,050	

The contract with Bee Sweet ended in April 2020 without renewal. BCP, working with Nature's Nectar, conducted a feasibility study between September and October 2020 for expanding the honey project. This study was used to provide baseline data to the new partner on the current status on the honey project. Following the feasibility study, BCP in March 2021 entered into a Specific Partnership Agreement with Nature's Nectar to manage the beehives and purchase honey from the managed beehives. Currently this Specific Partnership Agreement is working well with Nature's Nectar having already trained 116 Mentors in honey harvesting (Table 11).

Table 11. Number of bee mentors trained in the project zone.

District	Chiefdom	No. Mentors trained	Date of Completion of training	Facilitator	Topics
Mambwe	Mwanya	3	Jul-16	BeeSweet	Hive construction and maintenance and apiary management
	Jumbe	2	May-17	BeeSweet	
	Mnkhanya	1	May-17	BeeSweet	
	Msoro	3	Aug-17	BeeSweet	
	Malama	3	Aug-17	BeeSweet	
	Jumbe	3	Jun-21	Nature's Nectar	Honey harvesting
	Mnkhanya	2	Jun-21	Nature's Nectar	
	Msoro	3	Jun-21	Nature's Nectar	
	Nsefu	2	Jun-21	Nature's Nectar	
Lumezi	Mwanya	3	Jun-21	Nature's Nectar	
	Chitungulu	1	Jun-21	Nature's Nectar	

Nyimba	Shikabeta	76	Nov-22	Nature's Nectar	Beehives management, assembling, baiting, and hanging
	Nyalugwe	126	Nov-22	Nature's Nectar	

In the current monitoring period (M6), the beekeeping initiative recruited 300 new beekeepers in 5 chiefdoms, namely Mburuma(50), Mpuka(50), Luembe(100),Chitungulu (5000 and Sandwe(50) bringing the total number of beekeepers supported by the beekeeping initiative to 1331 across the project Zone. See table 12

Table 12. Beekeepers' recruitment during the current monitoring period (M6)

Chiefdom	2021 Beekeepers	2022 Beekeepers	New Beekeepers Recruited (2023)	Total	Instance
Jumbe	120	70	-	190	1
Nsefu	93	35	-	128	1
Mpanshya	0	100	-	100	1 and 2
Shikabeta	0	99	-	99	1 and 4
Luembe	0	100	100	200	1 and 4
Nyalugwe	0	100	-	100	1
Chitungulu	24	0	50	74	1
Mnkhanya	151	0	-	151	1
Msoro	99	0	-	99	1
Mwanya	90	0	-	90	1
Mburuma	-	-	50	50	3
Mpuka	-	-	50	50	3
Sandwe	-	-	50	50	1
TOTAL	577	504	300	1381	

Support is provided in form of trainings, distribution of beehives and provision market for the Honey produced.

Training: In M6, Nature's Nectar conducted beekeeping training targeting 300 new beekeeping Farmers and focused on beehive assembly, hive hanging, general beehive management and capturing GPS Coordinates of active beehives.

Beehive Distribution: In the current monitoring period (M6), the project distributed 3,000 new beehives, as shown in Table 13 (refer to Appendix B for supporting documents).

Table 13: Beehive distribution by Nature's Nectar in the project zone.

Chiefdom	Zone	# beehives distributed	Year of delivery	Instance
Jumbe	Mphata	354	2021	1
Shikabeta	Chisulo	650	2021	1
Mkhanya	Kumbukile	500	2021	1
Msoro	Lupande	340	2021	1
	Kawala	330	2021	1
	Kasamanda	330	2021	1
Mwanya	Chasera	350	2021	1
Nsefu	Kawaza	150	2021	1
Jumbe	Mphata	347	2022	1
	Chisulo	350	2022	1
Luembe	Chalubilo	1000	2022	1 and 4
Mpanshya	Nyampande	750	2022	1 and 2
	Chimusanya	250	2022	1 and 2
Nsefu	Kawaza	350	2022	1
Nyalugwe	Moombe	500	2022	1
	Muchimadzi	500	2022	1
Shikabeta	Mwateshi	250	2022	1 and 4
	Lusemfwa	250	2022	1 and 4
	Shimunguwo	244	2022	1 and 4
	Lubalashi	250	2022	1 and 4
Chitungulu		500	2023	1
Luembe	Chinambi	500	2023	1 and 4
	Simalima	250	2023	1 and 4
	Chisanga	250	2023	1 and 4
Sandwe	Lumbuka	500	2023	1

Mburuma	Chaulima	250	2023	3
	Maluwila	250	2023	3
Mphuka	Kafuwela	250	2023	3
	Mkaliva	250	2023	3
TOTAL 2021		3,004		
TOTAL 2022		5,041		
TOTAL 2023		3,000		
GRAND TOTAL		11,045		

Market Access: During the current monitoring period (2023; M6), a total of 3,036 kg of honey was purchased and generated K 61,925.40 ZMW of revenue to farmers in LCFP (Table 14). This has contributed to improved and diversified household income for beekeeping farmers across LCFP.

Table 14. A summary of the harvest data for LCFP for 2021- 2022 and 2023 (M6).

Location	Total kg Purchased			Total Paid Out (ZMW)			Instance
	2021-2022	2023 (M6)	Total	2021-2022	2023 (M6)	Total	
Chitungulu	718.4	281	999.4	16,763.00	5,731.30	22,494.30	1
Jumbe	1,048.20	729.4	1777.6	23,239.00	14,880.40	38,119.40	1
Luembe	-	142	142	-	2,897.00	2897	1 and 4
Mnkhanya	277.3	274.7	552	6,161.00	5,603.30	11,764.30	1
Mpanshya	-	148.9	148.9	-	3,032.00	3032	1 and 3
Msoro	329.8	-	329.8	7,688.00	-	7,688.00	1
Mwanya	3,287.40	999.1	4286.5	74,063.00	20,380.60	94,443.60	1
Nsefu	358.7	270.2	628.9	7,104.00	5,512.80	12,616.80	1
Shikabeta	-	190.7	190.7	-	3,888.00	3888	1 and 4
Total	6,019.80	3,036.00	9,055.80	135,018.00	61,925.40	196,943.40	

Expected Outcomes:

- Reduced encroachment into the forests under protection through REDD+ by local communities harvesting honey.
- Increased production of natural honey.
- Improvements in the income levels of rural households through the sale of honey.
- Reduction in the use of traditional hives and falling of trees due to honey hunting.
- Enhancement of the knowledge base and skills of the honey producer in modern honey production, processing, and marketing practices.
- Confidence built amongst honey producers due to having a guaranteed market for the honey produced.

Activity Area 3: Forest Encroachment and Wildlife Monitoring and Poaching Reduction

BCP provides support to the local CRB community scouts and the Department of National Parks and Wildlife (DNPW) to ensure the protection of the project area from encroachment by monitoring wildlife and reducing poaching. This activity is also supported by satellite-based Global Land Analysis and Discovery forest change alerts (GLAD Alerts) from Global Forest Watch and aerial monitoring.

Defined activities:

- Monthly analysis of GLAD Alerts and follow up by Aerial patrols
- Monthly patrols by community scouts along project area boundaries identified as encroachment hotspots.
- Monthly aerial and ground monitoring of wildlife
- Monthly or bi-monthly aerial monitoring of encroachment along project boundaries
- Monthly monitoring of high conservation value species
- Monthly anti-poaching activities including removal of snares, counting carcasses, and apprehending suspected poachers.

Expected Outcomes:

- Quick response to encroachment in the project area
- Rapid resolution of encroachment through the consultation process by local governance structures notably the CRB and chiefs.
- Reduction of encroachment over time as project activities expand and awareness of monitoring activities take hold.
- Greater understanding of wildlife populations and threats to wildlife.
- Adapt management to changing wildlife populations.
- Increase in wildlife populations, especially high conservation value species.

- Employment creation for community scouts.
- Reduction of leakage and project emissions.

Thus far monitoring has been rolled out in most of the project area by participating CRBs. BCP has developed an Impact Monitoring Manual which has a chapter that outlines the interaction of satellite-based alerts and aerial and ground-based monitoring. Potential encroachments received as GLAD Alerts are verified by aerial monitoring and recorded using a GPS. This information is then stored in a database and follow up ground monitoring is then actioned by BCP conservation staff. Scouts are given the location of encroachment, once confirmed on the ground and contact made with encroachers, the Community Engagement Team and CRB then follow up and investigate incidents further.

Aerial Forest Monitoring

Monitoring has been rolled out in all of the project areas and results of aerial monitoring are shared with all CRBs at the end of each month. Figure 7 below is an example of a monthly Aerial Patrol map for the Msoro Chiefdom and the associated post-flight report is shown in Appendix B, as an example.

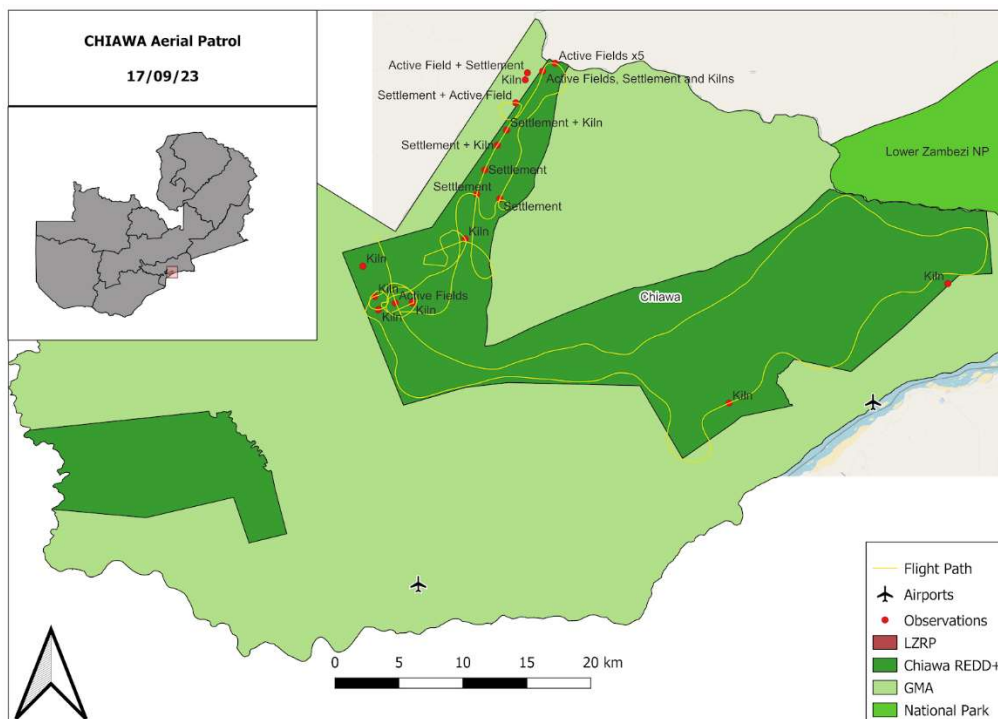


Figure 7. Aerial monitoring map of Chiawa for the month of September 2023.

Forest Monitors and Scouts

Trained resource protection teams composed of local community members patrol and secure the project area, reporting any acts of deforestation or wildlife poaching that take place. Particular emphasis is placed on protecting the perimeter of the property, especially the

boundary adjacent to community lands, with an aim to prevent further encroachment of the project area. Security activities are undertaken through close collaboration with the Forestry Department, Zambian Police and the (Department of National Parks and Wildlife) DNPW. Resource protection teams are also trained in effective conflict resolution practices, for example, effective communication styles for pursuing non-confrontational discussions with local community stakeholders. BCP's Forest Monitors are also engaged in ongoing comprehensive biodiversity monitoring programs, which are designed to track the ongoing impacts of BCP's REDD+ activities on local wildlife.

In the current monitoring period (6) of 2023, two SMART trainings were conducted:

Community Scouts SMART 7 Upgrade Training: From 16th February to 11th March 2023, 108 Community Scouts and 18 World Police Officers received training. The primary focus was on SMART 7, communication, the use of Garmin In-reach devices, and clarifying the roles and responsibilities of Community Scouts.

SMART 7 Setup and Training for Data Managers: A total of 10 people were trained. This included 8 SMART data managers from LZRP and LCFP, along with 11 data collectors from Mwanya chiefdom. The training focused on the new features in SMART 7 Mobile and Desktop, aimed at improving the overall user experience and workflow. The main objective was to ensure participants could effectively operate and implement the SMART 7 toolkit (check appendix B for supporting documentation).

In 2022, the project launched a scout recruitment initiative targeting both the new Instance 4 Chiefdoms and the existing chiefdoms. This effort continued during the current monitoring period (M6), with a formal training conducted by Nyamaluma Wildlife Training School from 18th September 2023 to 20th December 2023. The training began with 71 participants; however, some dropped out along the way, and a total of 49 scouts successfully completed the course, including 9 female officers drawn from various conservation entities.

The objective of this training was to establish standards for anti-poaching and law enforcement officers. The selected community scouts were recruited from Mwanya, Chitungulu, Kazembe, Luembe, Mwape, Sandwe, Mboroma, Chembe, Nsefu, Mnkhangya, Kakumbi, and Jumbe areas, and they underwent an intensive 90-day program. The training was divided into three phases: Induction and Selection, Basic Anti-Poaching Phase 1, and Basic Anti-Poaching Phase 2, each covering a series of targeted activities and practical sessions.

Of the 49 scouts who completed the course, 20 were from the new Instance 4 Chiefdoms. This initiative was designed to build capacity for forest and biodiversity patrols in the newly added areas, while also reinforcing existing manpower in the previously established chiefdoms (see supporting documentation in Appendix J).

During the same period (M6), conservation efforts in the form of Aerial, vehicle, foot and motorbike scouts' patrols were conducted in the LCFP project areas, the community scouts achieved a total patrol coverage of 26,274.3, of which 20,684 being foot coverage, 5,402.3 vehicle coverage and 188 motorbike coverage. This led to 5 apprehensions, 50 snares recovered, and 7 firearms confiscated/recovered.

See appendix B for annual Spatial Monitoring and Reporting Tool (SMART) reports for the monitoring period under review.

Fire Management

Fire plays a significant role in shaping the habitat of miombo and mopane woodlands, which dominate the Luangwa Valley. However, uncontrolled wildfires, primarily caused by human activities, contribute to forest degradation. To address this issue, LCFP, in collaboration with DNPW, FD, and the CFMGs, is implementing fire management programs in the LCFP REDD+ zones to prevent late-season intense fires. During the current monitoring period, the project, along with community partners and government agencies, carried out early burning activities in the Kazembe, Chitungulu, Mwanya, Malama, Nsefu, Jumbe, Msoro, and Mnkanya Chiefdoms. For additional details, see Appendix B.

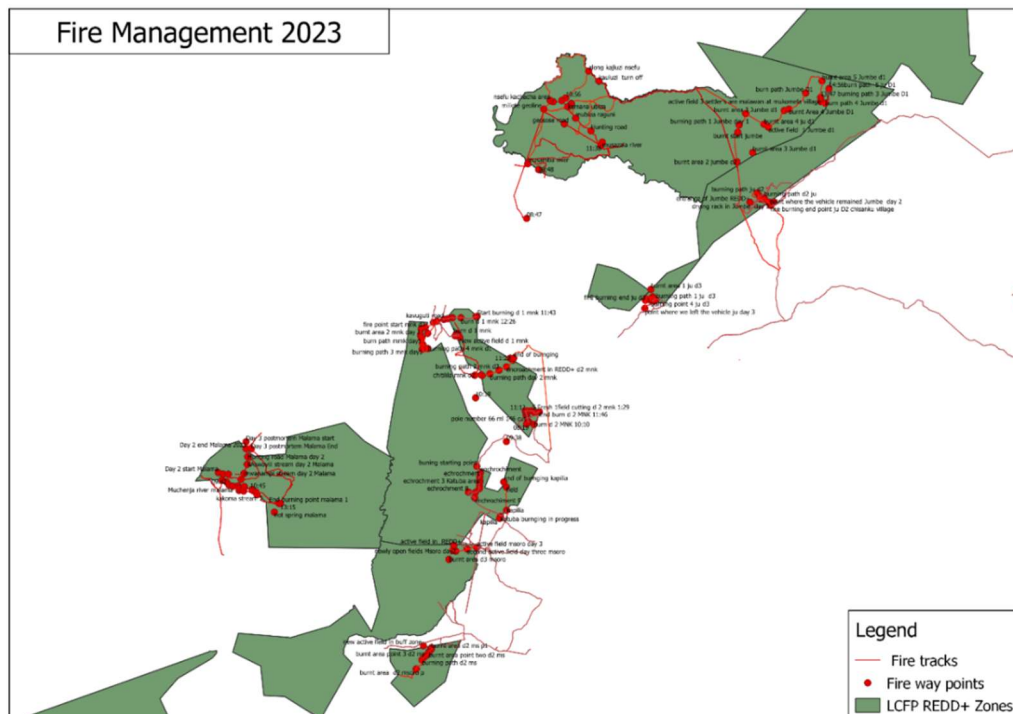


Figure 7.a . Early Fire Burning Map - 2023.

Structured Biodiversity Monitoring

The Line Transect Distance Sampling method is used to monitor medium to large mammals and other species of conservation importance, and indirect signs of wildlife presence are also recorded. In this survey, teams walk in a straight line in a predetermined and fixed direction. In order to infer abundance estimates, the perpendicular distance between the transect line center and the observation is recorded precisely which enables afterward to derive a detection probability function and then an effective strip width based on which density estimates are computed. A master sampling frame consisting of grid cells is overlaid on the survey areas and each cells are crossed by 2 parallel transects, resulting in a series of equidistant transects. One survey is planned per year per site, during the dry season, between June and October-November.

Additionally, camera traps are also deployed in selected sites, using the same grid based system than the Line Transects, with one camera trap station placed within the central part of the grid cell. Cameras are deployed during the dry season and left in the field for a period of two to three months. Wherever possible, camera trap surveys are repeated annually to support the data from transect surveys and are particularly valuable for capturing the presence of locally rare, nocturnal and elusive species. It enables as well to compute patch occupancy analysis which provides information on population trends.

To complement the Line Transect survey and camera trap arrays, wildlife is monitored on a daily basis by the scouts patrolling the conservancy.

Finally, vultures, listed as Critically Endangered on the IUCN Red List of Threatened Species, are monitored through gps trackers. It provides valuable information of the distribution and movement patterns of these birds.

In 2023, the Line Transect Distance Sampling survey took place in three sites, namely in the Munyamadzi, Mwanya and Nsefu REDD+ zones. Each survey followed a 2-day refresher training with all the scouts participating in the survey. The total survey effort across the three sites reached 270 km and 114 sampling units. During the surveys, 691 observations of terrestrial mammals belonging to 28 taxa, including 246 live sightings of animals (No. taxa = 23), were conducted on transects (see report in AppendixB).

Camera traps have been deployed in 43 stations across two sites, namely in Munyamadzi and Mwanya REDD+ zones. The photos remain to be processed.

Five white-backed vultures and one white-headed vulture were tagged with gps trackers in the Chiawa GMA and neighbouring Lower Zambezi National Park (see report in Appendix). Their movement, as well as the movement of the three white-backed vultures tagged in 2022 in the Munyamadzi REDD+ zone, are being monitored on a daily basis on various platforms (Movebank and EarthRanger). In terms of distance travelled, these birds flew on average a distance of 1837 km per month, ranging from 55 to 5176 km. Of the 137,812 km cumulative

total distance flown by the 9 tagged vultures, 38,003 km were flown over the BCP REDD+ zones.

For the very first time, an aerial survey of megaherbivores was conducted in the Lower Luangwa valley. One survey focused on the hippopotamus and crocodile populations and another on terrestrial large mammals in the Munyamadzi and Kazumba REDD+ zones. The Luangwa River Survey followed a single flight path over 123.9km of the main watercourse. A total of 1 054 hippopotami and 485 crocodiles were sighted during this flight. The Munyamadzi/Kazumba terrestrial large mammals survey followed predetermined flight paths, spaced 750m apart. A buffalo population estimate of 356 buffalo and an elephant population estimate of 432 elephants were assessed for the reserves. Population estimates were also calculated for other species seen during the survey, and included bushbucks, common duikers, greater kudu, impalas, puku, roan antelopes, Thornicroft giraffes, warthogs, waterbucks, Cookson's wildebeests and Crawshay's zebras. Details of the surveys are available in Appendix.

Finally, in November 2023, a road count of Thornicroft giraffes was conducted in the Nyakolwe REDD+ zone. This was part of a range-wide census of the Thornicroft giraffe initiated by the Giraffe Conservation Foundation and the Zambian Carnivores Program.

Theory of Change

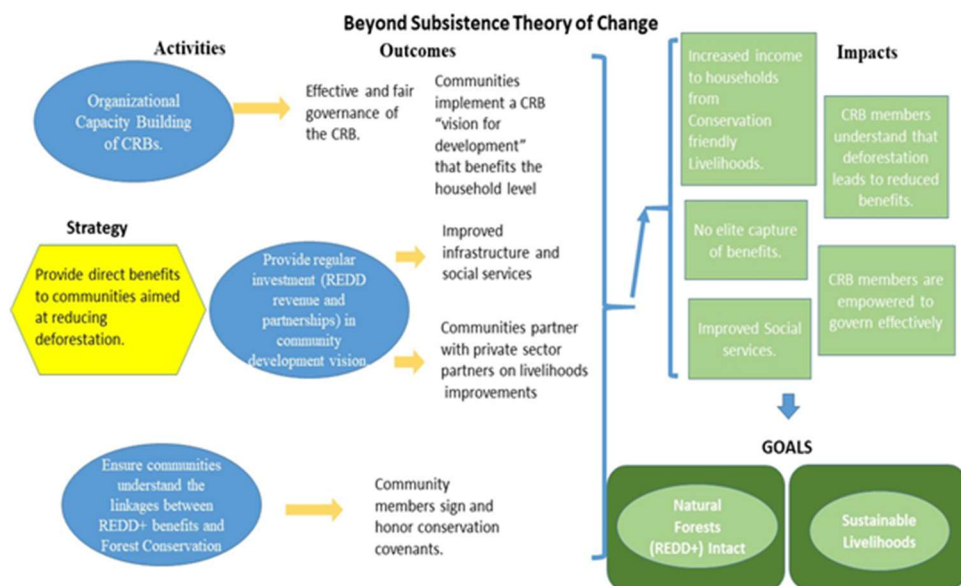


Figure 8. BCP Community Theory of Change

Our Theory of Change (Figure 8) around the provision of livelihoods support is that if we can help communities make long term investments in a shared vision for development and demonstrate that those investments are intrinsically linked to the successful long term conservation of forests, then livelihoods in those communities will improve demonstrably and be sustainable, while natural forests will remain intact.

Key risks to providing benefits to the communities include the following:

- Risk of elite capture of benefits, either from REDD+ or from livelihood activities themselves.
- Communities may not grasp the connection between performance (REDD+ forest conservation) and the benefits they receive.
- Households may not benefit enough from REDD+ to halt deforestation.
- Households may “cheat” and take benefits while continuing to deforest.

To address some of these risks BCP is implementing forest and biodiversity protection measures, in addition. Since these risks are complex and difficult to deal with we also forward a Beyond Subsistence Livelihoods approach that:

- Builds the capacity of CRBs to manage financial resources, govern themselves effectively and build a shared vision for development.
- Provides demonstrable, regular benefits that are used to invest in the shared vision for development that benefit the household level.
- Ensures communities understand linkages between receiving REDD+ benefits and long term forest conservation.

This combination of community-based natural resource governance and sustainable livelihood development will result in long term conservation and sustainable development impacts for these communities.

Our Beyond Subsistence Livelihoods activities are focused on achieving outcomes that will set the stage for achieving development impacts. CRBs need a vision for development implemented through effective and fair governance of the institution. Investments should lead to improved infrastructure and social services (education and health). The private sector should invest in these communities to build mutually beneficial partnerships. This approach requires that all members of the CRB “sign on” to and honor conservation covenants that spell out the responsibilities that go along with the benefits that come from REDD+.

If we can support our community partners to achieve these outcomes, then these impacts will flow from our work:

- Increased income at the household level from forest conservation-friendly livelihoods.
- CRB members will understand that deforestation leads to reduced benefits from REDD+.

- CRB members will be empowered to govern effectively.
- There will be no elite capture of REDD+ benefits.
- Households will benefit from improved social services.

In combination with our efforts to build local capacity and responsibility for forest and biodiversity conservation, these livelihood efforts lead to our ultimate goals of keeping natural forest ecosystems intact and ensuring that community livelihoods are profitable and sustainable.

Expected Positive Impacts:

- Reduction in the cost of living
- Increased level of education in communities
- Increased local capacities
- Increased life expectancy
- Reduced child mortality and disease transmission

Potential Negative Impacts:

- Conflicts related to the equitable distribution of benefits

All the above-mentioned activities are connected in some way to reducing the non-permanence risk. By ensuring little deforestation takes place in the project area, community members' shares are benefited by the project, hence reducing opportunity cost risks and activity displacement leakage is limited to a minimum.

The monitoring of the implemented activities in the current monitoring period for the project, including the new instances was done using our ODK central platform where all data was collected using ODK collect, in the field and uploaded to the server, where data cleaning and storage is done.

Some of the activities implemented in the new 4th instance started in 2022, like the scouts recruitment process and natural resources good governance support , i.e. pre-selection of scouts in the new instances and CRB formation/elections support (Chembe and Mboroma) respectively, and continued into 2023, with capacity building trainings. Activities like selection, training of scouts, CRBs and lead farmers, and distribution of inputs and beehives included in the new instances happened within the monitoring period.

The project's activities have significantly contributed to GHG emission reductions during the monitoring period. By strengthening natural resource governance through the formation and training of Community Resource Boards (CRBs) /Community Forest Management Groups (CFMGs), the project empowered local communities to enforce sustainable forest

management practices, reducing illegal logging and forest degradation. The training of community scouts also helped protect forests and provided employment opportunities for individuals previously involved in illegal activities like charcoal burning, shifting their livelihoods toward more sustainable practices. Additionally, the distribution of beehives and training in climate-smart agriculture enabled communities to adopt alternative income sources, reducing reliance on forest exploitation. Farmers, now cultivating smaller, more productive plots of land, no longer need to clear large areas for agriculture, further reducing deforestation. Collectively, these activities have helped preserve carbon stocks, reduce emissions from deforestation and land-use change, and promote long-term forest conservation.

3.2 Deviations

3.2.1 Methodology Deviations

MR.97

Demonstration of Forest Age

The methodology requires (in PDR.22) that a digital GIS-based map of the project accounting areas, including aerial or satellite imagery showing that they are comprised of forests or native grasslands as of the project start date and 10 years prior to the project start date. The project did not meet this requirement because it chose to map forests in the project area with PALSAR radar data and the earliest available data for that sensor is from 2007. However, this is justified on several grounds. The project areas are virgin forests that were previously remote and are inaccessible. Thus, there is no history of large disturbances in the area that would have been followed by regeneration between 2005 and 2007. An accurate 2007 forest map of these areas should be virtually indistinguishable from a 2005 map. Additionally, using the 2007 PALSAR imagery results in a much more accurate map of the forests that existed 10 years prior to the start date than would be possible with optical imagery. The optical imagery best suited to mapping the project area is generally from April-June. It is at this time of year, that relatively cloud-free imagery can be obtained when the forests still have leaves and are not dotted with burn scars. Even so, the passing of just a couple of weeks during this period, which is immediately after the rains, results in significant changes in the appearance of the forest in optical imagery. The project initially tried mapping forests with optical imagery but found significant changes between years that were the result of seasonality rather than real changes in forest areas. These effects are much reduced when using PALSAR radar data. This is because, in addition to being cloud penetrating, L band radar has a relatively long bandwidth and thus does not generally interact with the leaves of trees, but does interact with large branches and stems⁸. Finally, VM0009 does not

⁸ Mitchard, E. T. A., *et al.* "Using satellite radar backscatter to predict above - ground woody biomass: A consistent relationship across four different African landscapes." *Geophysical Research Letters* 36.23 (2009)

require a remote sensing analysis of an area, but rather to visually show that it is unconverted as of the project start date and 10 years prior. Such an approach is highly subjective since unconverted grasslands and farmlands may at times appear similar. With the PALSAR based analysis, all non-forest areas, whether natural or not, were excluded. Thus, using the PALSAR data improved the accuracy of the analysis and did not negatively impact the conservativeness of the quantification of GHG emission reductions or removals. The deviation only affects the monitoring and measuring part of the methodology.

Leakage Plot Protocol

There was a minor deviation of the visual approach for leakage monitoring (Appendix R, VM0009). Instead of Forest Inventory Team members estimating degradation, they were required to geo-reference every felled tree in the permanent plots and the total number of felled trees were compared against the average density of trees/ha in the project accounting area, again avoiding biased estimations/erroneous counting of trees in 1ha plots. This value was then placed in a degradation category as per VM0009. This approach removed all potential bias and greatly improves the robustness and repeatability of degradation monitoring. This deviation does not affect the conservativeness of any emissions reductions as it is in fact an improvement of the prescribed procedure and removes observer bias that could result in degradation in the leakage area being underestimated. The deviation only affects the monitoring and measuring part of the methodology.

Since a section of 39,694 ha of the second and third project activity instance areas overlapped with the initial activity shifting leakage area (originally 319,179 ha), the new leakage area comprises 279,485 ha. This is not strictly regarded as a methodological deviation, as VM0009 allows for existing leakage areas to be converted to future project activity instance areas.

Biomass estimation

The project uses two different allometric equations to estimate above-ground biomass. One was developed from data provided by Prof. Chudimayo from Zambian Miombo (see Appendix G) and was tested on trees up to 55 cm DBH. It is used to estimate the biomass of trees up to 63 cm dbh, with the biomass of trees between 55 cm and 63 cm dbh assumed to be equal to a 55 cm dbh tree. Then, a second equation developed by Mugasha et al. in Tanzanian Miombo (see Appendix G) is used to estimate the biomass of trees between 63 cm dbh and 110 cm dbh with trees with a greater than 110 cm dbh assumed to have biomass equal to a 110 cm dbh tree. This parsing is necessary because the methodology requires that the directly measured biomass of the largest tree in the representative sample of destructively harvested trees be greater than the biomass predicted by the equation and that the value of the first-order derivative of the largest tree in the representative sample and inventory not differ by more than 10%. The first selected allometric equation does underpredict the biomass of the largest tree in the representative sample, but the difference

of the first-order derivative values was greater than 10%. The second allometric equation doesn't pass the first test (it slightly over predicts the biomass of the largest tree in the sample). However, compared to the Zambian equation, it predicts lower biomass for every size tree. Therefore, the equations were applied as described above to enable the project to make an estimate of the biomass of larger trees that fell outside the range of the size of trees used to develop the equations. Only 44 trees out of 3687 trees in the inventory had a dbh above 55 cm and only 4 had a dbh above 110 cm. Applying the equations in this way is conservative and erases the possibility of the equation over predicting biomass of trees outside the size classes for which it was tested. This deviation only relates to how biomass is measured for monitoring purposes and doesn't affect any other part of the methodology. It results in a more conservative estimate of biomass and emissions savings. Therefore, it meets the criteria for an acceptable methodological deviation.

Soil Emission Calculations

The VM0009 baseline soil emissions model assumes that SOC in deforested areas will deplete to the same value as the proxy area after 5 years. Project SOC emissions are supposed to be tracked directly through field measurements in encroached areas. However, in the project area, the main drivers of deforestation (smallholder farmers) deliberately choose high fertility areas for conversion with higher than average SOC values. Following the methodology, it would appear that encroachment causes an increase in SOC, which is not consistent with what is actually occurring to soil stocks. To avoid this bias, we conservatively assumed that once encroached, the average SOC stocking per ha in the encroached area becomes the proxy area SOC stocking. This methodological deviation is, therefore, more conservative in calculating emissions reductions from SOC. It does not relate to any other part of the methodology, except for calculating soil carbon stocks in the encroached area. See the master biomass summary spreadsheets in Appendix G for this conservative calculation.

Carbon Stock Figures- Project Activity Instances Two and Three (Only Applicable to M5)

The project opted to use the first instance accounting area carbon stock value of 236.2 tCO₂e/ha in the other 2 project activity instances accounting areas, and recognized this as a methodology deviation.

Miombo woodlands across Zambia can be found in various stages of disturbance from human activities, mostly due to selective wood harvesting for charcoal production, leading to changes in canopy structure and species diversity. Often, these extractive activities modify the ecosystem to an extent that makes it vulnerable to further degradation. Studies such as

Handavu et al. (2021)⁹ and Bulusu et al. (2021)¹⁰ have demonstrated that these disturbances significantly affect plant density and height, which is likely to affect carbon storage of these woodlands. Furthermore, as explained by Bouvet et al. (2018)¹¹, while efforts to estimate carbon stocks in African woodlands have advanced in recent years, there are still challenges and uncertainties associated with accuracy. Improving the accuracy of carbon stock estimation requires continued refinement of remote sensing techniques, validation with ground-based measurements, development of region-specific allometric equations, and enhanced data availability and quality.

Field studies conducted in Miombo woodlands across the Sub Saharan Africa region have estimated carbon stocks values ranging between 167 tCO₂e/ha and 845 tCO₂e/ha (Handavu et al. (2021) indicating a high variability that results in high uncertainty when trying to adopt to a different location. As such, the LCFP project resorted to the use of its own forest inventory data, rather than reliance on literature. The carbon stocks for the project are calculated using locally derived allometric equations as mentioned in section 4.3 of the Monitoring Report.

The LCFP project applied Miombo biomass carbon stock values of 236.2 tCO₂e/ha across the 3 project activity instances estimated for a single stratum of intact forest. As explained in the LCFP PD (page 195), biomass plots are re-measured on a rotating basis, with 20% measured per year, such that the project's overall carbon stock estimates are updated every 5 years after all plots (100 %) have been re-measured. As per M5, the upcoming carbon stock dataset would be updated for the 2023 crediting period (M6) as the biomass plot monitoring rotation started in 2019. The forest inventory raw data for instances 2 and 3 to date (Appendix G) shows that the carbon stocks in PAI#2 (551.38 tCO₂e/ha) and PAI#3 (388.26 tCO₂e/ha) are actually higher than the PA#1 value of 236.2 tCO₂e/ha). The project, therefore, conservatively considered the use of the lower value in all the instances for this monitoring period. Moreover, most of the studies conducted in miombo woodlands reported carbon stocks that are higher than those used by the LCFP project in the previous monitoring period. For instance, Munishi et al. (2010)¹² calculated Miombo carbon stocks values of 385

⁹ Handavu, F, Syampungani, S Gudeta W. Sileshi & Paxie W. C. Chirwa (2021) Aboveground and belowground tree biomass and carbon stocks in the miombo woodlands of the Copperbelt in Zambia, Carbon Management, 12:3, 307-321, <https://doi.org/10.1080/17583004.2021.1926330>

¹⁰ Bulusu, M.; Martius, C.; Clendenning, J. Carbon Stocks in Miombo Woodlands: Evidence from Over 50 Years. Preprints 2021, 2021030029. <https://doi.org/10.20944/preprints202103.0029.v1>

¹¹ Bouvet, A. et al. An above-ground biomass map of African savannahs and woodlands at 25 m resolution derived from ALOS PALSAR. Remote sensing of environment 206, 156–173 (2018).

¹² Munishi PKT, Shirima, DD (2010). Measuring and Valuing the Carbon Stocks in Chome Nature Reserve, Eastern Arc Mountains, Report submitted to Eastern Arc Endowment Fund for Forest and Beekeeping Division, Dar es salaam Tanzania. p. 17

tCO₂e/ha in the southern highlands of Tanzania, and Missanjo et al. (2015)¹³ obtained carbon stocks of 845±16 tCO₂e/ha in Chongoni, Malawi.

These statistics, therefore, confirm that the locally calculated and VCS validated and four times verified carbon stock value of 236.2 tCO₂e/ha was a conservative stand-in value that could be used until the scheduled carbon stock master dataset update in the current monitoring period.

This deviation only applies to M5, and not the current monitoring period considering that in the current monitoring period, carbon stock dataset has been updated with Instances 1, 2 and 3 carbon stocks.

Carbon Stock Value- New Project Activity Instance Four

At the time of preparing this monitoring report, the project had not yet completed monitoring of the PAI4 biomass plots. However, preliminary and incomplete data (i.e. 55% complete) for PAI4 indicate a carbon stock value of 321 tCO₂e/ha (see Appendix P). To ensure a conservative approach, the project applied the lowest carbon stock value among the three PAIs with complete data—246.1 tCO₂e/ha from PAI1—rather than the higher values observed in PAI2 and PAI3, which are 599.6 and 380.8 tCO₂e/ha, respectively. Once complete data for PAI4 and the updated carbon stock value become available and it is determined that the carbon stock applied to PAI4 during this monitoring period was overestimated, the project is prepared to provide appropriate compensation in the next verification. The project is aware that there are several carbon stock values from literature but used values from individual PAIs because of the following;

Miombo woodlands across Zambia can be found in various stages of disturbance from human activities, mostly due to selective wood harvesting for charcoal production, leading to changes in canopy structure and species diversity. Often, these extractive activities modify the ecosystem to an extent that makes it vulnerable to further degradation. Studies such as Handavu et al. (2021)¹⁴ and Bulusu et al. (2021)¹⁵ have demonstrated that these disturbances significantly affect plant density and height, which is likely to affect carbon storage of these woodlands. Furthermore, as explained by Bouvet et al. (2018)¹⁶, while

¹³ Edward Missanjo* and Gift Kamanga-Thole Estimation of Biomass and Carbon stock for Miombo Woodland in Dzalanyama Forest reserve, Malawi. (2010) Research Journal of Agriculture and Forestry Sciences, ISSN 2320-6063 Vol. 3(3), 7-12, March (2015) Res. J. Agriculture and Forest

¹⁴ Handavu, F, Syampungani, S Gudeta W. Sileshi & Paxie W. C. Chirwa (2021) Aboveground and belowground tree biomass and carbon stocks in the miombo woodlands of the Copperbelt in Zambia, Carbon Management, 12:3, 307-321, <https://doi.org/10.1080/17583004.2021.1926330>

¹⁵ Bulusu, M.; Martius, C.; Clendenning, J. Carbon Stocks in Miombo Woodlands: Evidence from Over 50 Years. Preprints 2021, 2021030029. <https://doi.org/10.20944/preprints202103.0029.v1>

¹⁶ Bouvet, A. et al. An above-ground biomass map of African savannahs and woodlands at 25 m resolution derived from ALOS PALSAR. Remote sensing of environment 206, 156–173 (2018).

efforts to estimate carbon stocks in African woodlands have advanced in recent years, there are still challenges and uncertainties associated with accuracy. Improving the accuracy of carbon stock estimation requires continued refinement of remote sensing techniques, validation with ground-based measurements, development of region-specific allometric equations, and enhanced data availability and quality.

Field studies conducted in Miombo woodlands across the Sub Saharan Africa region have estimated carbon stocks values ranging between 167 tCO₂e/ha and 845 tCO₂e/ha (Handavu et al. (2021)) indicating a high variability that results in high uncertainty when trying to adopt to a different location. As such, the LCFP project resorted to the use of its own forest inventory data, rather than reliance on literature. The carbon stocks for the project are calculated using locally derived allometric equations as mentioned in section 4.3 of the Monitoring Report.

Most of the studies conducted in miombo woodlands reported carbon stocks that are higher than those used by the LCFP project in the current monitoring period for the fourth PAI (246.1 tCO₂e/ha). For instance, Munishi et al. (2010)¹⁷ calculated Miombo carbon stocks values of 385 tCO₂e/ha in the southern highlands of Tanzania, and Missanjo et al. (2015)¹⁸ obtained carbon stocks of 845±16 tCO₂e/ha in Chongoni, Malawi.

These statistics, together with the preliminary carbon stock of 321 tCO₂e/ha, therefore, confirm that the locally calculated carbon stock value of 246.1 tCO₂e/ha for PAI1 is a conservative stand-in value that can be used until the project has complete instance 4 biomass data.

3.2.2 Project Description Deviations

Parameters $t^{[i-1]}$, $t^{[m]}$, $t^{[m-1]}$, $U_B^{[m]}$, $U_{EM}^{[M]}$ were mistakenly excluded from section 3.3.2 of the validated PD but they are monitored during the crediting period and therefore this omission does not impact on the applicability of the methodology, additionality or appropriateness of the baseline scenario. These parameters are included in section 4.2 of this MR and will be included in the PD when it gets to be updated at the 10 years' baseline re-evaluation.

Section 3.3.3 of the validated Project Description, only highlights Sentinel-2 or Landsat imagery as data sources for the project's visual interpretation forest disturbance analysis, and does not mention the 4.77m spatial resolution Planet-NICFI mosaics dataset. It also lacks clarity on the accuracy assessment procedures for the manual forest disturbance analysis. Recognizing the significance of incorporating the Planet-NICFI mosaics dataset

¹⁷ Munishi PKT, Shirima, DD (2010). Measuring and Valuing the Carbon Stocks in Chome Nature Reserve, Eastern Arc Mountains, Report submitted to Eastern Arc Endowment Fund for Forest and Beekeeping Division, Dar es salaam Tanzania. p. 17

¹⁸ Edward Missanjo* and Gift Kamanga-Thole Estimation of Biomass and Carbon stock for Miombo Woodland in Dzalanyama Forest reserve, Malawi. (2010) Research Journal of Agriculture and Forestry Sciences, ISSN 2320-6063 Vol. 3(3), 7-12, March (2015) Res. J. Agriculture and Forestry

into the visual interpretation forest disturbance analysis and accuracy assessment procedure in the current monitoring period, modifications have been made in Section 5.2 of the Monitoring Report to incorporate both. This improvement is very important because the 4.77m spatial resolution of the Planet-NICFI dataset enables very reliable accuracy assessment of the manually digitized converted areas. The project has also developed an SOP to guide the manual digitization of converted areas (Appendix E) which also includes an accuracy assessment procedure. It's important to note that these alterations do not affect the methodology's applicability, nor do they compromise the baseline scenario's validity. In fact, the inclusion of the Planet-NICFI mosaics dataset as reference data for accuracy assessment has strengthened the accuracy and correctness of the analysis without diminishing the conservative approach in quantifying greenhouse gas emission reductions. To ensure completeness and transparency, both Planet-NICFI mosaic datasets and the accuracy assessment procedure will be integrated into the monitoring plan section of the Project Description at the next baseline re-evaluation, underscoring the commitment to continuous improvement and accuracy in MRV system and analysis processes.

Addition of new project activity instances and new project proponents

Sections 2.1.3 and 2.1.7 of the PD describes the project proponents and the location of project activity instances. Being a grouped project, the addition of new project activity instances that took place since project validation makes these two sections outdated. However, these changes to the PD do not impact the applicability of the methodology, additionally or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology. Indeed, all these new project activity instances were mentioned in the PD, section 2.1.7, table 4-6, as potential project expansion areas. These project activity instances falling in community lands resulted in the creation of new CFMGs that were added to the list of project proponents, whereas the project activity instances falling in private lands were added in the list of other entities involved in the project. See section 3.3 of this MR (Tables 23 and 24) for all Included project activity instance GFMGs and private game ranches including CFMGs included in the current monitoring period. In addition, the project also included the Ministry of Agriculture, Chama and Mpika District Offices in the current monitoring period.

Early CDM Update

VM0009 requires a baseline reevaluation every 10 years, with the first one scheduled for 2025, as outlined in section 2.1.13 of the validated project PD. However, the inclusion of new project activity instances under M5 resulted in the original reference area failing to meet the methodology requirement, which mandates that the forested area during the historic reference period must be equal to or greater than the project accounting area. Instead of delineating a reference area exclusively for instance 3, the project opted to define a new

reference area that represents the entire project area under M5, including all three project activity instances.

Due to insufficient data available to close finding #9 raised by Verra during its accuracy review (see the PRR) under M5, a FAR was imposed, requiring the project to delineate a representative reference area for the subsequent monitoring period, M6, which is the current period. The project acknowledges this as a PD deviation, as the CDM update was completed ahead of schedule. Despite this early action, the approach is considered conservative.

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Reference Area Selection

A reference area has been identified (see Figure 9) for the F-U3 baseline type that is similar to the project area as per the methodology requirements and had at least as much forest area as the project accounting areas at the start of the historical analysis in 1986.

Just like the initial reference area, the selection and delineation of the revised reference area for LCFP was done using ward boundaries data from the Electoral Commission of Zambia (ECZ) and Central Statistics of Zambia (CSO)¹⁹. Wards are delineated by the Electoral Commission of Zambia (ECZ) and the Central Statistics of Zambia (CSO) for the purpose of the population and housing census and elections. Administrative Wards units were used because they provide a similarity measure, i.e. population density that can be used to relate the reference area to the project area. Figure 9 below shows the new reference area and the LCFP project area (Instances 1, 2 and 3).

¹⁹ http://riskprofilesundrr.org/layers/geonode:popward/metadata_detail

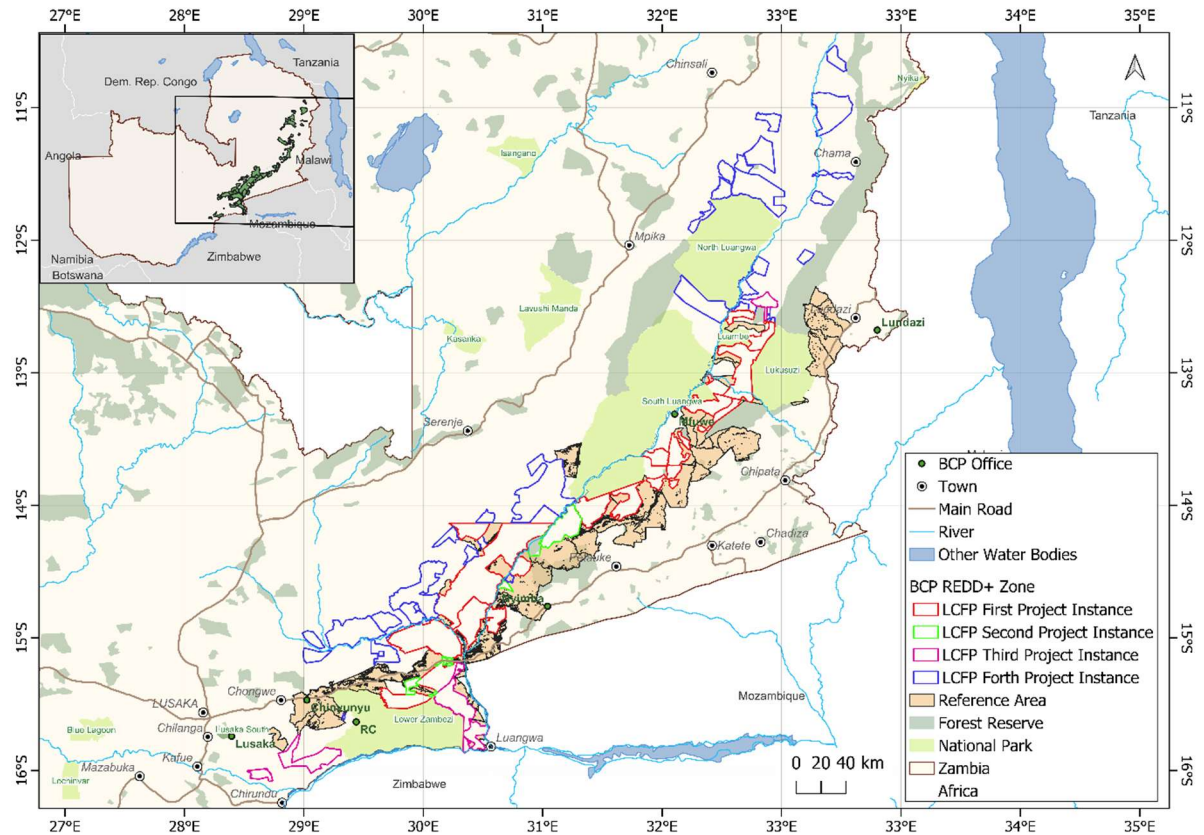


Figure 9. Reference and Project Area (Instance 1,2,3 and 4)

Reference Area Selection Process

The process for selecting the reference area was meticulously done, involving two key stages: representative ward selection and spatial analysis.

1. Administrative Ward Selection

The initial stage focused on identifying all administrative wards that either overlapped with or were adjacent to the Instance 1 to 3 project areas, resulting in the selection of 74 wards. A detailed similarity analysis was then performed, comparing each of these wards to the project area based on critical parameters such as median slope, median elevation, road density, proximity, and population density (refer to Appendix O for specifics).

To ensure precision, a ranking system was developed. Wards whose values aligned closely with the instance 1 to 3 project area's criteria were assigned a score of 1, while those that did not were scored 0. Each ward was then ranked based on the summation of these scores across all parameters. All parameters were weighted equally (1), except for road density and population density, which were deemed more influential and thus received a higher weighting (2). This system produced a final rank ranging from 7 (highest) to 0 (lowest).

Wards ranked in the top three categories (7, 6, or 5) were prioritized for final selection, except for those designated as future expansion areas. In contrast, wards ranked at the bottom (0 and 1) were completely excluded. To maintain balance, any top-tier wards (ranked 7 or 6) that were excluded due to future expansion plans were compensated by removing an equivalent area from wards ranked #2. These second-ranked wards were ordered by size, from largest to smallest, and exclusion was carried out from the largest downwards until the total excluded area was approximately equal to or more than the area omitted from the highest-ranked wards due to expansion considerations. This rigorous method ultimately led to the selection of 44 administrative wards. See Appendix O. For more details, see the ranking system in Appendix O.

2. Spatial Analysis

The final shapefile from the previous step was then subjected to spatial analysis where all areas designated as project areas, protected area, or potential expansion zones were excluded. All areas with slopes greater than 45degrees further excluded to get the final reference area. See Figure 9 and appendix I for spatial data.

The new reference area consists of a total of 44 reference administrative wards (6 wards overlap with the initial reference area wards, and 38 are new) with an overall extent of 1,316,116 ha. The ward selection process resulted in the discarding of 5 initial RA wards, i.e. over 50% of the initial RA extent was discarded. To demonstrate that the reference area has had an equal or greater forested area at any point during the historical reference period, the project used Hansen Global Forest Change data²⁰ to estimate the forested area in 2000 within the reference area. The analysis was conducted in Google Earth Engine (GEE), and the results show that in 2000, 1,246,812 ha were forested. When compared with the accounting area in M6, which covers 1,172,092 hectares, the reference area meets the size requirement as specified by VM009

Reference & Project Area Similarity Analysis

- Geographical Proximity Factors

Thirty-one (31) out of the 44-reference area administrative wards overlap with the project area administrative wards and the remaining 13 are adjacent. This translates to over 70% of the reference area wards overlapping with the project area wards, further indicating that the reference area is geographically contiguous with the project area, implying that the agents of conversion in the reference area are affected by similar cultural and socioeconomic factors

²⁰ Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." *Science* 342 (15 November): 850-53. 10.1126/science.1244693 Data available on-line at: <https://glad.earthengine.app/view/global-forest-change>.

as the agents of conversion in the project area, and therefore the social economic status of both the project and reference area is considered to be similar.

The same inference can be drawn regarding market access. Given the geographical proximity of the reference area to the project area (with 31 wards overlapping and 13 being adjacent), the same transportation routes/roads passing through the project areas also traverse the reference area, linking the same major towns. Thus, the reference area exhibits significant similarity in terms of market access as the project area. Figure 9 shows the roads and main towns around the project and reference areas.

- Road Density

The road density similarity analysis was conducted using the same publicly available dataset in both the reference area and the project area. The roads dataset has the same data source as the administrative ward's dataset²¹.

The result of the analysis is shown below,

Table 15. Road density - Reference Area (1986) and Project areas (2022)

Area	Road Distance (km)	Area (km ²)	Size	Road Density (km/km ²)
Reference	1032.95	13,236.67		0.078
Project	437.39	21,374.05		0.020

However, the road density data used misrepresents the status of the reference area in 1986 because a 2020 dataset was used, and due to the unavailability of the same reliable data set to compare the RA at the beginning of the HRP 1986 and the PA in 2022, a proxy parameter was as a result used. Population density was used because it has a strong correlation with road density. The project opted to disregard the results above and use a proxy (Pop density- strong correlation) to represent the scenario of road density in 1986 and 2022 in the RA and PA respectively.

LCCP's independent deforestation agents and drivers' study²² (Appendix K), identified the main driver variables explaining the quantity and location of deforestation as population

²¹ http://riskprofilesundrr.org/layers/geonode:popward/metadata_detail

²² https://pdf.usaid.gov/pdf_docs/PA00THNB.pdf

density and accessibility to forests, i.e., distance to roads, distance to settlements, and slope, making road density a proxy to forest access and consequently, to threat level. The results in the proxy for road density 2022 i.e. population density indicates that the RA was more threatened in 1986, at the beginning of the Historic Period, than the PA in 2022, i.e. population density in 1986 in the RA was estimated to be 6.97 persons/km² compared to that of the PA in 2022, that was estimated to be 15.47 persons/km² (See Table 16 and Table 17 below). Therefore, the reference area delineated is considered a conservative choice for a VM0009 reference area in this regard.

This approach is both conservative and methodologically sound. This is because population density data inherently encapsulates broader socio-economic variables, including infrastructure development, road access, water ways, provision of electricity, and other access points), offering a more comprehensive representation of deforestation pressures compared to road density alone. Additionally, population density data is more reliable and precise, avoiding inaccuracies associated with road density data, which misrepresented conditions in the areas under consideration at two points in time.

- Accessibility and Mobility of the Agents of Deforestation.

LCFP's independent agents and drivers study established that between 2007 and 2017, all deforestation in Eastern and Lusaka province happened on slopes less than 45 degrees and within 6.5 km from the roads. Therefore, the project opted to use these 2 parameters to identify areas that are accessible by the agents of conversion in both the project area and the reference area. In terms of the mobility and accessibility of the agents of conversion, the project area has been limited to those areas within 6.5 km from roads and slopes of less than 45% (to generate the accounting area - where the CDM is applied). The entire reference area is also limited to within 6.5 km of roads, and all areas with slopes greater than 45% were excluded.

Considering that the same distance from roads and slope delimitation was used in the project area to get the accounting area (where the CDM is applied) and when delineating the reference area, the reference area can be considered similar to the project area as far as accessibility and mobility of the agents of conversion is concerned.

- Population Density

LCFP's independent agents and drivers' study looks at the drivers of deforestation across the entire Eastern and Lusaka Provinces, and so includes both the project area and the reference area. In this study, population density was "...identified as the driver variable that possesses a clear relationship with historical deforestation, and thus, can explain the quantities of deforestation in the historical reference period in [Lusaka and Eastern Provinces]." Population density in the reference area wards in 1986, at the beginning of the historic reference period, was examined in relation to population density in 2022 in the project area's reference wards.

The analysis used ward level population data from 2000 and 2010 census reports, district level 1990-2010 and 2010-2022 average annual population growth rates, and 1980-1990 Provincial annual average population growth rates published by the Zambian Central Statistics Office²³. With these data, population density figures were estimated for the individual reference wards in 1986 (beginning of the historic reference period) and project area wards in 2022. Lastly, the analysis also used population wards spatial data²⁴. The resultant wards population density data for the reference and project wards is shown in the table 16 and 17.

Because district level data was not available in the 1990 census report, provincial annual growth rates were used instead of district level to get the 1986 population numbers. In addition, because the Chamtowa, Kachama, Nyamanongo and Ukwimi wards were introduced in 2010 only, their 1986 population numbers were estimated based on the 2010 population numbers and population growth rates between 1980-1990 and 1990-2010. (See supporting documentation and the population estimation dataset in Appendix O).

Table 16. Reference Area Administrative Wards Population Density in 1986

Ward	Province	District	Area Size	Pop1986	PopDensity1986
Bunda Bunda	Lusaka	Rufunsa	1497	3959	2.64
Chamilala	Eastern	Nyimba	1380	2494	1.81
Chamtowa	Eastern	Lumezi	477	5655	11.86
Chibande	Eastern	Lumezi	2224	3677	1.65
Chikowa	Eastern	Mambwe	332	886	2.67
Chinambi	Eastern	Nyimba	1580	4101	2.60

²³ <https://www.zamstats.gov.zm/2022-census/reports/>

²⁴ http://riskprofilesundrr.org/layers/geonode:popward/metadata_detail

Chinsimbwe	Eastern	Nyimba	562	936	1.67
Chipapa	Eastern	Mambwe	535	1605	3.00
Dzalo	Lusaka	Luangwa	45	2107	46.82
Jumbe	Eastern	Mambwe	734	3078	4.19
Kabowo	Lusaka	Luangwa	638	78	0.12
Kachama	Eastern	Lumezi	283	3990	14.10
Kakumbi	Eastern	Mambwe	510	3528	6.92
Kamimba	Eastern	Lumezi	471	5724	12.15
Katipa	Eastern	Nyimba	968	1180	1.22
Katondwe	Lusaka	Luangwa	407	1313	3.23
Kaunga	Lusaka	Luangwa	65	930	14.31
Kazembe	Eastern	Lumezi	1264	2592	2.05
Luangwa	Eastern	Nyimba	3454	1612	0.47
Lukusuzi	Eastern	Lumezi	1403	1478	1.05
Lumimba	Eastern	Lumezi	2202	3750	1.70

Lunya	Lusaka	Luangwa	47	450	9.58
Lusangazi	Eastern	Lusangazi	1310	1491	1.14
Mankanda	Lusaka	Rufunsa	1225	2298	1.88
Mankhokwe	Lusaka	Luangwa	58	758	13.07
Mateyo Mzeka	Eastern	Lusangazi	352	4998	14.20
Mawanda	Eastern	Lusangazi	1794	5132	2.86
Mburuma	Lusaka	Luangwa	173	1165	6.73
Mkaliva	Lusaka	Luangwa	1884	460	0.24
Mnkhanya	Eastern	Mambwe	168	7199	42.85
Mphomwa	Eastern	Mambwe	662	655	0.99
Mphuka	Lusaka	Luangwa	225	854	3.80
Msoro	Eastern	Mambwe	156	583	3.74
Ncheke	Eastern	Mambwe	344	246	0.71
Ndimba	Eastern	Mambwe	1009	3727	3.69
Nsefu	Eastern	Mambwe	609	2757	4.53

Nyamanongo	Lusaka	Rufunsa	1232	1189	0.97
Phwazi	Lusaka	Luangwa	157	645	4.11
Rufunsa	Lusaka	Rufunsa	2970	5960	2.01
Ukwimi	Eastern	Lusangazi	419	5087	12.14
Wachitangachi	Eastern	Lumezi	255	3146	12.34
Kabansa	Central	Serenje	436	360	0.82
Kaliwe	Eastern	Nyimba	308	4024	13.06
Lwimba	Lusaka	Rufunsa	142	2156	15.18
					6.97

Table 17. Project Area Administrative Wards Population Density in 2022

Ward	Province	District	Area Size	Pop2022	PopDensity2022
Bunda Bunda	Lusaka	Rufunsa	1497	22903	15.30
Chamilala	Eastern	Nyimba	1380	6356	4.61
Chibande	Eastern	Lumezi	2224	15916	7.16
Chinambi	Eastern	Nyimba	1580	14750	9.34

Chinsimbwe	Eastern	Nyimba	562	1372	2.44
Chisangu	Eastern	Lusangazi	243	14435	59.40
Chisomo	Central	Serenje	3299	3389	1.03
Chiyaba	Lusaka	Kafue	1630	10685	6.55
Dzalo	Lusaka	Luangwa	45	7530	167.33
Jumbe	Eastern	Mambwe	734	8872	12.09
Kabowo	Lusaka	Luangwa	638	301	0.47
Kakumbi	Eastern	Mambwe	510	25532	50.06
Kambale	Lusaka	Kafue	806	9168	11.37
Kamimba	Eastern	Lumezi	471	19174	40.71
Katipa	Eastern	Nyimba	968	1569	1.62
Katondwe	Lusaka	Luangwa	407	3712	9.12
Kaunga	Lusaka	Luangwa	65	4127	63.49
Kazembe	Eastern	Lumezi	1264	15235	12.05
Luangwa	Eastern	Nyimba	3454	3670	1.06
Lukusuzi	Eastern	Lumezi	1403	3655	2.60

Lunya	Lusaka	Luangwa	47	924	19.66
Lusangazi	Eastern	Lusangazi	1310	3715	2.84
Malama	Eastern	Mambwe	271	744	2.75
Mandombe	Lusaka	Luangwa	32	1078	33.68
Mankanda	Lusaka	Rufunsa	1225	6471	5.28
Mankhokwe	Lusaka	Luangwa	58	989	17.05
Mawanda	Eastern	Lusangazi	1794	19798	11.04
Mburuma	Lusaka	Luangwa	173	4249	24.56
Mkaliva	Lusaka	Luangwa	1884	1282	0.68
Mnkhanya	Eastern	Mambwe	168	12310	73.27
Mphuka	Lusaka	Luangwa	225	1720	7.64
Ncheke	Eastern	Mambwe	344	973	2.83
Ndimba	Eastern	Mambwe	1009	16957	16.81
Nsefu	Eastern	Mambwe	609	13915	22.85
Phwazi	Lusaka	Luangwa	157	1358	8.65
Rufunsa	Lusaka	Rufunsa	2970	25175	8.48

Shikabeta	Lusaka	Rufunsa	1931	3128	1.62
Kalwa	Central	Mkushi	2475	10268	4.15
Chipala	Muchinga	Chama	1187	1591	1.34
Chisunga	Muchinga	Chama	1400	4686	3.35
Muchinga	Muchinga	Chama	3512	5156	1.47
Ndunda	Muchinga	Chama	597	2386	4.00
Kabansa	Central	Serenje	436	1071	2.46
Mwalala	Central	Mkushi	1264	3354	2.65
Mwalala	Muchinga	Chama	863	7719	8.94
Chapaba	Central	Mkushi	1262	2770	2.19
Mapamba	Muchinga	Chama	661	4447	6.73
Bazimu	Muchinga	Chama	626	4499	7.19
Mabinga	Muchinga	Chama	412	8218	19.95
Lumezi	Muchinga	Chama	443	6503	14.68
Chilenje	Muchinga	Chama	443	6453	14.57
Muchinga	Muchinga	Mpika	2425	3236	1.33

Mutekwe	Muchinga	Mpika	1412	8751	6.20
Chipembele	Muchinga	Mpika	1544	16296	10.55
Chifungwe	Muchinga	Mpika	7321	10890	1.49
					15.47

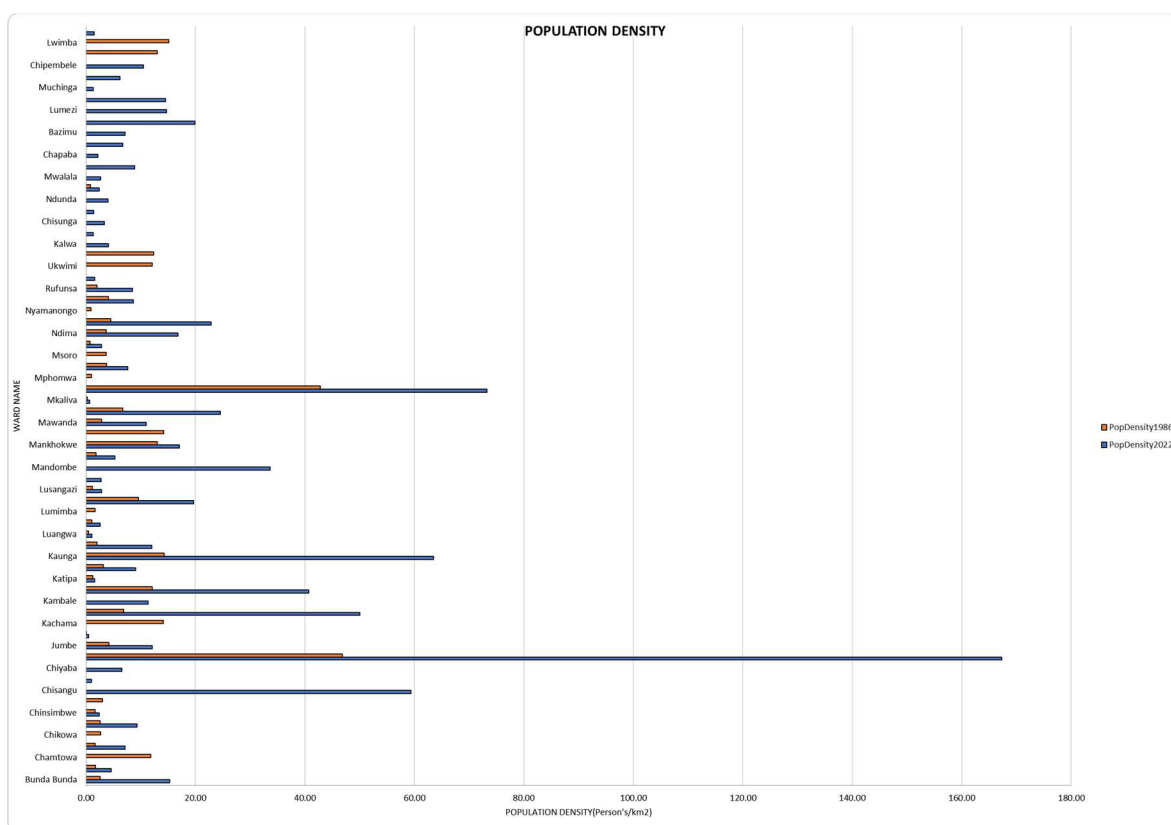


Figure 10. Population Density - Project Area Administrative Wards vs Reference Area Administrative Wards

The similarity is sufficient in that the 1986 average population density in the reference area wards was estimated to be 6.97 persons per km², while the 2022 population density for project area wards is estimated at 15.47 persons per km². This indicates that there are more people per square kilometer in 2022 in the project area wards than there were in the reference area wards in 1986 at the beginning of the Reference Period.

Given that the independent agents and drivers of deforestation study for the project identified population density as the driver variable that possesses a clear relationship with historical deforestation, population density is therefore considered as a suitable proxy for deforestation threat. In this respect, the results above indicate that the project area faces higher levels of deforestation threat in 2022 compared to the reference area at the beginning of the reference period (1986). Therefore, the choice of the reference area for the project is considered conservative in this regard.

- Landscape configuration.

1. Slope and Elevation

Parameter	AA	RA
Elev_Range(m)	327-1616	315-1497
Elev_Mean(m)	705	785.7
Elev_Median(m)	659.7	755.5
Slope_Max	0-70	0-64.3
Slope_Mean	5.8	4.6
Slope_Median	3.9	3.3

Utilizing NASA SRTM Digital Elevation 30m data, the mean elevation was estimated for both regions i.e. Project and Accounting areas in Google Earth Engine. Table above shows the results.

The Accounting area and Reference Areas exhibit closely comparable topographical features. In terms of elevation, the maximum elevation in AA is only 7.9% higher than in RA, while the mean and median elevation values differ by 11.4% and 12.7%, respectively. These differences fall well within the 20% margin, indicating that both regions share similar altitudinal characteristics despite RA being slightly higher on average. Even at their lowest points, the regions are nearly identical, with a minimal 3.8% difference in minimum elevation. This suggests that both regions have comparable elevation profiles, particularly in their base levels and central elevation tendencies.

The slope characteristics also reveal strong similarities between AA and RA. The maximum slope in AA is 8.9% steeper than in RA, and the median slopes differ by 15.4%, showing that the general incline of the terrain is alike in both regions. Although the mean slope in AA is

20.7% higher than in RA, this slight exceedance still implies that both regions have overall moderate terrain, with AA being marginally steeper. The identical minimum slope values (0.0°) in both regions further indicate that both areas have flat sections in their landscapes. Taken together, these observations support the conclusion that the AA and RA regions have similar land configurations, with only minor variations that do not detract from their overall similarity. See slope and elevation in figure 11.

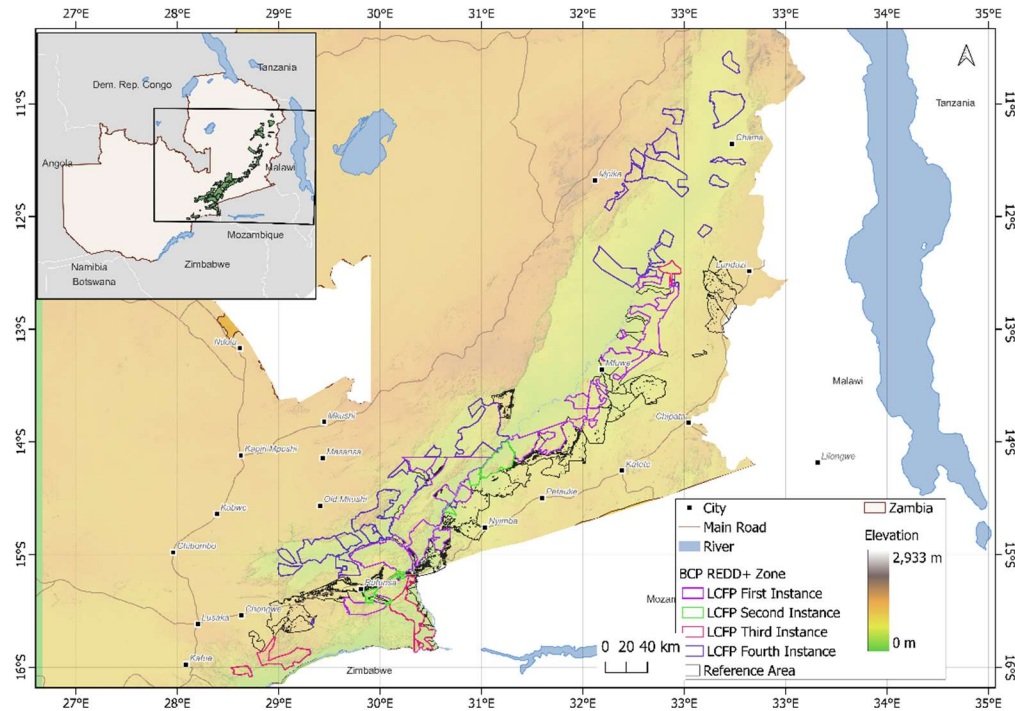


Figure 11.1 Project and Reference Area Configuration (Elevation and Slope)

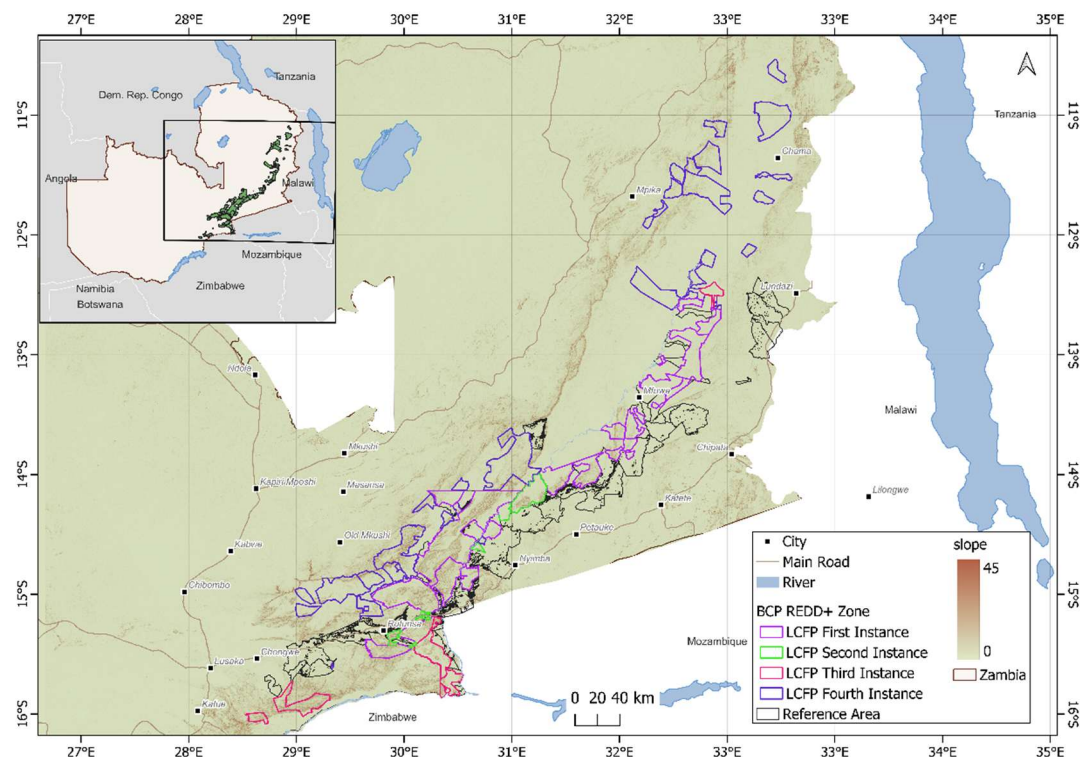
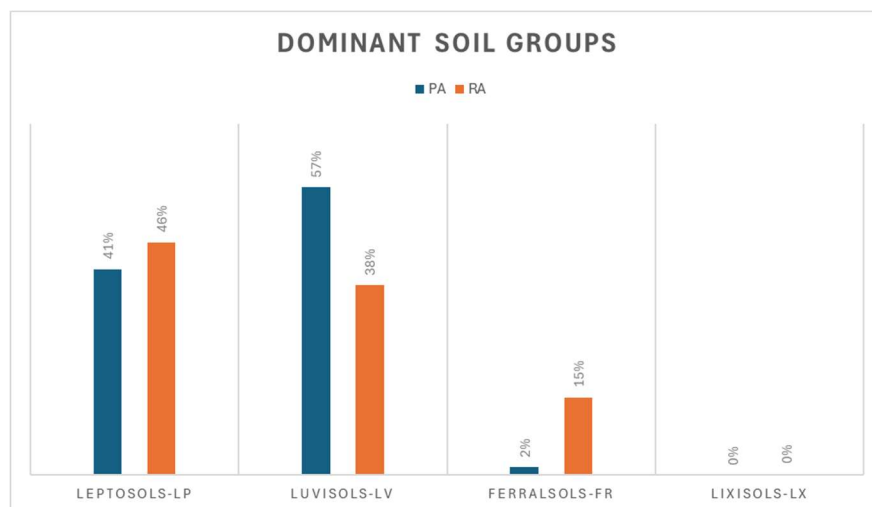


Figure 11.2 Project and Reference Area Configuration (Elevation and Slope)

2. Soil Types²⁵



²⁵ Harmonized World Soil Database v2.0: Data Source; <https://www.fao.org/soils-portal/data-hub/soil-maps-and-databases/harmonized-world-soil-database-v20/en/>

Based on the analysis, PA and RA share strong similarities in terms of Leptosols and Luvisols, two of the dominant soil types in both regions, with differences within the 20% threshold. However, RA has a notably higher presence of Ferralsols, while Lixisols are only present in the RA. Thus, while the soil composition in PA and RA is broadly similar, the increased occurrence of Ferralsols in RA introduces a degree of variability between the two. However, when the data is evaluated within the context of agricultural expansion as the primary driver of land conversion in the baseline scenario, the conservative selection of the reference area (RA) becomes evident. The RA has a higher proportion of Ferralsols (FR) at 15%, compared to just 2% in the PA. Ferralsols are characterized by low fertility and are generally not suitable for agriculture, limiting the likelihood of agricultural development in the RA. Although both regions share a significant presence of Leptosols (LP) at similar percentages, the RA has a lower proportion of Luvisols (LV) at 38% compared to 57% in the PA. Since Luvisols are highly fertile and conducive to agriculture, their higher abundance in the PA makes it more susceptible to agricultural expansion.

Based on the Appendix D of the VM0009 Methodology, the RA conservatively meets the "Areas of Limited Soil Productivity" requirements, as the PA contains a greater abundance of more productive soils like Luvisols compared to the RA, which is dominated by Ferralsols and Leptosols. The differences in soil composition, particularly the lower abundance of fertile Luvisols and the presence of less fertile Ferralsols in the RA, indicate that the RA is less vulnerable to agricultural expansion pressures. This supports the conservative nature of selecting the RA as a reference area, as its soil profile aligns with the limited soil productivity criteria, providing a cautious and realistic baseline scenario for land conversion risks.

Number of CDM Sample Points

Given the overlap of the new reference area with the original and the necessity to utilize the data already collected for the initial reference area, the project has chosen to estimate the necessary number of CDM interpretation points for the new reference area by extrapolating from the CDM point density of the initial reference area, ensuring consistency.

The new reference area covers a total extent of 1,316,116 ha and based on the original reference area point density, i.e. 0.004673662 points per hectare, approximately 6,151 points were estimated to be dispersed into the new reference area. However, the project opted to allocate more points than estimated. In total, the project randomly allocated 6,190 points in the new reference area. The resulting logistic function for the second baseline included 50,804 forest state observations during the historic reference period.

In summary, with 6,190 points randomly distributed within the 1,316,116 ha of the new reference area, building upon the previous analysis, the new CDM results from a comprehensive executed sampling approach aimed at capturing the diverse characteristics of the reference area.

Reference Period and Historic Imagery to Parameterize Cumulative Deforestation Model

PDR.48

The start of the reference period is May, 1986 and the end is May, 2022.

PDR.49

Table 18. List of available historical imagery for the reference area

Sensor	Path/Row or Tile Name	Date
Landsat 5	169/068	1986/05/04
Landsat 5	169/069	1986/05/04
Landsat 5	169/070	1986/05/04
Landsat 5	170/068	1986/08/31
Landsat 5	170/069	1986/05/11
Landsat 5	170/070	1986/05/11
Landsat 5	171/070	1986/05/18
Landsat 5	171/071	1986/05/18
Landsat 5	169/068	1991/05/02
Landsat 5	169/069	1991/05/02
Landsat 5	169/070	1991/04/16
Landsat 5	170/069	1991/05/09
Landsat 5	170/070	1991/05/09
Landsat 5	171/070	1991/06/01
Landsat 5	171/071	1991/07/03
Landsat 5	169/068	1993/06/08
Landsat 5	169/069	1993/06/08

Landsat 5	169/070	1993/05/23
Landsat 5	170/068	1993/07/01
Landsat 5	170/069	1993/07/01
Landsat 5	171/070	1993/05/21
Landsat 5	171/071	1993/05/21
Landsat 5	169/068	1999/08/28
Landsat 5	169/070	1999/08/28
Landsat 5	170/068	1999/01/07
Landsat 5	170/069	1999/02/24
Landsat 5	170/070	1999/04/29
Landsat 5	171/070	1999/07/09
Landsat 5	171/071	1999/07/09
Landsat 5	169/068	2001/08/17
Landsat 5	169/069	2001/08/17
Landsat 5	169/070	2001/08/17
Landsat 5	170/069	2001/05/04
Landsat 5	170/070	2001/05/04
Landsat 5	171/070	2001/08/15
Landsat 5	171/071	2001/08/15
Landsat 5	169/068	2007/04/28
Landsat 5	169/069	2007/04/28
Landsat 5	169/070	2007/04/28
Landsat 5	170/069	2007/05/21
Landsat 5	170/070	2007/05/21

Landsat 5	171/070	2007/06/13
Landsat 5	171/071	2007/06/13
Landsat 5	169/068	2009/05/19
Landsat 5	169/069	2009/04/17
Landsat 5	169/070	2009/05/19
Landsat 5	170/068	2009/05/26
Landsat 5	170/070	2009/05/26
Landsat 5	171/071	2009/05/17
Landsat 5	170/069	2009/06/27
Landsat 5	171/070	2009/05/17
Sentinel-2	T36LTK	2016/05/07
Sentinel-2	T36LUK	2016/05/07
Sentinel-2	T36LVL	2016/05/07
Sentinel-2	T36LVM	2016/05/07
Sentinel-2	T36LWM	2016/05/07
Sentinel-2	T36LUL	2016/05/07
Sentinel-2	T35LPC	2016/04/20
Sentinel-2	T35LPD	2016/04/20
Sentinel-2	T35LQC	2016/04/20
Sentinel-2	T35LQD	2016/04/20
Sentinel-2	T36LTK	2017/5/22
Sentinel-2	T36LUK	2017/5/22
Sentinel-2	T36LVL	2017/5/22
Sentinel-2	T36LVM	2017/5/22

Sentinel-2	T36LWM	2017/5/22
Sentinel-2	T36LUL	2017/05/12
Sentinel-2	T35LPC	2017/05/05
Sentinel-2	T35LPD	2017/05/05
Sentinel-2	T35LQC	2017/05/25
Sentinel-2	T35LQD	2017/05/25
NICFI	planet_medres_normalized_analytic_2020-12_mosaic	2020/12
NICFI	planet_medres_normalized_analytic_2021-05_mosaic	2021/05
NICFI	planet_medres_normalized_analytic_2022-05_mosaic	2022/05

PDR.50

No specific timeline of events is known for the agents of conversion

PDR.51

Deforestation in Eastern Province started in the southern side of the province near settlements along the Great East Road. As population has expanded, deforestation advanced towards the Luangwa valley, passing through the reference areas on the way towards the project area. No specific events regarding this movement were identified, so just like in the initial baseline estimation, the project simply selected a reference period based on the best historical imagery that covered the new reference areas. Landsat 5 imagery was used for older periods (1986-2009), Sentinel-2 imagery was used for the middle period (2016-2017) and NICFI images used for the last 2 years (2021-2022) of the historic reference period. The May 1986 Landsat scenes provided the earliest suitable imagery. The inclusion of NICFI images, with a spatial resolution of 4.77 meters, made it easier to interpret the land use compared to Landsat imagery and Sentinel 2, so this helped to improve the accuracy of the analysis.

PDR.52-58

The selected imagery was chosen specifically to minimize clouds and was thus almost entirely cloud free, resulting in 100% double coverage, meaning that all parts of the reference area were covered by the selected imagery at least twice during the historical reference period. Figure 12 below shows the reference area, Location of CDM interpretation sample points/Double coverage points (100%).

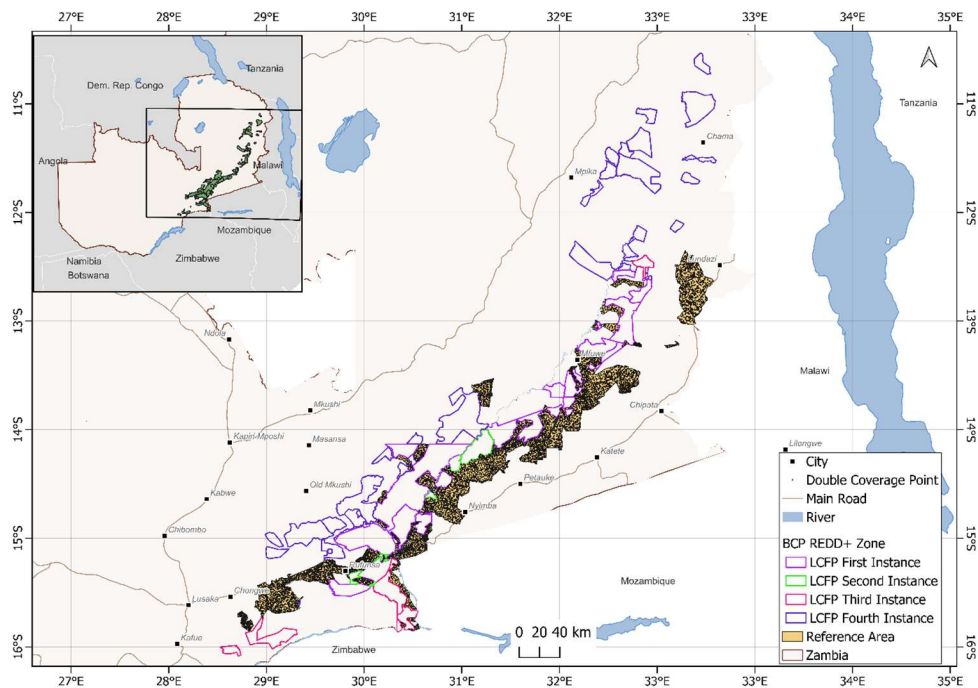


Figure 12. Map of reference area and Location of the CDM interpretation sample points/Double Coverage (100%)

To develop the point interpretation sampling frame, 6,190 random points were generated using this QGIS random points in polygons function. These are also shown in Figure 12 above

Figure 13 below shows the temporal location of the images used to develop the CDM for the first baseline for the Luangwa Community Forests Project, while Figure 14 shows the temporal location of the images used to develop the CDM for the baseline re-evaluation. The temporal locations are, on average, located evenly across the reference period thereby fulfilling the stationarity requirement.

The analysis of conversion in the interpolation points was conducted in Earth Engine (script is available to share with VVB). This made it very easy to examine each point systematically and rapidly flip from one image date to the next. As shown in Table 18, all of the imagery used was 30-meter resolution or less.

The registration for the imagery was visually checked before starting the analysis. All of the images were well registered with less than 10% RMSE with the exception of the Landsat 5 image from 1999. The shift in that image was considered while interpreting the images.



Figure 13. Initial Line Plot to Demonstrate Approximate Stationarity of Historical Imagery

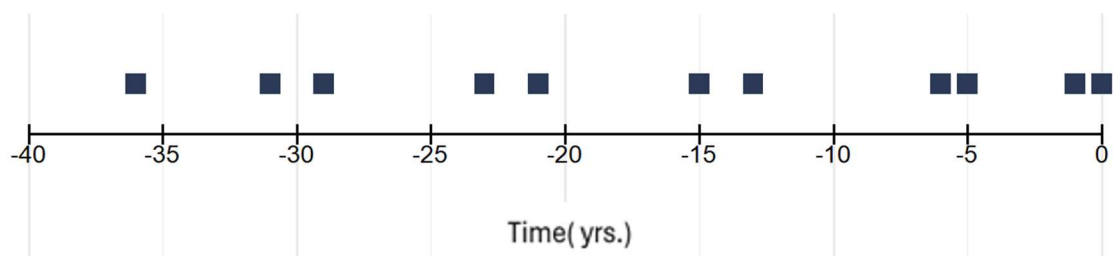


Figure 14. Updated CDM Line Plot to Demonstrate Approximate Stationarity of Historical Imagery

Figure 14 above shows that the time series is stationary (evenly distributed through the timeline).

Point Interpretation and fitting the Logistic Function

PDR.59-62

For this CDM updated, the project has used the same covariates and parameters as those in the validated PD therefore because, VM0009 allows for using parameters (θ) other than time to improve the fit of the logistic function. However, the project only tested a single model with time and found that it provided a good fit. Therefore, no other parameters were considered.

PDR.63

The point interpretation analysis was conducted using a script in Earth Engine to display the historical imagery and make it easy for the user to navigate to each of the 6,190 points (script available for VVB review). A protocol was developed to guide the 3 interpreters who conducted the work. The protocol was developed by a BCP employee who was an expert in remote sensing in Miombo forests in Zambia and very familiar with interpreting a variety of imagery types. The protocol describes, with illustrations:

- How to discern conversion based on changes in pixels, the shapes of changes, surrounding context, and using supplementary higher resolution imagery.
- Being aware of seasonal changes that occur in vegetation, which was most prominent in June imagery (though the historical imagery was specifically selected to avoid this issue as much as possible)
- Defined deforestation as a clearing of 0.5 ha in order to reduce errors associated with image speckle or degradation that did not lead to deforestation. A 5 x 5 grid of Landsat pixel boundaries was overlaid on the imagery and the protocol required that the interpretation pixel (the center pixel) be deforested and have an orthogonal connection to at least 5 other pixels to be considered deforested.

PDR.64-65

A 5% ($6,190 \times 0.05 = 310$) random sample was drawn from the forest state interpretations by the 3 interpreters and compared to a forest state classification performed by another interpreter who is more familiar with the study area. Table 19 reports the classification accuracy as well as the Kappa statistic for each of the image dates. The accuracies returned were suitable and well within the criteria stipulated by the methodology. The data used to determine the errors can be found in Appendix O

Table 19. Results of an independent Updated CDM error assessment.

Year	Richard Burns				
	Agreement	Kappa	SE	95% conf	
1986	97.64%	0.91	0.20	0.89	0.94
1991	98.99%	0.99	0.13	0.97	1.00
1993	98.31%	0.98	0.17	0.96	1.00
1999	97.97%	0.97	0.19	0.94	0.99
2001	96.94%	0.95	0.23	0.92	0.98
2007	95.95%	0.93	0.28	0.90	0.96
2009	96.62%	0.95	0.22	0.93	0.98
2016	96.30%	0.95	0.25	0.92	0.98
2017	96.28%	0.95	0.25	0.93	0.98
2021	95.95%	0.95	0.26	0.92	0.98

2022	96.28%	0.96	0.28	0.93	0.99
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On average, there was 97% agreement. No systematic errors were detected, but following guidance from VM0009 v3.0, it was decided to set all values after observed conversion to conversion, so the data was recorded with a formula in LibreOffice.

PDR.66-67

The logistic function (Figure 15) was fit using an R script. The results and standard errors are shown in table 20. Additionally, the standard deviation of observed conversion $\sigma^{\wedge}_{EM}$ was estimated using equation F.13 from VM0009 v3.0. $\sigma^{\wedge}_{EM}$ was found to be 0.407

$$\hat{\sigma}_{EM} = \sqrt{\left[\sum_{i \in J} w_i o_i \right] \left[1 - \sum_{i \in J} w_i o_i \right]}$$

Equation F.13

Table 20. Initial CDM function fitting results from R

Coefficient	Estimate	Standard Error
α	0.2188	0.02932
β	0.0003271	0.000006976

Table 20a: M5 Logistic function fitting results from R

Coefficient	Estimate	Standard Error
α	0.3530	0.01548
β	0.0003166	0.000003562

Table 21. Updated Logistic function fitting results from R

Coefficient	Estimate	Standard Error
α	-0.01711	0.01604
β	0.0002983	0.000003740

PDR.74-75

No covariates to conversion were used as in the initial CDM.

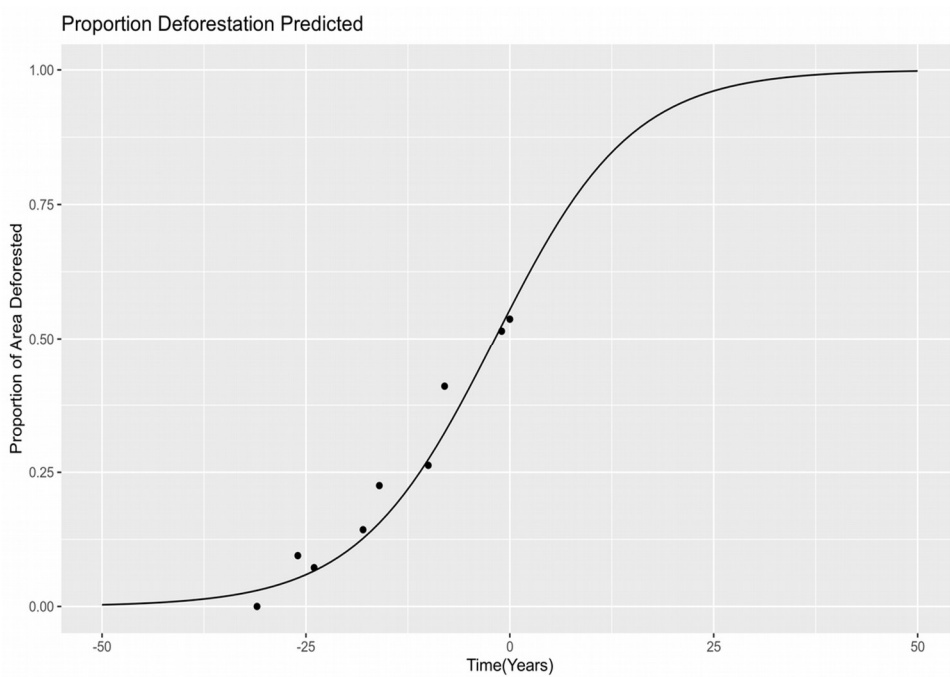


Figure 15. Initial Logistic Function

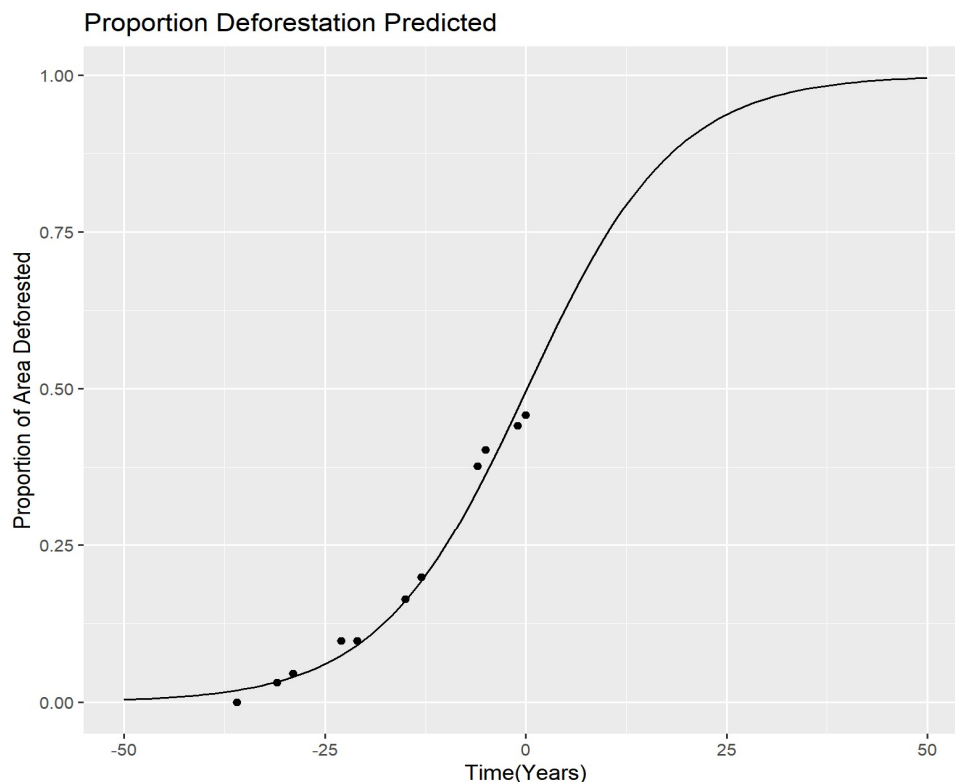


Figure 16. Updated Logistic function used in CDM

3.3 Grouped Projects

The second and third project activity instances verified in M4 and M5 comprised a total project area of 92,990 ha and 199,621 ha respectively, and in the current monitoring period (M6), a fourth project activity instance has been included comprising of 901,147 ha of project area, of which 743,784 ha consist of forest according to the Zambian definition of forest (Table 22 and 23). Within this forested area, 513,011 ha is calculated as a project accounting area (Table 23) and subject to verification in this monitoring period.

Table 22. Summary of Project Area - REDD+ Project Zones on Private Land, Second project activity instance.

Project Activity Instance	Private Game Ranch	Chiefdom	Project area (ha)	Forest area (ha)	Accounting area (ha)
2	Nyakolwe	Luembe	57,706	32,013	29,856
2	Nyamvu	Luembe	15,238	7,176	7,172
2	Kazumba	Mwape	4,775	2,732	2,724

Table 23. Summary of Project Area - REDD+ Project Zones under communal tenure, Second, third and fourth project activity instances.

Project Activity Instance	CRB	GMA	Chiefdom	Project area (ha)	Forest area (ha)	Accounting area (ha)
2	Mpanshya corridor	Rufunsa	Mpanshya	15,271	13,430	10,978
3	Kazembe	Upper Lumimba	Kazembe	18,515	13,241	13,248
3	Mwape	Chisomo	Mwape	20,500	18,845	5,149
3	Mburuma	Rufunsa	Mburuma	66,520	62,537	34,146
3	Mphuka	Rufunsa	Mphuka	25,881	24,541	24,375
3	Chiawa	Rufunsa	Rufunsa	68,205	64,343	45,938
4	Kambombo	Musalangu	Kambombo	77,182	60,081	35,382
4	Chikwa	Musalangu	Chikwa	81,691	73,541	46,158
4	Chifunda	Musalangu	Chifunda	37,197	30,734	30,238
4	Mukungule	Mukungule	Mukungule	31,469	30,380	30,293
4	Nabwalya	Musalangu	Nabwalya	67,047	22,706	17,577
4	Lundu	Musalangu	Lundu	30,490	29,934	17,847
4	Kasumba	Open Area	Bundabunda	739	666	666
4	Luembe Corridor	West Petauke	Luembe	4,727	4,581	4,336
4	Chibulika	Musalangu	Lundu	43,728	41,649	37,149
4	Tiyeseke	Musalangu	Mulilo	17,526	13,677	13,677
4	Chisomo	Chisomo	Chisomo	157,802	128,062	65,460
4	Shikabeta Expansion	South Luano	Shikabeta	30,412	28,327	27,196

4	Kazembe Expansion	Upper Lumimba	Kazembe	12,965	10,298	10,293
4	Mboshya	North Luano	Mboshya	45,660	38,217	22,531
4	Kakoko	Musalangu	Mukungule	16,189	15,310	14,572
4	Tembwe	Musalangu	Tembwe	23,279	22,073	22,073
4	Chembe	North Luano	Chembe	107,254	84,729	55,598
4	Mboroma	North Luano	Mboroma	115,790	108,819	61,965

Following the guidance on grouped projects under the VCS, all the new project activity instances shall meet the eligibility criteria for inclusion as explained in the PD, section 2.1.20 as shown below in table 24.

Table 24. Eligibility criteria under which the second, third and fourth project instance is incorporated into the project.

Criteria	Justification	Proof (Relevant Documents)
Must be within the chiefdoms already identified as potential future activity instances in the PD	All the project instances are within the project boundaries identified in the PD (page 36-40)	Map showing project boundaries see Figure 9 & 10 and Tables 6 -8 in the PD. See Figure 16.1 in this MR
The project type for future project instances must be avoided unplanned deforestation. Accordingly, the end land use in the baseline scenario must be non-forest.	The baseline scenario and the demonstration of additionally are determined for the entirety of the geographic project area within which project activity instances are developed. Like instances 1,, Instance 2,3 and 4 have the end land uses driven by deforestation agents are	PD, Figure 10, page 40. Vinya 2011, KZ_Drivers and Agents Study_Report (Appendix K).

	largely agricultural fields, urban settlements, and degraded landscapes. In these provinces, smallholder agricultural expansion is the dominant driver, with forests being cleared for maize and other crops. Charcoal production, driven by urban demand like Lusaka, leaves extensive degraded areas.	
The baseline drivers and agents of deforestation in future project instances must be of the same type as the current project instances - clearing of forested land for expansion of small-holder farming and, or charcoal production.	Instances 2, 3, and 4 share the same agents and drivers of deforestation as those observed in the first instance project areas. In Zambia, deforestation is driven by a consistent set of factors nationwide, as highlighted in various publications and reports. Key agents include smallholder farmers, charcoal producers, firewood collectors, illegal timber harvesters, miners, and users of fire. Their activities are driven by factors such as agricultural expansion, charcoal production, firewood extraction, infrastructure development, and the use of fire. These pressures are further amplified by underlying causes, including poverty, rapid population growth, insecure land tenure, weak regulatory frameworks, and a heavy reliance on wood fuel	Drivers and agents study by UNIQUE (Appendix K) Vinya 2011, KZ_Drivers and Agents Study_Report (Appendix K).

Future project accounting areas must have met the Zambian definition of forest for at least 10 years prior to the project start date.	According to the Forest Act 2015, “forest” means any land with a tree canopy cover of more than ten percent and area of more than zero point five hectares and includes young stands that have not yet reached, but are expected to reach, a crown density of ten percent and tree height of five metres that are temporarily under stocked areas. All fourth instance project areas meet the definition of forest and accounting areas were calculated according to the same method as First Activity Instance areas. This is demonstrated in the accounting area delieniation where all forest pixels less than 8 connected pixels are sieved from the forest non forest classification to meet the 0.5ha minimum requirement.	See the classification method described in the PD. Forest Act 2015 ²⁶
Some point within 2km of the perimeter of future accounting areas must have been converted from forest to farming.	Perimeters of the newly added areas under the fourth project activity instance did satisfy this requirement without exception.	See r_U value in NER calculations in Appendix G
Future project accounting areas must be located in a tropical ecosystem and must not contain peat soil.	No peatland was detected in the Fourth project activity instance areas	Spatial data for accounting areas does not overlap with available peatland data (See Appendix I)

²⁶ <https://www.parliament.gov.zm/sites/default/files/documents/acts/The%20Forest%20Act%202015.pdf>

For each new accounting area, a reference area meeting the requirements in terms of size and similarity to the accounting area as per section 6.8.1 of VM0009 v3.0 must be delineated.	First instance project areas share a common reference area as the Second, Third and fourth instances. The CDM update in the current monitoring period involved delineation of a new reference area which has forested area in 2000 more than the accounting area in M6, hence meeting the area size requirement at some point in the historical reference period as per VM0009v3.0. See Section 3.2.2 in this MR for more details.	Map and spatial data for the common reference areas GEE script for estimating forested area in the RA using Hansen global forest change dataset. ²⁷
For any new reference areas that may be required, there is sufficient historical imagery meeting the requirements of section 6.8.4 of VM0009 v3.0.	Third ,Second and fourth instance project areas share a common reference area as the first project activity instances	Map and spatial data for the common reference areas See section 3.2.2 ,Table 18
Project activities for new project instances are the same as those described in this PD.	instance 4 share a common RA as the initial Instances 1,2 and 3 and have the same project activities as described in the PD	
The project proponents can access any new leakage or proxy areas that may be required for monitoring related to new project instances as per sections 8.3.2.1 and 6.4 of VM0009	Instance 4 areas share common leakage and proxy areas with the 1 st instance project areas	Map showing accessibility to the common leakage and proxy areas – see Figure 9.

²⁷ <https://code.earthengine.google.com/c3550ea99c4a6685347a88337759aebb>

v3.0.		
Same Governance and Land Tenure and Social Economic Systems	Just like the first project activity instance, All second, third and fourth instance activity areas are private and communal land tenure systems.	Title Deed from private game ranch owners and community forest management Agreements signed between government and Community resources boards (CFMGs)

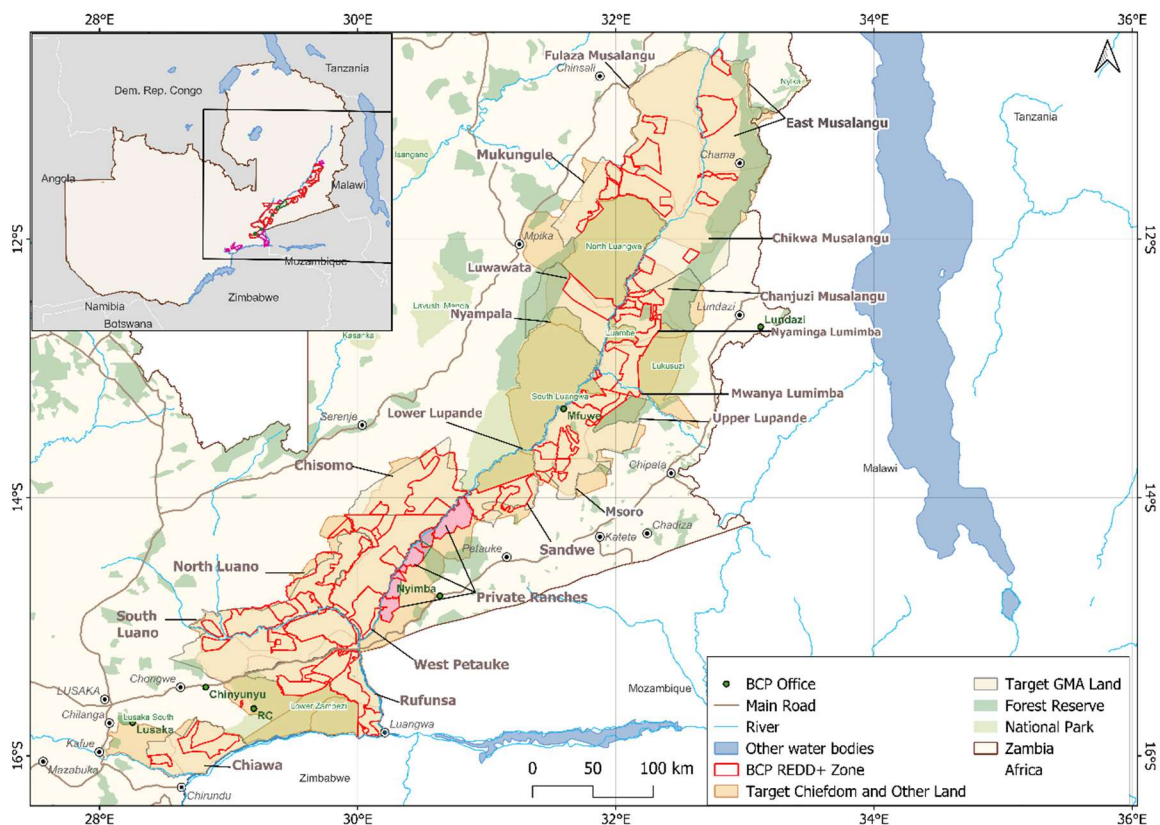


Figure 16.1 Target areas for potential expansion and project areas (Instance 1,2,3 and 4)

MR.7 - 8

The project activity start date for the initial project area instance is the same as the project start date: May 1st, 2015. Therefore, the number of days since the project start date for the initial project area instance is 0.

The start date of the second project activity instance is 11th August 2021. The number of days since the project start date is 2,294 days.

The start date of the third project activity instance is 1st January 2022, The number of days since project start is 2,437 days.

The start date of the fourth instance is 1st January 2023, the number of days since project start is 2802 days

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	<i>A</i>
Data unit	Unitless
Description	Combined effects of β and θ at the start of the historic reference period
Source of data	Reference area and historic reference period
Value applied	-0.01711
Justification of choice of data or description of measurement methods and procedures applied	Time and place in which the logistic model is fit. Analysis undertaken as described in section 3.2.1 of the project document. The Analysis was conducted by BioCarbon Partners Carbon Team at Baseline evaluation. See Appendix O for more information Including the LCFP CDM Point Interpretation SOP
Purpose of Data	Calculation of baseline emissions
Comments	This parameter has been changed from the initial due to the CDM update in the current monitoring period (M5)

Data / Parameter	<i>B</i>
Data unit	Unitless
Description	Effect of time on the cumulative proportion of conversion over time
Source of data	Reference area and historic reference period
Value applied	0.0002983

Justification of choice of data or description of measurement methods and procedures applied	Time and place in which the logistic model is fit. Analysis undertaken as described in section 3.2.1 of the project document. The Analysis was conducted by BioCarbon Partners carbon Team at Baseline evaluation. See Appendix O for more information Including the LCFP CDM Point Interpretation SOP
Purpose of Data	Calculation of baseline emissions
Comments	This parameter has been changed from the initial due to the CDM update in the current monitoring period (M5)

Data / Parameter	Γ
Data unit	Days
Description	Time shift from beginning of historic reference period to project start date
Source of data	Historic reference period
Value applied	10,589
Justification of choice of data or description of measurement methods and procedures applied	Time in which the logistic model is fit. Analysis undertaken as described in section 3.2.1 of the project document. The Analysis was conducted by BioCarbon Partners carbon Team at Baseline evaluation. See Appendix O for more information Including the LCFP CDM Point Interpretation SOP
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	λ_{soc}
Data unit	Proportion (unitless)
Description	Exponential soil carbon decay parameter
Source of data	VCS AFOLU default for tropical regions
Value applied	0.2
Justification of choice of data or description of measurement methods and procedures applied	Conservative default based on IPCC value.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	σ_{EM}
Data unit	Standard deviation (unitless)
Description	The estimated standard deviation of the state observations used to fit the logistic function
Source of data	Remote sensing image interpretation. Analysis undertaken as described in section 3.2.1 of the project document.
Value applied	0.407
Justification of choice of data or description of measurement methods and procedures applied	Time and place in which the logistic model is fit. Analysis undertaken as described in section 3.2.1 of the project document. The Analysis was conducted by BCPs Carbon Team at M6 CDM Update. See Appendix O for more information Including the LCFP CDM Point Interpretation SOP
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	B
Data unit	Set
Description	The set of all selected carbon pools in biomass. Is a subset of C
Source of data	PDD
Value applied	2
Justification of choice of data or description of measurement methods and procedures applied	AGOT and BGOT, See section 1.1.1 of the project document for justification
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	C
Data unit	Set
Description	The set of all selected carbon pools
Source of data	Monitoring records
Value applied	3

Justification of choice of data or description of measurement methods and procedures applied	AGOT, BGOT, SOC, See section 1.1.1 of the project document for justification
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	<i>J</i>
Data unit	Set
Description	The set of all observations of conversion. When superscripted with a monitoring period, the conversion observations are taken for leakage analysis
Source of data	Remote sensing image interpretation or field observations in the leakage area
Value applied	13,194
Justification of choice of data or description of measurement methods and procedures applied	Analysis undertaken as described in section 3.2.1 of the project document. Leakage area monitored by BCP's forest monitoring teams as per Leakage Monitoring SOP in Appendix R
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	<i>M</i>
Data unit	Set
Description	The set of all monitoring periods
Source of data	Monitoring records
Value applied	27
Justification of choice of data or description of measurement methods and procedures applied	The project crediting period is 30 years and after the first verification, the project uses annual verification. Thus there will be 27 verification periods.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	A_{PAA}
Data unit	Ha
Description	Size of all Four activity instance project accounting areas. The total accounting areas for all the 4 PAIs is 1,172,092 .
Source of data	GIS analysis prior to sampling
Value applied	485,495 for PAI1 , 50,730 for PAI2 ,122,856 for PAI3 and 513,011 for PAI4
Justification of choice of data or description of measurement methods and procedures applied	Area within the project area that is on slopes of less than 45%, less than 6.5 km from a road, and was forest at least 10 years before the project start date. Described in more detail in section 3.2.1 of the project document. Spatial Analysis conducted by BCPs Carbon Accounting team.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	A_{PX}
Data unit	Ha
Description	Area of proxy area
Source of data	GIS analysis prior to sampling
Value applied	3,840
Justification of choice of data or description of measurement methods and procedures applied	Areas converted from forest to non-forest between 2010 and 2017 falling within 2 km of buffer around roads passing through communities favorable to having proxy plots on their lands. Described in more detail in section 3.2.1 of the project document. Spatial Analysis conducted by BCPs Accounting team.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	n_d
Data unit	Unitless
Description	Number of spatial points in the reference area
Source of data	Remote sensing image interpretation
Value applied	6,190
Justification of choice of data or description	Value deemed sufficient as per VM0009 to adequately quantify forest state in the reference area. Described in more

of measurement methods and procedures applied	detail in section 3.2.1 of the project document. Remote sensing Image interpretation and Analysis was conducted by BCP's Carbon Team at M5 CDM Update. See Appendix O for more information.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	o_i
Data unit	Binary
Description	State observation for the sample point in the reference area
Source of data	Remote sensing image interpretation
Value applied	0 or 1
Justification of choice of data or description of measurement methods and procedures applied	Data collected as per the methodology. Described in more detail in section 3.2.1 of the project document. Remote sensing Image interpretation and Analysis was conducted by BCP's Carbon Team at M5 CDM Update. See Appendix O for more information.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	P_{LME}
Data unit	Proportion (unitless)
Description	Portion of leakage related to market
Source of data	Analysis of drivers of deforestation (Appendix K)
Value applied	0
Justification of choice of data or description of measurement methods and procedures applied	Few wood products are taken from the project area in the baseline scenario and most farming in the baseline scenario is subsistence.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	Q
Data unit	Days
Description	Lag between start of degradation and conversion
Source of data	Consultation with agents of deforestation in near project area in Lusaka province – 28 farmers were questioned to determine how long they usually wait after clearing an area before ploughing it.
Value applied	620
Justification of choice of data or description of measurement methods and procedures applied	Based on observations in the reference area, hence applicable to the project area.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	r_{RS}
Data unit	Unitless
Description	Expansion factor for above-ground biomass to below-ground biomass (root/shoot ratio)
Source of data	Chidumayo, E. N. 2013. Estimating tree biomass and changes in root biomass following clear-cutting of <i>Brachystegia-Julbernardia</i> (Miombo) woodland in central Zambia. <i>Environmental Conservation</i> . 42(1), pp. 54 - 63.
Value applied	0.54
Justification of choice of data or description of measurement methods and procedures applied	The root-shoot ratio was determined within a study site that overlaps one of the same provinces the project is in. See Appendix P for more information including documentation pertaining to measurements and procedures that were applied. In addition, the justification for the use of the shoot to root (RS) ratio of 0.54 in the project is supported by the following; - <i>Local Applicability</i>: The RS ratio of 0.54 was derived by Chidumayo (2014) specifically for Miombo woodlands in the Chongwe district, Zambia, which is geographically close to the LCFP project area. This proximity means similar ecological conditions and disturbances, aligning with the scientific principle of using local models for accuracy in biomass estimation.

	Conservative Estimation: Chidumayo's study adopted a conservative approach by using pit samples and excluding finer root material, which tends to underestimate belowground biomass. This conservatism ensures that the ratio is not inflated and remains a reliable minimum estimate. Independent Validation: Kachamba et al. (2016) evaluated various allometric models and found that Chidumayo's models had non-significant mean prediction errors, indicating their robustness and accuracy across different Miombo sites. Model Safeguards: The LCFP project applies different models for trees with stem diameters over 55 cm, ensuring the RS ratio is not misapplied to larger trees, which could lead to overestimations. Comparison with Other Studies: While other studies in Miombo woodlands have reported different RS ratios, the Chidumayo (2014) ratio of 0.54 is the most locally relevant and conservatively derived, making it the most suitable for the LCFP project's specific conditions.
Purpose of Data	Calculation of baseline emissions
Comments	Overall, the combination of local relevance, conservative estimation methods, independent validation, and appropriate application safeguards justifies the continued use of the 0.54 RS ratio for belowground biomass estimation in the project

Data / Parameter	r_U
Data unit	Proportion (unitless)
Description	Onset proportion of conversion immediately adjacent to project area
Source of data	Remote Sensing Deforestation analysis (Described in section 1.1.2 of the PD) /GIS analysis and image interpretation
Value applied	0.084 for PAI1, 0.163 for PAI2, 0.054 for PAI3 and 0.028 for PAI4
Justification of choice of data or description of measurement methods and procedures applied	Result of remote sensing analysis described in more detail in section 3.2.1 of the project document. For project activity instances 1,3 and 4 (PAI1, PAI3 and PAI4) this calculation is based on the percentage of threatened perimeter close to recent deforestation (Detailed Steps for calculating the threatened boundary, converted boundary and r_U value is in section 3.2.1 of the validated PD). In summary;

	Getting Threatened perimeter - Removal of the project area perimeter that border with areas not accessible to the agents and drivers of deforestation (Interior boundaries for the accounting areas, natural non-forest areas such as wide rivers, grassland and slopes greater than 45%, protected area) - The remaining perimeter is then rasterized Getting Converted perimeter - Raster buffer of 5 pixels was made for areas mapped as deforested in the PALSAR deforestation analysis. - Then band math was used to identify the threatened boundary pixels that overlapped with the converted areas. Calculating the Ru Value r^U value was then calculated as the ratio of the threatened boundary pixels that overlapped with conversion or the buffer compared to the total threatened boundary pixels. For project activity instances 2 (PAI2) this calculation is based on the ratio of conversion and accounting area minus conversion area. Steps for the Ru value calculation included mapping of deforested area using PALSAR deforestation analysis, calculating the size and then getting the ratio of converted area to the difference between the accounting area and the converted area. See the calculations provided in the ER calculation spreadsheets, Appendix G. GIS analysis and image interpretation conducted by BCPs Carbon team.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	T
Data unit	Days
Description	Time since project start date
Source of data	Calendar/Monitoring records
Description of measurement methods and procedures to be applied	Number of days since project start (Project start date is May 1st, 2015 and the current monitoring period ended December 31st, 2023.)

Frequency of monitoring/recording	Every Monitoring period
Value Monitored	3,164
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of Data	Calculation of baseline emissions
Calculation method	Deduct project start date from end of date of current monitoring
Comments	

Data / Parameter	t_i
Data unit	Days
Description	The point in time of the observation made at point i
Source of data	Remote sensing image interpretation
Value applied	1-13,175
Justification of choice of data or description of measurement methods and procedures applied	The historical reference period stretches from May 4 th , 1986 to May 31 st 2022, which is 13,175 days in total. Remote sensing image interpretation and data analysis conducted by BCPs Carbon team.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	t_{PL}
Data unit	Days
Description	Length of project crediting period
Source of data	PD
Value applied	10,957
Justification of choice of data or description of measurement methods and procedures applied	The project crediting period is from May 1 st , 2015 to April 30 th , 2045 which is equivalent to 10957 days.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	w_i
Data unit	Unitless
Description	Weight applied to the i th sample point in the reference area
Source of data	Remote sensing image interpretation
Value applied	Varies (see Appendix O)
Justification of choice of data or description of measurement methods and procedures applied	Calculated as specified in VM0009. Remote sensing image interpretation and data analysis conducted by BCP's Carbon team. See Appendix O for more information.
Purpose of Data	Calculation of baseline emissions
Comments	

Data / Parameter	$x_i y_i$
Data unit	Geographic coordinates
Description	Latitude and Longitude of the i th sample point
Source of data	Remote sensing image interpretation
Value applied	Varies (see Appendix O)
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions
Comments	

4.2 Data and Parameters Monitored

MR.85-87

Data / Parameter	$A_{P1}^{[m=0]}$
Data unit	ha
Description	Area of project accounting area stratum 1 prior to first verification event
Source of data	GIS analysis prior to sampling

Description of measurement methods and procedures to be applied	GIS analysis removed areas in the project area that were non-forest prior to the project start date, on slopes greater than 45% or in areas farther than 6.5 km from a road.
Frequency of monitoring/recording	First monitoring period / 10 years
Value monitored	485,495
Monitoring equipment	N/A
QA/QC procedures to be applied	Double checking GIS analysis
Purpose of the data	Calculation of baseline emissions
Calculation method	GIS area calculation
Comments	

Data / Parameter	$c_B^{[m]}$
Data unit	tCO ₂ e / ha
Description	Baseline carbon stocks at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	Proxy area sampling as per the protocol Appendix P.
Frequency of monitoring/recording	20% of plots measured annually
Value monitored	13.8
Monitoring equipment	See Appendix P. Standard vegetation quantification equipment.
QA/QC procedures to be applied	See Appendix P and description in monitoring report.
Purpose of the data	Calculation of baseline emissions

Calculation method	Using standard vegetation ecology plot sampling techniques and subsequent quantification of biomass using allometric equations.
Comments	This value has changes from 15.6 to 13.8 after biomass data set update in the current monitoring period.(This is attributed to loss of stems in some of the proxy plots from 2019 to 2023.

Data / Parameter	$C_{BBGB}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in BGB at the end of the current monitoring period
Source of data	Equation F.32 from VM0009
Description of measurement methods and procedures to be applied	Ongoing forest monitoring as per Appendix P
Frequency of monitoring/recording	Based on peer reviewed literature and prescribed equation in VM0009
Value monitored	-190,574
Monitoring equipment	See Appendix P
QA/QC procedures to be applied	See Appendix P
Purpose of the data	Calculation of baseline emissions
Calculation method	Applied equation F.32 in VM0009 3.0
Comments	

Data / Parameter	$C_{B\ SOC}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in SOC at the end of the current monitoring period
Source of data	Project accounting area sampling and application of equation F.33 from VM0009 3.0

Description of measurement methods and procedures to be applied	Accounting area sampling as per the protocol in Appendix P and application of equation F.33, VM0009 V3.0
Frequency of monitoring/recording	Every monitoring period
Value monitored	-964,646
Monitoring equipment	See Appendix P standard soil sampling procedures and equipment.
QA/QC procedures to be applied	See Appendix P
Purpose of the data	Calculation of baseline emissions
Calculation method	Application of equation F.33 VM0009 V3.0 using SOC values from the project accounting area.
Comments	

Data / Parameter	$C_{Bb}^{[m]}$
Data unit	tCO ₂ e / ha
Description	Baseline scenario average carbon stock in selected carbon pools
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	Proxy area sampling as per the protocol Appendix P.
Frequency of monitoring/recording	20% of plots measured annually
Value monitored	13.8
Monitoring equipment	See Appendix P. Standard vegetation quantification equipment.
QA/QC procedures to be applied	See Appendix P and description in monitoring report.

Purpose of the data	Calculation of baseline emissions
Calculation method	Using standard vegetation ecology plot sampling techniques and subsequent quantification of biomass using allometric equations.
Comments	This value has changed from 15.6 to 13.8 after biomass data set update in the current monitoring period.(This is attributed to loss of stems of in some of the proxy plots from 2019 to 2023.

Data / Parameter	$C_{BBM}^{[m]}$
Data unit	tCO ₂ e / ha
Description	Baseline carbon stocks in biomass at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	Proxy area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	At first verification and baseline revision
Value monitored	13.8
Monitoring equipment	See Appendix P
QA/QC procedures to be applied	Review of monitoring records as described in Appendix P and re-sampling of 20% of plots
Purpose of the data	Calculation of baseline emissions
Calculation method	Using standard vegetation ecology plot sampling techniques and subsequent quantification of biomass using allometric equations. Averages calculated as per equation B.9 VM0009 V3.0
Comments	This value has changes from 15.6 to 13.8 after biomass data set update in the current monitoring period.(This is attributed to loss of stems of in some of the proxy plots from 2019 to 2023.

Data / Parameter	$c_{BSOC}^{[m]}$
Data unit	tCO ₂ e / ha
Description	Baseline soil carbon stocks at the end of the current monitoring period
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	Once at first verification
Value monitored	210.6
Monitoring equipment	See Appendix P, standard soil sampling equipment
QA/QC procedures to be applied	Review of monitoring records at next baseline re-evaluation
Purpose of the data	Calculation of baseline emissions
Calculation method	Quantification of SOC done according to Annex B.2.6, VM0009 3.0
Comments	

Data / Parameter	$c_p^{[m]}$
Data unit	tCO ₂ e / ha
Description	Project carbon stocks at the end of the current monitoring period
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Plot monitoring as per the protocol in Appendix P
Frequency of monitoring/recording	20% of plots monitored annually
Value monitored	246.1 for PAI1 and PAI4, 599.6 for PAI2, 380.8 for PAI3

	in intact forest and 13.8 in encroached forest
Monitoring equipment	See Appendix P, standard vegetation sampling equipment
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	In the previous monitoring period, a uniform carbon stock value was applied across all PAIs. In the current period, this approach has been revised following an update to the carbon stock dataset. Individual carbon stock values have now been assigned to each PAI to reflect more accurate and conservative estimates: 246.1 tCO₂e/ha for PAI1, 599.6 tCO₂e/ha for PAI2, and 380.8 tCO₂e/ha for PAI3. This change was based on a comparative analysis that considered both the size of the 3 PAI and the exponential behavior of the Baseline Emissions Model (BEM). The analysis concluded that using individual values is more conservative than applying the updated consolidated value uniformly across all PAIs through the end of the current baseline validity period. Due to incomplete carbon stock data for PAI4 at the time of preparing this monitoring report, the project conservatively applied the carbon stock value from PAI1—246.1 tCO₂e/ha—to PAI4. This value was selected because it is the lowest among the three PAIs with complete data, ensuring a precautionary and conservative approach in the absence of finalized data for PAI4. This is recognized as a methodology deviation detailed in section 3.2.1. This was justified as a conservative approach since the carbon stock value of 246.1 is lower than the carbon stock value from the preliminary PAI4 estimate of 321 tCO₂e/ha (see section 3.2.1 of the MR for details).

Data / Parameter	$c_p^{[m-1]}$
Data unit	tCO ₂ e / ha
Description	Project carbon stocks at the beginning of the current

	monitoring period
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	20% of plots monitored annually
Value monitored	246.1 for PAI1 and PAI4, 599.6 for PAI2, 380.8 for PAI3
Monitoring equipment	Review of monitoring records, see Appendix G.
QA/QC procedures to be applied	Review of monitoring records, re-sampling of 20% of plots.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	In the previous monitoring period, a uniform carbon stock value was applied across all PAIs. In the current period, this approach has been revised following an update to the carbon stock dataset. Individual carbon stock values have now been assigned to each PAI to reflect more accurate and conservative estimates: 246.1 tCO₂e/ha for PAI1, 599.6 tCO₂e/ha for PAI2, and 380.8 tCO₂e/ha for PAI3. This change was based on a comparative analysis that considered both the size of each PAI and the exponential behavior of the Baseline Emissions Model (BEM). The analysis concluded that using individual values is more conservative than applying the consolidated value uniformly across all PAIs to the end of the current baseline validity period. Due to incomplete carbon stock data for PAI4 at the time of preparing this monitoring report, the project conservatively applied the carbon stock value from PAI1-246.1 tCO₂e/ha - to PAI4. This value was selected because it is the lowest among the three PAIs with complete data, ensuring a precautionary and conservative approach in the absence of finalized data for PAI#4. This is recognized as a methodology deviation. This was justified as a conservative approach since the applied carbon stock value of 246.1 is lower than the preliminary PAI1 carbon stock estimate of 321 tCO₂e/ha(see section 3.2.1 of the MR for details).

Data / Parameter	$c_p^{[m=0]}$
Data unit	tCO2e / ha
Description	Project carbon stocks prior to first verification event
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	First monitoring period
Value monitored	236.2
Monitoring equipment	Appendix P describes the plot based monitoring procedure.
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	

Data / Parameter	$c_{P1BM}^{[m=0]}$
Data unit	tCO2e / ha
Description	Project carbon stocks in stratum 1 prior to first verification event
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	First monitoring period
Value monitored	236.2

Monitoring equipment	Appendix P describes the plot based monitoring procedure.
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	

Data / Parameter	$C_{PBM}^{[m=0]}$
Data unit	tCO ₂ e
Description	Project carbon stocks in biomass prior to first verification event
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	First monitoring period
Value monitored	114,668,494
Monitoring equipment	Appendix P describes the plot based monitoring procedure.
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	

Data / Parameter	$C_{Pb}^{[m]}$
Data unit	tCO ₂ e / ha

Description	Average carbon in biomass in the project accounting area
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	20% of biomass plots annually
Value monitored	246.1 for PAI1 and PAI4, 599.6 for PAI2, 380.8 for PAI3
Monitoring equipment	Appendix P describes the plot based monitoring equipment.
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	In the previous monitoring period, a uniform carbon stock value was applied across all PAIs. In the current period, this approach has been revised following an update to the carbon stock dataset. Individual carbon stock values have now been assigned to each PAI to reflect more accurate and conservative estimates: 246.1 tCO₂e/ha for PAI1, 599.6 tCO₂e/ha for PAI2, and 380.8 tCO₂e/ha for PAI3. This change was based on a comparative analysis that considered both the size of each PAI and the exponential behavior of the Baseline Emissions Model (BEM). The analysis concluded that using individual values is more conservative than applying the consolidated value of 295 tCO₂e/ha uniformly across all PAIs upto the end of the current baseline validity period. Due to incomplete carbon stock data for PAI4 at the time of preparing this monitoring report, the project conservatively applied the carbon stock value from PAI1 - 246.1 tCO₂e/ha - to PAI4. This value was selected because it is the lowest among the three PAIs with complete data, ensuring a precautionary and conservative approach in the absence of finalized data for PAI#4. This is recognized as a methodology deviation. This was justified as a conservative approach since the carbon stock value of 246.1 is lower than the consolidated preliminary

	PAI4 estimate of 321 tCO ₂ e/ha (see section 3.2.1 of the MR for details).
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Data / Parameter	$c_{P1b}^{[m]}$
Data unit	tCO ₂ e / ha
Description	Average carbon in biomass for project accounting area stratum 1
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	20% of biomass plots annually
Value monitored	246.1 for PAI1 and PAI4, 599.6 for PAI2, 380.8 for PAI3
Monitoring equipment	Appendix P describes the plot based monitoring equipment.
QA/QC procedures to be applied	Review of monitoring records, see Appendix G.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard plot sampling techniques to quantify vegetation and application of allometric equations. Averages calculated using equation B.9 VM0009 V3.0.
Comments	In the previous monitoring period, a uniform carbon stock value was applied across all PAIs. In the current period, this approach has been revised following an update to the carbon stock dataset. Individual carbon stock values have now been assigned to each PAI to reflect more accurate and conservative estimates: 246.1 tCO ₂ e/ha for PAI#1, 599.6 tCO ₂ e/ha for PAI#2, and 380.8 tCO ₂ e/ha for PAI#3. This change was based on a comparative analysis that considered

	both the size of each PAI and the exponential behavior of the Baseline Emissions Model (BEM). The analysis concluded that using individual values is more conservative than applying the updated consolidated value uniformly across all PAIs through the end of the current baseline validity period. Due to incomplete carbon stock data for PAI#4 at the time of preparing this monitoring report, the project conservatively applied the carbon stock value from PAI#1—246.1 tCO₂e/ha—to PAI#4. This value was selected because it is the lowest among the three PAIs with complete data, ensuring a precautionary and conservative approach in the absence of finalized data for PAI#4. This is recognized as a methodology deviation. This was justified as a conservative approach since the updated carbon stock value of 246.1 is lower than the preliminary PAI4 carbon stock estimate of 321 tCO₂e/ha(see section 3.2.1 of the MR for details).
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Data / Parameter	$c_{PSOC}^{[m=0]}$
Data unit	tCO ₂ e / ha
Description	Project soil carbon stocks prior to first verification event
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	Project accounting area sampling as per the protocol in Appendix P
Frequency of monitoring/recording	First monitoring period
Value monitored	235.2
Monitoring equipment	Appendix P, standard soil sampling equipment
QA/QC procedures to be applied	Quantification of SOC done according to Annex B.2.6, VM0009 3.0 at soil lab.
Purpose of the data	Calculation of baseline emissions
Calculation method	Quantification of SOC done according to Annex B.2.6, VM0009 3.0 at soil lab.
Comments	

Data / Parameter	$E_{\Delta GER}^{[m]}$
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Data unit	tCO ₂ e
Description	GERs for the current monitoring period
Source of data	Area measurements
Description of measurement methods and procedures to be applied	Accounting area plots monitoring as per Appendix P.
Frequency of monitoring/recording	Every monitoring period
Value monitored	3,004,873
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Review of GER calculations
Purpose of the data	Calculation of project emissions
Calculation method	Calculated with equation F.53 as per section 8.4.1 of VM0009 V3.0
Comments	

Data / Parameter	$E_{\Delta GER}^{[i]}$
Data unit	tCO ₂ e
Description	GERs for monitoring period i
Source of data	Area measurements
Description of measurement methods and procedures to be applied	Accounting area plots monitoring as per Appendix P.
Frequency of monitoring/recording	Prior monitoring period

Value monitored	14,118,327
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Review of GER calculations
Purpose of the data	Calculation of project emissions
Calculation method	Calculated with equation F.53 as per section 8.4.1 of VM0009 V3.0
Comments	

Data / Parameter	$E_{\Delta NER}^{[i]}$
Data unit	tCO2e
Description	NERs for monitoring period i
Source of data	Area measurements
Description of measurement methods and procedures to be applied	Accounting area plots monitoring as per Appendix P.
Frequency of monitoring/recording	Prior monitoring period
Value monitored	12,307,340
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Review of NER calculations
Purpose of the data	Calculation of project emissions
Calculation method	Calculated with VCS AFOLU Non-Permanence Risk Tool and equation F.55 as per section 8.4.3 of VM0009 V3.0
Comments	

Data / Parameter	$E_B^{[m]}$
Data unit	tCO2e
Description	Cumulative baseline emissions at the end of the current monitoring period
Source of data	Proxy area measurements
Description of measurement methods and procedures to be applied	Proxy area plots monitoring as per Appendix P and equation F.16.
Frequency of monitoring/recording	Every monitoring period
Value monitored	14,984,708
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation F.16 from VM0009 V3.0
Comments	

Data / Parameter	$E_B^{[m-1]}$
Data unit	tCO2e
Description	Cumulative baseline emissions at the beginning of the current monitoring period
Source of data	Proxy area measurements
Description of measurement methods and procedures to be applied	Proxy area plots monitoring as per Appendix P and equation F.16.
Frequency of monitoring/recording	Prior monitoring period
Value monitored	11,764,035

Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation F.16 from VM0009 V3.0
Comments	

Data / Parameter	$E_{BA}^{[m]}$
Data unit	tCO ₂ e
Description	Change in baseline emissions
Source of data	Proxy area measurements
Description of measurement methods and procedures to be applied	Proxy area plots monitoring as per Appendix P and equation F.15.
Frequency of monitoring/recording	Every monitoring period
Value monitored	3,220,673
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation F.15 from VM0009 V3.0
Comments	

Data / Parameter	$E_{BABGB}^{[i]}$
Data unit	tCO ₂ e
Description	Change in baseline emissions from below-ground biomass during monitoring period i

Source of data	Monitoring the proxy area
Description of measurement methods and procedures to be applied	Proxy area plots monitoring as per Appendix P
Frequency of monitoring/recording	Every monitoring period
Value monitored	5,181,278
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculation of above ground biomass using standard vegetation sampling techniques and application of an acceptable root: shoot ratio and application of equation F.10 of VM0009 V3.0, the decay emissions model
Comments	

Data / Parameter	$E_{BASOC}^{[m]}$
Data unit	tCO ₂ e
Description	Baseline change in emissions from soil carbon
Source of data	Measurement in the project area
Description of measurement methods and procedures to be applied	Soil sampling in project accounting area as per Appendix P
Frequency of monitoring/recording	At first verification but values updated at every monitoring period
Value monitored	269,538
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to	Annual monitoring of proxy area. See Appendix P for error

be applied	correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculation of SOC using standard soil sampling techniques and application of equation F.7 and F.29 of VM0009 V3.0, the SOC decay emissions model
Comments	

Data / Parameter	$E_{BASOC}^{[i]}$
Data unit	tCO ₂ e
Description	Baseline emissions from soil carbon in monitoring period i
Source of data	Measurement in the project area
Description of measurement methods and procedures to be applied	Soil sampling in project accounting area as per Appendix P
Frequency of monitoring/recording	At first verification but values updated at every monitoring period
Value monitored	1,363,694
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculation of SOC using standard soil sampling techniques and application of equation F.7 and F.29 of VM0009 V3.0, the SOC decay emissions model
Comments	

Data / Parameter	$E_{BBGB}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from below-ground biomass at the end of the current monitoring period

Source of data	Measurement in the proxy area
Description of measurement methods and procedures to be applied	Standard vegetation sampling techniques to quantify above ground biomass, application of a root-shoot ratio and a decay emissions model.
Frequency of monitoring/recording	Every monitoring period
Value monitored	4,990,704
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculation of above ground biomass using standard vegetation sampling techniques and application of an acceptable root to shoot ratio and application of equation F.10 of VM0009 V3.0, the decay emissions model
Comments	

Data / Parameter	$E_{BGB}^{[m-1]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from below-ground biomass at the beginning of the current monitoring period
Source of data	Measurement in the proxy area
Description of measurement methods and procedures to be applied	Standard vegetation sampling techniques to quantify above ground biomass, application of a root-shoot ratio and a decay emissions model.
Frequency of monitoring/recording	Every monitoring period
Value monitored	3,929,104
Monitoring equipment	See Appendix P, standard plot sampling equipment

QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Calculation of above ground biomass using standard vegetation sampling techniques and application of an acceptable root-to-shoot ratio and application of equation F.10 of VM0009 V3.0, the decay emissions model
Comments	

Data / Parameter	$E_{BBM}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from biomass at the end of the current monitoring period
Source of data	Measurement in the proxy area
Description of measurement methods and procedures to be applied	See Appendix E
Frequency of monitoring/recording	Every monitoring period
Value monitored	14,585,663
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	Annual monitoring of proxy area. See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Standard vegetation sampling techniques, quantification of deforestation in the reference area and application of equation F.4 and F.24, VM0009 V3.0
Comments	

Data / Parameter	$E_{BSOC}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from soil carbon at the end of the current monitoring period
Source of data	Measurement in the project area
Description of measurement methods and procedures to be applied	Standard soil sampling techniques in the proxy area, laboratory analysis and application of the soil decay model.
Frequency of monitoring/recording	At first verification but values updated at every monitoring period
Value monitored	1,363,694
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Quantification of soil carbon and application of equation F.9 and F.29, VM0009, V3.0
Comments	

Data / Parameter	$E_{BSOC}^{[m-1]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from soil carbon at the beginning of the current monitoring period
Source of data	Measurement in the project area
Description of measurement methods and procedures to be applied	Standard soil sampling techniques in the proxy area, laboratory analysis and application of the soil decay model.
Frequency of monitoring/recording	At first verification but values updated at every monitoring period

Value monitored	1,094,156
Monitoring equipment	See Appendix P, standard plot sampling equipment
QA/QC procedures to be applied	See Appendix P for error correction procedures.
Purpose of the data	Calculation of baseline emissions
Calculation method	Quantification of soil carbon and application of equation F.9 and F.29, VM0009, V3.0
Comments	

Data / Parameter	$E_{BA}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative emissions allocated to the buffer account at the end of the current monitoring period
Source of data	VCS Non-Permanence Risk Report, See Appendix H
Description of measurement methods and procedures to be applied	See Appendix H – standard VCS procedure used.
Frequency of monitoring/recording	Non-permanence risk revised at every baseline re-assessment.
Value monitored	-631,023
Monitoring equipment	None
QA/QC procedures to be applied	Annual review of risk criteria and disturbance monitoring
Purpose of the data	Calculation of project emissions
Calculation method	Procedure followed in VCS non-permanence risk tool and emissions allocated to buffer account subtracted from GERs.
Comments	

Data / Parameter	$E_L^{[m]}$
Data unit	tCO2e
Description	Cumulative emissions from leakage at the end of the current monitoring period
Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	None
QA/QC procedures to be applied	See Appendix R, standard vegetation sampling equipment
Purpose of the data	Calculation of leakage emissions
Calculation method	Application of equation F.44 and F.45 to field data collected.
Comments	See Appendix R, all evidence of tree-felling by humans are geo- referenced and plots photographed

Data / Parameter	$E_L^{[m-1]}$
Data unit	tCO2e
Description	Cumulative emissions from leakage at the beginning of the current monitoring period
Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0

Monitoring equipment	None
QA/QC procedures to be applied	See Appendix R, standard vegetation sampling equipment
Purpose of the data	Calculation of leakage emissions
Calculation method	Application of equation F.44 and F.45 to field data collected.
Comments	See Appendix R, all evidence of tree-felling by humans are geo- referenced and plots photographed

Data / Parameter	$E_{LA}^{[m]}$
Data unit	tCO ₂ e
Description	Change in emissions due to leakage
Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	None
QA/QC procedures to be applied	See Appendix R, standard vegetation sampling equipment
Purpose of the data	Calculation of leakage emissions
Calculation method	Application of equation F.44 and F.45 to field data collected.
Comments	See Appendix R, all evidence of tree-felling by humans are geo- referenced and plots photographed

Data / Parameter	$E_{LASF}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative emissions from activity-shifting leakage in forested strata at the end of the current monitoring period

Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	None
QA/QC procedures to be applied	See Appendix R, standard vegetation sampling equipment
Purpose of the data	Calculation of leakage emissions
Calculation method	Application of equation F.44 and F.45 to field data collected.
Comments	See Appendix R, all evidence of tree-felling by humans are geo- referenced and plots photographed

Data / Parameter	$E_{LME}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative emissions from market leakage at the end of the current monitoring period
Source of data	N/A
Description of measurement methods and procedures to be applied	Land-use by deforestation agents is subsistence and therefore all market leakage is captured by monitoring in activity shifting leakage areas.
Frequency of monitoring/recording	N/A
Value monitored	0
Monitoring equipment	None
QA/QC procedures to be applied	N/A

Purpose of the data	Calculation of leakage emissions
Calculation method	N/A
Comments	

Data / Parameter	$E_{P\Delta}^{[m]}$
Data unit	tCO ₂ e
Description	Change in project emissions
Source of data	Monitoring records for Forest Fire, Burning, logging, wood products, and natural disturbance events
Description of measurement methods and procedures to be applied	Standard vegetation sampling techniques and remote sensing to determine the extent of fires and other disturbances.
Frequency of monitoring/recording	Every monitoring period
Value monitored	-215,800
Monitoring equipment	Standard vegetation sampling equipment and satellite imagery.
QA/QC procedures to be applied	Remote sensing, patrols and field measurements
Purpose of the data	Calculation of project emissions
Calculation method	Monitoring data from areas of Forest Fire, Burning, logging, wood products, and natural disturbance events and equation F.41 VM0009 V3.0.
Comments	

Data / Parameter	$E_{P\Delta BRN}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative project emissions due to burning at the end of the current monitoring period
Source of data	Monitoring plots in the project accounting area

Description of measurement methods and procedures to be applied	Application of equation F.42 using burning monitoring data as input.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	Standard vegetation sampling equipment
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of project emissions
Calculation method	Monitoring data from areas of Burning and equation F.42 VM0009 V3.0.
Comments	Biomass burning in the project accounting area is not a project activity

Data / Parameter	$E_U^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative confidence deduction at the end of the current monitoring period
Source of data	N/A
Description of measurement methods and procedures to be applied	Application of equation F.57 which is a linear combination of weighted standard errors of estimates from baseline emission models and carbon stock measurements.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of calculations
Purpose of the data	Calculation of project emissions

Calculation method	Equation F.57 from VM0009 V3.0
Comments	

Data / Parameter	$P_{LDEG}^{[m]}$
Data unit	Proportion (unitless)
Description	Portion of leakage due to degradation at the end of the current monitoring period
Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.
Frequency of monitoring/recording	Every monitoring period
Value monitored	0.1
Monitoring equipment	See Appendix R, standard vegetation sampling equipment
QA/QC procedures to be applied	See Appendix R, all evidence of tree-felling by humans are geo-referenced and plots photographed
Purpose of the data	Calculation of leakage
Calculation method	Calculated using equation B.9, VM0009 V3.0. Minimum sample size determined using equation B.31, VM0009 V3.0
Comments	

Data / Parameter	$P_{LDEG}^{[m=0]}$
Data unit	Proportion (unitless)
Description	Portion of leakage due to degradation prior to first verification event
Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	Plot based sampling of leakage area and estimation of degradation.

applied	
Frequency of monitoring/recording	First monitoring period
Value monitored	0.0815
Monitoring equipment	See Appendix R, standard vegetation sampling equipment
QA/QC procedures to be applied	See Appendix R, all evidence of tree-felling by humans are geo-referenced and plots photographed
Purpose of the data	Calculation of leakage
Calculation method	Calculated using equation B.9, VM0009 V3.0. Minimum sample size determined using equation B.31, VM0009 V3.0
Comments	

Data / Parameter	t
Data unit	Days
Description	Time since project start date
Source of data	Calendar/Monitoring records
Description of measurement methods and procedures to be applied	Number of days since project start (Project start date is May 1st, 2015 and the current monitoring period ended December 31st, 2023.)
Frequency of monitoring/recording	Every Monitoring period
Value Monitored	3,164
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of Data	Calculation of baseline emissions
Calculation method	Deduct project start date from end of date of current monitoring
Comments	

Data / Parameter	$t^{[i-1]}$
Data unit	Days

Description	Time from the project start date to beginning of monitoring period i
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	NA
Frequency of monitoring/recording	Prior monitoring period
Value monitored	2,800
Monitoring equipment	NA
QA/QC procedures to be applied	NA
Purpose of the data	Calculation of baseline emissions
Calculation method	Count of days in project crediting period
Comments	

Data / Parameter	$t^{[m]}$
Data unit	Days
Description	Time from project start date to end of current monitoring period
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	NA
Frequency of monitoring/recording	Every monitoring period
Value monitored	PAI1 =3,164; PAI2 = 871 ; PAI3 = 728, PAI4: 364
Monitoring equipment	NA
QA/QC procedures to be applied	NA

Purpose of the data	Calculation of baseline emissions
Calculation method	Deduct project start date from end of date of current monitoring
Comments	

Data / Parameter	$t^{[m-1]}$
Data unit	Days
Description	Time from project start date to beginning of current monitoring period
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	NA
Frequency of monitoring/recording	Prior monitoring period
Value monitored	PAI1= 2,800; PAI2 = 507 ; PAI3 = 364 ;PAI4=0
Monitoring equipment	NA
QA/QC procedures to be applied	NA
Purpose of the data	Calculation of baseline emissions
Calculation method	Deduct project start date from end of date of previous monitoring
Comments	

Data / Parameter	$U_B^{[m]}$
Data unit	tCO2e
Description	Total uncertainty in proxy area carbon stock estimate
Source of data	Biomass and soil carbon inventory data, Appendix G
Description of measurement	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting

methods and procedures to be applied	area carbon stocks
Frequency of monitoring/recording	Every monitoring period
Value monitored	16,833
Monitoring equipment	NA
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation B.10 VM0009 v3.0
Comments	

Data / Parameter	$U_{EM}^{[M]}$
Data unit	tCO ₂ e
Description	Total uncertainty in Baseline Emissions Models
Source of data	Forest State Interpretation, Appendix O
Description of measurement methods and procedures to be applied	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting area carbon stocks
Frequency of monitoring/recording	Every monitoring period
Value monitored	17,326
Monitoring equipment	NA
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation B.14 VM0009 v3.0
Comments	

Data / Parameter	$U_P^{[m]}$
Data unit	tCO2e
Description	Total uncertainty in project accounting area carbon stock estimate
Source of data	Biomass and soil carbon inventory data, Appendix G
Description of measurement methods and procedures to be applied	Calculation of the standard error of the total of the baseline emissions model, proxy area carbon stocks and accounting area carbon stocks
Frequency of monitoring/recording	Every monitoring period
Value monitored	19,070,476 for PAI1, 8,312,380 for PAI2 , 15,049,173 for PAI3 and 19,070,476 for PAI4
Monitoring equipment	NA
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation B.10 VM0009 v3.0
Comments	PAI1 carbon stock values were applied in PAI4 because at the time of preparing the MR, the project had incomplete carbon stock data for PAI4; therefore, PAI1 and PAI4 have the same Total Uncertainty value (see section 3.2.1 for more details).

4.3 Monitoring Plan

Table 25. Summary of monitoring activities

Monitoring Activity	Timing	Methods
Trespassing and boundary transgressions	Monthly patrols backed up with aerial surveys at least once per dry season.	Scouts patrol the project are on an ongoing basis, it is their core duty
Leakage monitoring	Annually	Forest Inventory team following VM0009 and re-measuring

		100% of leakage plots each year as per protocol in Appendix R.
Plot measurements	Annually	Forest Inventory Team following VM0009, re-measuring 20% of plots in project accounting and project proxy areas as per protocol in Appendix P. Since all the plots (100%) were measured a year prior to project validation (i.e. 2018), the 20% per year rotation started in 2019. An additional 20% was measured in 2020,2021 and 2022. Therefore, 100% rotation was completed in the current monitoring period(2023- M6).
Disturbance monitoring	One a year using satellite imagery from April-May	Remote sensing using Sentinel-2 or Landsat imagery. Followed up with aerial surveys and, or scout patrols.

PDR.122

The principal means of monitoring project emissions is with inventory plots in project accounting areas where above-ground biomass is measured by recording tree dbh. Allometric equations are used to convert the measures to above and below-ground biomass. Soil samples are also collected during the first monitoring period to establish the soil carbon stocks for the project accounting area. VM0009 requires that all such plots must be measured during the first monitoring period and then 20% measured during each subsequent monitoring period. After mapping the project accounting area described in section 3.2.1 of the project document, the project used GIS software to generate 122 plots randomly within the instance one project accounting area polygon. One of these plots became encroached, thus biomass monitoring plots used for biomass stocks accounting in the forested area for M1 to M5 monitoring periods were 121 (see **MR.33**). The sample size was estimated based on the variance in biomass inventory plot data from BCP's other REDD project, the Lower Zambezi REDD project. The sample size for Instance 2 and 3 accounting area was estimated based on the plot density in the first project activity instance.

The project has completed revisiting the final 20% of the initial carbon stock plots during the current monitoring period (M6), achieving 100% coverage of all proxy and accounting area plot carbon stock data in accordance with the project's monitoring plan. The initial carbon stock dataset has been updated with data collected from 2019 to 2023, as scheduled. Additionally, carbon stock plot data from project activity instances 2 and 3, collected in M4 and M5 respectively, have been integrated into the final carbon stock dataset. This integration has increased the number of accounting area plots in all the PAI from 121 to 162 broken down as follows, 120 in PAI1, 11 in PAI2 and 31 in PAI3. With this update, 1 more biomass plot from the initial set was monitored and found to be encroached, raising the number of encroached plots from 2 to 3.

MR.93

Plot monitoring is conducted in plot locations shown in figure 18, according to the BCP field sampling manual (Appendix P). Optimum plot size and minimum tree diameter were determined under BCP's other project, the Lower Zambezi REDD Project. Circular plots (12m radius) are used due to their simplicity, ease of layout and reduced measurement error. A randomly generated plot location is navigated-to using a handheld GPS or Android Smartphone. When the plot location is reached, the center is permanently marked with a steel rebar driven into the ground.

Trees are identified to species level as far as possible. The use of a generic allometric equation to calculate AGOT mass fortunately negated mistakes or uncertainties with tree species identification.

As explained above, plots are re-measured on a rotating basis, with 20% re-measured per year, however stock estimates are only updated every 5 years after all plots have been re-measured. The initial data set was updated in the current monitoring period (M6) as scheduled.

In addition to the inventory plots, human and natural disturbances in the project accounting area are mapped using visual interpretation of Sentinel-2 and if needed Landsat data. This is done once a year using the most cloud-free imagery from April-May. This represents the end of the rainy season and the beginning of the dry season. This is generally the best time of the year for mapping woodlands in Zambia as there is less cloud cover, trees generally still have leaves, and the understory grass has started to dry out providing better contrast between grassy and wooded areas. The woodlands in the project area are fire-adapted and fires generally don't cause a massive disturbance. April-May imagery helps avoid mistakenly mapping fire scars as a disturbance when the fire likely only burned the understory grass. With April-May imagery, only permanently damaging fires will be mapped as a disturbance.

When significant disturbances are detected in an area not covered by an inventory plot, a polygon will be drawn around the area and the per hectare emissions factors determined from the plot inventory work will be applied to the area to calculate project emissions.

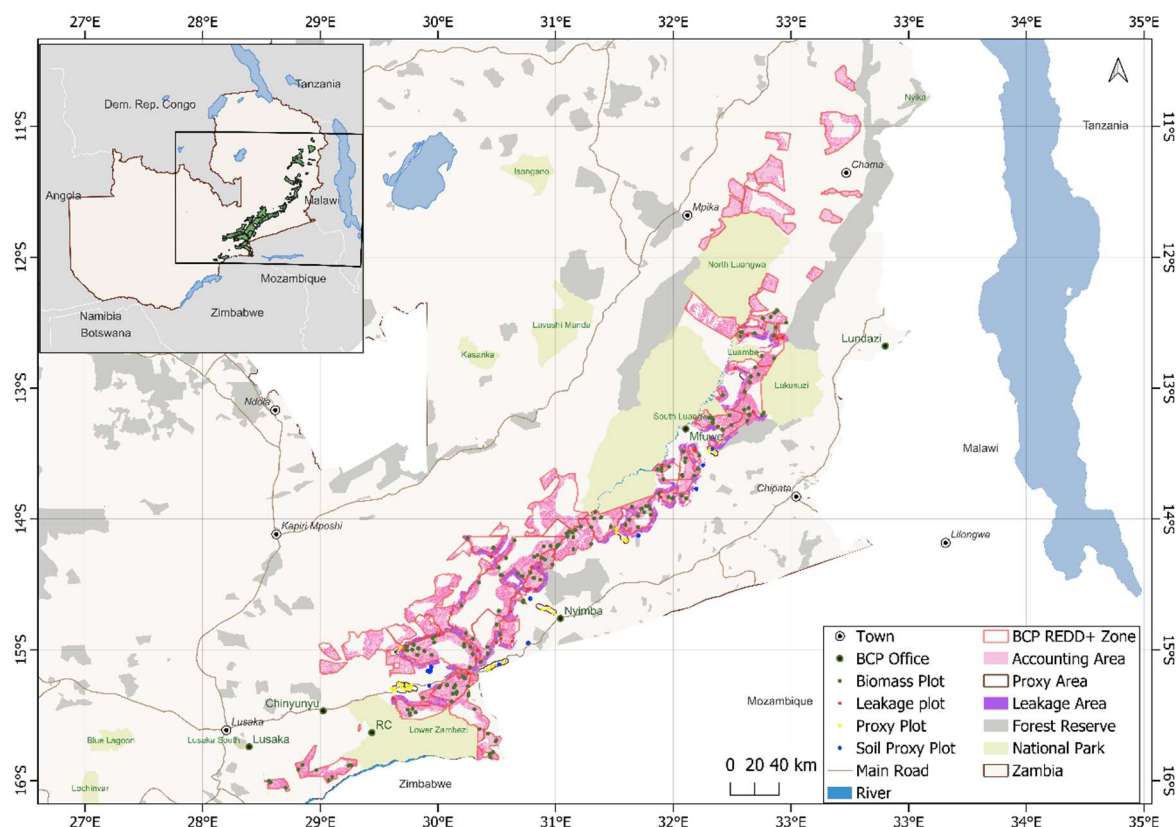


Figure 17. Accounting, Proxy, and Leakage Plots (MR.91)

PDR.123

Proxy plots are used to estimate residual biomass after conversion and the end point for soil carbon decay. For estimating residual biomass, after mapping the proxy areas as described in section 3.2.1 of the project document, the project generated a random sample of 45 points within the proxy areas. Variability in proxy plots is high since some farmers leave large isolated trees in their farms and invariability, some proxy plots will include these trees. Based on experience from the previous LZRP REDD project, BCP settled on a sample size of just 45 points (Table 15). This is because while the variability with proxy plots is high relative to the proxy plot average, that variability is low relative to the accounting area carbon stocks and thus represents a relatively small portion of the overall uncertainty in baseline emissions.

The same biomass and soil sampling protocols used for accounting areas (Appendix P) were used for proxy areas as well.

Proxy soil measurements were conservatively excluded in M1 and M2. From M3 onwards, proxy soil sampling was conducted in areas that represented the end point of conversion and the data was analyzed for SOC accounting. See Appendix C for details.

PDR.124

Leakage plots in the leakage area are used to estimate activity-shifting leakage from the project accounting areas. The project generated a random sample of 25 points within the leakage area where 1 ha leakage plots could be established. Equation B.31 as per VM0009, suggested the minimum number of plots required was 22.

The leakage plot protocol is described in Appendix R.

MR.92

GPS coordinates for all of the accounting area, proxy, and leakage plots can be found in Appendix I.

MR.98

All accounting area, proxy, and leakage plots were measured during monitoring period 1 and revisited in M2 to M6. The project is verified on an annual basis, therefore, measures all leakage plots each year and 20% of the accounting area and proxy plots each year.

Organizational Structure, responsibilities, and competencies

BioCarbon Partners has a team of experts responsible for carbon stock monitoring and standards compliance. As per VM0009, carbon stock monitoring is done using a combination of permanent plots in the project accounting area, proxy area, and leakage area, and remote sensing. Scout teams are used to confirm encroachment and deforestation in the project area as part of the community engagement process to resolve encroachment (Figure 18). The carbon accounting department oversees all forest-related data collection, processing, storage, GIS and remote sensing, and electronic data capture systems with a central database (Figure 18).

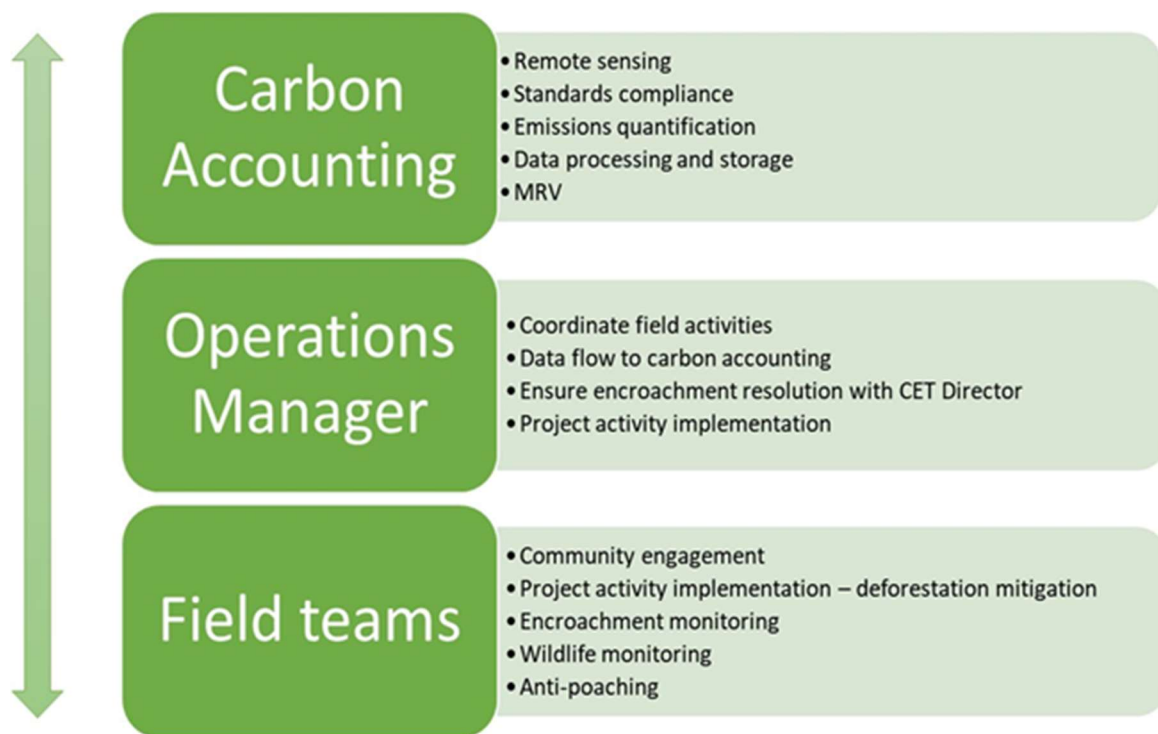


Figure 18. BCP Carbon Monitoring Process.

Both the carbon accounting manager and remote sensing and GIS specialist have post graduate degrees with a strong focus on African ecology and collectively have more than 20 years' experience in biological inventories, remote sensing, and GIS.

Data Management

The process followed for field data collection is outlined in Figure 19. It is a feedback system that relies heavily on training, review and good communication. All training is followed by trial runs of the sampling procedure and then actual data collection under supervision. Data is continuously submitted from the field to the carbon accounting department, and feedback is provided if any corrective actions are required. Remote Sensing data does not have a field component, but all data is also stored on Google Drive. Once data has been error checked and cleaned it is safely stored online using Google Drive and then transferred to an online relational database.

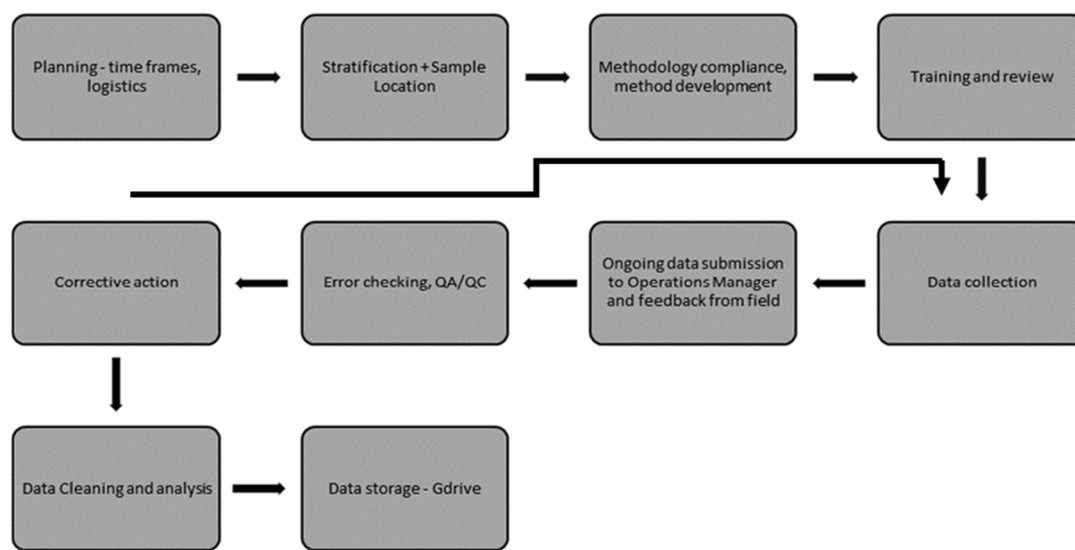


Figure 19. BioCarbon Partners data collection, QA/QC and storage process.

MR.90

Quality Assurance and Quality Control

All data submitted to the central database is subjected to quality control by appropriate staff. In 2023, the Carbon Department was composed of the Senior Carbon Scientist, a Carbon Accountant, a Carbon Specialist, a GIS technician, and a Carbon Specialist/Biodiversity Manager. Together, the team has over 50 years of cumulative GIS & Remote Sensing experience and contributed to 15 successful verification of BCP REDD+ projects. The majority of field data is collected using digital tools on smartphones and are either directly loaded to the database or saved on Google Drive where it is checked and then transferred to the database.

A set of Standard Operating Procedures and Field Manuals have been developed for all the various aspects of the carbon inventory. As indicated above, BCP has strong systems in place to ensure all carbon-related data is collected according to the required quality standards. Quality Control is embedded in the organizational structure of the Carbon Accounting department (Figure 19).

Continuous feedback from the field, coupled with field visits from senior staff, ensure that errors are identified in a timely fashion and corrected (Figure 19). Spot checks and internal audits are conducted to make sure all data collected is of the highest standard. The new digital data capture system furthermore ensures that errors are identified and rectified immediately, unlike paper-based systems where data often takes weeks to enter and error check. Spot errors are dealt with as per Appendix P.

With regards to GIS and RS, similar procedures are followed although this role resides mainly within the senior management's responsibility.

MR.88

Three forest monitoring teams were used to collect the biomass and SOC data. Each team was led by an experienced member of what was once a single team formed for the assessment of biomass and SOC data in the Lower Zambezi Redd+ Project. This initial team was trained over a period of 12 days in February and September of 2012. They received a refresher 2-day training in December of 2012, June of 2014, and May of 2016. This core team has been collecting data annually for the other REDD project since 2012 and are thus highly experienced.

In order to speed up the carbon inventory work, a second forest monitoring team was formed. Each of the new teams was led by a highly experienced member of team 1 and all new team members received training before starting field work. At the beginning of each year, refresher training is conducted with the forest monitoring teams.

MR.99

The project uses two allometric equations to estimate above-ground biomass. For the majority of tree stems, a generic miombo equation developed by Chidumayo (2013) at a study site very close to the project area was used:

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

It was based on a destructive sampling of 113 trees of 19 different species (all of which are found in the project accounting area) with a DBH range of 2 to 39 cm.

The other equation used by the project is another general miombo equation developed by Mugasha et al, 2013 (see Appendix P for publication copy):

$$\text{Wood Biomass (kg)} = 0.1027 * \text{DBH}^{2.4798}$$

It was based on destructive sampling in 4 different sites in Tanzania of 167 sample trees of 60 tree species with a DBH range from 1.1 to 110 cm.

MR.100

Having been developed from sample trees in Zambia near the project area, the Chidumayo equation was the more local of the two equations. It also gave higher biomass estimates for all DBHs than the Mugasha equation. Therefore, it was the preferred equation. Unfortunately, it was not validated for trees above 55 cm. Therefore, it was applied to all trees with a DBH of 55 cm or less. It was also applied to trees less than 63 cm DBH, but the DBH of these trees was conservatively changed to be 55 cm since the equation had not been tested on

trees larger than 55 cm DBH. This deviation is explained in more detail in section 2.2. The equation was used to estimate 80% of the project area carbon stocks.

For trees between 63 and 110 cm DBH, the Mugasha equation, which was validated for trees up to 110 cm DBH was applied. It was also applied to 3 trees with diameters greater than 110 cm DBH, by changing the DBH of these trees to 110 cm. This deviation is explained in more detail in section 2.2. The equation was used to estimate 20% of the project area carbon stocks.

MR.101

Both equations were used in the same way as for the first monitoring period.

MR.102

As per VM0009, there was no need to validate the Chidumayo equation with destructive harvesting because the equation came from existing published literature and was developed for miombo forests very similar to the project area. However, BCP did conduct some relevant destructive harvesting as part of developing its first REDD+ project in Lusaka province. Additionally, BCP has the destructive harvesting data from Chidumayo's study of miombo biomass allometry in Lusaka province. So, these two datasets were used to validate the Mugasha et al. equation, which comes from further away.

Also, the samples used to develop both equations did not include trees as large as the largest trees in the inventory data and the equations do not pass the first-order derivative test required by VM0009. Therefore, as described in **MR.100** when the equations were applied to a tree with a DBH greater than the range used to develop the equation, the DBH was changed to match the maximum DBH for which the equation was validated. This deviation is described in more detail in section 2.2.

MR.103

Chidumayo (2013) developed the equation through destructive harvesting of study plots located between latitudes 15.2167° and 15.2833°S and longitudes 29.1500° and 29.2333°E, which was miombo woodland in Lusaka province. The sample consisted of 113 trees spanning 19 species, all of which occur in the project and proxy areas.

The Mugasha equation was also developed for miombo from 4 different sites in Tanzania. Out of 156 trees identified at the species level in the Mugasha et al. Dataset, 87 (56%) were species found in the accounting area biomass plots for this project. Out of 165 sample trees identified at the genus level, 141 (85%) were from a genus found in the accounting area inventory plots. Thus, there was a large number of species and genus overlap between the project accounting area and the Mugasha et al. 2013 sample trees, showing that miombo in

Tanzania is similar. Additionally, the equation appears to be conservative relative to the Chidumayo equation and predicts less biomass for any DBH than the Chidumayo equation.

MR.104

The Chidumayo equation did not require validation with destructive harvesting as it was developed from miombo sites in the centre of Lusaka province within 60 km of the project area. Thus, the destructive harvesting data from the Chidumayo study and 7 additional trees destructively harvested by BCP were used to validate the Mugasha equation.

MR.105

Chidumayo (2013) developed the equation through destructive harvesting of study plots located between latitudes 15.2167° and 15.2833°S and longitudes 29.1500° and 29.2333°E, which was miombo woodland in Lusaka province within 60 km of the project accounting area. The diameter at breast height (DBH) range for the Chidumayo model was 2-39 cm and it was developed from a sample size of 113 destructively sampled trees covering 19 species, including most of the common species in the project accounting area. BCP then destructively harvested 7 more trees to bring the size range up to 55 cm DBH.

BCP has the original data from the author and has made it available to the VVB (Appendix G). As part of the work to establish its first REDD+ project, BCP destructively sampled another seven trees of various species to extend the diameter range of the Chidumayo equation to 55 cm (Table 26). The procedures followed for destructive harvesting are described in Appendix P and was developed under the guidance of Professor Chidumayo.

Table 26. Results of allometry validation and diameter range expansion.

Species	DBH (cm)	Total dry mass (kg)	Mass Predicted by equation (kg) (Chidumayo 2013)	Latitude	Longitude
<i>Brachystegia boehmii</i>	49	2750	2143	-15.3672	29.08735
<i>Brachystegia boehmii</i>	48	2838	1957	-15.3654	29.08534
<i>Brachystegia boehmii</i>	42	1236	1346	-15.3627	29.08307
<i>Brachystegia spiciformis</i>	41	1141	1318	-15.3678	29.08696
<i>Brachystegia utilis</i>	43	2212	1462	-15.3627	29.08266

<i>Brachystegia utilis</i>	48	2006	2030	-15.3635	29.08613
<i>Parinari curatellifolia</i>	55	3823	2950	-15.3654	29.08537
Total Mass		16006	13206		

MR.106

The field protocol is available in Appendix P.

MR.107

The field protocol (Appendix P) was based on the methods used by Chidumayo (2013) to develop the original equation. It is a methodical and robust approach that is conservative. The same wet-dry mass ratio as used by Chidumayo (2013) was applied.

MR.108

As shown in Appendix G, the Chidumayo equation predicts 10% less biomass than the cumulative measured biomass of the destructively sampled trees. Thus, it is acceptable under VM0009. The Mugasha equation is also acceptable under this condition, predicting 25% less biomass than the cumulative measured biomass of the destructively sampled trees (Appendix G).

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

MR.95

Table 27. Estimated carbon stock, standard error of the total for each stock, and the sample size for each stratum in the area selected.

Parameter	Project Accounting Area		Proxy Area	
	Forest (AGOT + BGOT)	Soil	Proxy Area (AGOT + BGOT)	Proxy Area Soil*
Plots (P)	PAI1: 120 PAI2: 11 PAI3: 31 PAI4: Nil ²⁸	25	45	25
Total Possible plots ($N_{p,k}$)	PAI1: 10,731,796 PAI2: 1,121,379 PAI3: 2,715,714 PAI4: 11,340,033	PAI1: 10,731,796 PAI2: 1,121,379 PAI3: 2,715,714 PAI4: 11,340,033	84,883	6,008
C	PAI1: 119,378,579 PAI2: 30,417,706 PAI3: 46,622,381 PAI4: 126,151,416	PAI1: 114,080,829 PAI2: 11,932,637 PAI3: 28,799,465 PAI4: 120,553,103	53,164	57,251
U (B.10) per stratum	PAI1: 10,773,958 PAI2: 8,148,146 PAI3: 14,512,830	PAI1: 15,735,392 PAI2: 1,644,195 PAI3: 3,981,879	16,539	3,133

²⁸ Applied PAI1 carbon stock value due to incomplete data for instance 4 at the time of writing the MR(see section 3.2.1 for more details)

	PAI4: 10,773,958 ²⁹	PAI4: 15,735,392 ³⁰		
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MR.10

Baseline emissions ($E_{(BA)}^{[m]}$) for the current monitoring period (January 1st, 2023 to December 31st, 2023) are summarized in Table 29. Equation F.15 was used to calculate these baseline emissions. Cumulative baseline emissions were calculated using a logistic deforestation model, based upon a point interpretation of forest state in the reference area applying equation F.16 from VM0009 v3.0.

Table 28. Baseline emissions summary for the current monitoring period (see Appendix G for calculations).

Monitoring Period	Carbon Pool	Baseline Emissions (tCO2e)
M6	AGOT	2,067,950
M6	BGOT	1,061,600
M6	SOC	91,125
Total		3,220,675

MR.11

Total Cumulative baseline emissions from prior monitoring periods were 11,764,035

tCO2e. Refer to Appendix G for calculations.

MR.12

Cumulative baseline emissions for each selected pool ($E_{BBM}^{[m]}$ and $E_{BSOC}^{[m]}$) and undecayed carbon ($C_{BBGB}^{[m]}$, $C_{BSOC}^{[m]}$) as of the current monitoring period are summarized below.

See Appendix G for calculations.

$$E_{BBM}^{[m]} = 14,585,663 \text{ tCO}_2\text{e}$$

$$E_{BSOC}^{[m]} = 1,363,694 \text{ tCO}_2\text{e}$$

$$C_{BBGB}^{[m]} = -190,574 \text{ tCO}_2\text{e}$$

²⁹ Same as PAI1 , because PAI1 carbon stock value was applied due to incomplete data for PAI4 at the time of writing the MR

³⁰ Same as PAI1 , because PAI1 carbon stock value was applied due to incomplete data for PAI4 at the time of writing the MR

$$C_{BSOC}^{[m]} = -964,646 \text{ tCO}_2\text{e}$$

MR.15-17

Baseline emissions from biomass for the current monitoring period are based on per project activity average carbon stock in selected carbon pools from AGOT, BGOT given by equation F.17 for the accounting area and F.18 for the proxy area. The per PAI carbon stock values applied in the current monitoring period are 246.1, 599.6, 380.8, 246.1 tCO₂e/ha for PAI1, PAI2, PAI3 and PAI4 respectively. The proxy area (baseline scenario) carbon stocks are 13.8 tCO₂e.

Cumulative baseline emissions from biomass ($E_{BBM}^{[m]}$) for the current monitoring period were calculated by equation F.24 from VM0009 V3.0. See Appendix G for calculations.

$$14,585,663 \text{ tCO}_2\text{e}$$

Current baseline emissions from SOC ($E_{(BASOC)}^{[m]}$) as of the current monitoring period were 269,538 tCO₂e, calculated with equation F.29. See Appendix G for calculations.

Cumulative baseline emissions from biomass ($E_{BBM}^{[m]}$) for all prior monitoring periods were 11,456,113 tCO₂e.

See Appendix G for calculations.

MR.26

Carbon stored in non-decayed BGB ($C_{BBGB}^{[m]}$) for the current monitoring period was calculated using equation F.32. See Appendix G for calculations.

$$-190,574 \text{ tCO}_2\text{e}$$

MR.27

Cumulative baseline emissions from BGB for the current monitoring period ($E_{BBGB}^{[m]}$) were calculated using equation F.30. See Appendix G for calculations.

$$4,990,704 \text{ tCO}_2\text{e}$$

MR.28

Cumulative baseline emissions from BGB ($E_{BBGB}^{[m]}$) for all prior monitoring periods were calculated using equation F.30. See Appendix G for calculations.

11,456,113 tCO₂e

MR.29

Carbon stored in non-decayed SOC for the current monitoring period ($C_{BSOC}^{[m]}$) was calculated using equation F.33. See Appendix G for calculations.

-964,646 t CO₂e

5.2 Project Emissions

MR.32

Major disturbances within the project area, typically associated with clearing for cropland preparation, were manually digitized from cloud-free Sentinel-2 images obtained between April and May 2023 (as per the validated PD) for comparative analysis with the previous year's assessment conducted during the same period. Figures 20, 21a, 21b ,22 and 22a display maps delineating the boundaries of these areas. The imagery was sourced from Earth Engine and exported to Google Cloud as map tiles (script provided to VVB). Both Sentinel-2 mosaics from 2022 and 2023 were imported into QGIS and compared to each other to detect changes in the forest cover. Subsequently, any identified forest disturbances were manually delineated as polygons.

To ensure the accuracy of the forest disturbance analysis process, the project implemented a three-tier verification approach. This involved two analysts and one verifier, consisting of a GIS Technician, a Carbon Specialist, and a Carbon Manager, respectively. All three possess extensive expertise in visual image interpretation, enabling them to accurately identify forest loss. Following the BCP annual deforestation Standard Operating Procedure (SOP) detailed in Appendix E, the first analyst (GIS technician) applied Sentinel-2 imagery to identify and delineate converted areas. Subsequently, the second analyst (Carbon Specialist) conducted a comprehensive assessment of the dataset generated by the first analyst, employing the same Sentinel-2 imagery (10m resolution). Finally, both analysts discussed their findings at the completion of the mapping process in order to reconcile any discrepancies. The resulting final dataset revealed a forest cover loss of 914.67 hectares in the current monitoring period (see table 29 for the breakdown of forest disturbed areas stratified by chiefdom).

Table 29. Results of disturbance mapping in the project area

Area Name	PAI	Clearing in 2023 (ha)	Total per PAI
Chitungulu	1	0.51	416.43
Jumbe	1	158.58	
Mnkhanya	1	31.90	
Mpanshya	1	3.12	
Msoro	1	68.28	
Mwanya	1	92.79	
Nsefu	1	40.19	
Sandwe	1	19.40	
Luembe	1	1.66	
Chiawa	3	411.84	418.95
Mburuma	3	7.11	
Tembwe	4	11.02	79.29
Mboroma	4	1.4	
Lundu	4	43.45	
Chibulika	4	23.42	
Total		914.67	914.67

To further enhance the accuracy assessment in the current monitoring period, the project incorporated Planet-NICFI imagery with a spatial resolution of 4.77m. The verifier (Carbon Manager) conducted an evaluation of the manually digitized polygons (Figures 20, 21, 21 and 22) by comparing the final dataset (10-meter resolution) reported in this monitoring report with a reference dataset generated by the verifier using Planet NICFI imagery (4.77-meter resolution). The outcomes obtained by the verifier were applied to evaluate the accuracy of the deforestation mapping (see Table 29). The sampling design encompassed a comprehensive examination of 100% of the digitized area, as well as the remainder of the

project area, to detect any omission (as per Olofsson et al., 2020)³¹ or commission errors (as per Ming Lu et al., 2017)³². An agreement of equal to or greater than 95% between the two datasets is considered acceptable. The accuracy assessment yielded the following results:

- Total area of final reported dataset (Sentinel-2 imagery) - 914.67 ha
- Total area of reference dataset (Planet-NICFI imagery) - 894.19 ha
- Total Area covered: 923.55 ha
- Commission error: 29.36 ha
- Omission error: 8.88 ha
- Overall agreement(Intersection): 885.31 ha
- Overall Agreement : 95.86%

Overall agreement of 95.86% demonstrates acceptable agreement between the two datasets, and therefore, the reported deforested areas are considered to be accurate. Both the reported final dataset and the reference dataset are provided in Appendix B.

MR.33

The disturbed stratum during M1 to M6 periods accounted for only 0.38% of the project accounting area in the current monitoring period. By random chance, one of the original permanent sample plots (established between M1 and M3) fell within this disturbed area and was measured post-disturbance. To ensure enough plots for variance estimation, an additional randomly located plot was selected within the disturbed area and measured. In the current monitoring period, another permanent plot was also randomly affected by encroachment and now falls within the disturbed stratum. These plots were measured post disturbance in accordance with Appendix G. These plots collectively represent the encroached (disturbed) stratum. The data and carbon stock values from these plots have been incorporated into the master carbon stock dataset.

Current emissions from changes in project carbon stocks are calculated with equation F.41 VM0009 v3.0. After restratification (Table 30), the project accounting area stocks at the end of this monitoring period were equal to 598,455,611 tCO₂e (Appendix G) compared to 351,728,283 tCO₂e³³ at the end of the previous monitoring period (M5). Removing the

³¹ Olofsson, P., Arévalo, P., Espejo, A.B., Green, C., Lindquist, E., McRoberts, R.E., Sanz, M.J., 2020. Mitigating the effects of omission errors on area and area change estimates. *Remote Sensing of Environment* 236, 111492. doi:10.1016/j.rse.2019.111492

³² Lu, Ming, Bin Chen, Xiaohan Liao, Tianxiang Yue, Huanyin Yue, Shengming Ren, Xiaowen Li, Zhen Nie, and Bing Xu. 2017. "Forest Types Classification Based on Multi-Source Data Fusion" *Remote Sensing* 9, no. 11: 1153. <https://doi.org/10.3390/rs9111153>

³³ Value is different from that reported in M5 Monitoring report because of the updated emission factors.

project carbon stocks for the instance added within this monitoring period, the project area stocks were 351,512,483 tCO₂e. The project emissions for this monitoring period were therefore -215,800 tCO₂e.

Table 30. Project accounting area stocks at the end of the current monitoring period

Parameter	Project Accounting Area			
	Forest Stratum (AGOT + BGOT)	Forest Stratum (Soil)	Disturbed Stratum (AGOT + BGOT)	Disturbed Stratum (Soil)
Plots (P)	PAI1: 120 PAI2: 11 PAI3: 31 PAI4: Nil ³⁴	25	3	25
Total Possible plots (N _{p,k})	PAI1: 10,731,796 PAI2: 1,121,379 PAI3: 2,715,714 PAI4: 11,340,033	PAI1: 10,731,796 PAI2: 1,121,379 PAI3: 2,715,714 PAI4: 11,340,033	PAI1: 10,957 PAI2: 0 PAI3: 9,261 PAI4: 10,957	PAI1: 10,957 PAI2: 0 PAI3: 9,261 PAI4: 10,957
C	PAI1: 119,378,579 PAI2: 30,417,706 PAI3: 46,622,381 PAI4: 126,151,416	PAI1: 114,080,829 PAI2: 11,932,637 PAI3: 28,799,465 PAI4: 120,553,103	PAI1: 47,814 ³⁵ PAI2: 0 PAI3: 40,411	PAI1: 104,413 ³⁶ PAI2: 0 PAI3: 88,247
U (B.10) per stratum	PAI1: 10,773,958 PAI2: 8,148,146 PAI3: 14,924,306	PAI1: 15,735,392 PAI2: 1,644,195 PAI3: 3,981,879	PAI1: 47,808 PAI3: 40,405 PAI4: 47,808	PAI1: 5,719 PAI3: 4,832 PAI4: 5,719

³⁴ Applied PAI1 carbon stock value due to incomplete data for instance 4 at the time of writing the MR(see section 3.2.1 for more details)

³⁵ Includes PAI4 values

³⁶ Includes PAI4 values

PAI4: 10,773,958³⁷

PAI4: 15,735,392³⁸

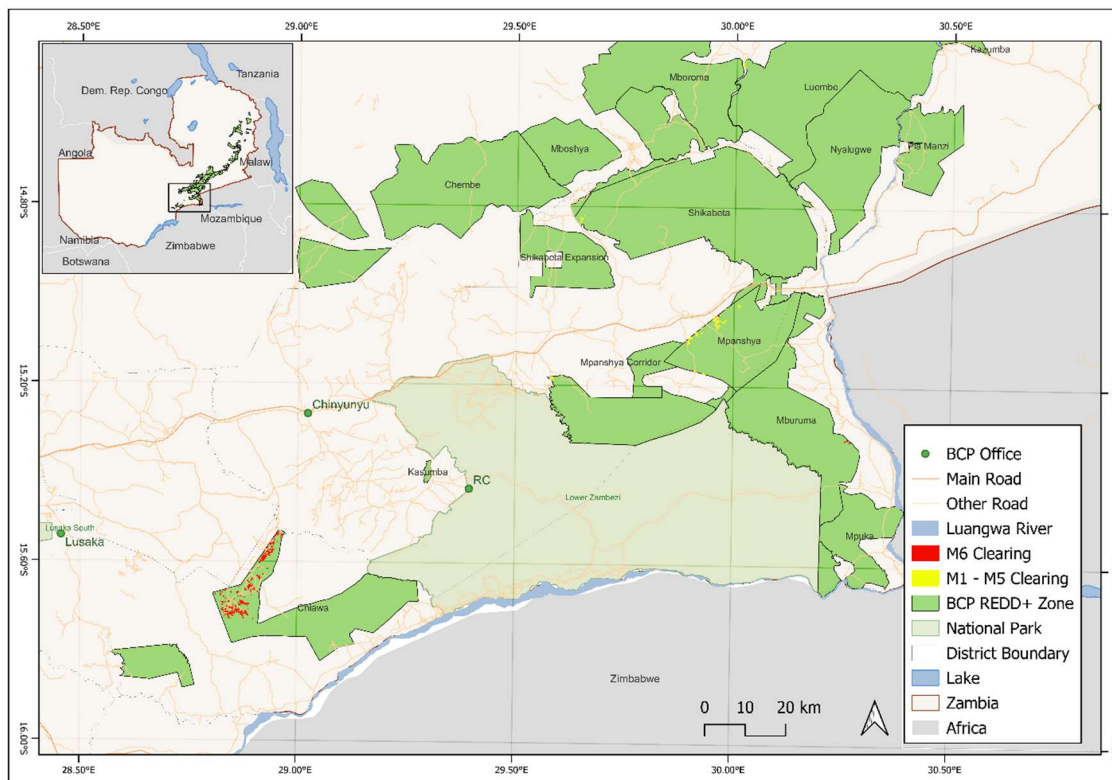


Figure 20. Project area clearings in the Southern part of the project area.

³⁷ Same as PAI1 , because PAI1 carbon stock value was applied due to incomplete data for instance 4 at the time of writing the MR(See section 3.2.1 for details)

³⁸ Same as PAI1 , because PAI1 carbon stock value was applied due to incomplete data for instance 4 at the time of writing the MR(see section 3.2.1 for details)

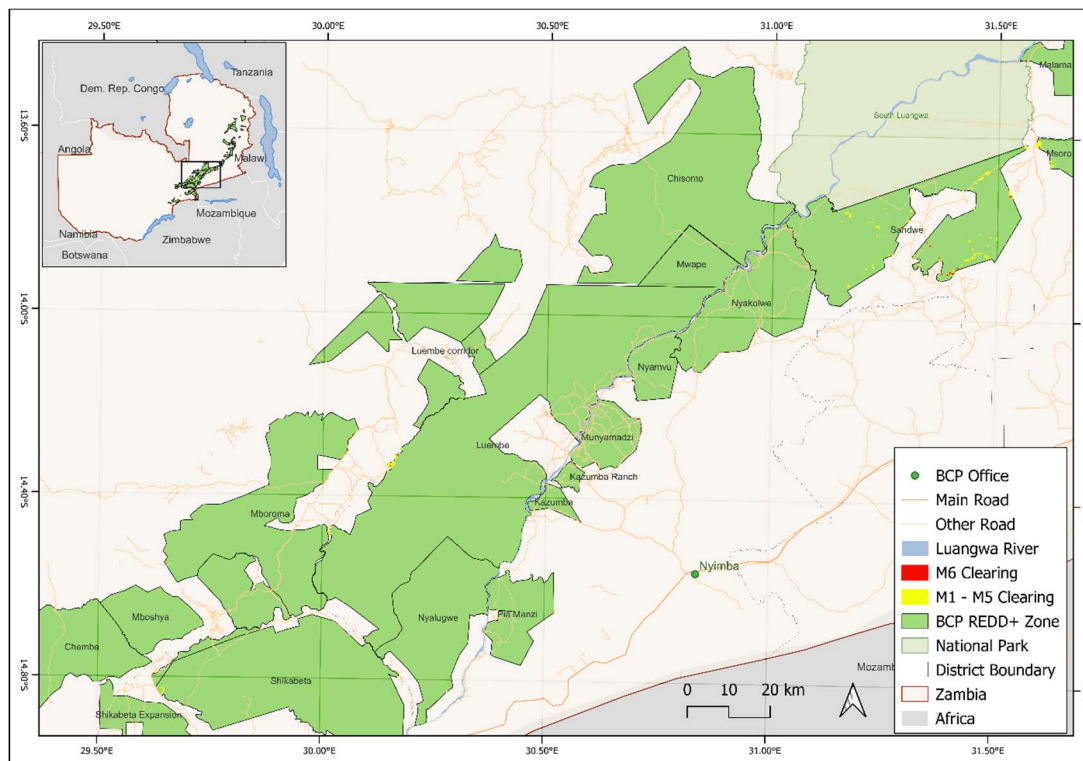


Figure 21a. Project area clearings in the Central part of the project area.

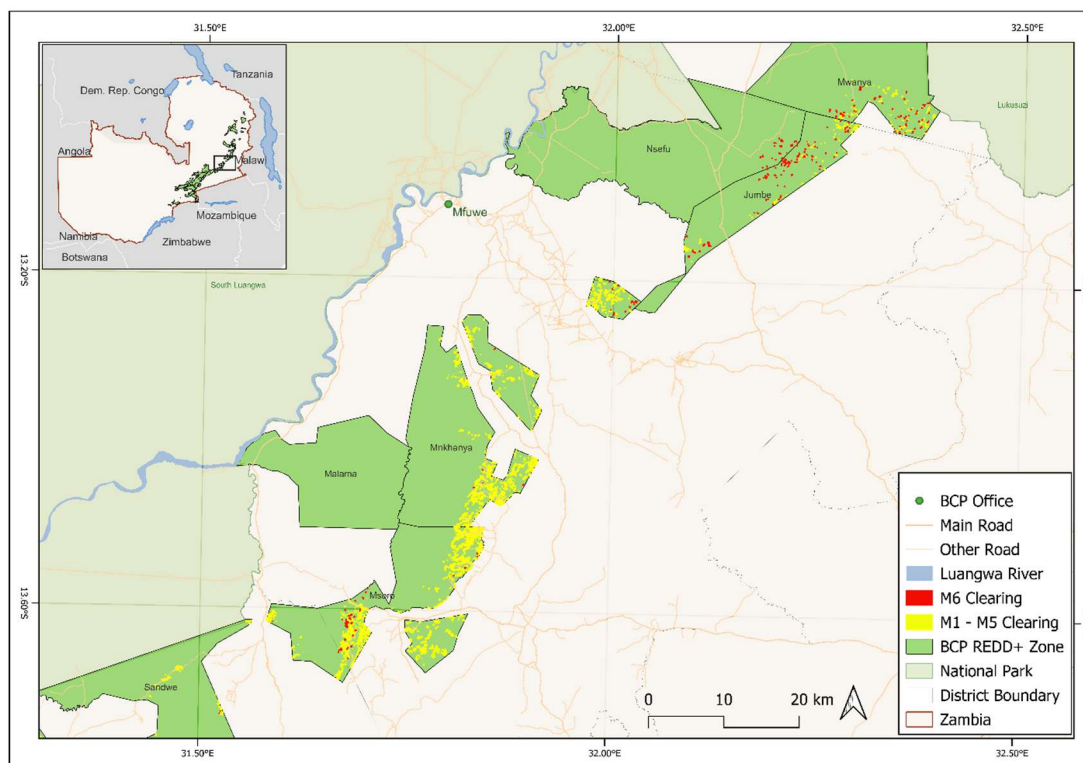


Figure 21b. Project area clearings in the Central part of the project area.

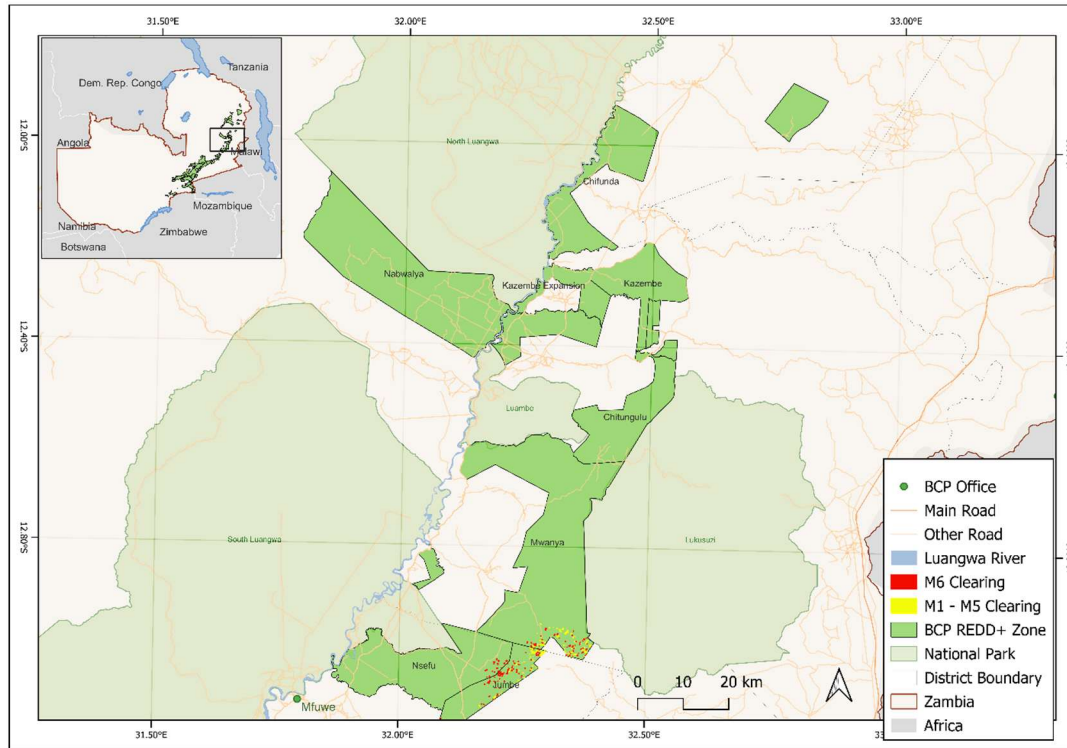


Figure 22. Project area clearings in the Northern part of the project area.

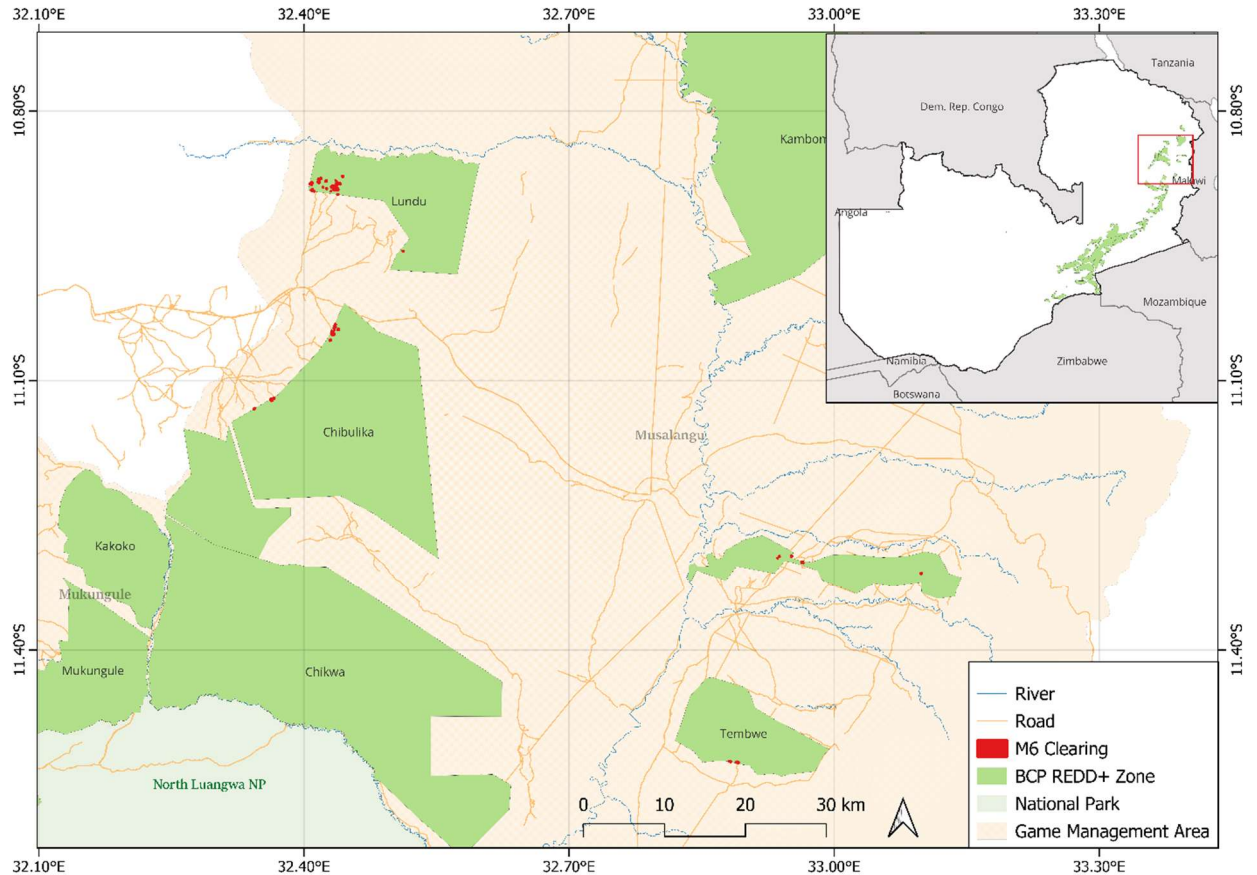


Figure 22a. Project area clearings in the Northern part of the project area.

5.3 Leakage

MR.44

The primary leakage mitigation strategies of the project are improving agricultural techniques with conservation farming and agroforestry and promoting alternative livelihoods that don't depend on forest clearing such as beekeeping. See section 4.3 of this report for more detailed descriptions of the leakage mitigation activities employed by this project. Based on the experience of BCP's other REDD+ project in Lusaka Province, which employed similar leakage mitigation activities and has not experienced any leakage in 10 years, it is assumed that these activities will also be effective at preventing leakage from the LCFP project area.

During the sixth monitoring period, a total of 25 plots were sampled using a predefined leakage monitoring strategy. In M4), two (2) initial leakage plots were discarded because they fell within the second project activity instance Project area. As a result, two (2) new replacement plots were included in M5. In the current monitoring period(M6), all the 25 leakage plots were monitored. Observed degradation was calculated from these 25 plots using equation B.9 VM0009, v3.0 (see Appendix C for calculations). The result was a score

of 0.1 (Table 31). This value is slightly higher than what was recorded (0.08) for the fifth monitoring period.

Table 31. Monitoring results for the activity shifting leakage area for the 6th monitoring period.

Plot ID	Stump_Count	Leakage Score	Degradation Factor
Lkg2	57	11.39%	0.2
Lkg20	3	0.60%	0.2
Lkg26	0	0.00%	0
Lkg27	8	1.60%	0.2
Lkg28	5	1.00%	0.2
Lkg29	0	0.00%	0
Lkg3	7	1.40%	0.2
Lkg30	0	0.00%	0
Lkg48	0	0.00%	0
Lkg32	1	0.20%	0.2
Lkg33	0	0.00%	0
Lkg34	0	0.00%	0
Lkg35	0	0.00%	0
Lkg36	3	0.60%	0.2
Lkg37	18	3.60%	0.2
Lkg38	22	4.40%	0.2
Lkg39	0	0.00%	0
Lkg40	0	0.00%	0
Lkg42	3	0.60%	0.2
Lkg31	0	0.00%	0.0
Lkg43	2	0.40%	0.2

Lkg47	2	0.40%	0.2
Lkg5	0	0.00%	0
Lkg6	0	0.00%	0
Lkg46	0	0.00%	0
Pldeg	131		0.10

MR.48

Under VM0009 V3.0, cumulative emissions from activity-shifting leakage ($E_{(LASF)}^{[m]}$) for the current monitoring period are 0.

MR.49

Cumulative emissions from activity-shifting ($E_{(LAS)}^{[m]}$) for the prior monitoring periods are 0.

MR.56

The parameter ($p_{(LDEG)}^{[m]}$) for the current monitoring period was estimated using equation B.9. The calculations can be found in Appendix G.

$$p_{(LDEG)}^{[m]} = 0.10$$

MR.57

For the first monitoring period, $p_{(LDEG)}^{[m=0]} = 0.08$

MR.63

BCP is a project proponent representing the private land-owners in this project. BCP doesn't own any land, but is the project proponent in one other REDD+ project in the country involving a private land-owner. The management plans and land-use of land in that REDD+ project have not changed as a result of this project.

The community resource boards (CRBs) are the project proponents for the project areas under community forest management agreements (CFMAs). The project areas are the only lands under their control.

5.4 Net GHG Emission Reductions and Removals

MR.65

GERs (Net GHG emissions or removals in Table 32) for the current monitoring period were calculated using equation F.53 as per section 8.4.1 of VM0009 V3.0 (see Appendix G).

3,004,873 tCO₂e.

MR.66

GERs (Net GHG emissions or removals) for the prior monitoring period were calculated using equation F.53 as per section 8.4.1 of VM0009, v3.0 (see Appendix G).

2,430,236 tCO₂e³⁹

MR.67

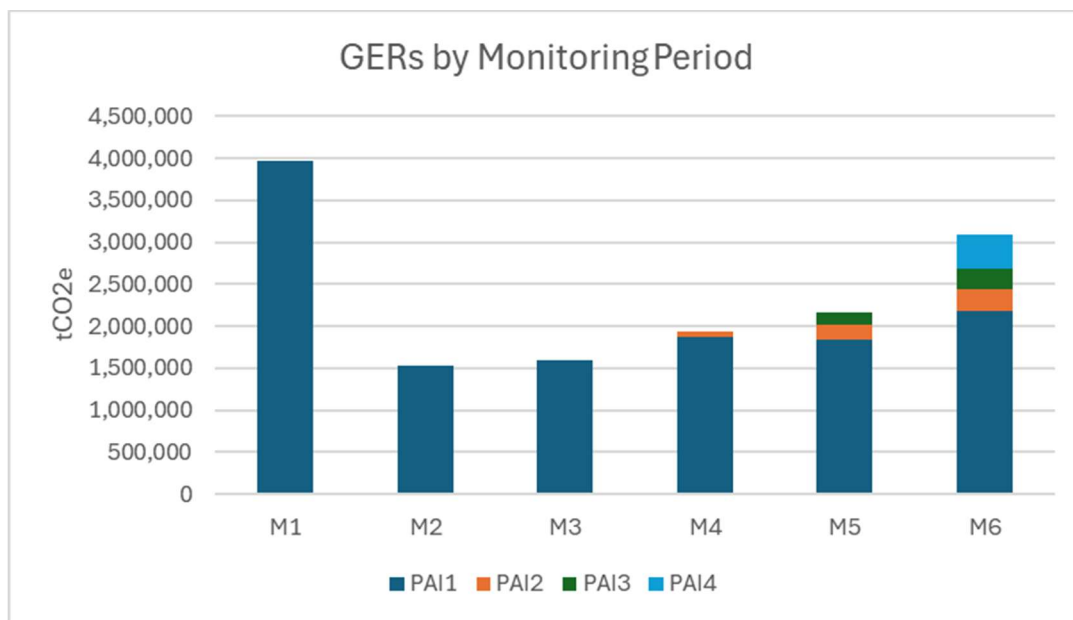


Figure 23. Graph of GERs by monitoring year, and project instance.

³⁹ Value is different from that reported in M5 Monitoring report because of the M6 CDM update and the updated Emission factors in the current monitoring Period.

Table 32. Net GHG emissions reductions or removals for the current monitoring period

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)	Buffer pool allocation	VCUs eligible for issuance
2023	3,220,673	-215,800	0	3,004,873 ⁴⁰	-631,023	2,373,847
Total	3,220,673	-215,800	0	3,004,873	-631,023	2,373,847

MR.68

$U_B^{[m]}$ - Total uncertainty in proxy area carbon stock estimate =16,833tCO₂e

$U_{EM}^{[m]}$ - Total uncertainty in Baseline Emissions Models = 17,326

tCO₂e

$U_P^{[m]}$ - Total uncertainty in project accounting area carbon stock estimate =

- PAI1: 19,070,476
- PAI2: 8,312,380
- PAI3: 15,049,173
- PAI4: 19,070,476

$E_u^{[m]}$ - Total uncertainty =

- PAI1: -34,999
- PAI2: 90,086
- PAI3: 55,464
- PAI4: -34,999

There was no confidence deduction as the uncertainty was insignificant.

⁴⁰ In the previous monitoring period (M5), a FAR was raised to ensure that any overestimation of emission reductions (ERs) resulting from the use of the PAI-1 carbon stock value for the three active PAIs would be addressed during the next verification (i.e., the current verification). The VVB that conducted the previous verification demonstrated that the potential overestimation risk would need to be compensated by the PP once the carbon stock values for the three PAIs are updated. However, no compensation was applied to the final ER numbers. This is because the VVB conducted a site visit during the current monitoring period, during which the audit team assessed plots from PAIs 2 and 3, obtaining figures consistent with those inventoried by the PP

MR.69

$U_B^{[m]}$ was calculated with equation B.10 VM0009 V3.0

$U_{EM}^{[m]}$ was calculated with equation F.14 VM0009 V3.0

$U_P^{[m]}$ was calculated with equation B.10 VM0009 V3.0

$E_u^{[m]}$ was calculated with equation F.57 VM0009 V3.0

For more details, see Appendix G.

MR.74

NERs (VCUs as per VCS) generated for the current monitoring period were calculated using equation F.55 from VM0009 V3.0 and are reported in Table 32.

MR.75

NERs for the M5 monitoring period were 2,187,211 tCO₂e⁴¹

MR.76

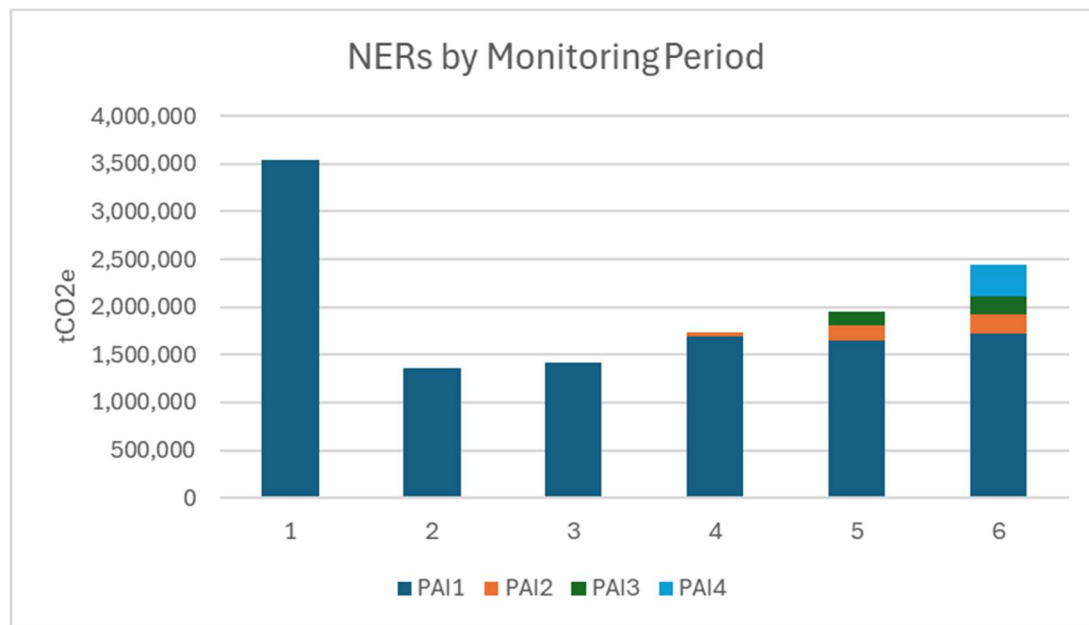


Figure 24. Graph of NERs by monitoring year, and project instance.

⁴¹ Value is different from that reported in M5 Monitoring report because of the CDM update and application of updated per PAI carbon stock values in the current monitoring period.

MR.77

VCS Non-Permanence Risk Assessment Tool V4.0 (Appendix H) was used to calculate buffer account allocation, calculated as GERs x Non Permanence Risk score (21%) = - 631,023 tCO₂e.

MR.78

Please see Appendix H for non-permanence risk calculations using the VCS Non-Permanence Risk Assessment Tool V4.0.

MR.82

See Table 32 for quantified NERs by vintage year for the current monitoring period. See Appendix G for calculations.

MR.83

The ex-ante estimated NERs for this monitoring period were 3,220,673 tCO₂e compared to an ex-post estimate of 3,004,873 tCO₂e.

MR.84

The difference between ex-ante and ex-post estimates is primarily due to two factors:

1. The inclusion of revised SOC values in monitoring period 3.
2. The inclusion of additional project instances in monitoring periods 4,5 and 6.

Table 33. Estimated ex-ante and achieved GHG emission reductions for the current monitoring period.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jan-2023 to 31-Dec-2023	3,220,673	3,004,873	7 %	Achieved emissions reductions were less than those estimated ex-ante, as project emissions were under-estimated ex-ante.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

No commercially sensitive information has been included in this monitoring report.

APPENDIX 2: AVAILABLE UPON REQUEST

Appendix A: Community Forest Management Agreements and Communication Agreement. Confidential

Appendix B: Project Implementation Status Support Documents. Public

Appendix C: Proxy Soil Sampling and Analysis. Confidential

Appendix E: BCP Community Engagement SOPs and Monitoring Systems. Confidential

Appendix G: Emissions Reductions Calculations. Confidential

Appendix H: VCS Non-permanence risk assessment. Public

Appendix I: Spatial Data. Confidential

Appendix K: Drivers and Agents of Deforestation Study Report

Appendix O: Cumulative Deforestation Model. Confidential

Appendix P: Biomass and Soil Sampling Protocol. Confidential

Appendix R: Leakage Monitoring Protocol. Confidential

ANNEX 3: LIST OF VM0009 V3.0 MR REQUIREMENTS APPLICABLE TO F-U3 BASELINE TYPE

MR#	Category	Applicable to Project
MR.1	Spatial Project Boundaries	Yes
MR.2	Temporal Project Boundaries	Yes
MR.3	Temporal Project Boundaries	Yes
MR.4	Grouped Projects	Yes
MR.5	Grouped Projects	Yes
MR.6	Project Accounting Areas	Yes
MR.7	Determining t_{PAI}	Yes
MR.8	Determining t_{PAI}	Yes
MR.9	Determining x_{PAI}	No. No covariates to conversion were used.
MR.10	Baseline Emissions	Yes
MR.11	Baseline Emissions	Yes
MR.12	Baseline Emissions	Yes
MR.15	Applying the Spatial Algorithm	Yes, but there is only one stratum
MR.16	Applying the Spatial Algorithm	Yes, but there is only one stratum
MR.17	Applying the Spatial Algorithm	Yes, but there is only one stratum
MR.21	Carbon Not Decayed in DW	No. All biomass is burned in baseline scenarios
MR.22	Carbon Not Decayed in DW	No. All biomass is burned in baseline scenarios
MR.23	Carbon Not Decayed in DW	No. All biomass is burned in baseline scenarios
MR.24	Carbon Not Decayed in DW	No. All biomass is burned in baseline scenarios
MR.25	Carbon Not Decayed in DW	No. All biomass is burned in baseline scenarios
MR.26	Carbon Not Decayed in BGB	Yes
MR.27	Carbon Not Decayed in BGB	Yes
MR.28	Carbon Not Decayed in BGB	Yes
MR.29	Carbon Not Decayed in SOC	Yes
MR.30	Carbon Stored in Wood Products	No. No timber harvesting in baseline
MR.31	Carbon Stored in Wood Products	No. No timber harvesting in baseline
MR.32	Emissions Events in Project Area	Yes
MR.33	Emissions Events in Project Area	Yes
MR.34	Emissions from Burning from Project Activities	No. No biomass burning in project activities
MR.35	Carbon Stored in Wood Products from Project Activities	No. Timber harvesting is not a project activity
MR.36	Carbon Stored in Wood Products from Project Activities	No. Timber harvesting is not a project activity

MR.37	Carbon Stored in Wood Products from Project Activities	No. Timber harvesting is not a project activity
MR.38	Livestock Grazed in the Project Area	No. Livestock grazing is not permitted in the project area and unpermitted grazing was determined to be de minimus.
MR.39	Livestock Grazed in the Project Area	No. Livestock grazing is not permitted in the project area and unpermitted grazing was determined to be de minimus.
MR.40	Livestock Grazed in the Project Area	No. Livestock grazing is not permitted in the project area and unpermitted grazing was determined to be de minimus.
MR.41	Synthetic Fertilizer in the Project Area	No. Project activities do not include the use of synthetic fertilizers.
MR.42	Synthetic Fertilizer in the Project Area	No. Project activities do not include the use of synthetic fertilizers.
MR.43	Synthetic Fertilizer in the Project Area	No. Project activities do not include the use of synthetic fertilizers.
MR.44	Leakage Mitigation Strategies	Yes
MR.45	Commodity Production for Leakage Mitigation	No. The baseline scenario is subsistence
MR.46	Commodity Production for Leakage Mitigation	No. The baseline scenario is subsistence
MR.47	Commodity Production for Leakage Mitigation	No. The baseline scenario is subsistence
MR.48	Estimating Emissions from Activity-Shifting Leakage	Yes
MR.49	Estimating Emissions from Activity-Shifting Leakage	Yes
MR.50	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area instance, however No changes have been made during the current monitoring period
MR.51	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area instance, however No changes have been made during the current monitoring period
MR.52	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area instance, however No changes have been made during the current monitoring period
MR.53	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area

		instance, however No changes have been made during the current monitoring period
MR.54	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area instance, however No changes have been made during the current monitoring period
MR.55	Change to the Activity-Shifting Leakage Area	Yes. The Initial leakage area was reduced (229,291 ha) due to its overlap with second project area instance, however No changes have been made during the current monitoring period
MR.56	Estimating $\rho_{L\ DEG}$	Yes
MR.57	Estimating $\rho_{L\ DEG}$	Yes
MR.58	Estimating $\rho_{L\ CONG}$	No. No grassland in project area
MR.59	Estimating $\rho_{L\ CONG}$	No. No grassland in project area
MR.60	Determining Emissions from Market Leakage	No. The baseline scenario is subsistence
MR.61	Determining Emissions from Market Leakage	No. The baseline scenario is subsistence
MR.62	Determining Emissions from Market Leakage	No. The baseline scenario is subsistence
MR.63	Ensuring No Leakage Within Project Proponent's Ownership	Yes
MR.65	Quantification of GERs	Yes
MR.66	Quantification of GERs	Yes
MR.67	Quantification of GERs	Yes
MR.68	Confidence Deduction	Yes
MR.69	Confidence Deduction	Yes
MR.72	Reversal Event	No. No reversal occurred
MR.73	Reversal Event as a Result of Baseline Reevaluation	No. No baseline reevaluation occurred
MR.74	Quantification of NERs for a PAA	Yes
MR.75	Quantification of NERs for a PAA	Yes
MR.76	Quantification of NERs for a PAA	Yes
MR.77	Buffer Account	Yes
MR.78	Buffer Account	Yes
MR.79	Quantification of NERs across PAAs	Yes. There is currently 3 PAA
MR.80	Quantification of NERs across PAAs	Yes. There is currently 3 PAA
MR.81	Quantification of NERs across PAAs	Yes. There is currently 3 PAA
MR.82	Vintages	Yes
MR.83	Evaluating Project Performance	Yes
MR.84	Evaluating Project Performance	Yes
MR.85	Data and Parameters Monitored	Yes

MR.86	Data and Parameters Monitored	Yes
MR.87	Data and Parameters Monitored	Yes
MR.88	Description of the Monitoring Plan	Yes
MR.89	Description of the Monitoring Plan	No. No project activity with biomass burning
MR.90	Description of the Monitoring Plan	Yes
MR.91	Description of the Monitoring Plan	Yes
MR.92	Description of the Monitoring Plan	Yes
MR.93	Description of the Monitoring Plan	Yes
MR.94	Description of the Monitoring Plan	No. No new equations were developed
MR.95	Description of the Monitoring Plan	Yes
MR.96	Description of the Monitoring Plan	No. Timber harvesting is not a project activity
MR.97	Description of the Monitoring Plan	Yes
MR.98	Description of the Monitoring Plan	Yes
MR.99	Sources of Allometry	Yes
MR.100	Sources of Allometry	Yes
MR.101	Sources of Allometry	Yes
MR.102	Sources of Allometry	Yes
MR.103	Sources of Allometry	Yes
MR.104	Validating Previously Developed Allometry	Yes
MR.105	Validating Previously Developed Allometry	Yes
MR.106	Validating Previously Developed Allometry	Yes
MR.107	Validating Previously Developed Allometry	Yes
MR.108	Validating Previously Developed Allometry	Yes
MR.109	Validating Newly Developed Allometry	No. No new allometric equations were developed.
MR.110	Validating Newly Developed Allometry	No. No new allometric equations were developed.
MR.111	Validating Newly Developed Allometry	No. No new allometric equations were developed.
MR.112	Validating Newly Developed Allometry	No. No new allometric equations were developed.
MR.113	Validating Newly Developed Allometry	No. No new allometric equations were developed.