

PROJECT MONITORING REPORT



Document Prepared By **Carbon Tanzania¹, and TerraCarbon²**

Project title	Ntakata Mountains REDD Project
Project ID	1897
Crediting period	19 May 2017 – 18 May 2047; 30 year lifetime
Monitoring period	19 May 2023 – 18 May 2024; 1 year
(CCB) GHG accounting period	19 May 2017 – 18 May 2047; 30 year lifetime
Original date of issue	31 August 2024
Most recent date of issue	04 October 2025
Version	3.0
VCS Standard version	4.7
CCB Standards version	3.1
Project location	United Republic of Tanzania, Tanganyika District
Project proponent(s)	Carbon Tanzania (CT, Ltd.) Marc Baker, CEO Email: marc@carbontanzania.com Tel: +255 (0) 784 448 761
Validation/verification body	Aster Global Environmental Solutions, Inc. VVB ID: 016 Email: info@asterglobal.com Location: 3800 Claremont St NW North Lawrence, Ohio 44666 Website: www.asterglobal.com

History of CCB Status	Validation – 23 June 2020 Initial Verification – 10 November 2020 Second Verification – September 2022 Third Verification – May 2023 Fourth verification – Expected May 2024
Gold Level criteria	GL1 – Climate Change Adaptation Benefits All relevant GL1 requirements are completed in Section 3.4 by addressing aspects of positive climate change adaptation benefits that are attributable to the project activities. GL2 – Exceptional Community Benefits All relevant GL2 requirements are completed in Section 4.4 by addressing aspects of positive community benefits that are attributable to the project activities. GL3 – Exceptional Biodiversity Benefits All relevant GL3 requirements are completed in Section 5.4 by addressing aspects of positive biodiversity benefits that are attributable to the project activities.
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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Village Land Use Plans (VLUPs) developed	Implemented	2.5	8
2) Protection of habitat suitable for Chimpanzees	Habitat Suitability Index of 0.436 compared to baseline index of 0.371	5.1	Reduced decline of Habitat Suitability Index in with-project scenario vs. baseline.

1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	N/A	-	N/A
	Net estimated emission reductions in the project area, measured against the without-project scenario	461,289 t CO ₂ e	3.2.4	4,805,634 t CO ₂ e
Forest ¹ cover	For REDD ² projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	4,267 ha	3.2.4	59,833 ha
	For ARR ³ projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	N/A	-	N/A
Improved land management	Number of hectares of existing production forest land in which IFM ⁴ practices have occurred as a result of the project's activities, measured against the without-project scenario	N/A	-	N/A
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	N/A	-	N/A

¹ Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO, or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

² Reduced emissions from deforestation and forest degradation (REDD) – Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

³ Afforestation, reforestation and revegetation (ARR) – Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

⁴ Improved forest management (IFM) – Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood, and fuelwood (*VCS Program Definitions*)

Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	3,381	4.3.1	19,340
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities	1,690	4.3.1	9,669
Employment	Total number of people employed in of project activities, ⁵ expressed as number of full-time employees ⁶	122	4.3.1	122
	Number of women employed in project activities, expressed as number of full-time employees	27	4.3.1	27
Livelihoods	Total number of people with improved livelihoods ⁷ or income generated as a result of project activities	57,189	4.1.3	57,189
	Number of women with improved livelihoods or income generated as a result of project activities	28,594	4.1.3	28,594
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	26,400	4.3.1	26,400
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	13,200	4.3.1	13,200
Education	Total number of people for whom access to, or quality of, education was	375	4.3.1	1,795

⁵ Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers, and community members that are paid to carry out project-related work.

⁶ Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region, or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102]; [17.28])

⁷ Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

	improved as a result of project activities, measured against the without-project scenario			
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	187	4.3.1	897
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	0	-	0
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	0	-	0
Well-being	Total number of community members whose well-being ⁸ was improved as a result of project activities	57,189	4.4.1	57,189
	Number of women whose well-being was improved as a result of project activities	28,594	4.4.1	28,594
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation, ⁹ measured against the without-project scenario	>200,000 ha	5.3.1	>200,000 ha
	Number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a	6 species	5.3.1	6 species

⁸ Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

⁹ Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

¹⁰ Per IUCN's Red List of Threatened Species

result of project activities,¹¹ measured against the without-project scenario

2 PROJECT DETAILS

2.1 Summary Description of the Implementation Status of the Project

2.1.1 Summary Description of the Project (VCS, 2.1, 3.6; CCB, G1.2)

During the current monitoring period the project activities have been implemented as planned. The project enabled communities to provide training, education, and healthcare to the participating villages throughout the reporting period. Through successful VGS patrols and community governance the project successfully reduced forest loss. As a consequence, chimpanzee habitat was successfully conserved during this period as well.

Leakage and non-permanence risk factors were monitored using remotely sensed satellite and aerial imagery, as detailed in Section 2.1 below and followed the methodology outlined in M-REDD VMD-00015. No major disturbances were observed during the monitoring period that resulted in significant loss of forest carbon stocks. Leakage was monitored by comparing forest cover in the with-project scenario and the without-project scenario. Forest loss due to leakage is calculated and documented in Section 3.2 below.

Over the monitoring period, the project area resulted in 573,124 tons t CO₂e reductions with a buffer pool contribution of 154,744t CO₂e and a total emission reduction of 461,289t CO₂e after accounting for leakage (60,190t CO₂e).

2.1.2 Audit History (VCS, 4.1)

Audit Type	Period	Program	VVB Name	Number of years
Validation/ Verification	19 May 2017 – 18 May 2019	VCS-CCB	Epic	Two years
Verification	19 May 2019 – 18 May 2021	VCS-CCB	Aster Global	Two years
Verification	19 May 2021 – 18 May 2022	VCS-CCB	Aster Global	One year

¹¹ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

Verification	19 May 2022 – 18 May 2023	VCS-CCB	Aster Global	One year
Verification	19 May 2023 – 18 May 2024	VCS-CCB	Aster Global	One year

2.1.3 Sectoral Scope and Project Type (VCS, 3.2)

Sectoral Scope	14: Agriculture, forestry, and other land use
AFOLU Project Category	Reducing Emissions from Deforestation and Degradation (REDD)
Project Activity Type	Avoided Unplanned Deforestation (AUDD)

2.1.4 Project Proponent (VCS, 3.7; CCB, G1.1)

Organization name	Carbon Tanzania (CT, Ltd.)
Contact person	Marc Baker
Title	CIO
Address	PO Box 425 Arusha, Tanzania
Telephone	+255 (0) 784 448 761
Email	marc@carbontanzania.com

2.1.5 Other Entities Involved in the Project

Organization name	TerraCarbon LLC
Role in the project	Support in development, specifically around Climate and Biodiversity
Contact person	David Shoch
Title	Director, Forestry and Technical Services
Address	1822 W. Willow Wood Dr. Peoria IL 61614
Telephone	+1 (309) 693 9303
Email	david.shoch@terracarbon.com

Organization name	Tanganyika District Government
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Role in the project	District Authority
Contact person	Juma Shaban Juma
Title	District Executive Director
Address	P.O. Box 103 Mpanda Katavi Tanzania
Telephone	+255 0754 870 344
Email	ded@tanganyikadc.go.tz

Organization name	Tanganyika District Government
Role in the project	District Authority, Knowledge Base
Contact person	Bruno Mwaisaka
Title	District Natural Resource Officer
Address	P.O. Box 103 Mpanda Katavi Tanzania
Telephone	+255 745 647 148
Email	brunonicholaus@gmail.com

Organization name	The Greater Mahale Ecosystem Research and Conservation
Role in the project	Technical Biodiversity Advisor and Collaborator
Contact person	Alex Piel
Title	Dr.
Address	http://gmerc.org/
Telephone	+447557915813
Email	sokwemt@gmerc.org

2.1.6 Project Start Date (VCS, 3.8)

Project start date	19-May-2017
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Justification	The Ntakata REDD project start date is 19th May 2017, corresponding with the date on which Carbon Tanzania, The Nature Conservancy and Pathfinder signed a Memorandum of Understanding leading to the start of project activities engaging villages in land use planning and conservation of forest cover.
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2.1.7 Benefits Assessment and Project Crediting Period (VCS, 3.9; CCB, G1.9)

Crediting Period	The Ntakata REDD Project has an initial project crediting period of 30 years, starting on 19th May 2017. The initial project crediting period is set to end on 18th May 2047. The initial baseline period started on 19th May 2017 and is set to continue through 18 th May 2027.
Start Date of First or Fixed Crediting Period	19 May 2017 – 18 May 2047
Total Number of Years of Crediting Period	30 years
CCB Benefits Assessment Period	19 May 2017 – 18 May 2047

2.1.8 Project Location (VCS, 3.11; CCB, G1.3)

The project is located in The United Republic of Tanzania specifically in the Tanganyika District which is located on the western side of the country, close to Lake Tanganyika. A centrally located point in the project is 6.249629 30.647925 (Kapanga Village). The project zone contains the project area and the villages where the project is being implemented. The project area consists of all land classified as forest within the project zone boundaries at the project start date based on the initial land cover classification (see Figure 2.1).

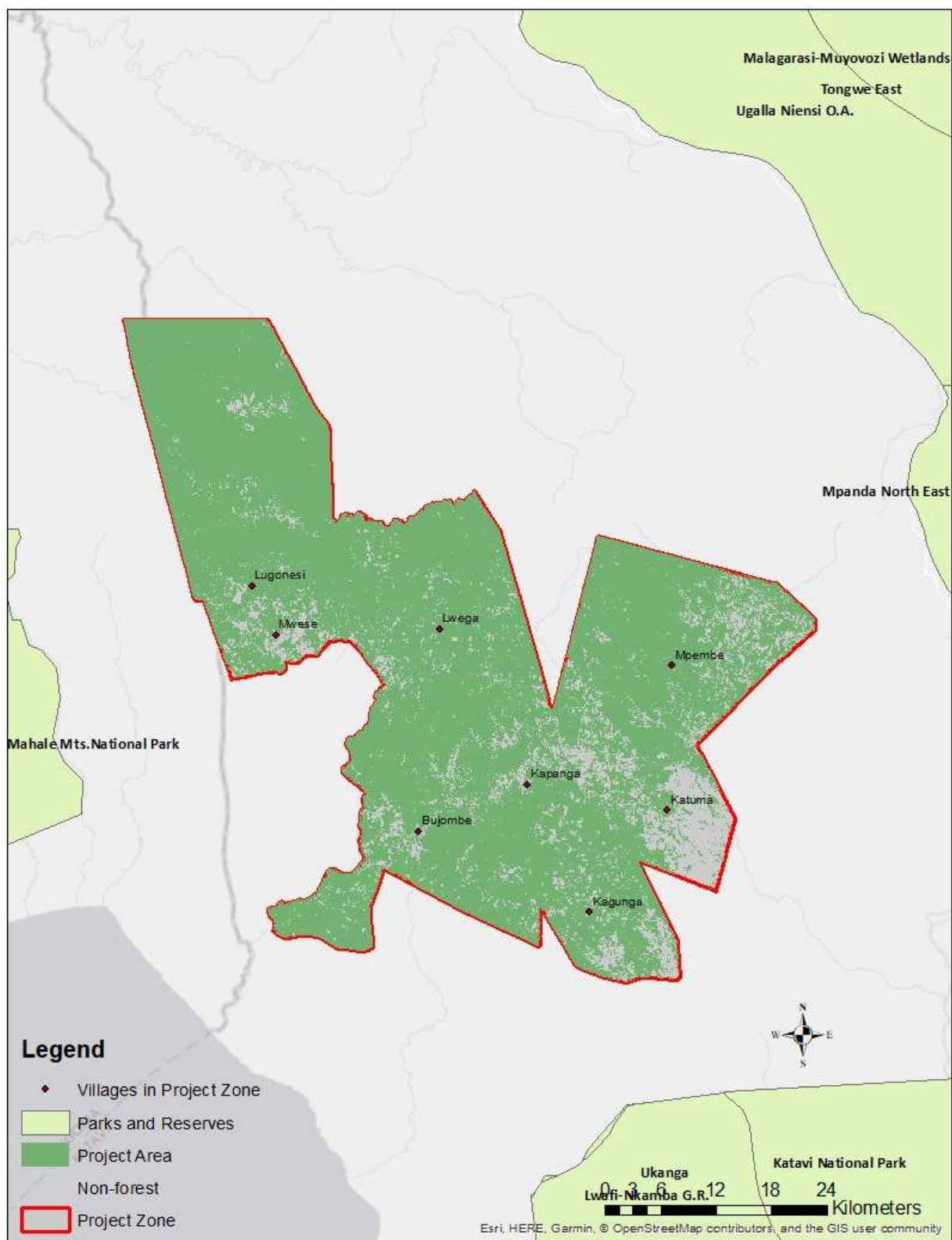


Figure 2.1 Map of the project zone (red boundary) and project area (green) which is the area forested at the project start date.

☒ KML file has been provided

2.1.9 Title and Reference of Methodology (VCS, 3.1)

Provide the title, reference, and version number of the following information for the methodology(ies), tools, and modules applied to the project (where applicable).

Type (methodology, tool, module)	Reference ID (if applicable)	Title	Version
REDD Methodology Framework (REDD-MF)	VM0007	VM0007: REDD Methodology Modules (REDD-MF)	1.5
Module	VMD0001	CP-AB: VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools	1.1
Module	VMD0002	CP-D: VMD0002 Estimation of carbon stocks in the dead-wood pool	1.0
Module	VMD0007	BL-UP: VMD0007 Estimation of baseline carbon stock changes and greenhouse gas emissions from unplanned deforestation	3.2
Module	VMD0010	LK-ASU: VMD0010 Estimation of emissions from activity shifting for avoided unplanned deforestation	1.1
Module	E-BPB	E-BPB: Estimation of greenhouse gas emissions from biomass burning and peat burning	1.2
Module	VMD0015	M-MON: Methods for monitoring of greenhouse gas emissions and removals	2.1
Module	VMD0016	X-STR: Methods for stratification of the project area	1.1
Module	VMD0017	X-UNC VMD0017 Estimation of uncertainty for REDD project activities	2.1

Tools	T-SIG	T-SIG: CDM tool “Tool for testing significance of GHG emissions in A/R CDM project activities	1.0
Tools	VT0001	T-ADD: VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities	3.0
Tools	T-BAR	T-BAR: Tool for AFOLU non-permanence risk analysis and buffer determination	4.2

2.1.10 Double Counting and Participation under Other GHG Programs (VCS, 3.23; CCB, G5.9)

2.1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program, or any other form of community, social, or biodiversity unit or credit?

☐ Yes ☒ No

If yes, provide required evidence of no double issuance as outlined by the VCS Standard and the CCB Standard. Include all relevant information about the community, social, or biodiversity credit.

2.1.10.2 Registration in Other GHG Programs

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

☐ Yes ☒ No

If yes, provide the registration number and all relevant details. Specify how double counting is avoided.

2.1.10.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

If yes, provide the program name(s), reason(s) and date for the rejection, justification of eligibility under the VCS Program, and any other relevant information.

2.1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions (VCS, 3.24)

2.1.11.1 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

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

2.1.11.2 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

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

2.1.11.3 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

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."?

☐ Yes ☒ No

If yes to all:

Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (VCS, 3.2; CCB, G1.9)

The following schedule details ongoing project activities that began before or during the current reporting period. No losses resulting in a reversal took place during this reporting period.

Date	Milestone(s) in the project's development and implementation	CCB Activity Indicator
February 2016	District personnel conduct introductory meetings with project villages to ensure free prior and informed consent is given for Carbon Tanzania to visit project villages	
April 2017	Final land use plans are completed for Bujombe and Kapanga villages	
May 2017	First 8 Village Game Scouts (VGS) complete training at Pasiansi and return to villages to begin support of village land use plans	
May 19 2017	Start of project GHG accounting period. Signing of MOU between Carbon Tanzania, The Nature Conservancy and Pathfinder 19th May 2017. Implementation of protection measures on villages land use plans that lead to GHG emission reductions.	
May 19 2017	Start of biodiversity monitoring activities	
February 2017	Project introductory meetings in: Mpembe, Mwese, Lwega, Katuma.	
June 2017	Project introductory meetings in: Lugonesi, Kagunga, Bujombe, Kapanga.	
October 2017	Forest inventory (including training of VGS)	
October 2018	Village contracts signed	
November 2018	Carbon Champions program in all project villages	
April 2019	Submission of PD to VCS	
May 2019	Presentation of the PD to villages	

	Presentation of BMP to villages Presentation of CMP to villages	
June 2019	Project validation and verification initiated	
June 2020	Project validated	
November 2020	Initial verification complete	
19th January 2021 – 21st January 2021	Good Governance Training By TACADECOC conducted in Bujombe Village.	
19th January 2021 – 21st January 2021	Good Governance Training By TACADECOC conducted in Kagunga Village.	
19th January 2021 – 21st January 2021	Good Governance Training By TACADECOC conducted in Kapanga Village.	
19th January 2021 – 21st January 2021	Good Governance Training By TACADECOC conducted in Katuma Village	
19th January 2021 – 21st January 2021	Good Governance Training By TACADECOC conducted in Mwese Village	
22nd January 2021	Good Governance and Sustainable Natural Resources Management Stakeholders Workshop	
23rd February 2021 – 27th February 2021	Carbon Champions activity conducted in Katuma Village	
23rd February 2021 – 2nd March 2021	Carbon Champions activity conducted in Kapanga Village	
23rd February 2021 – 8th March 2021	Carbon Champions – Household Sensitization Activity Conducted in Ntakata Mountains REDD Project	
23rd February 2021 – 3rd June 2021	Carbon Champions activity conducted in Lwega Village	
24th February 2021 – 29th February 2021	Carbon Champions activity conducted in Mpembe Village	

24th February 2021 – 4th March 2021	Carbon Champions activity conducted in Mwese Village	
25th February 2021 – 2nd March 2021	Carbon Champions activity conducted in Kagunga Village	
26th February 2021 – 5th March 2021	Carbon Champions activity conducted in Bujombe Village	
27th February 2021 – 13rd March 2021	Secondary Carbon Champions activity conducted in Mwese Village	
May 2021	Insurance Purchasing	
May 2019 – May 2021	Carbon Champions activity conducted in Lugonesi Village	
May 2019 – May 2021	272 Effectively and Overall number of Patrols conducted in NTAKATA Mountains REDD Project and reported: 15 Poaching incidents, 32 Wires and ropes snares, 9 Agricultural land clearing incidents and 7 illegal timber harvesting incidents.	
27th February 2021 – 13rd March 2021	Secondary Carbon Champions activity conducted in Mwese Village	
August 2021	Second verification initiated	
12nd January 2021	Bujombe COCOBA Group Meeting.	
15th January 2021	Good Governance Training in Kapanga Village.	
18th May 2021	Good Governance Training in Kapanga Village.	
20th May 2021	Lwega COCOBA Group Meeting.	
May 2021	Steering Committee Meeting.	
3rd May 2021 – 9th October 2021	Carbon Champions activity conducted in Mwese Village.	
12th June 2021	Kagunga COCOBA Group Meeting.	
30th June 2021	Lwega COCOBA Group Meeting.	

13rd July 2021	Mpembe COCOBA Group Meeting.	
15th July 2021	Kapanga COCOBA Group Meeting.	
15th July 2021	Lugonesi COCOBA Group Meeting.	
16th July 2021	Mwese COCOBA Group Meeting.	
23rd July 2021	Kagunga COCOBA Group Meeting.	
3rd August 2021	Good Governance Training in Kagunga Village.	
8th August 2021	Good Governance Training in Lwega Village.	
9th August 2021	Katuma COCOBA Group Meeting.	
3rd September 2021	Good Governance Training in Mwese Village.	
10th September 2021	Lugonesi COCOBA Group Meeting.	
3rd November 2021	Lugonesi COCOBA Group Meeting.	
3rd November 2021	Good Governance Training in Lwega Village.	
10th November 2021	Good Governance Training in Lwega Village.	
19th November 2021	Good Governance Training in Kagunga Village.	
5th December 2021	Lugonesi COCOBA Group Meeting.	
5th December 2021	Katuma COCOBA Group Meeting.	
15th December 2021	Good Governance Training in Mwese Village.	
23rd December 2021	Good Governance Training in Kagunga Village.	
31st December 2021	Good Governance Training in Kagunga Village.	
2nd January 2022	Good Governance Training in Katuma Village.	
6th January 2022	Good Governance Training in Katuma Village.	

14th January 2022	Kagunga COCOBA Group Meeting.	
21st January 2022	Good Governance Training in Mpembe Village.	
28th January 2022	Good Governance Training in Lugonesi Village.	
28th January 2022	Good Governance Training in Kagunga Village.	
January 2022 – March 2022	VGS of NTAKATA Mountains REDD Project participated in other community forces.	
19th February 2022	Katuma COCOBA Group Meeting.	Community - Livelihoods
28th February 2022	Katuma COCOBA Group Meeting.	Community - Livelihoods
2nd February 2022 – 21st May 2022	Carbon Champions activity conducted in Bujombe Village.	Community - Capacity
3rd February 2022 – 23rd April 2022	Carbon Champions activity conducted in Mwese Village.	Community - Capacity
4th March 2022 – 6th March 2022	Good Governance Training in Jumiminta Village.	Community - Capacity
5th March 2022	Good Governance Training in Lwega Village.	Community - Capacity
7th March 2022	Good Governance Training in Mpembe Village.	Community - Capacity
16th March 2022	Kapanga COCOBA Group Meeting.	Community - Livelihoods
18th March 2022	Kagunga COCOBA Group Meeting.	Community - Livelihoods
March 2022	Steering Committee Meeting.	Community - Capacity
12nd April 2022	Good Governance Training in Lwega Village.	Community - Capacity
13rd April 2022	Lwega COCOBA Group Meeting.	Community - Livelihoods
14th April 2022	Good Governance Training in Mpembe Village.	Community - Capacity
11st May 2022	Good Governance Training in Mpembe Village.	Community - Capacity

17th May 2022	Good Governance Training in Kapanga Village.	Community - Capacity
May 2022	Good Governance Training in Kagunga Village.	Community - Capacity
12nd July 2022	Good Governance Training in Kagunga Village.	Community - Capacity
20th May 2021 – 13rd May 2022	Carbon Champions activity conducted in Mpembe Village.	Community - Capacity
May 2021 – May 2022	4400 households of NTAKATA Mountains REDD Project received health insurances.	Community - Healthcare
May 2021 – May 2022	150 Effectively and Overall number of Patrols conducted in NTAKATA Mountains REDD Project and reported: 78 Poaching incidents, 14 Wires and ropes snares, 7 Agricultural land clearing incidents and 19 illegal timber harvesting incidents.	Biodiversity – Negative impact tracking
May 2021 – May 2022	444,348 USD transferred to Village Governments where 163,678 USD spent on education and 140,107 USD spent on health.	Community - Capacity
May 2021 – May 2022	11 COCOBA's were registered through which 8 grants was provided and 236 women owned business started through COCOBA's.	Community - Livelihoods
May 2021 – May 2022	Continuing conducting tracking of village population and keep accurate records on the number of births, deaths, immigration and outmigration to the villages.	Community - Population
1st June 2021 – 21st May 2022	Carbon Champions activity conducted in Kapanga Village.	Community - Capacity
11st June 2021 – 23rd April 2022	Carbon Champions activity conducted in Katuma Village.	Community - Capacity
1st July 2021 – 2nd May 2022	Carbon Champions activity conducted in Lwega Village.	Community - Capacity
20th July 2021 – 18th May 2022	Carbon Champions activity conducted in Lugonesi Village.	Community - Capacity

10th November 2021– 13rd April 2022	Carbon Champions activity conducted in Kagunga Village.	Community - Capacity
September 2022	Third verification initiated	
July 2022	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of Degradation and Illegal logging in the Ntakata. Surveys were conducted in Bujombe, Kapanga, Katuma, Mpembe and Mwese.	Community - Capacity
14th – 27th September 2022	Carbon Champions activity conducted in Mpembe Village.	Community - Capacity
15th – 28th September 2022	Carbon Champions activity conducted in Katuma Village.	Community - Capacity
15th – 24th September 2022	Carbon Champions activity conducted in Kapanga Village.	Community - Capacity
1st – 7th October 2022	Carbon Champions activity conducted in Bujombe Village.	Community - Capacity
30th October 2022	Village Government Assembly Meeting held in Kagunga Village	Community - Capacity
3rd October – 24th November 2022	Carbon Champions activity conducted in Lugonesi Village.	Community - Capacity
5th – 22nd November 2022	Carbon Champions activity conducted in Kagunga Village.	Community - Capacity
24th October – 15th November 2022	Carbon Champions activity conducted in Mwese Village.	Community - Capacity
26th October – 14th November 2022	Carbon Champions activity conducted in Lwega Village.	Community - Capacity
15th December 2022	Bi-annual finance and grievance and steering committee meeting	Community - Capacity
13th – 16th December 2022	Good Governance Meeting in Ntakata.	Community - Capacity
19th December 2022	Village Government Assembly Meeting held in Kapanga Village	Community - Capacity
20th December 2022	Village Government Assembly Meeting held in Lugonesi Village	Community - Capacity

31 st December 2022	Village Government Assembly Meeting held in Katuma Village	Community - Capacity
2 nd January 2023	Village Government Assembly Meeting held in Mwese Village	Community - Capacity
January 2023	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of Degradation and Illegal logging in the Ntakata. Surveys were conducted in Bujombe, Kapanga, Katuma, Mpembe and Mwese.	Community - Capacity
18 th February 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
19 th February 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
19 th February 2023	Village Government Assembly Meeting held in Mpembe Village	Community - Capacity
20 th February 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
21 st February 2023	Village Government Assembly Meeting held in Bujombe Village	Community - Capacity
24 th February 2023	Village Government Assembly Meeting held in Lwega Village	Community - Capacity
27 th – 29 th March 2023	Good Governance Training for the village government leaders in Ntakata.	Community - Capacity
28 th March 2023	Lwega COCOBA Group Meeting.	Community - Livelihoods
28 th March 2023	Mpembe COCOBA Group Meeting.	Community - Livelihoods
29 th March 2023	Mwese COCOBA Group Meeting.	Community - Livelihoods
29 th March 2023	Kagunga COCOBA Group Meeting.	Community - Livelihoods
29 th March 2023	Katuma COCOBA Group Meeting.	Community - Livelihoods
29 th March 2023	Kapanga COCOBA Group Meeting.	Community - Livelihoods
25 th April 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
25 th - 26 th April 2023	Good Governance Training in Mwese and Lugonesi.	Community - Capacity
28 th April 2023	Good Governance Training in Ntakata.	Community - Capacity
28 th – 29 th April 2023	Good Governance Training in Kapanga Village.	Community - Capacity

30th April 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
18th May 2023	Lugonesi COCOBA Group Meeting.	Community - Livelihoods
19th May 2022 – 18th May 2023	All households of NTAKATA Mountains REDD Project re-enrolled in health insurance.	Community – Healthcare
19th May 2022 – 18th May 2023	139 Overall number of Patrols conducted in NTAKATA Mountains REDD Project and reported: 2 Poaching incidents, 3 Wires and ropes snares, 37 Agricultural land clearing incidents and 19 illegal timber harvesting incidents.	Biodiversity – Negative impact tracking
19th May 2022 – 18th May 2023	1,852,161 USD transferred to Village Governments where 577,668 USD spent on education and 493,750 USD spent on health.	Community - Livelihoods
19th May 2022 – 18th May 2023	32 COCOBA's were registered through which 12 grants was provided and 233 women owned business started through COCOBA's.	Community - Livelihoods
May 2023	Forest Loss Analysis – Forest Carbon Benchmark Map	Climate – Remote sensing
May – Aug 2023	Reduced emissions accounting	Climate – Carbon accounting
May 2023	Chimpanzee habitat suitability modelling	Biodiversity – Chimpanzee habitat
October 2023	Fourth verification initiated	
19th May 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
19th May 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
22nd May 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
22nd May 2023	Good Governance Meeting in Mwese Village.	Community - Capacity
25th May 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
27th May 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity

27th May 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
29th May 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
30th May 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
4th June 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
7th June 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
10th June 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
10th June 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
12nd June 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
13th June 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
14th June 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
14th June 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
14th June 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
15th June 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
15th June 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
16th June 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
16th June 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
16th June 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
17th June 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
18th June 2023	Good Governance Meeting in Lwega Village.	Community - Capacity

21st June 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
22nd June 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
24th June 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
28th June 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
10th July 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
10th July 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
12nd July 2023	Good Governance Meeting in Lugonesi Village.	Community - Capacity
19th July 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
21st July 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
24th July 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
26th July 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
31st July 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
1st August 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
2nd August 2023	Good Governance Meeting in Lugonesi Village.	Community - Capacity
7th August 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
9th August 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
10th August 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
18th August 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
20th August 2023	Good Governance Meeting in Lwega Village.	Community - Capacity

23th August 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
24th August 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
25th August 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
27th August 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
31st August 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
5th September 2023	Good Governance Meeting in Lwega Village.	Community - Capacity
5th September 2023	Good Governance Meeting in Kapanga Village.	Community - Capacity
6th September 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
7th September 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
8th September 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
8th September 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity
14th September 2023	Good Governance Training in Lugonesi Village.	Community - Capacity
14th September 2023	Good Governance Training in Mwese Village.	Community - Capacity
15th September 2023	Good Governance Training in Lwega Village.	Community - Capacity
18th September 2023	Good Governance Training in Katuma Village	Community - Capacity
18th September 2023	Good Governance Training in Mpembe Village.	Community - Capacity
18th September 2023	Good Governance Training in Kagunga Village.	Community - Capacity
19th September 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
20th September 2023	Good Governance Meeting in Kagunga Village.	Community - Capacity

20th September 2023	Good Governance Training in Kagunga Village	Community - Capacity
21st September 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
23rd September 2023	Good Governance Meeting in Bujombe Village.	Community - Capacity
25th September 2023	Good Governance Meeting in Mwese Village.	Community - Capacity
16th October 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
27th October 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
2nd November 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
8th November 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
10th November 2023	Good Governance Meeting in Katuma Village.	Community - Capacity
November 2023	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of Degradation and Illegal logging in the Ntakata. Surveys were conducted in Bujombe, Kapanga, Katuma, Mpembe and Mwese.	Community - Capacity
22nd December 2023	Good Governance Meeting in Mpembe Village.	Community - Capacity
3rd March 2024	Steering Committee Meeting conducted in NTAKATA Mountains REDD Project.	Community - Capacity
3rd – 11st May 2024	Carbon Champions activity conducted in Kapanga Village.	Community - Capacity
4th – 9th May 2024	Carbon Champions activity conducted in Mpembe Village.	Community - Capacity
4th – 9th May 2024	Carbon Champions activity conducted in Katuma Village.	Community - Capacity
5th – 10th May 2024	Carbon Champions activity conducted in Bujombe Village.	Community - Capacity
5th – 16th May 2024	Carbon Champions activity conducted in Lugonesi Village.	Community - Capacity

2nd – 7th May 2024	Carbon Champions activity conducted in Kagunga Village.	Community - Capacity
5th – 13th May 2024	Carbon Champions activity conducted in Mwese Village.	Community - Capacity
6th – 16th May 2024	Carbon Champions activity conducted in Lwega Village.	Community - Capacity
18th May 2024	Training on the Procurement and Financial Procedures Kapanga Village	Community - Capacity
18th May 2024	Training on the Procurement and Financial Procedures Lwega Village	Community - Capacity
19th May 2023 – 18th May 2024	851 households of NTAKATA Mountains REDD Project renewed health insurance policies.	Community - Healthcare
19th May 2023 – 18th May 2024	273 Overall number of Patrols conducted in NTAKATA Mountains REDD Project and reported: 1 Poaching incidents, 2 Wires and Snares, 14 Agricultural land clearing incidents and 25 illegal timber harvesting incidents.	Biodiversity – Negative impact tracking
19th May 2023 – 18th May 2024	5,746,117.00 USD transferred to Village Governments, 1,377,412.20 USD spent on education and 383,200.94 USD spent on health	Community - Capacity
19th May 2023 – 18th May 2024	12 COCOBA's were registered through which 6 grants was provided and 32 women owned business started through COCOBA's.	Community - Livelihoods
November 2024	Fifth verification initiated	

2.2.2 Baseline Reassessment (VCS, 3.2.6, 3.2.7)

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

2.2.3 Methodology Deviations (VCS, 3.20)

The following methodology deviations were applied:

1. Parameter UP,SS,i,pool# will be monitored at least once every 10 years, on re-measurement of forest carbon stocks. While module X-UNC requires that monitoring of this parameter occur every < 5 years, this requirement is inconsistent with the VM0007 pools modules, which specify that stock estimates (from which uncertainty is calculated) are assumed valid for 10 years. Therefore, a deviation to module X-UNC is applied to permit parameter UP,SS,i,pool# to be monitored every 10 years, putting it into alignment with modules CP-AB and CP-D. This deviation does not negatively impact the conservativeness of the quantification of reductions or removals because it addresses a discrepancy in the methodology.
2. The parameter, ARRL, was last monitored in 2019, but as it does not drive project accounting, its omission during this monitoring period does not negatively impact the conservativeness of the quantification of GHG emission reductions or removals. The ARRL will be updated with the next baseline update.
3. The similarities of the project boundaries were assessed using population density rather than settlement density. This methodological deviation is warranted due to inconsistencies in the available data on the location of settlements within Tanzania. Use of population density data still meets the intent of the methodology as both population and settlement density reflect the relative density of resident populations (and level of pressures associated with those populations). This deviation does not negatively impact the conservativeness of the quantification of reductions or removals because it uses a more accurate data source.
4. The parameter TOTFOR has not been "limited to forest areas within 5km of roads and rivers suitable for conversion to agriculture / livestock" as specified in the methodology, for lack of relevant data on suitability. As the resulting TOTFOR value is greater, the AVFOR value is also greater. The PROPLB parameter is therefore smaller thus resulting in more leakage outside the leakage belt and hence a conservative estimate. This deviation results in conservative accounting of leakage outside the leakage belt.
5. The parameter COLB has not been "limited to areas demonstrated to be suitable for agriculture or livestock ranching" as specified in the methodology, for lack of relevant data on suitability. This deviation does not negatively impact the conservativeness of the quantification of reductions or removals because the information required by the methodology is not practically available.
6. Two deviations are employed in the treatment of wood products to correct errors in the methodology and improve accuracy. In eq. 4 of CP-W, an additional term (incorporating volume-weighted specific gravity of commercial volumes) is applied to convert volume in m³/ha (from application of 1/BCEF) back to t CO₂e/ha (units of output parameter CXB). Also, per current treatment in BL-UP, there is double counting of emissions from wood products because in eq. 24 the entirety of aboveground tree biomass is emitted at the time of deforestation, and in addition, the fraction of aboveground tree biomass entering the wood products pool is steadily emitted over 20 years. Eq. 24 of BL-UP was modified to subtract CWP (fraction of aboveground tree biomass extracted, not immediately emitted and entering wood product pool at time of harvest) from ΔCABtree to avoid double counting of emissions in the baseline.

7. To calculate PROPCS for outside leakage belt leakage, mean live aboveground tree biomass t CO₂/ha was replaced with mean stem volume m³/ha. The available national data in the NAFORMA 2015 Report for Tanzania is inaccurate. The aboveground biomass in stem wood is overinflated when multiplied by the appropriate BCEF (selected from the IPCC 2006 Vol 4 Table 4.5), making it ineffective to compare mean live aboveground tree biomass within the project area from the inventory to the national data. Therefore, mean live stem volume was used in its place, dividing mean live aboveground stem volume within the project area by the area weighted average mean live aboveground stem volume in Tanzanian forests based on the provided volumes in the NAFORMA 2015 Report.
8. In the baseline modeling scenario in section 3.2.1, the landscape factor of slope steepness ratio is not included because it is evident that all slope classes are subject to agricultural conversion. Therefore, the ratio of slope steepness between the PA and the LB/RRD is not important to the determination of the RRD and LB areas. Table 3.5b below illustrates comparable amounts of agricultural activity across all steepness classes in both the PA, RRD, and LB. This deviation does not negatively impact the conservativeness of the quantification of reductions or removals because it is a more accurate assessment of deforestation risk.

Table 3.5b. Area deforested by slope class, showing presence of deforestation for agriculture on all slopes within the PA, RRD, and LB between 2007 and 2017.

Slope Class (%)	Area Deforested (ag conversion) 2007-2017 (km ²)	Total Area (ha)	% Area Deforested
1 to 10	1,171,178.2	15,558,044.8	7.53%
11 to 20	86,741.5	1,213,882.2	7.15%
21 to 30	27,431.1	1,035,667.7	2.65%
31 to 40	13,104.8	215,682.7	6.08%
41 to 50	6,431.4	109,988.7	5.85%
51 to 60	2,950.8	47,413.1	6.22%
61 to 70	1,203.3	17,097.1	7.04%
71 and greater	583.3	7,108.6	8.21%

2.2.4 Minor Changes to Project Description (CCB Program Rules, 3.5.6)

The PD lists the Giant Ground Pangolin as a trigger species in Section 5.3.1, however, the actual species found in the Ntakata project area is a Temminck's Ground Pangolin. This change has been made in this MR.

Diospyros crassiflora is listed as an HCV species in the BMP, validated with the PD. This species of African Ebony was not actually documented in the forest inventory and was mixed up with a very similar species of African Ebony known as *Diospyros mespilitorimis*.

The PD incorrectly states an initial accounting period is 20 years long, however it is actually 30 years long, and will occur from May 19, 2017 to May 18, 2047.

2.2.5 Project Description Deviations (VCS, 3.21; CCB Program Rules, 3.5.7 – 3.5.10)

1. The PD and Carbon Tanzania grievance policy was updated in August 2024 to further specify the Feedback and Grievance Redress Procedure (2.3.12) and Accessibility of the Feedback and Grievance Redress Procedure (2.3.12).

Carbon Tanzania has a clear grievance redress mechanism which is outlined in the company grievance policy. The grievance policy is also part of the files kept at the Village Government office. The policy defines a grievance and its scope as a dispute, complaint or concern raised during project planning, implementation or evaluation by communities and other stakeholders about the project's impact on, but not limited to, free, prior and informed consent, rights to lands, territories and resources, benefit sharing, participation rights, wellbeing, and the environment, as well as complaints raised by employees against their employment, and by community members against individuals working for or on behalf of Carbon Tanzania.

The grievance policy outlines a sequence of steps for managing grievances (each step initiated if the previous step has not successfully resolved the grievance):

1. Informal process to amicably resolve grievances, whereby aggrieved parties submit grievances to Carbon Tanzania via direct contact, email or telephone, the grievance is received and recorded. Carbon Tanzania will work with the aggrieved to resolve the grievance amicably and report the findings of the investigation and the proposed resolution in five days.
2. Formal hearing administered by Carbon Tanzania, whereby a grievance is formally submitted in writing to the Carbon Tanzania CEO (or to a company board member if the grievance is against the CEO). An impartial investigating officer is assigned, and a hearing is conducted within ten days following investigation to seek resolution of the matter.
3. Mediation with a third party, in the event of an appeal or a resolution cannot be reached in the formal hearing,
4. Arbitration through the Tanzanian Commission for Mediation and Arbitration, where a resolution cannot be secured through mediation with a neutral third party.

Grievances will be handled as quickly and fairly as possible, and timelines are specified in the grievance policy. All grievances, and the outcomes of the grievance redress procedures, are

documented in a grievance log and made public by reporting in annual meetings with communities and stakeholders. Additional details, including the contact numbers of the directors, are included in the grievance policy, available in both English and Swahili.

The CT Grievance policy for employees, partners, and community members is available in both English and Swahili and a copy is available in each Village's Government office. In addition, the grievance policy is described briefly in the project summary that is disseminated throughout the project area. The carbon champions have disseminated information specifically on the grievance policy as part of their awareness raising efforts and they are available to help project participants raise grievances if needed.

Project staff, permanently stationed in the project area are available to communicate any grievances to the village leadership and to Carbon Tanzania. Meetings are held annually where leadership representing all project stakeholders, can gather comments from community members and air grievances to Carbon Tanzania and/or the district government. The grievance mechanisms are explained, discussed, and updated as needed at these meetings. The outcomes of these meetings are shared at local meetings and/or the minutes are shared with the community. Carbon champions also serve as a point of contact for community members to express grievances about the project. Finally, the public comment period is well-publicized to stakeholders and provides an additional opportunity to lodge grievances about the project if they do not want to reach out directly to the project. All grievances, and the outcomes of the grievance redress procedures, are documented in a grievance log and made public by reporting in annual meetings with communities and stakeholders.

2. 'Other entity' associated with the project, Tuungane, ceased operations with the project in 2020 when project staff were recalled due to the Covid Pandemic. Carbon Tanzania continued to operate the project without the assistance of Tuungane. They did not return to the project after leaving as the project was functioning well without their services. This deviation does not affect the applicability, additionality, or appropriateness of the baseline scenario because the project continues to function properly. Tuungane was integral to the establishment of the project, but is no longer needed for further implementation of project activities.
3. The Mpanda District government, included in the PD as an 'other entity', transitioned to Tanganyika District in 2017, during the first years of the project. The transition, including name change and move to new offices took a few years to finalize. This change has no affect on the applicability, additionality, or appropriateness of the baseline scenario because this change was purely administrative.
4. Parameter 3 in the Community Monitoring Plan will no longer directly track female reproductive health, rather it will track provision of health insurance. Health insurance creates access to a wide range of community health care options including reproductive health. Therefore, access to reproductive health is still being implemented as a part of this project activity, but as a part

of a broader range of health care provisions. The number of women enrolled in health insurance will serve as an effective proxy for access to reproductive health care. In this, and future, monitoring periods, the project will track the number of people covered by health insurance based on household surveys conducted at least every 5 years.

2.2.6 Grouped Projects (VCS, 3.6; CCB, G1.13-G1.15, G4.1)

Not a group project.

2.2.7 Sustainable Development Contributions (VCS, 3.17)

Tanzania's National Development Vision of 2025 outlines the country's commitment to sustainable development. It includes goals related to 'high quality livelihood', and 'good governance and the rule of law'. Further it states: "It is also envisaged that fast growth will be pursued while effectively reversing current adverse trends in the loss and degradation of environmental resources (such as forests, fisheries, fresh water, climate, soils, biodiversity) and in the accumulation of hazardous substances."

Whilst the Ntakata REDD project contributes directly to these goals in the target area. This project does not aim to specifically monitor achieving any nationally stated sustainable development priorities, however is developed in line with national policies such as The Forest Act (2002) and the National Land Policy (1995). This project does not have any provisions for reporting and monitoring on national policies.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	1.1	2.3.1 Secure access to natural resources.	Implemented activities to increase	No further changes this monitoring period	The project has secured access to land rights across 8 villages over ~204,000 ha
2)	3.2	1.4.2 Secure land rights for indigenous communities	Implemented activities to increase	No further changes this monitoring period.	The project has secured land rights for indigenous communities living in the eight villages across over ~204,000 ha.
3)	8.3	8.3.1 Direct and sustainable employment	Implemented activities to increase	During this reporting period, the project employed 122 people, including 103 VGS, 16 carbon champions, and 3 project managers.	Over the project lifetime, the project has employed 122 people.
4)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By conserving ~204,000 ha of miombo woodland, the project has prevented the release of ~573,000 tonnes of carbon into the atmosphere during the monitoring period	Prevented the release of ~5,852,000 tonnes of carbon into the atmosphere

5)	15.1	15.1.1 Protection of forest resources resulting in reduced deforestation	Implemented activities to decrease	During the reporting period deforestation decreased by ~4,200 ha.	During the project lifetime deforestation has been reduced by ~60,000 ha.
6)	3.8	3.8.2 Coverage of community by health insurance	Implementation activities to increase	During this reporting period, 851 households have been provided with health insurance.	4400 households have been provided health insurance during the project lifetime.

2.2.8 Risks to the Project (CCB, G1.10)

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions needed and designed to mitigate the risk
1. Increased mining especially gold mining	Mining leads directly to clearing of forest to access minerals but also to clearing for settlement of migrants attracted to the area.	• Maintaining a close relationship with district and local government. • Empowerment of villagers to protect their resources for equitable benefit sharing. • CT works closely with the District Government • Villages have been empowered through the implementation of the VLUPs
2. New major roads	New major roads (such as the road planned to link Mpanda to Uvinza) would lead to clearing of forest for road construction but also to further clearing from roadsides due to easier access and increased land values.	• CT works closely with the District government to ensure the project proponent is well informed on planned developments.
3. Change in national REDD+ policy to disallow voluntary market carbon projects	The suspension of carbon revenues associated with the project (unless replaced immediately by national sources) would lead to great resistance by the communities and possibly a return to pre-project conditions. Forests and biodiversity would be at much greater risk of loss.	• Continued involvement in national REDD+ dialogue. • Technical support for nesting of the project within a national GHG accounting system. • Active engagement of district government and other stakeholders with delivery of benefits to develop a constituency of support for the project. • CT works closely with the Tanzania Forest Service and National Carbon Monitoring Centre to ensure the project proponent is well informed. CT makes annual visits to Minister of Environment to ensure ministerial government is

		aware of project objectives.
4. Diminished village engagement	If villages disengage from participation in VLUPs, forestland and wildlife habitat may face increased pressure due to illegal harvest and/or land conversion for agriculture.	- Meet regularly with villages to remain engaged with the process and to support the needs of the communities. - Regular meetings with village government during steering committee meetings and regular meetings with village government through training (see section 2.3.)
5. Climate change results in species compositional shifts and negatively impacts conservation target species	As the climate changes, species' habitat ranges may be diminished within the project area or eliminated entirely.	- Continued support and development of REDD+ carbon projects to mitigate the impacts of climate change. - Develop climate change adaptation measures for species habitats. - Maintaining large areas of habitat, risk of habitat loss is potentially mitigated. - Regular patrols by VGS and assessment every verification of habitat for Chimpanzee.
6. Risk of VLUPs and village engagement attracting new immigrants and increased pressure on natural resources	Current natural resource availability in villages may not be able to support an influx of immigrants and may increase pressure on natural resources.	- Supporting successful development of VLUPs in other communities that create opportunities for sustainable use of resources in neighboring regions reduces the need for migration to these villages. - Village land use plans implemented
7. Risk that sufficient carbon revenue is not generated, reducing support to villages.	A lack of sufficient carbon revenue may reduce the efficacy of the project activity because villages may increase pressure on natural resources to compensate for a lack of financial resources.	Work to find buyers for carbon credits generated through the REDD+ project.

2.2.9 Benefit Permanence (CCB, G1.11)

There are two principal strategies to ensure the maintenance and enhancement of the project benefits beyond the project lifetime. The first is capacity development. The project provides opportunities for learning, and the knowledge and skills gained will last beyond the project cycle. District officers, village committees and VGS are, and will continue to be made, more capable and efficient in their jobs. They will be able to identify and access new funding sources to continue the forest management work, whether it be from external donors or resources from within the better-off community itself. The forest will also be less degraded with greater potential to provide timber and non-timber forest products on a sustainable basis – a means to offset management costs. The local population will have a greater appreciation of the benefits of sustainably managing forest resources as a result of support to the education of both children and adults through the school system and adult education.

The second strategy relates to how land-use planning will set down long term goals for the land-use and management that will set norms around those lands and allow for the expansion of agricultural and settlement in a sustainable way. While land use plans may be adjusted over time, the forest reserves are set aside for long term protection beyond the lifetime of the project.

The measures discussed above serve to ensure climate, community and biodiversity benefits related to maintenance and protection of forest cover for at least 100 years.

During this monitoring period the project succeeded in achieving and demonstrating significant progress in completing, implementing, and enforcing land use plans. Furthermore, capacity was increased around governance, scout training, environmental education (carbon champions), COCOBAs, and improved access to health care (see section 4.3.1). All of these changes represent permanent knowledge and skill transfers that also conferred long term benefits. Many of these activities also involved youth, which increases the longevity of benefits and capacity growth.

2.3 Stakeholder Engagement & Safeguards

2.3.1 Stakeholder Identification (VCS, 3.18, 3.19; CCB, G1.5)

The stakeholders involved in the project activities have not changed since validation.

2.3.2 Stakeholder Access to Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

A copy of the full Project Document (PD) was provided to each district officer and village committee to review and keep on file for public access. In addition, copies of last monitoring reports were delivered to the district offices and village committees. Since these documents are in English, of which there is limited knowledge in the villages, CT prepared summaries in Swahili and spoke at regular meetings to convey the relevant information in an efficient manner.

Along with the monitoring report a local language summary was uploaded to the registry before the verification. A notice letter was sent informing stakeholders of such and its surrounding procedures. The district, the overseeing authority of all governance and representative processes in the area confirmed during site visit their knowledge and use of the registry. The summary was also sent to the district directly. The summary was also sent to the project manager who shared it and informed community members and leaders. Any community leaders who are digitally available also received the digital copy.

Carbon Champions also received copies and shared it and discussions in their regular interactions with community members, it was noted during site visit that even when Carbon Champions are not on an explicit deployment the community view and come to them as a source of project information.

Though some community members were unable to recall specific monitoring results or documentation community members were largely knowledgeable and confirmatory on positive climate, community, and biodiversity benefits achieved during this monitoring period. In the case of the community results the majority were generated directly by the communities themselves and collated through the official and representative governance structures the project works with. It should be noted that Katavi region has one of the lowest literacy rates in a country in one of the lowest literacy regions of the world and this informs the project in its practical commitment to ensuring multi-directional information flow and results sharing with the participating community.

2.3.3 Dissemination of Summary Project Documents (VCS, 3.18, 3.19; CCB, G3.1)

Since English knowledge is limited and there is no strong culture of reading in the area, the project team planned face-to-face interactions using the carbon champions to provide a summary of the PD to committees and other interested villagers. These meetings were conducted within a short time from the completion of the PD. A shorter document in Swahili was prepared and circulated to summarize the most relevant sections of the PD for villagers. Similarly, summaries of the last monitoring results were prepared and explained in regular governance meetings, The same process will occur for this monitoring report.

2.3.4 Informational Meetings with Stakeholders (VCS, 3.18, 3.19; CCB, G3.1)

Information on the project has been provided to the village committees on several occasions prior to project validation and verification. These meetings were conducted in Swahili and attended by most of the 25 members of the village committees. Official meeting minutes were recorded. During these meetings, the project team has explained the project background as well as the roles and responsibilities of the villages if they are to engage. Risks such as the possible failure to sell credits, have been mentioned and discussed. The project team welcomes any questions or comments on the project, and there is ample time to share and exchange ideas. In addition to the village development committee meetings, CT has also attended and presented in the village general assemblies which bring together more members of the community. The general assembly meetings are publicized by word-of-mouth at the sub-village level, so that all families are made aware of the time and place of the meeting. The table in Section 2.2.1 summarizes the informational meetings and consultations that have been conducted and minutes or summary reports are on file.

2.3.5 Risks from the Project and No Net Harm (VCS, 3.18, 3.19)

Increased patrols for illegal logging and poaching can bring VGS into more frequent confrontations and wildlife. VGS are provided with professional training to properly handle or report confrontations with humans and/or wildlife. VGS do not carry firearms to patrol the project area. Additionally, all Carbon Tanzania employees go through yearly human resources training. Staff have also started taking an internationally certified Wilderness First Aid course to respond to emergencies in the field. See Appendix 3 and Section 4.4.2.

2.3.6 Community Costs, Risks, and Benefits (CCB, G3.2)

The project team has discussed the costs, risks, and potential benefits of the project candidly with the Village Governments in all the target villages, during the project introductory meetings. Most information is conveyed in these face-to-face meetings, but CT has also prepared a leaflet on the project and its background. Numerous copies have been distributed to the Village Governments over the course of introducing the project. The risks discussed include the risk of not being able to sell carbon credits, thus reducing revenues to support project activities. CT has emphasized its commitment to sell the project credits, along with its track record in having done so for other similar projects; however, CT has been candid in explaining that the global market forces affecting carbon credit prices and sales are beyond the company's control. As of now CT has significant commitments for the purchase of project credits and does not see inability to sell as a significant risk.

The project also developed the strategy of 'carbon champions' to share and gather information. The champion selected in each village was chosen based on interest and capabilities, also considering gender balance. These champions were given additional training about the project and they in turn are asked to spread key messages throughout the villages. These champions also convey information from project participants back to the project team.

In discussing potential benefits, CT has described the other projects it has initiated, including the Yaeda project which has already delivered financial returns to the community. However, CT is also careful not to unduly raise expectations. CT has also explained the correlation between financial flows and overall effectiveness in protecting the forest in the project area. If one or two communities fail to protect the forest, for example, then revenues to all communities could be affected. CT has also explained that some of the project revenues must be spent on project running costs, including salaries, transportation, marketing, validation, and verification costs. It has also been explained that payments to communities are based on results and correlated with a base amount and the area of the forest protected.

Project activities result in minimal impacts caused by pollutant emissions to air, discharges to water, noise and vibration, the generation of waste, or the release of hazardous materials, and the project is committed to the principles of preventing net harm to the communities. The project enables effective governance and implementation of local environmental laws that mitigate potential impacts by allowing local authorities to respond effectively.

See Section 4.4.2 for additional measures to address risks to minority and marginalized groups in the local communities.

2.3.7 Information to Stakeholder on Verification Process (VCS, 3.18.6, 3.19; CCB, G3.3)

As mentioned, the verification process has been explained in the face-to-face meetings in each village. Villagers are encouraged to speak openly and candidly to the project auditors. Information on the verification process has also been included in the project summary that has been circulated to the Village Governments. Face-to-face meetings are the most effective way of sharing information in the villages. The Village Governments are responsible for carrying the key information on the project verification to the sub-villages, according to the village governance structure. Oral communication does not depend on literacy levels, so those with lower education are not excluded. Meetings are organized at convenient times so that women can participate. The carbon champions also share information on the verification process door-to-door. Generally, it is easier for women to meet at home since they are busy without household tasks. Peak harvest season is also avoided to ensure good participation.

Additionally, Carbon Tanzania shares information about the validation and verification process publicly through its social media channels.¹²

2.3.8 Site Visit Information and Opportunities to Communicate with Auditor (VCS, 3.18.6, 3.19; CCB, G3.3)

¹² See document “Validation and Verification Link” in Supporting Documents.

The communities were informed about the visit of the auditor through the Village Government. The day and time of the meeting will be clearly communicated by CT to the Village Government at least one month before arrival by a letter explaining the date and purpose of the visit as well as the names of the auditors.¹³ The Village Government will be asked to inform all villagers about the audit and to remind them again of the visit one day before. Depending on the request of the auditor, meetings may be arranged with each Village Government or sub-village representative. It is also possible for the auditor to travel door to door to gather information and feedback on the community perspective in a more informal manner. A member(s) of the CT team may accompany the auditor if desired to assist in any clarifications; however, it is also possible for the auditor to make the visit with the assistance of a local government official or Village Government representative. Additionally, Carbon Champions distribute information about the audit visit to community members at the grassroots level.¹⁴

2.3.9 Stakeholder Consultation (VCS, 3.18; CCB, G3.4)

Ongoing consultation	The monitoring report was made available for review during the public comment period, and this was achieved through multiple channels. A notice letter was sent informing stakeholders of the monitoring report and local language summary uploaded to the registry and the surrounding procedures.
Date(s) of stakeholder consultation	November 2023

¹³ See document “Announce Visit-Ntakata.pdf” in Supporting Documents folder ‘Audit Visit Letter’.

¹⁴ See document “Carbon Champions Teach Summary – Ntakata.pdf” in Supporting Documents folder ‘Carbon Champions Communication Materials’.

Communication of monitored results	Many community members are not literate in either Swahili or English and very small amount are digitally literate in any way. Considering this, and as a supplement to the notice letter and the letter informing of communities of the upcoming verification, information was shared in face-to-face meetings and interactions with the Village Governments who are under the authority of the district government and responsible for information sharing. This was done through village government leaders, district officials, and the project manager and carbon champions who come from and are constantly within the project area and engaging with the greater community. Communities were informed they could use a digital process themselves, could ask someone to engage in a digital process on their behalf, or they could separately engage the verifiers through feedback as they were to visit the villages (as per the later letter).
Consultation records	The formal public comment period is contextually a difficult concept to get across to many community members. Community members understood that if they had comments or grievances regarding the project they could go to their village leaders, these village leaders are under and report to the district. The district was demonstrated to have a knowledge of the registry and documentation processes. Community members had been informed and were waiting for the auditors' arrival in all villages, eager to share their views on the project and results.
Stakeholder input	Feedback has been received from stakeholders, as detailed in the minutes of the first Carbon Trading Advisory Committee meeting, that discussions between Carbon Tanzania, the relevant villages, and the Tanganyika District Council have "taken a long time without resolution, causing conflict and delays in project implementation." This was due to "a lack of common understanding regarding the Carbon project implementation and a good advisory system for leaders", according to the Chairman of the committee. The project's response to this feedback was the creation of the aforementioned committee, made up of representatives of Carbon Tanzania, the Tanganyika District Council, and other government representatives to "reduce unnecessary conflicts and delays in project activities, thus increasing efficiency", as well as to

“facilitate the process and provide advice to expedite project implementation”.

2.3.10 Continued Consultation and Adaptive Management (VCS, 3.18; CCB, G3.4)

The CT team and its partners are in the project landscape on a regular basis. Staff are based in the district and travel on a weekly basis to the villages in the project site. During this period, CT conducted governance training and meetings for the purpose of informing adaptive management within the project. The discussions in these meetings are documented in minutes and decisions were taken to address project issues or suggest improvements to the project strategy. The CT team communicates informally with the village governments on a regular basis.

Summary of comments received	Actions taken
Feedback stating that discussions between Carbon Tanzania, the relevant villages, and the Tanganyika District Council have “taken a long time without resolution, causing conflict and delays in project implementation”, due to “a lack of common understanding regarding the Carbon project implementation and a good advisory system for leaders”.	Planning for creation of the Carbon Trading Advisory Committee (also known as the “Executive Committee”) to build capacity and increase efficiency among project implementers.

2.3.11 Stakeholder Consultation Channels (CCB, G3.5)

The communities in the project area were informed and consulted adequately on the project, and they gave their clear consent for its initial and continued implementation. Meetings to introduce and discuss the project with the Village Governments in each village took place on several occasions. Village Government members are elected and have a responsibility to convey the information to the sub-village level. Copies of leaflets in Swahili explaining the project were also printed and distributed in each village, and project summary information was spread by Carbon Champions. CT encouraged Village Governments to carry through this responsibility, and while it is not feasible to verify communication on the project with every household, some spot checks reveal that the community at large is well informed. For example, in Mwese the Village Government confirmed that they had spoken to villagers in all 5 sub-villages about the project. They reported having discussed the potential project benefits and the need to continue mobilize people around forest protection. Community member’s rights to participate in and consent to consultation will continue to be respected by the project.

Additionally, project leadership created the Carbon Trading Advisory Committee to build capacity and increase efficiency of stakeholder institutions, who are involved in project consultations, such as the Tanganyika District Council and other government bodies.

2.3.12 Stakeholder Participation in Decision-Making and Implementation (VCS, 3.18, 3.19; CCB, G3.6)

CT has taken steps to ensure that the project was effectively communicated with all communities, including disadvantaged groups, and that they have been given an opportunity to participate. First, face-to-face meetings were organized to present the opportunities to participate in the project, and CT encouraged equal opportunities for all members. For example, while women might not be normally considered for the work of Village Game Scout (VGS) due to gender perceptions, during the monitoring period there were 18 female VGS. In addition, the project adopts existing governance structures as a means to implement the project. These structures are democratic and culturally accepted in the communities. The Carbon Champions, who act as grassroots door-to-door educators and information spreaders, also took feedback from hard to reach stakeholder which made its way to village leadership and the greater project implementation and governance structure.

Additionally, project leadership created the Carbon Trading Advisory Committee to build capacity and increase efficiency of stakeholder institutions, who are involved in project decision-making, such as the Tanganyika District Council and other government bodies.

2.3.13 Anti-Discrimination Assurance (VCS, 3.19; CCB, G3.7)

Carbon Tanzania has company policies to prevent discrimination and outline a course of action, should it occur. The human resource (HR) policy provides a clear statement on discrimination relating to gender, religion or sexual discrimination. Discrimination is considered a level A misconduct under the HR policy. Where discrimination occurs within the company, partner organizations or within project areas (project participants), actions are outlined in the grievance policy to ensure that any discrimination is dealt with by the senior management. All company employees and field partners sign a code of conduct with CT that includes anti-discrimination.

2.3.14 Grievances (VCS, 3.18.4; CCB, G3.8)

Carbon Tanzania has a clear grievance redress mechanism which is outlined in the company grievance policy. The grievance policy is also part of the files kept at the Village Government office. The policy defines a grievance and its scope and outlines both an informal and formal procedure for managing grievances. Under the informal procedure, an affected person first discusses with a director or another member of the management team. The director attempts to resolve the grievance on an informal basis, taking advice, if necessary, from other parties. The director and affected person work together to resolve the problem. If a grievance cannot be resolved via informal discussions, the formal procedure may then be used. The formal procedure requests the grievance to be in written form (or if not possible, by telephone to the director). An

investigation is arranged within 1 week (7 days) to gather additional information, followed by a grievance hearing. The hearing should occur within 10 working days of the investigation being completed. A third-party mediator will be included in the grievance proceedings as is laid out in the PDD and company policy. Additional details, including the contact numbers of the directors, are included in the grievance policy, available in both English and Swahili.

During this reporting period, a meeting was held in November 2023 where village leadership were specifically asked to report any grievances from their communities. Carbon champions also visited each household and provided an opportunity for stakeholders to communicate grievances to the project. Project staff, including two project managers and a landscape manager were present constantly during the period, and made themselves available to stakeholders.

Grievances received	Resolution and outcome
No grievances were logged during this reporting period as reported during the grievance meeting and by the district government.	N/A

2.3.15 Worker Training (VCS, 3.19; CCB, G3.9)

There were opportunities for community members to participate in orientations and training to gain new knowledge and skills in relation to the project. Carbon Tanzania has conducted several meetings with the Village Governments to orient members to the project and to share knowledge on key concepts such as REDD, carbon markets, and sustainable forest management. During this period CT trained Carbon Champions who raise awareness and understanding at the grassroots level by going household to household and Village Game Scouts.

Capacity has been built through employment and job training, training on good governance, and increased project awareness. As these capacities are based in skill and knowledge, they have greater longevity. 16 carbon champions participated in the environment education program during this period. This is bolstered by the fact that the project engages with community structures that exist independent of the project. This means that capacity-building efforts with local government bodies will continue to exist beyond the project lifetime and will benefit from the increased capacity. Lastly, the young age of many of the community members receiving this capacity-building (most of the Carbon Champions and VGS are youth) helps ensure the longevity of these efforts.

2.3.16 Community Employment Opportunities (VCS, 3.19.13; CCB, G3.10)

All members of the community are eligible and encouraged to apply for open positions and their applications are assessed fairly and without bias. The Village Governments are requested to ensure that women and other marginalized groups are informed about new opportunities and encouraged to apply. During this period all employees of the Ntakata REDD project area were employed from the project area. Carbon Tanzania is an equal opportunity employer and follows the national employment regulations and has proven this through continued reissuance of their business license. Additionally, Carbon Tanzania has strong internal labor policies that go above and beyond the national laws and regulations. Employees are paid competitive wages relative to comparable work in Tanzania.

The limited number of females employed is a result of the nature of the cultural preferences and desires for certain positions and not a result of the unfair nature of the process used by the villages to fill positions. The village governments are democratically elected and participate. Though still underrepresented, the number of female VGS during this reporting period was 18 out of 103 VGS. Across Tanzania and Africa, rangers are often male due to the perceived nature of the job and personal and cultural preference for women to not apply for those roles. Women are also employed in other aspects of the project operations (9 women served as Carbon Champions, 8 women were employed in other roles, meaning 35 total women employed by the project during the monitoring period). Women were given a fair chance and encouraged to fill project positions and have made inroads compared to the baseline.

Furthermore, a significant amount of the official village leadership, especially chairpersons and village executive officers are female. Females have also filled most of the available positions in the community COCOBAs.

2.3.17 Occupational Safety Assessment (VCS, 3.19; CCB, G3.12)

The risks of employment or involvement in the project are well within a normal range and CT has taken measures to inform workers of possible risks and to minimize these risks. Risks during the project activities include vehicle accidents, insect, or snake bites, as well as conflict-related violence during enforcement operations. Workers are informed about these risks during orientation. Risks are minimized by promoting driver safety, avoiding travel by public bus whenever possible, providing appropriate equipment, ensuring use of tents / mosquito nets for fieldwork, and giving training to deal peacefully and effectively with conflict, including training on arrest procedures for Village Game Scouts. No occupational safety incidents were reported during this monitoring period.

In Tanzania, CT is required by law to:

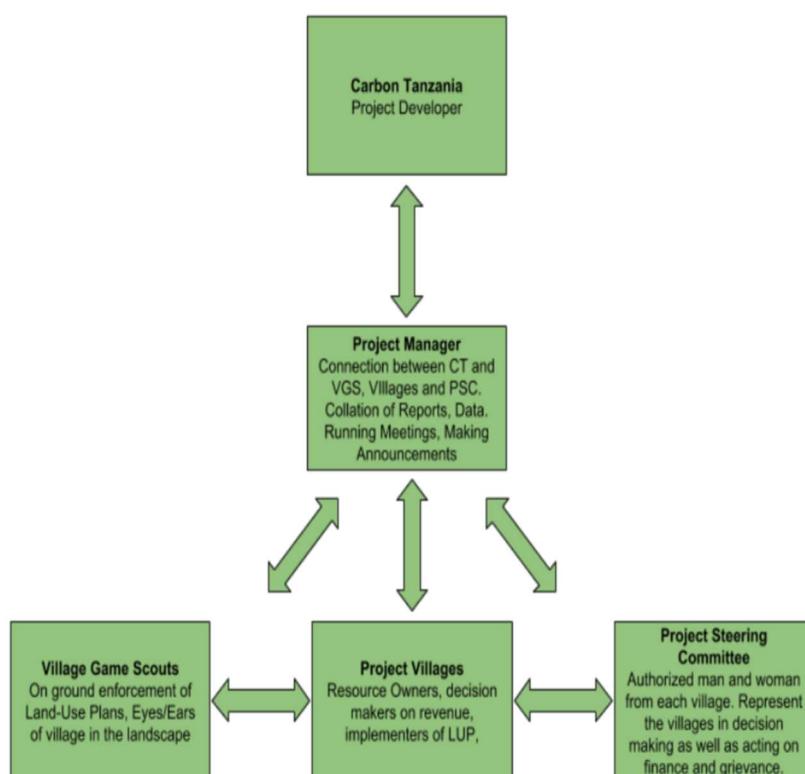
1. Contribute to employees' pension
2. Pay for workers compensation fund in case of injury
3. File annual returns for non-citizens employees

Total compliance with labor and business laws allows a company to receive tax clearance and renew their business license, both of which CT has accomplished during this reporting period.

2.4 Management Capacity

2.4.1 Required Technical Skills (VCS, 3.19; CCB, G4.2)

The project requires a range of key technical skills for successful implementation. These skills include project management, marketing, community engagement, natural resources conservation, biodiversity assessment, provision of health services, rural development, and carbon measure and monitoring. Curriculum vitae of project personnel are available to show skills in these areas.



2.4.2 Management Team Experience (VCS, 3.19; CCB, G4.2)

The members of the project management team possess the key technical skills required to implement the project. These skills include project management, credit marketing, community development, reproductive health, conservation and biodiversity assessment, forest law enforcement, and community engagement and facilitation. The key management team staff already have experience in developing and implementing two other forest carbon projects in Tanzania including the Yaeda Valley REDD Project and the Makame Savannah REDD Project. During this monitoring period the Carbon Tanzania team consisted of members who have extensive carbon project development experience and have been with the project since its inception in 2016 including Jo Anderson (Director of Finance and Sales), Marc Baker (Chief Innovation Officer), and David Beroff (Director of Operations). Additionally, the project maintains locally-based staff with professional experience in community forest management. The National Carbon Monitoring Center calls on Carbon Tanzania regularly for guidance on developing a national framework for carbon projects and other carbon project related issues. Please refer to the curriculum vitae of key project staff for additional details on staff experience.

2.4.3 Project Management Partnerships/Team Development (VCS, 3.19; CCB, G4.2)

TerraCarbon LLC was contracted to provide services on carbon measurement and monitoring in the initial start-up phase, while building the team's own capacity in this area. TerraCarbon has also provided support in the preparation of the Project Document and subsequent monitoring reports. TerraCarbon is a world leader in the development of VCS REDD projects.

2.4.4 Financial Health of Implementing Organization(s) (CCB, G4.3)

Carbon Tanzania is an established company with a sound financial basis for operations over the project lifetime. Annual audit reports and financial statements are available upon request by the auditors.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (VCS, 3.19; CCB, G4.3)

Carbon Tanzania and its partners are not involved in or complicit in any form of corruption. The policies of the company (HR Policy) explicitly state a zero-tolerance policy for corruption under gross misconduct. All forms of bribery and corruption are prohibited. Any breach of Carbon Tanzania company policy on corruption and unethical behavior or local law could result in disciplinary action being taken. During this MP no reports were received of unethical behaviour as a result of project activities.

2.4.6 Commercially Sensitive Information (VCS, 3.5.2-3.5.4; CCB Program Rules, 3.5.13 – 3.5.14)

There is no commercially sensitive information that has been excluded from the public version of the project document. Only internal financial records are kept confidential.

2.5 Legal Status and Property Rights

2.5.1 National and Local Laws (VCS, 3.1, 3.6, 3.7, 3.14, 3.18, 3.19; CCB, G5.6)

The following table lists the most relevant laws and regulations governing the projects compliance during development and operations. Links to the relevant acts are provided. New regulations were added to national law to regulate carbon trading in Tanzania in October 2023. During the monitoring period, the project signed a new contract to adhere to updated carbon regulations (see “Revised Contracts for Ntakata Project_20.pdf”).

The project proponent (Carbon Tanzania Ltd.) has taken formal and verifiable steps to ensure compliance with the 2023 Tanzania Carbon Trading Regulation, specifically during the one-year transition period allowed under Section 48 of the Regulation. On 5 June 2023, Carbon Tanzania held a formal meeting with the National Carbon Monitoring Center (NCMC) at Sokoine University of Agriculture (SUA). The objective was to seek clarity and establish transitional arrangements for carbon credit sales that were initiated prior to the enactment of the 2023 regulations.

During this engagement, it was mutually agreed with NCMC that:

1. Pre-existing, validated contracts and verified credits for carbon credit sales would be honored under original terms.
2. The transitional period would apply to allow the project to align with the new regulatory framework.

While a formal regulatory directive was requested, NCMC and other government authorities confirmed that letters and normal and ongoing engagement would serve as recognition of this transition status and acceptance by the government.

The Office of the President – TAMISEMI issued a formal letter dated 22 February 2024 confirming the following:

1. Recognition of carbon revenue earned by the project during the monitoring period.
2. Revenue share approval and confirmation of sales legitimacy, based on pre-existing agreements.
3. Acknowledgment of continued cooperation between the government and Carbon Tanzania under the carbon trading framework.

Although no separate letter has yet been issued for the Makame project, the Ntakata letter represents a clear national precedent, developed in consultation with NCMC and applicable to other legacy projects including Makame. Both projects fall under the same legal, regulatory, and contractual context.

Additionally, on 13 November 2023, the Minister of Environment, Hon. Suleiman Jafo, confirmed project figures and formally approved revenue allocation at a public event, after validation with NCMC.

Projects are both still registered on the national registry by NCMC / the DNA.

The project continues to be in compliance with all national and local laws and regulations that are relevant to the project activities. Total compliance with labor and business laws allows a company to receive tax clearance and renewed business license as Carbon Tanzania has done during this reporting period. All contracts are made under the contract laws. The project is built to incorporate and strengthen the enforcement of the land, forest, and wildlife laws. Carbon Tanzania maintains company policies in line with national corruption laws. Carbon Tanzania retains a Tanzanian law firm to always ensure legal compliance and ensure the project is continually receiving relevant legal advice and direction.

Year	Law/Regulation	Compliance
1967	Land Acquisitions Act ¹⁵	Provides a basis for land governance in the project area
1999	Land Act, number 4 & Village Land Act number 5 ¹⁶	Provides the basis for the communities to control and make decisions on the land in the project area.
2002	Forest Act ¹⁷	This act defines village forest land reserves upon which the project area is based.
2002	Contract Act ¹⁸	Provides the basis for the contractual agreement between the villages and Carbon Tanzania
2004	Employment and Labor Relations Act ¹⁹	Sets standards that the project follows in employing its staff
2004	Prevention and Combatting of Corruption ²⁰ .	Sets standards to prevent corruption which the project

¹⁵ <http://lands.go.tz/uploads/documents/en/1456413954-The%20Land%20Acquisition%20Act%20Cap%20118.pdf>

¹⁶ https://www.tanzania.go.tz/egov_uploads/documents/The_Village_Land_Act_5-1999_en.pdf

¹⁷ <https://www.tfs.go.tz/index.php/en/resources/view/forest-act-2002>

¹⁸ <http://tanzanialaws.com/principal-legislation/law-of-contract-act>

¹⁹ https://www.tanzania.go.tz/egov_uploads/documents/Employment%20and%20Labour%20Relation%20Act.pdf

²⁰ https://www.tanzania.go.tz/egov_uploads/documents/PREVENTION_AND_COMBATING_OF_CORRUPTION_ACT_sw.pdf

		adheres to in its zero-tolerance policy
2009	Wildlife Conservation Act ²¹	Provides a basis for protection of wildlife and enforcement activities in the project area.
2017	Employment and Labor Relations (General) Regulations ²²	Sets standards that the project follows in employing its staff.
2022	Environmental Management Regulations	Set control and management of carbon trading
2023	Tanzania Carbon Trading Regulation	Set further requirements for carbon projects to follow.

2.5.2 Relevant Laws and Regulations Related to Worker's Rights (VCS, 3.18, 3.19; CCB, G3.11)

Tanzania overhauled its employment and labor laws in 2004 when it enacted the Employment and Labor Relations Act, Act No. 6 of 2004 ("the Employment Act") and the Labor Institutions Act, Act No. 7 of 2004 ("Labor Institutions Act"). The Employment Act provides for labor standards, rights and duties, together with the Labor Institutions Act constitute the main governmental instruments to deal with worker's rights. In 2007, additional legislation was added to facilitate the enforcement of labor rights and standards stipulated in the Employment Act. One of the most significant of these is the Employment and Labor Relations (Code of Good Practice) Rules, G.N. No. 42 of 2007. CT is organizationally committed through internal policy to following these laws (see "Labor Compliance Evidence" folder). All employees receive a briefing on laws and worker's rights in Tanzania and receive a copy of the CT company policy documents. This information is to be shared with the relevant parties prior to each verification event.

2.5.3 Human Rights (VCS, 3.19)

²¹https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/pdfpreview/wildlife_conservation_act_2009_tanzania_0.pdf

²² https://www.tanzania.go.tz/egov_uploads/documents/Employment%20and%20Labour%20Relation%20Act.pdf

Carbon Tanzania's projects are deeply aligned with local land ownership and tenure systems, often enhancing them, which is a fundamental aspect of their operations. The regulatory framework for carbon projects in Tanzania supports this approach by safeguarding the land resources and benefit rights of local communities. Carbon Tanzania is well-known for its strong connections with indigenous rights networks and collaborations with government ministries responsible for land, natural resources, and local governance, ensuring that their projects are in harmony with national and local priorities. The project demonstrates compliance with the ILO Declaration on Fundamental Principles and Rights at Work:

1. Freedom of Association and the Effective Recognition of the Right to Collective Bargaining:

Our organization is committed to upholding the principles of freedom of association and the effective recognition of the right to collective bargaining, as outlined in our company policy. While we are not currently registered with a trade union, we proactively support our employees' rights to associate freely and collectively address concerns through an established Welfare Committee. This committee, composed of employee representatives from various sections, serves as a platform for raising welfare-related issues and ensures that management responds promptly and appropriately to any concerns raised. This approach aligns with our commitment to fostering an environment where employees can engage in open dialogue and collaborative problem-solving.

2. The Elimination of All Forms of Forced or Compulsory Labour:

Our company policy firmly commits to the elimination of all forms of forced or compulsory labour. We prioritize transparency and mutual agreement in all employment terms. Every employee is provided with a contract in a language they understand, clearly outlining their role and responsibilities. Job descriptions, which are agreed upon and signed by employees, form the basis of our performance management system. This system emphasizes a two-way communication process where employees and their supervisors collaboratively set, review, and evaluate key performance indicators annually. This method ensures that employees have autonomy over their work objectives, thereby eliminating any form of forced or compulsory labour.

3. The Effective Abolition of Child Labour:

Our safeguarding policy, which is part of our broader company policy, is dedicated to preventing harm to vulnerable groups, including children. We strictly enforce a no-employment policy for individuals under 18 years of age. This policy is reinforced by our whistleblowing system, which provides clear channels for reporting any safeguarding concerns, including child labour. The management regularly reviews any reported cases to assess the effectiveness of the policy. Additionally, we have engaged a safeguarding expert to conduct regular training for stakeholders and project employees, ensuring continuous awareness and adherence to this policy.

4. The Elimination of Discrimination in Respect of Employment and Occupation:

Our organization's company policy is strongly committed to promoting equality, diversity, and inclusion across all levels. As an equal opportunities employer, we do not tolerate any form of discrimination based on status, religion, ethnicity, age, race, sex, gender, ability, or sexual orientation. Discrimination is considered a serious abuse of human rights within our organization. To uphold these values, we ensure that all employees are fully aware of our recruitment policies and anti-discrimination measures. Furthermore, we conduct annual training sessions for project staff to reinforce our commitment to these principles.

5. A Safe and Healthy Working Environment:

Our company policy reflects our commitment to ensuring a safe and healthy working environment. Our organization is registered with the Tanzania Occupation Safety and Health Association (OSHA) and strictly adheres to all safety regulations. As we transition to a new workplace, we are actively conducting a comprehensive risk assessment and developing mitigation strategies, which will be reviewed and approved by OSHA. We take responsibility for ensuring compliance with our safety policies and OSHA requirements. To this end, we provide appropriate safety gear to all employees, particularly those who utilize motorcycles in project implementation, to ensure their safety and well-being.

2.5.4 Indigenous Peoples and Cultural Heritage (VCS, 3.18, 3.19)

Carbon Tanzania is continuously preserving cultural and natural heritage by protecting natural landscapes, enhancing livestock grazing areas, sustaining pastoral life, enhancing cultural language and educating the community about the importance of conservation efforts.

The organization's initiatives have been recognized with several prestigious awards, including the Pathfinder Award, the Equator Prize, and designation as NCS lighthouse projects, reflecting their commitment to environmental conservation and cultural preservation. By protecting land rights and environmental resources vital to the livelihoods of local communities, such as farmers, pastoralists, and honey hunters, Carbon Tanzania's projects inherently safeguard cultural traditions. Additionally, these initiatives protect important ritual and spiritual sites, like sacred trees, which hold significant cultural and spiritual value for the communities involved.

Furthermore, by creating local employment opportunities, Carbon Tanzania's projects contribute to allowing the youth to remain within their communities. This not only helps in reducing urban migration but also plays a crucial role in maintaining and promoting local cultures and traditions, ensuring the sustainability of these communities' ways of life.

2.5.5 Recognition of Property Rights (VCS, 3.7, 3.18, 3.19; CCB, G5.1)

Disputes over rights to territories and resources	No disputes exist currently over rights and resources
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Respect for property rights

The Village Land Use Plans (VLUPs) in each village provide the basis for understanding tenure rights in the project zone, including both statutory and customary user rights. These plans include designations for a variety of land use categories including farming areas (Kilimo Nchikavu), forest reserves (Msitu wa Hifadhi wa Kijiji), spiritual sites (Eneo la Matambiko), wildlife corridors (Ushoroba), and pastures (Eneo la Malisho), among others. Under the Village Land Act, these plans are legally enforceable. While villagers generally do not possess formal titles to their land, there are agreements, sometimes verbal, and sometimes written, for the transfer of land from one family or individual to another. Unfortunately, the lack of formal titles and clear boundary demarcation for individual parcels has led to numerous land conflicts within villages. These usually involve small plots of agricultural land and sometimes are linked to issues of grazing. Nevertheless, there is general agreement and respect for the land use designations in the village land use plans. (See Appendix 3 in the PDD)

Though there is variation between villages with regards to access and use rights, most forest reserves are strictly protected, at least in theory. In Mwese, people are forbidden from going to the forest to avoid contaminating water supplies. Villagers tend to collect firewood from nearby farms rather than going as far as the reserve forests. In Lwega, villagers need to seek permission before installing a honey box in the forest.

Under the Land Act, number 4 and the Village Land Act, number 5 (1999), villagers were granted equal rights to access, use and control land, corresponding to vast areas of mainland Tanzania. However, despite this progressive law, there are many land conflicts throughout the country due to the fact that the registration process for certificates of customary rights of occupancy (CCROs) has proceeded very slowly. Similarly, in the project area, most villagers do not have CCROs and boundaries between properties are unclear and prone to dispute. There are also increasing conflicts between farmers and pastoralists as land pressures increase.

	While these conflicts generally do not affect the project area directly, they can create discord within the community and exert an indirect influence on the solidarity of the community and therefore the project's effectiveness. Carbon Tanzania aims to have a positive impact on this situation through support to the Village Government in terms of capacity building and financial resources to deal with tenure-related issues. Within the local governance system, the village government is tasked with creating VLUPs and with helping secure and enforce statutory rights. The project has made significant progress in increasing the recognition and upholding of property rights for the community. It has achieved these goals by supporting and capitalizing the village governments to implement the Village Land Use Plans, increasing governance capacity, securing employment for VGS who ensure rights and regulations are upheld, and creating strong examples of the benefits of land and communities with clear and enforced rights structures.
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2.5.6 Benefit Sharing Mechanism (VCS, 3.18, 3.19)

Summary of the benefit sharing plan	The benefit sharing mechanism of the project is based on existing democratic governance structures and procedures. It incorporates checks and balances and allows for participation of the wider community through the elected village committee representatives. Payments from carbon sales flow directly to the village committees on a bi-annual basis (every six months). Together all eight villages receive 51% of the net revenues from sales with 49% remaining with CT to cover its operating costs and invest in new projects. Revenues are announced, administered and reported on through the project steering committee, which is comprised of the village executive officer and village chairman from each project village. The steering committee was formed and convened in 2019, while carbon sale revenues started in 2020 and continued through the current period.
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	The payments to communities are based on three criteria: participation, size of the forest area managed, and performance. All eight villages received a base payment for participation in the project amounting to 30% of the bi-annual allocation. An additional 40% of the biannual allocation was based on the size of the forest area protected, divided proportionately depending on the number of hectares protected. Villages that are protecting larger areas of forest – and presumably exerting more effort - received payments proportionate to the larger area. The remaining 30% was allocated based on performance and results. If it is demonstrated that a village is not performing (i.e. forest is being destroyed), its allocation may be reduced or withheld based on evidence collected either through satellite imagery or on-the-ground surveys. These breakdowns are subject to change based on community feedback or project developments. The benefit sharing mechanisms are now enshrined in the national carbon regulations established in 2022 in Tanzania. Carbon Champion activities during this period ensure that at a grassroots level and throughout the landscape community members were educated about the project, its potential benefits, and the steering committee mechanism. Furthermore, during this period Carbon Tanzania attended general community assemblies, highlighting the forthcoming carbon revenue, and discussing the mechanisms for it to be used fairly by the community. Villages provided spending reports based on the revenues they received, and along with Carbon Tanzania the district government ensured that spending was legitimate and geared towards community benefits and project outcomes.
Benefit sharing during the monitoring period	During this period, \$5,746,117 USD was transferred to village governments, and \$1,377,412 USD (24%) was spent on education, \$383,201 USD (7%) on health, \$654,533 USD (11%) on forest protection, \$946,496 USD (16%) on administrative costs, \$1,664,266 USD (17%) on infrastructure, and \$145,598 USD (3%) on COCOBAs.

	The funds were successfully disbursed in May and June of 2024 after a joint site visit by the Carbon Tanzania and District technical teams that assessed project implementations, financial reports, and the submission of village plans that were approved by the village general assembly and properly reviewed by the joint team, which allowed the finance team to proceed with the fund disbursements. The above ensures community involvement and decision making to empower the communities. The committees applied payments received to priorities already established in the existing village development plans. The precise division of funds varied depending on the community needs and priorities; however, all adjustments and transfers were made based on discussion and decision-making among the village committee members. To increase transparency in the process, CT publicly posts the amount of the bi-annual payment in an accessible and visible way so that the wider community is aware of the amount received. Whenever possible, CT also attended and made a short presentation to the general assembly to update the wider community on the project activities and revenues.
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2.5.7 Free, Prior, and Informed Consent (VCS, 3.18, 3.19; CCB, G5.2)

Consent	The project attests that it has and will continue to provide appropriate compensation to the affected project parties. This includes meeting all the contractual obligations with the Village and District Governments through direct financial transfers.
Outcome of FPIC	As stated, the designation of the project area is based on the Village Land Use Plans (VLUPs) that were developed under a participatory process in consultation with multiple stakeholders. There were no overlapping claims in these areas, and communities gave their free prior and informed consent for the project to be implemented in the village forest reserves. This consent was based on a series of

informational consultation meetings to introduce the project and discuss the potential risks and benefits, culminating in the project contracts with each of the eight villages. These contracts were negotiated and finalized by the Village Government that, as an elected committee, has the authority to act on behalf of the villagers to make the agreement. The table below lists the consultation meetings leading to consent to the project.

Location	Date	Stakeholders	Topics
Tanganyika District	June 2016	District Government	Introduction to project and discussion of potential next steps
District/ Project Villages	Feb 2017	District/ Projects Villages	Introduction of project to some project villages/ update report to district
District/ Project Villages	July 2017	District/ Projects Villages	Introduction of project to remaining villages/ update report to district
District/ Project Villages	October 2017	District/ Projects Villages	Explanation of baseline survey, request of permission to conduct baseline survey, conducting of baseline survey (in each village individually)
District/ Project Villages	July 2018	District/ Projects Villages	preliminary results of baseline survey, explanations of general terms of potential future contract (in each village individually)
District/ Project Villages	Sept 2018	District/ Projects Villages	Full contract read through and explanation (in each village individually) Group signing of

				contract
	Consultation Meetings (minutes of meetings are available in Swahili) Consultation with the communities is ongoing regarding project activities, benefit sharing, and grievances as described in the previous sections. Communities are informed of the consultations prior to each verification. Additionally, during the monitoring period, a revised contract was signed with the villages to comply with updated Tanzania carbon trading regulations. See supporting documents.			

2.5.8 Property Right Protection (VCS, 3.18, 3.19; CCB, G5.3)

The project activities did not involve any involuntary removal or remit of property rights holders from their lands. The previous land use planning activities involving multiple stakeholders have already used participatory processes to designate village forest reserves where settlement and agricultural activities are not permitted. There have been no cases of relocation of habitation or legitimate user rights in the project area. In the case that claims for land or user rights occur within the project area, they will be resolved according to the legal procedures and will involve the appropriate government authorities. No such claims have been logged in this reporting period.

2.5.9 Identification of Illegal Activity (VCS, 3.19, CCB, G5.4)

The illegal activities that could affect the project's impacts include logging and clearing of forest – including by setting fires - in the project area (village forest reserves) and illegal hunting of wildlife. All of these issues were addressed directly by the project's core activity: the employing and training of Village Game Scouts (VGS) who patrol the village forest reserves. The schedule of the VGS patrols is unpredictable in order to increase their effectiveness with an element of surprise. Their role is further facilitated by the complementary village development activities such as educational support, and health care services, which reduce pressure on forests.

Carbon Tanzania is in compliance with national and local laws. The agreements between Carbon Tanzania and communities are made under the purview of Tanzanian law which prohibits the use of forced labor, child labor, and human trafficking. The use of forced labor, child labor, or human trafficking is against company policy and practices. All Carbon Tanzania policies apply to third-party contractors hired for the project.

2.5.10 Ongoing Disputes (VCS, 3.18, 3.19; CCB, G5.5)

The VLUP process has resolved land disputes that previously affected the project area (village forest reserves) through participatory planning and mapping with multiple stakeholders. These plans are now widely recognized and legally enforceable. Furthermore, each Village Government has a Village Land Committee, and there are ward-level Land Councils (Katuma, Mpembe, Mwese) that specifically focus on resolution of land conflict, usually occurring within the village agricultural areas. From time to time in certain villages there may be new migrants moving to the area who encroach on the village forest reserves, and these committees help to resolve such conflicts. The project also prevents these problems through regular patrolling by trained VGS. The VGS have training in mediation and conflict resolution using techniques to ensure peaceful resolution of disputes. No further disputes took place during the monitoring period.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation (VCS, 3.16)

Data / Parameter	$\Delta C_{BSL,PA,unplanned}$	
Data unit	t CO ₂ -e	
Description	Net CO ₂ emissions in the baseline from unplanned deforestation in the project area	
Source of data	Set at start of project baseline	
Value applied	Year	$\Delta C_{BSL,PA,unplanned}$
	2023	627,508.6
Justification of choice of data or description of measurement methods and procedures applied	Derived and justified in Section 3.2 of PD in which baseline is set	
Purpose of data	Calculation of baseline emissions	
Comments		

Data / Parameter	ABSL,PA-UNPLANNED,t	
Data unit	ha	
Description	Projected area of unplanned baseline deforestation in the project area in year t	
Source of data	Set at start of project baseline	
Value applied	Year	ABSL,PA-UNPLANNED,t
	2023	4,972.1
Justification of choice of data or description of measurement methods and procedures applied	Derived in Section 3.2 of the PD	
Purpose of data	Calculation of leakage emissions	
Comments		

Data / Parameter	CLB	
Data unit	t CO2-e ha-1	
Description	Area-weighted average aboveground tree carbon stock for forests available for unplanned deforestation inside the Leakage Belt	
Source of data	Values transformed from NAFORMA data. p48 NAFORMA, Ministry of Natural Resources and Tourism, Tanzania Forest Services Agency, Government of Finland, AND FAO. 2015. NAFORMA - National Forest Resources Monitoring and Assessment of Tanzania Mainland - Main Results.	
Value applied	118.3	
Justification of choice of data or description of measurement methods and procedures applied	Derived in Section 3.2 of the PD	
Purpose of data	Calculation of leakage emissions	

Comments	
Data / Parameter	COLB
Data unit	t CO ₂ -e ha ⁻¹
Description	Average aboveground tree carbon stock for forests available for unplanned deforestation outside the Leakage Belt
Source of data	Values transformed from NAFORMA data. p48 NAFORMA, Ministry of Natural Resources and Tourism, Tanzania Forest Services Agency, Government of Finland, AND FAO. 2015. NAFORMA - National Forest Resources Monitoring and Assessment of Tanzania Mainland - Main Results.
Value applied	54.7 t CO ₂ -e ha ⁻¹
Justification of choice of data or description of measurement methods and procedures applied	Derived in Section 3.2 of the PD
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	$\Delta C_{BSL,LK,unplanned}$	
Data unit	t CO ₂ -e	
Description	Net CO ₂ emissions in the baseline from unplanned deforestation in the leakage belt	
Source of data	Derived in Section 3.2 of PD	
Value applied	Year	$\Delta C_{BSL,LB,unplanned}$
	2023	307,914.3
Justification of choice of data or description of measurement methods and procedures applied	Derived and justified in Section 3.2 of PD in which baseline is set	

Purpose of data	Calculation of leakage
Comments	

Data / Parameter	CF
Data unit	t C t ⁻¹ d.m.
Description	Carbon fraction of biomass
Source of data	IPCC 2006GL
Value applied	0.47
Justification of choice of data or description of measurement methods and procedures applied	Global default
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	COMFi
Data unit	Dimensionless
Description	Combustion factor
Source of data	Derived from Table 2.6 of IPCC, 2006.
Value applied	0.45
Justification of choice of data or description of measurement methods and procedures applied	Primary open tropical forest.
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	Ggi
Data unit	g kg-1 dry matter burnt
Description	Emission factor for gas g
Source of data	Derived from Table 2.5 of IPCC, 2006.
Value applied	GCH4 = 6.8 GN2O = 0.2
Justification of choice of data or description of measurement methods and procedures applied	Default values from IPCC
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	GWPg
Data unit	dimensionless
Description	Global warming potential for gas g
Source of data	Default factor from the latest IPCC Assessment Report
Value applied	CH4 = 28 N2O = 265
Justification of choice of data or description of measurement methods and procedures applied	Default values from IPCC SAR
Purpose of data	Calculation of baseline emissions
Comments	

Data / Parameter	$f_j(X,Y)$
Data unit	kg d.m. tree-1
Description	Allometric equation for species j linking measured tree variable(s) to aboveground biomass of living trees.
Source of data	Data resulting from the forest inventory.
Value applied	See forest inventory excel workbook "Mahale2017 inventory.xls"
Justification of choice of data or description of measurement methods and procedures applied	Mugasha, W. A., Eid, T., Bollandås, O. M., Malimbwi, R. E., Chamshama, S. A. O., Zahabu, E., & Katani, J. Z. (2013). Allometric models for prediction of above-and belowground biomass of trees in the miombo woodlands of Tanzania. Forest Ecology and Management, 310, 87-101.
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	Mugasha et al 2013 allometric equations used for both above-and belowground biomass estimation.

3.1.2 Data and Parameters Monitored (VCS, 3.16)

Data / Parameter	$\Delta C_{P,DefPA,i,t}$	
Data unit	t CO ₂ -e	
Description	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	
Source of data	Calculated	
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.	
Frequency of monitoring/recording	Every ≤ 5 years	
Value monitored	Year	$\Delta C_{P,DefPA,i,t}$ (t CO ₂ -e)
	2023	80,778.6
Monitoring equipment	None.	

QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method	Equation 3, VMD0015
Comments	None

Data / Parameter	$\Delta CP, DefLB, i, t$		
Data unit	t CO2-e		
Description	Net carbon stock change as a result of deforestation in the project case in the leakage belt in stratum i at time t		
Source of data	Calculated		
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.		
Frequency of monitoring/recording	Every < 5 years		
Value monitored	Year	$\Delta CP, DefLB, i, t$ (t CO2-e)	
	2023	54,528.2	
Monitoring equipment	None.		
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.		
Purpose of the data	Calculation of leakage		
Calculation method	Equation 4, VMD0015		
Comments	None		

Data / Parameter	$\Delta CP, DistPA, i, t$
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Data unit	t CO ₂ -e				
Description	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t				
Source of data	Calculated				
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.				
Frequency of monitoring/recording	Every < 5 years				
Value monitored	<table border="1"> <tr> <td>Year</td><td>$\Delta CP, DistPA, i, t$ (t CO₂-e)</td></tr> <tr> <td>2023</td><td>0</td></tr> </table>	Year	$\Delta CP, DistPA, i, t$ (t CO ₂ -e)	2023	0
Year	$\Delta CP, DistPA, i, t$ (t CO ₂ -e)				
2023	0				
Monitoring equipment	None.				
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.				
Purpose of the data	Calculation of project emissions				
Calculation method	Equation 20, VMD0015				
Comments	None				

Data / Parameter	ADefPA,u,i,t
Data unit	ha
Description	Area of recorded deforestation in the project area stratum i converted to land use u at time t
Source of data	Monitored at each monitoring/verification event through the use of classified satellite imagery
Description of measurement methods and procedures to be applied	Detailed procedures are provided under monitoring plan description. Monitoring responsibilities are listed in section 3.3.

Frequency of monitoring/recording	Every < 5 years	
Value monitored	Year	ADefPA,u,i,t (ha)
	2023	704.1
Monitoring equipment	ArcGIS	
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description	
Purpose of the data	Calculation of project emissions	
Calculation method	Not relevant	
Comments	None	

Data / Parameter	ADefLB,u,i,t	
Data unit	ha	
Description	Area of recorded deforestation in the leakage belt stratum i converted to land use u at time t	
Source of data	Monitored at each monitoring/verification event through the use of classified satellite imagery	
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.	
Frequency of monitoring/recording	Every < 5 years	
Value monitored	Year	ADefLB,u,i,t (ha)
	2023	475.3
Monitoring equipment	ArcGIS	

QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of leakage
Calculation method	Not relevant
Comments	None

Data / Parameter	ADistPA,q,i,t						
Data unit	ha						
Description	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t						
Source of data	Monitored at each monitoring/verification event through the use of classified satellite imagery						
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.						
Frequency of monitoring/recording	Every < 5 years						
Value monitored	<table><tr><td>Year</td><td>ADistPA,q,i,t</td></tr><tr><td>2023</td><td>0</td></tr></table>	Year	ADistPA,q,i,t	2023	0		
Year	ADistPA,q,i,t						
2023	0						
Monitoring equipment	ArcGIS						
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description						
Purpose of the data	Calculation of project emissions						
Calculation method	Not relevant						
Comments	None						

Data / Parameter	ADegW,i,t
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Data unit	ha
Description	Area potentially impacted by degradation processes in stratum i
Source of data	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Repeated each time the PRA indicates a potential for degradation. PRA conducted every < 2 years
Value monitored	0
Monitoring equipment	None.
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method	Not relevant
Comments	PRAs conducted in 2021 indicated <10% of respondents reported extraction of wood from the project area, well below the threshold that triggers further analysis of degradation per module M-REDD.

Data / Parameter	C _{BSL,i}
Data unit	t CO ₂ -e ha ⁻¹
Description	Carbon stock in all pools in the baseline case in stratum i
Source of data	Estimated from forest carbon inventory.
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description Monitoring responsibilities are listed in section 3.3.

Frequency of monitoring/recording	Every ≤ 10 years.
Value monitored	163.8
Monitoring equipment	dbh tape, measuring tape, GPS, clinometer
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Use equations as stated in the forest inventory and section 3.3 of the PD.
Comments	None

Data / Parameter	$C_{P,post,u,i}$
Data unit	t CO ₂ -e ha ⁻¹
Description	Carbon stock in all pools in post-deforestation land use u in stratum i
Source of data	In the Katavi Rukwa region, not all trees are removed in areas forests are cleared for grazing or agriculture. In Banda et al 2006 the residual basal area is estimated to be 12 m ² /ha ²³ . Regression of BA m ² /ha to live AGB and BGB t CO ₂ /ha were derived from the inventory data in "Ntakata 2017 inventory 1-31-19.xls" to determine C-post. From these regressions an estimated 35.29 t CO ₂ /ha live AGB and 13.20 t CO ₂ /ha BGB will remain C-post. Dead wood is assumed not to be a persistent pool in these agro-pastoral systems.

²³ Banda, T., Schwartz M., Caro, T. Woody vegetation structure and composition along a protection gradient in a miombo ecosystem of western Tanzania. 2006. Forest Ecology and Management. 230 (179-185). doi:10.1016/j.foreco.2006.04.032

Description of measurement methods and procedures to be applied	Value will be updated as new relevant published studies become available. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every ≤ 10 years.
Value monitored	49.1
Monitoring equipment	None
QA/QC procedures to be applied	
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Equation 5, VMD0015
Comments	None

Data / Parameter	BCEF
Data unit	Unitless
Description	Biomass conversion and expansion factor for conversion of commercial wood volume per unit area to total aboveground tree biomass per unit area; note that BCEF as defined here, and in most applications, is not applied on a per stem basis.
Source of data	The BCEF is found in Table 4.5 of the IPCC 2006 Report Volume 4 Ch 4. Humid tropical forest was selected as the forest type based on the IPCC climatic model that demonstrates that Tanzania is composed of moderate to humid tropical forest.
Description of measurement methods and procedures to be applied	Value will be updated as new relevant published studies become available. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every ≤ 10 years.

Value monitored	1.8 (Higher value selected because tops and branches are not considered part of growing stock)
Monitoring equipment	None
QA/QC procedures to be applied	
Purpose of the data	Calculation of harvested wood products
Calculation method	Equation 5, VMD0005
Comments	None

Data / Parameter	Pcom _i
Data unit	Dimensionless
Description	Commercial volume as a percent of total aboveground volume in stratum i.
Source of data	Based on direct inventory data. Trees greater than 20 cm DBH and included in the following list of species used for timber in the Miombo woodlands of Tanzania were considered commercial: Albizia antunesiana Brachystegia spiciformis Isoberlinia globiflora Julbernardia globiflora Lannea humilis Pterocarpus angolensis Swartzia madagascariensis The mean volume m³/ha of commercial stems / mean aboveground volume m³/ha
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.

Frequency of monitoring/recording	Every ≤ 10 years.
Value monitored	12.9%
Monitoring equipment	None
QA/QC procedures to be applied	
Purpose of the data	Calculation of harvested wood products
Calculation method	Equation 1, VMD0005
Comments	Note that application of the commercial percentage of total volume introduces the simplifying assumption (and conservative, as it is only used in the ex-ante baseline calculations) that all commercial stocks are extracted (i.e. perfect efficiency).

Data / Parameter	SLF _{ty}				
Data unit	Dimensionless				
Description	SLF = Fraction of wood products that will be emitted to the atmosphere within 5 years of production by class of wood product ty Winjum et al. 1998 give the following proportions for wood products with short-term (<5 yr) uses after which they are retired and oxidized (applicable internationally): Sawnwood 0.2 Woodbase panels 0.1 Other industrial roundwood 0.3 Paper and Paperboard 0.4 The methodology makes the assumption that all other classes of wood products, and where wood product class ty is unknown, are 100% oxidized within 5 years. Therefore SLF, by wood product class, is equal to: <table border="1"> <tr> <td>Wood Product Class</td><td>SLF</td></tr> <tr> <td>Sawnwood</td><td>0.2</td></tr> </table>	Wood Product Class	SLF	Sawnwood	0.2
Wood Product Class	SLF				
Sawnwood	0.2				

	Woodbase panels	0.1
	Other industrial roundwood	0.3
	Paper and paperboard	0.4
	Other classes of wood products	1.0
Source of data	The source of data is the published paper of Winjum et al. 1998 ²⁴	
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.	
Frequency of monitoring/recording	Every ≤ 10 years.	
Value monitored	0.2	
Monitoring equipment	None	
QA/QC procedures to be applied		
Purpose of the data	Calculation of harvested wood products	
Calculation method	Equation 2,4 VMD0005	
Comments	-	
Data / Parameter	WW _{ty}	
Data unit	Dimensionless	

²⁴ Winjum, J.K., Brown, S. and Schlamadinger, B. 1998. Forest harvests and wood products: sources and sinks of atmospheric carbon dioxide. Forest Science 44: 272-284

Description	WW = Fraction of extracted biomass effectively emitted to the atmosphere during production by class of wood product ty Winjum et al. 1998 indicate that the proportion of extracted biomass that is oxidized (burning or decaying) from the production of commodities to be equal to 19% for developed countries, 24% for developing countries. WW is therefore equal to $C_{XB,ty}$ multiplied by 0.19 for developed countries and 0.24 for developing countries.
Source of data	The source of data is the published paper of Winjum et al. 1998 ²⁵
Description of measurement methods and procedures to be applied	Parameter values to be updated if new empirically based peer-reviewed findings become available. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every ≤ 10 years.
Value monitored	0.24
Monitoring equipment	None
QA/QC procedures to be applied	
Purpose of the data	Calculation of harvested wood products
Calculation method	Equation 2,4 VMD0005
Comments	-

Data / Parameter	A_i
Data unit	ha
Description	Total area of stratum i

²⁵ Winjum, J.K., Brown, S. and Schlamadinger, B. 1998. Forest harvests and wood products: sources and sinks of atmospheric carbon dioxide. Forest Science 44: 272-284

Source of data	Direct forest inventory
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every ≤ 10 years.
Value monitored	216,994
Monitoring equipment	None
QA/QC procedures to be applied	
Purpose of the data	Calculation of harvested wood products
Calculation method	Equation 1 VMD0005
Comments	Ex-ante it shall be assumed that strata area will remain constant.

Data / Parameter	CDegW,i,t
Data unit	t CO2-e
Description	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t
Source of data	Estimated from diameter measurements of cut stumps in sample plots
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value monitored	0
Monitoring equipment	None.

QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method	Equation 8, VMD0015
Comments	PRAs conducted in 2021 indicated <10% of respondents reported extraction of wood from the project area, well below the threshold that triggers further analysis of degradation per module M-REDD.

Data / Parameter	APi
Data unit	ha
Description	Total area of degradation sample plots in stratum i
Source of data	Calculated as 3% of ADegW,i,t
Description of measurement methods and procedures to be applied	Detailed procedures provided under the monitoring plan description. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value monitored	NA
Monitoring equipment	ArcGIS
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method	Not relevant
Comments	None

Data / Parameter	$\Delta CP, DegW, i, t$
Data unit	t CO2-e

Description	Net carbon stock changes as a result of degradation in stratum i in the project area at time t
Source of data	Calculated
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value monitored	0
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method	Equation 8, VMD0015
Comments	PRAs conducted in 2021 indicated <10% of respondents reported extraction of wood from the project area, well below the threshold that triggers further analysis of degradation per module M-REDD.

Data / Parameter	PROPIMM
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by immigrating population
Source of data	Calculated based on the population data from the 2022 Tanzanian Census.
Description of measurement methods and procedures to be applied	To reference new government population growth data as released. Monitoring responsibilities are listed in section 3.3.

Frequency of monitoring/recording	Every < 5 years
Value monitored	29.0%
Monitoring equipment	None
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of leakage
Calculation method	Not relevant
Comments	None

Data / Parameter	PROPRES
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by resident population
Source of data	Calculated based on the population data from the 2022 Tanzanian Census.
Description of measurement methods and procedures to be applied	To reference new government population growth data as released. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 5 years
Value monitored	29.0%
Monitoring equipment	None
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of leakage
Calculation method	Not relevant

Comments	None
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Data / Parameter	CAB,tree,i
Data unit	t CO2e ha-1
Description	Carbon stock in aboveground biomass in trees in stratum i
Source of data	Calculated in Section 3.2 of the PD
Description of measurement methods and procedures to be applied	Provided in validated inventory SOPs "Ntakata SOPs 2017.09.25.doc"
Frequency of monitoring/recording	At least every 10 years, when forest inventory data is collected
Value monitored	118.3
Monitoring equipment	N/A
QA/QC procedures to be applied	Provided in validated inventory SOPs "Ntakata SOPs 2017.09.25.doc"
Purpose of the data	Calculation of baseline and project emissions
Calculation method	See validated inventory SOPs "Ntakata SOPs 2017.09.25.doc"
Comments	

Data / Parameter	CDW,i
Data unit	t CO2e ha-1
Description	Carbon stock in dead wood in the baseline in stratum i
Source of data	Calculated
Description of measurement methods and procedures to be applied	See forest inventory calculations "Mahale2017 inventory 1-31-19.xls"

Frequency of monitoring/recording	At least every 10 years, when inventory data is collected
Value monitored	1.1
Monitoring equipment	N/A
QA/QC procedures to be applied	See forest inventory calculations “Mahale2017 inventory 1-31-19.xls”
Purpose of the data	Calculation of baseline and project emissions
Calculation method	See forest inventory calculations “Mahale2017 inventory 1-31-19.xls”
Comments	

Data / Parameter	Project Forest Cover Benchmark Map
Data unit	N/A
Description	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data	Remote sensing data
Description of measurement methods and procedures to be applied	See section 3.2.2
Frequency of monitoring/recording	At least every 5 years or prior to verification
Value monitored	N/A
Monitoring equipment	
QA/QC procedures to be applied	Accuracy assessment (see Appendix 2)
Purpose of the data	Calculation of project emissions

Calculation method	
Comments	

Data / Parameter	Leakage Belt Forest Cover Benchmark Map
Data unit	N/A
Description	Map showing the location of forest land within the leakage belt area at the beginning of each monitoring period. Only applicable where leakage is to be monitored in a leakage belt
Source of data	Remote sensing data
Description of measurement methods and procedures to be applied	See Section 2.2.3
Frequency of monitoring/recording	At least every 5 years or prior to verification
Value monitored	N/A
Monitoring equipment	
QA/QC procedures to be applied	Accuracy assessment (see Appendix 2)
Purpose of the data	Calculation of project emissions
Calculation method	
Comments	

Data / Parameter	ARRL,forest,t
Data unit	ha
Description	Remaining area of forest in RRL at time t
Source of data	Calculated

Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3. See deviation.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	4,533,253 ha
Monitoring equipment	ArcGIS
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of project emissions
Calculation method	Calculated as the total area of the RRL minus all non-forested areas.
Comments	None

Data / Parameter	Aburn,q,i,t.
Data unit	ha
Description	Area burnt in post-natural disturbance stratum q in stratum i, at time t;
Source of data	See parameter ADistPA,q,i,t
Description of measurement methods and procedures to be applied	Monitored as part of ADistPA,q,i,t Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 5 years
Value monitored	0 ha
Monitoring equipment	None.
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description

Purpose of the data	Calculation of project emissions
Calculation method	$Aburn,q,i,t = ADistPA,q,i,t$ (area burnt in natural disturbance)
Comments	None

Data / Parameter	dbh
Data unit	cm
Description	diameter at breast height
Source of data	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied	Detailed procedures provided below in the SOPs. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years
Value monitored	See forest inventory excel sheet.
Monitoring equipment	dbh tape, measuring tape,
QA/QC procedures to be applied	Detailed procedures are provided under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Not relevant
Comments	None

Data / Parameter	UP,SS,i,pool#
Data unit	%
Description	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks

	and greenhouse gas sources in the with-project case (1,2...n represent different carbon pools and/or GHG sources)
Source of data	Calculations arising from field measurement data
Description of measurement methods and procedures to be applied	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Monitored at least once every 10 years (on re-measurement of forest carbon stocks)
Value monitored	Same as UBSL,SS,i,pool# values below.
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Not relevant
Comments	Same as UBSL,SS,i,pool# values below as forest carbon stock growth was not tracked.

Data / Parameter	EBSL SS,i, pool#
Data unit	t CO2-e
Description	Carbon stock or GHG sources (e.g. trees, dead wood, soil organic carbon, emission from fertilizer addition, emission from biomass burning etc.) in the baseline case
Source of data	Calculated

Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.					
Frequency of monitoring/recording	Every < 10 years.					
Value monitored	<table><tr><td>Year</td><td>GHGP-E,i,t (t CO2-e)</td></tr><tr><td>2023</td><td>31,735.7</td></tr></table>		Year	GHGP-E,i,t (t CO2-e)	2023	31,735.7
Year	GHGP-E,i,t (t CO2-e)					
2023	31,735.7					
Monitoring equipment	None					
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.					
Purpose of the data	Calculation of baseline emissions Calculation of project emissions					
Calculation method	Not relevant					
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period					

Data / Parameter	UBSL,SS,i,pool#
Data unit	%
Description	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the baseline case (1,2...n represent different carbon pools and/or GHG sources)
Source of data	Calculated
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.

Frequency of monitoring/recording	Every < 10 years.
Value monitored	25.1%
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	See equation 5 in the X-UNC module.
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / Parameter	EBSL SS,i						
Data unit	t CO2-e						
Description	Sum of combined carbon stocks and GHG sources in stratum i multiplied by the area of stratum i (Ai) in the baseline case						
Source of data	Calculated						
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.						
Frequency of monitoring/recording	Every < 10 years.						
Value monitored	<table><tr><td>Year</td><td>GHGP-E,i,t (t CO2-e)</td></tr><tr><td>2023</td><td>5,341.4</td></tr></table>	Year	GHGP-E,i,t (t CO2-e)	2023	5,341.4		
Year	GHGP-E,i,t (t CO2-e)						
2023	5,341.4						
Monitoring equipment	None						

QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Not relevant
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / Parameter	UBSL,SS,i
Data unit	%
Description	Percentage uncertainty in the combined carbon stocks and greenhouse gas sources in stratum i in the baseline case
Source of data	Calculated
Description of measurement methods and procedures to be applied	As this parameter was calculated rather than measured, no measurements methods are noted. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years.
Value monitored	25.1%
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this calculated parameter.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	See equation 5 in the X-UNC module.
Comments	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / Parameter	Bi,t
Data unit	tonnes d. m. ha ⁻¹
Description	Average aboveground biomass stock before burning stratum i,time t
Source of data	Calculated using forest inventory data
Description of measurement methods and procedures to be applied	Detailed forest inventory procedures are provided in the SOPs. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years
Value monitored	69.3
Monitoring equipment	None
QA/QC procedures to be applied	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method	Use equations in the forest inventory.
Comments	Ex-ante Bi,t is the weighted average across all strata

Data / Parameter	AGB
Data unit	tonnes d. m. ha ⁻¹
Description	Aboveground biomass density
Source of data	Calculated using forest inventory data

Description of measurement methods and procedures to be applied	Detailed forest inventory procedures are provided in the SOPs. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years
Value monitored	118.3
Monitoring equipment	None
QA/QC procedures to be applied	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Use equations as stated in the forest inventory.
Comments	None

Data / Parameter	Asp
Data unit	ha
Description	Area of sample plots in ha
Source of data	Recording and archiving of number and size of sample plots
Description of measurement methods and procedures to be applied	Detailed forest inventory procedures are provided in the SOPs. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years
Value monitored	See forest inventory report.
Monitoring equipment	None

QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Not relevant
Comments	None

Data / Parameter	Hsdw
Data unit	m
Description	Height of standing dead tree in m
Source of data	Monitored during the course of each forest inventory
Description of measurement methods and procedures to be applied	Detailed procedures provided below in the SOPs. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Every < 10 years
Value monitored	See forest inventory excel workbook.
Monitoring equipment	measuring tape, clinometer
QA/QC procedures to be applied	Detailed procedures are provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions Calculation of project emissions
Calculation method	Not relevant
Comments	None

Data / Parameter	CP,Dist,q,i
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Data unit	t CO ₂ -e ha ⁻¹
Description	Carbon stock in all pools in post-natural disturbance q in baseline stratum i
Source of data	Monitored
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	0, conservative assumption
Monitoring equipment	dbh tape, measuring tape, GPS, clinometer
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of project emissions
Calculation method	None
Comments	It can be conservatively assumed that a post-natural disturbance live and dead vegetation stock is equal to zero

Data / Parameter	A _i
Data unit	ha
Description	Total area of stratum i
Source of data	GIS coverages

Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	Every < 10 years
Value monitored	216,994
Monitoring equipment	ArcGIS
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of baseline emissions Calculation of project emissions Calculation of leakage
Calculation method	N/A
Comments	Ex-ante, it shall be assumed that stratum area will remain constant for the baseline period

Data / Parameter	AVFOR
Data unit	ha
Description	Total available national forest area for unplanned deforestation; ha
Source of data	GFRA Report 2020
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	26,027,000

Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Calculation of project emissions
Calculation method	None
Comments	

Data / Parameter	TOTFOR
Data unit	ha
Description	Total available national forest area; ha
Source of data	GFRA Report 2020
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	45,745,000
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Calculation of project emissions
Calculation method	None
Comments	

Data / Parameter	MANFOR
Data unit	ha

Description	Total area of forests under active management nationally; ha
Source of data	GFRA Report 2020
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	19,718,000
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Calculation of project emissions
Calculation method	None
Comments	

Data / Parameter	PROTFOR
Data unit	ha
Description	Total area of fully protected forests nationally; ha
Source of data	Conservatively set to 0, therefore not reported
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	0
Monitoring equipment	None

QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Calculation of project emissions
Calculation method	None

Data / Parameter	PROPLB
Data unit	ha
Description	Area of forest available for unplanned deforestation as a proportion of the total national forest area available for unplanned deforestation; proportion
Source of data	Calculated
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	0.007
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Not relevant
Calculation method	None

Data / Parameter	PROPCS
Data unit	proportion
Description	The proportional difference in stocks between areas of forest available for unplanned deforestation both inside and outside the Leakage Belt; proportion

Source of data	Calculated
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	0.462
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.
Purpose of the data	Calculation of project emissions
Calculation method	None

Data / Parameter	LKPROP
Data unit	Proportion
Description	Proportional leakage for areas with immigrating populations; proportion
Source of data	Calculated
Description of measurement methods and procedures to be applied	Procedures provided in section 3.3 of the PD. Monitoring responsibilities are listed in section 3.3.
Frequency of monitoring/recording	Prior to each verification event and at least every 5 years.
Value monitored	0.133
Monitoring equipment	None
QA/QC procedures to be applied	Neither QA/QC procedures nor calibration are relevant for this parameter.

Purpose of the data	Calculation of project emissions
Calculation method	Not relevant

3.1.3 Monitoring Plan (VCS, 3.16, 3.20)

This monitoring plan has been developed to be consistent with module VMD0015 of the REDD Methodological Module, “Methods for monitoring of greenhouse gas emissions and removals (M-MON).” This section focuses on establishing procedures for monitoring deforestation, illegal degradation, natural disturbance, and project emissions ex-post in the project area and leakage belt. Further, procedures for updating the forest carbon stocks and revising the baseline are also provided below.

For accounting purposes, the project conservatively assumes stable stocks and no biomass monitoring is conducted in areas undergoing carbon stock enhancement, as permitted in the methodology monitoring module VMD0015, hence $\Delta CP_{Enh,i,t}$ is set to 0.

Further as no commercial harvest of timber (including FSC selective logging) occurs in the with-project case, the degradation due to selective logging of certified areas is not monitored, thus parameter $\Delta CP_{SelLog,i,t}$ is set to 0. Because there is no commercial harvest, $CWP_{I,t}$ is also conservatively set to 0.

A separate section on quality assurance/quality control and data archiving procedures covers all monitoring tasks.

Organizations responsible for monitoring are listed below in Table 3.23. These organizations are responsible for implementing all aspects of a particular monitoring task, as described in the monitoring sub-sections below.

Estimation of ex-post net carbon stock changes and greenhouse gas emissions

Ex-post net carbon stock changes and greenhouse gas emissions will be calculated after monitoring:

- The net carbon stock change as a result of deforestation in the project area;
- The net carbon stock change as a result of degradation in the project area;
- The net carbon stock change as a result of natural disturbance in the project area; and
- The greenhouse gas emissions as a result of deforestation and degradation activities within the project area.

Monitoring Deforestation and Natural Disturbance

Forest cover change due to deforestation and natural disturbance is monitored through periodic assessment of classified satellite imagery, see below, covering the project area. Emissions ($\Delta C_P, Def, i, t$ and $\Delta C_P, DistPA, i, t$ for deforestation and natural disturbance, respectively) are estimated by multiplying areas $A_{DefPA, u, i, t}$ and $A_{DistPA, q, i, t}$, for deforestation and natural disturbance, respectively, by average forest carbon stock per unit area. Note that $A_{DistPA, q, i, t}$, is limited to the area where credits have been issued and is identified as the overlap between the delineated area of the disturbance and the summed area of unplanned deforestation in the project area to the year in which the disturbance occurred. Stock estimates from the initial field inventory completed in 2017, are valid for 10 years (per VM0007). Table 3.1 shows the data and parameters monitored.

Table 3.1. Data and Parameters for Monitoring Deforestation and Natural Disturbance.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$\Delta C_P, Def, i, t$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	t CO _{2e}	Calculated
$\Delta C_P, DistPA, i, t$	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum i at time t	t CO _{2e}	Calculated
$A_{DefPA, u, i, t}$	Area of recorded deforestation in the project area stratum i converted to land use u at time t	Ha	Monitored for each verification event
$A_{DistPA, q, i, t}$	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t	Ha	Monitored for each verification event
$C_{BSL, i}$	Carbon stock in all pools in the baseline case in stratum i	t CO _{2e} ha ⁻¹	Estimated from the forest carbon inventory
$ARRL, forest, t$	Remaining area of forest in RRL at time t	Ha	Updated prior to each verification event

Changes in forest cover (ADefPA,u,i,t and ADistPA,q,i,t) are monitored using classified Landsat imagery. Landsat 1G imagery products which are both radiometrically and geometrically corrected are used and converted to reflectance using the solar elevation angle parameter in the MTL text file and DN Haze parameter which is calculated from the raw imagery. Each image is then processed separately using hard classification techniques with a combination of supervised and clustering approaches. Areas of known land cover types (forest, bushlands, grasslands, agriculture) are used to develop training sites for a supervised classification. To reduce cloud and shadow coverage, multiple images from each scene are combined. All land cover types are combined into forest and non-forest groups for each Landsat scene, and then all scenes are combined to complete coverage of the full reference region. Once all scenes are combined, a mode filtering procedure is used whereby, a 3 x 3 pixel filter will be used to increase the minimum mapping unit to 0.81 ha. (90m x 90m).

The project area (and leakage belt boundary), as set in the PD, serves as the initial “forest cover benchmark map” against which changes in forest cover are assessed over the interval of the first monitoring period; the entire project area has been demonstrated to meet the forest definition at the beginning of the crediting period. For this monitoring period, change in forest cover is assessed against the preceding classified forest cover map marking the beginning of the monitoring interval. The area of remaining forest in the RRL (ARRL,forest,t) is derived by subtracting the non-forested area within the RRL, as found in the forest benchmark map from the total area of the RRL.

Monitoring Illegal Degradation

Emissions due to illegal logging is tracked by conducting surveys in the surrounding areas every two years. The parameters for monitoring illegal degradation are listed in Table 3.2 below. Locations surveyed will include villages in the project area and surrounding area. Implementation of the project action, the development of Village Land Use Plans, involved extensive interviews with members of communities in and around the project area. The interviews found insufficient evidence of illegal logging to proceed with further sampling of the project area. Therefore ADegW,i,t is set to 0 in this monitoring period (see “*Ntakata Continued Participatory Rural Appraisal Log Sheet (2023).pdf*”).

Insignificant illegal logging has occurred based on surveys conducted as a component of the VLUP development within the project area and leakage belt, and therefore, the additional sampling is unnecessary for the monitoring period.

Table 3.2. Data and Parameters for Monitoring Illegal Degradation.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
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$A_{DegW,i,t}$	Area potentially impacted by degradation processes in stratum i	Ha	Delineated based on survey results indicating general area of project potentially accessed and typical depth of penetration of illegal harvest activities from points of access
$C_{DegW,i,t}$	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t	t CO ₂ e	Estimated from diameter measurements of cut stumps in sample plots
AP_i	Total area of degradation sample plots in stratum i	Ha	Calculated as 3% of $A_{DegW,i,t}$
$\Delta C_{P,DegW,i,t}$	Net carbon stock changes as a result of degradation in stratum i in the project area at time t	t CO ₂ e	Calculated

Monitoring Project Emissions

With project emissions are calculated as the sum of emission from fossil fuel combustion ($E_{FC,i,t}$) + non-CO₂ emissions due to biomass burning ($E_{BiomassBurn,i,t}$) + direct N₂O emissions as a result of nitrogen application ($N_{2Odirect-N,i,t}$). As stipulated in the methodology, fossil fuel combustion in all situations is an optional emission source. Further, no nitrogen is applied on alternative land uses in the with-project case and hence project emissions therefore equal $E_{BiomassBurn}$ and are calculated using the VMD0013, "Estimation of greenhouse gas emissions from biomass burning (E-BB)" of the AD Partners modular REDD Methodology.

Non-CO₂ emissions from biomass burning in the project case include emissions from burning associated with deforestation and burning associated with natural disturbance, i.e. forest fire. It will be conservatively assumed that the total area burnt during the deforestation process is equal to the area deforested, $A_{DefPA,u,i,t}$. Thus, the area used when calculating E-BB is equal to $A_{burn,i,t}$. (area burnt) = $A_{burn,q,i,t}$. (area burnt in natural disturbance) + $A_{DefPA,u,i,t}$ (area burnt via deforestation in project ex post)."

Emissions from biomass burning are monitored with the parameters listed in Table 3.3. Analysis of aerial imagery during land cover classification did not reveal any substantial burn scars. Additionally, VGS patrols did not report any major fires within the project area during the monitoring period.

Table 3.3. Data and Parameters for Monitoring Emissions from Biomass Burning.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$E_{\text{BiomassBurn},t}$	Greenhouse emissions due to biomass burning as part of deforestation activities in stratum i in year t	tCO ₂ e of each GHG (CH ₄ , N ₂ O)	Calculated
$A_{\text{burn},i,t}$	Area burnt for stratum i at time t	Ha	Monitored for each verification event
$B_{i,t}$	Average aboveground biomass stock before burning stratum i , time t	tonnes d. m. ha ⁻¹	Conservatively assumed to be the carbon stock in all pools in the baseline case ($C_{\text{BSL},i}$).
COMF_i	Combustion factor for stratum i ; dimensionless	dimensionless	0.45 for primary open tropical forest. Derived from Table 2.6 of IPCC, 2006.
$G_{g,i}$	Emission factor for stratum i for gas g	kg t ⁻¹ dry matter burnt	GCH ₄ = 6.8 g kg ⁻¹ and GN ₂ O = 0.2 g kg ⁻¹ . Derived from Table 2.5 of IPCC, 2006.
GWP_g	Global warming potential for gas g	t CO ₂ /t gas g	Default values from IPCC Fifth Assessment SAR: CH ₄ = 28; N ₂ O = 265).

Monitoring of leakage carbon stock changes and greenhouse gas emissions

Leakage by local agents of deforestation is quantified in the leakage belt. The area deforested in the leakage belt ($A_{DefLB,i,t}$) is estimated in the same manner as the area deforested in the with-project case ($A_{DefPA,u,i,t}$) using the procedures outlined above in the monitoring deforestation section. Activity-shifting leakage within the leakage belt ($\Delta CLK-ASU-LB$) is then calculated as the with-project emissions in the leakage belt ($\Delta CP, LB$) minus the baseline emissions in the leakage belt ($\Delta CBSL, LK, unplanned$). Activity shifting leakage is monitored using the parameters listed in Table 3.4.

Table 3.4. Data and Parameters for Monitoring Activity Shifting Leakage.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$\Delta CP, LB$	Net greenhouse gas emissions within the leakage belt in the project case	t CO ₂ e	Calculated
$A_{DefLB,i,t}$	Area of recorded deforestation in the leakage belt at time t	ha	Monitored for each verification event
$\Delta CP, Def, i, t$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t	t CO ₂ e	Calculated

Immigrant leakage is calculated using a series of equations found in the LK-ASU module. Most of the data for calculating immigrant leakage has been derived for the ex-ante estimates (including $\Delta CBSL, LK, unplanned$; AVFOR; TOTFOR; PROTFOR; MANFOR; PROPLB; LBFOR; COLB; CLB; PROPCS; and $ABSL, PA, unplanned, t$) or gathered in the course of monitoring activity shifting leakage within the leakage belt and deforestation in the project area (including A_{DefPA} ; $A_{DefLB, i, t}$; and $\Delta CP, LB$).

The monitoring parameters MANFOR, PROTFOR, TOTFOR are sourced from the NAFORMA report and these monitoring parameters will be updated on review of current literature at least every 5 years. Demonstration that managed and protected forests are protected against deforestation is demonstrated, as stipulated in the LK-ASU module. Leakage caused by immigration is estimated using the parameters listed in Table 3.5.

To determine what proportion of the agents of deforestation have been resident in and around the leakage belt and project area for ≥ 5 years (PROPRES) and the proportion of area deforested by population that has migrated into the area in the last 5 years (PROPIMM), the 2022 Tanzanian Census was referenced. As it is sensitive to ask explicit questions regarding responsibility for deforestation, “the proportion of area deforested by population that has migrated into the area in the last 5 years” is assumed to be equal to the percentage of recent immigrants among local population with potential access to the project area (i.e. without directly asking if they are deforestation agents). Similarly, the “proportion of baseline deforestation caused by population that has been resident for ≥ 5 years” is assumed to be equal to the percentage of the local population residing in the area longer than 5 years with potential access to the project area. Therefore, based on the most recent census data, the PROPIMM parameter was estimated as the rate of population increase in the Katavi region over the last 5 years at an annual rate of 7.1%, totaling 29.0%. The rate was calculated by compounding the annual rate: $((1.071^5)-1)/1.071^5$

Table 3.5. Data and Parameters for Monitoring Immigrant Leakage.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
PROPIMM	Proportion of area deforested by immigrant agents in the leakage belt and project area	proportion	Monitored prior to each verification event and at least every 5 years
PROPRES	Proportion of baseline deforestation caused by population that has been resident for ≥ 5 years	proportion	Monitored prior to each verification event and at least every 5 years
TOTFOR	Total available national forest area	ha	Monitored prior to each verification event and at least every 5 years
PROTFOR	Total area of fully protected forests nationally	ha	Monitored prior to each verification event and at least every 5 years

MANFOR	Total area of forests under active management nationally	ha	Monitored prior to each verification event and at least every 5 years
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Monitoring of actual carbon stock changes and greenhouse gas emissions

Forest carbon stock estimates will be derived from field measurements less than or equal to 10 years old. Aboveground and belowground live tree and dead wood stocks will be re-assessed on or before November 2027. Carbon stocks and baseline greenhouse gas emissions are based on estimates from the initial inventory conducted in 2017 and detailed in the Ntakata Mountains Project Document.

Quality Assurance/Quality Control and Data Archiving Procedures

Monitoring Deforestation, Natural Disturbance, and Leakage

To ensure consistency and quality results, spatial analysts carrying out the imagery processing, interpretation, and change detection procedures strictly adhered to best practices and good practice guidelines, when using the alternative method for quantifying deforestation. All data sources and analytical procedures are documented and archived (detailed under data archiving below).

Accuracy of the classification is assessed by comparing the classification with ground-truth points or samples of high-resolution imagery. Any data collected from ground-truth points is recorded (including GPS coordinates, identified land-use class, and supporting photographic evidence) and archived. Any sample points of high-resolution imagery used to assess classification accuracy will also be archived. Samples used to assess classification accuracy are well-distributed throughout the project area (as far as is possible considering availability of high-resolution imagery and/or logistics of acquiring ground-truth data), with a minimum sampling intensity of 50 points each for the forest and non-forest classes.

The classification is only used in the forest cover change detection step if the overall classification accuracy, calculated as the total number of correct samples / the total number of samples, is equal to or exceeds 90%. The classification accuracy for this monitoring period is >90%.

All data sources and processing, classification and change detection procedures are documented and stored in a dedicated long-term electronic archive.

Information related to monitoring deforestation maintained in the archive include:

Forest / non-forest maps;

Documentation of software type and procedures applied (including all pre-processing steps and corrections, spectral bands used in final classifications, and classification methodologies and algorithms applied); and

Data used in accuracy assessment - ground-truth points (including GPS coordinates, identified land-use class, and supporting photographic evidence) and/or sample points of high-resolution imagery.

Forest Carbon Stocks and Degradation

Field sampling was not required in this monitoring period.

Quality control procedures related to monitoring leakage include conducting a review of the current literature at least every 5 years to source information on the area of the monitoring parameters MANFOR, PROTFOR, and TOTFOR. Further, participatory rural appraisals used to assess the length of time people have been living in the project area and leakage belt will be implemented by personnel with experience conducting community surveys.

Data Archiving

Data archived will be maintained through at least two years beyond the end of the project crediting period. All project records are secure and retrievable. This includes project documents saved on the desktop of the Director of Carbon Tanzania and stored in the Director's file cabinets (based in Arusha, Tanzania). An identical version of the project documents are remotely saved on an external hard drive and in the cloud via Dropbox. Furthermore, many project documents (e.g., VCS Project Description, Monitoring Reports, CCBS Project Design Document, Project Implementation Reports, Validation and Verification Reports, etc.) are publicly available and stored on both the Standards' website and on the Markit Environmental Registry. Given the extended time frame and the pace of production of updated versions of software and new hardware for storing data, electronic files will be updated periodically or converted to a format accessible to future software applications, as needed.

3.1.4 Dissemination of Monitoring Plan and Results (VCS, 3.18; CCB, CL4.2)

A summary of the monitoring plan was translated to Swahili and disseminated to the community groups and other stakeholders prior to validation. Monitoring results are communicated through meetings with the Village Governments in each of the eight villages on a bi-annual basis. A copy of the monitoring results was shared with the Tanganyika and Mpanda districts. All of these meetings (with Village Governments and districts) provide an opportunity to analyze and discuss the project strategy and activities to assess effectiveness and consider adjustments.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions (VCS, 3.15)

The calculation of baseline emissions is detailed in the Quantification of GHG Emission Reductions and Removals section 3.2.1 of the Ntakata Mountains Project Document titled, “Ntakata_PD_Validated_UpdatedFeb2025_CLEAN.pdf”. The calculations for baseline emissions are included in “Ntakata_REDD_Calcs_3-8-19.xlsx” and the values are carried into the monitoring calculations “Ntakata_2024_VCS-Monitoring-Calcs_*.xlsx”. The next baseline revision is scheduled in 2027, 10 years from the project start date. A summary description of the procedures, equations, and parameters used in the calculation of baseline emissions during the reporting are included in this section.

During the reporting period, 704 ha of forest cover was lost, compared to 4,972 ha in the baseline. Therefore, the project prevented 4,267 ha of forest loss during the reporting period.

Table 3.6 Annual baseline deforestation expected during the reporting period.

Year	Unplanned, i.e., PA (ha)
2023	4,972.1

Development of the project baseline emissions from unplanned deforestation, both rate and location, was conducted in conformance with the VCS modular REDD methodology VM0007, specifically the BL-UP module using the simple historic approach. The simple historic approach is conservative in this case compared to the alternate population driver approach because the population in Tanzania is expanding rapidly, at a national rate of 3.0% per year, according to the World Bank²⁶. By applying the simple historic approach the baseline scenario conservatively excludes the impact of a growing population on the rate of deforestation in the RRD.

The reference region for rate of deforestation (RRD) had a total area of 6,508,672 hectares²⁷ and was delineated as shown in Figure 3.1. It excluded the project area and leakage belt, and all non-forested areas at the start of the historical reference period in the year 2007. Further, the reference region had been defined with knowledge of the drivers of unplanned deforestation in the region.

A guiding principle in the delineation of the reference region was, to the extent possible within the requirements of the VM0007 methodology, to reflect political boundaries (districts).

The main agents of deforestation in the RRD are small scale farmers who intend on establishing croplands through conversion of forest land. The proportion of agriculturalist to ranchers is the same in the RRD as is expected in the project area in the baseline case. Landscape factors (i.e., soil type, vegetation type, elevation, and slope) do not drive agricultural decisions for small scale farmers.

The reference region for projecting location of deforestation (RRL) has approximately the same boundary as the RRD, but it excludes all forest reserves because it was expected that conservation of forest reserves would be enforced during the baseline projection period (i.e. will improve from the

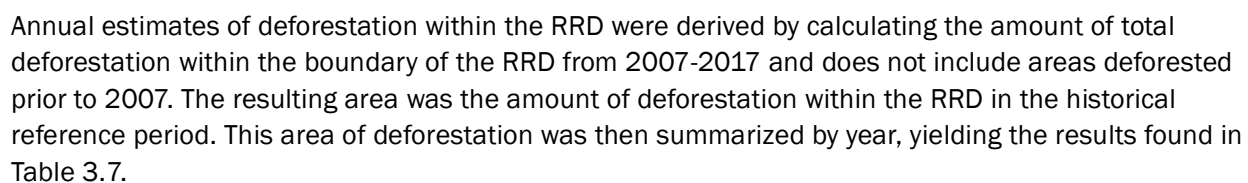
²⁶ World Bank. 2019. Population growth annual percent – Tanzania.

<https://data.worldbank.org/indicator/SP.POP.GROW?locations=TZ>

²⁷ The area of the RRD is larger than the minimum required (MREF). The MREF was calculated to be 294,080 ha.

historic reference period). The RRL has an area of 4,533,253 hectares. In agreement with the methodology, it is a single parcel, contiguous with and including the project area and the leakage belt. Further, it is 29.23% non-forest and 70.57% forest and thus in compliance with the methodological requirements of a minimum of 5% non-forest and a minimum of 50% forest. The area of the RRL is within $\pm 25\%$ of the area of the RRD. As the primary driver of deforestation is subsistence and small-scale farming, access to and availability of land are the most important factors when determining if land is suitable for conversion. Neither, soil suitability, precipitation, elevation, or access to markets play a significant role in the deforestation agent's decision on where to settle and convert land. All conservation lands where the protected status is likely to be enforced were removed from the RRL.

Figure 3.1. Reference Region for Rate (RRD) and Reference Region for Location (RRL).



Year	Area of deforestation in RRD (ha/yr)
2007-2013	124,024

2010-2017	146,327
Average	135,176

The mean area deforested across the historical reference period (ABSL,RRD,unplanned,t), located above in Table 3.7, was used for each year in the baseline period.

ABSL,RRD,unplanned,t = 135,175ha

Estimation of Annual Areas of Unplanned Baseline Deforestation in the Project Area

The projected amount of unplanned baseline deforestation in the RRL was estimated using Equation 4 in module BL-UP:

$$A_{BSL,RR,unplanned,t} = A_{BSL,RRD,unplanned,t} * P_{RRL} \quad \text{Equation 4}$$

Where:

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

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

P_{RRL} Ratio of forest area in the RRL at the start of the baseline period to the total area of the RRD; dimensionless

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

Table 3.8. Projected Area of Unplanned Baseline Deforestation in the RRL.

Parameter	Description	Value	Justification
ABSL,RR,unplanned,t	Projected area of unplanned baseline deforestation in the reference region for location (RRL) in year t ; ha	117,046	
ABSL,RRD,unplanned,t	Projected area of unplanned baseline deforestation in RRD in year t ; ha	135,175	Derived in Section 3.2.1
PRRL	Ratio of forest area in the RRL at the start of the baseline period to the total area of the RRD; dimensionless	0.866	RRL2007 Forest = 5,635,752 ha
			RRD = 6,508,672 ha

The measure of performance of the risk maps used to develop that baseline, as mandated by the methodology is the “Figure of Merit” (FOM) that confirms the model prediction in statistical manner (Pontius et al. 2008²⁸; Pontius et al. 2007²⁹). The FOM is a ratio of the intersection of the observed change (change between the reference maps in time 1 and time 2) and the predicted change (change between the reference map in time 1 and simulated map in time 2) to the union of the observed change and the predicted change. The FOM ranges from 0%, where there is no overlap between observed and predicted change, to 100% where there is a perfect overlap between observed and predicted change. The highest percent FOM and least number of factor maps used for creating the deforestation risk map must be used as the criteria for selecting the most accurate deforestation risk map to be used for predicting future deforestation.

Equation 15 in module BL-UP VMD0007.

$$FOM = \frac{CORRECT}{CORRECT + Err_A + Err_B}$$

Where,

CORRECT Area correct due to observed change predicted as change; ha

ErrA Area of error due to observed change predicted as persistence; ha

ErrB Area of error due to observed persistence predicted as change; ha

The final model was selected from multiple runs, according to the methodology as having the highest FOM value with the fewest number of factor maps with a minimum of one factor map in each of the four categories defined.

FOM 57975 ha / (57975ha + 1311001 ha + 1266126)

%FOM = 31.1%

The minimum threshold for the best fit as measured by the Figure of Merit (FOM) is defined by the net observed change in the reference region for the calibration period of the model (2005-2010). Net observed change is calculated as the total area of change being modeled in reference region during the calibration period as percentage of the total area of the reference region. Net change from 2007-2013 was 744,142.42 hectares out of a total of 6,508,672.19 which is 11.4% of total area. The FOM value therefore meets the minimum threshold.

Figure 3.5. Map of the Predicted Deforestation in the Baseline Period from 2017 to 2026.

²⁸ R G Pontius Jr, W Boersma, J-C Castella, K Clarke, T de Nijs, C Dietzel, Z Duan, E Fotsing, N Goldstein, K Kok, E Koomen, C D Lippitt, W McConnell, A Mohd Sood, B Pijanowski, S Pithadia, S Sweeney, T N Trung, A T Veldkamp, and P H Verburg. 2008. Comparing input, output, and validation maps for several models of land change. *Annals of Regional Science*, 42(1): 11-47.

²⁹ R G Pontius Jr, R Walker, R Yao-Kumah, E Arima, S Aldrich, M Caldas and D Vergara. 2007. Accuracy assessment for a simulation model of Amazonian deforestation. *Annals of Association of American Geographers*, 97(4): 677-695.)

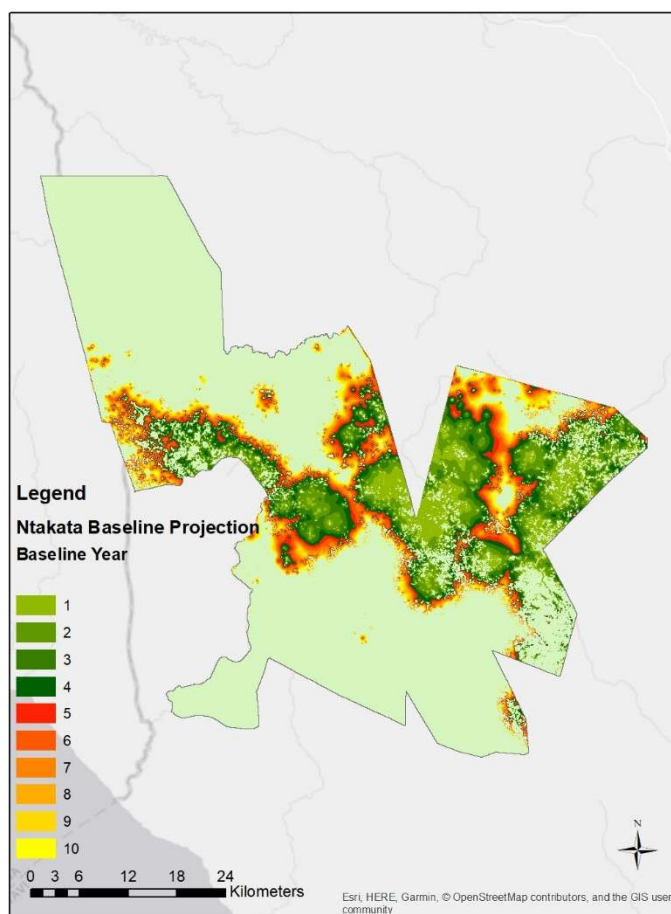


Table 3.10. Amount of Baseline Deforestation (ha) in the Project Area.

Year	Aunplanned,i,t, PA (ha)
2017	11,229.8
2018	14,144.1
2019	13,023.1
2020	11,169.0
2021	6,914.3
2022	7,435.7
2023	4,972.1
2024	4,830.2
2025	4,746.6

2026	4,441.0
Total	82,906.0

Table 3.11. Amount of Baseline Deforestation (ha) in the Leakage Belt.

Year	Aunplanned,i,t, PA (ha)
2017	2,399.0
2018	5,245.1
2019	5,799.7
2020	5,833.3
2021	3,969.7
2022	4,007.3
2023	2,609.1
2024	2,687.5
2025	2,784.0
2026	2,471.9
Total	37,806.4

Baseline stock change in each carbon pool was calculated by subtracting post-deforestation stocks from forest carbon stocks using equations 16-22:

$$\Delta C_{AB_{tree},i} = C_{AB_{tree,bsl},i} - C_{AB_{tree,post},i} \quad (16)$$

$$\Delta C_{AB_{non-tree},i} = C_{AB_{non-tree,bsl},i} - C_{AB_{non-tree,post},i} \quad (17)$$

$$\Delta C_{BB_{tree},i} = C_{BB_{tree,bsl},i} - C_{BB_{tree,post},i} \quad (18)$$

$$\Delta C_{BB_{non-tree},i} = C_{BB_{non-tree,bsl},i} - C_{BB_{non-tree,post},i} \quad (19)$$

$$\Delta C_{DW,i} = C_{DW,bsl,i} - C_{DW,post,i} \quad (20)$$

$$\Delta C_{LI,i} = C_{LI,bsl,i} - C_{LI,post,i} \quad (21)$$

$$\Delta C_{SOC,i} = C_{SOC,bsl,i} - C_{SOC,PD-BSL,i} \quad (22)$$

Where:

$\Delta C_{AB_tree,i}$	Baseline carbon stock change in aboveground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_tree,bsl,i}$	Forest carbon stock in aboveground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_tree,post,i}$	Post-deforestation carbon stock in aboveground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{BB_tree,i}$	Baseline carbon stock change in belowground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_tree,bsl,i}$	Forest carbon stock in belowground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_tree,post,i}$	Post-deforestation carbon stock in belowground tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{AB_non-tree,i}$	Baseline carbon stock change in aboveground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_non-tree,bsl,i}$	Forest carbon stock in aboveground non-tree vegetation in stratum i ; t CO ₂ -e ha ⁻¹
$C_{AB_non-tree,post,i}$	Post-deforestation carbon stock in aboveground non-tree vegetation in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{BB_non-tree,i}$	Baseline carbon stock change in belowground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_nontree,bsl,i}$	Forest carbon stock in belowground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$C_{BB_nontree,post,i}$	Post-deforestation carbon stock in belowground non-tree biomass in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{DW,i}$	Baseline carbon stock change in dead wood in stratum i ; t CO ₂ -e ha ⁻¹
$C_{DW,bsl,i}$	Forest carbon stock in dead wood in stratum i ; t CO ₂ -e ha ⁻¹
$C_{DW,post,i}$	Post-deforestation carbon stock in dead wood in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{LI,i}$	Baseline carbon stock change in litter in stratum i ; t CO ₂ -e ha ⁻¹
$C_{LI,bsl,i}$	Forest carbon stock in litter in stratum i ; t CO ₂ -e ha ⁻¹
$C_{LI,post,i}$	Post-deforestation carbon stock in litter in stratum i ; t CO ₂ -e ha ⁻¹
$\Delta C_{SOC,i}$	Baseline carbon stock change in soil organic carbon in stratum i ; t CO ₂ -e ha ⁻¹
$C_{SOC,bsl,i}$	Forest carbon stock in soil organic carbon in stratum i ; t CO ₂ -e ha ⁻¹
$C_{SOC,PD-BSLi}$	Post-deforestation carbon stock in soil organic carbon in stratum i ; t CO ₂ -e ha ⁻¹
i	1, 2, 3, ... M strata

To estimate GHG emissions in the baseline within the project boundary, equation 25 was used:

$$GHG_{BSL,E} = \sum_{t=1}^t \sum_{j=1}^M (E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t}) \quad (25)$$

Where:

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

Finally, net baseline emissions were calculated using equations 24, 25 and 26:

$$\Delta C_{BSL,unplanned} = \Delta C_{BSL,PA,unplanned} + GHG_{BSL,E} \quad (26)$$

$$\Delta C_{BSL,PA,unplanned} = \Delta C_{TOT,PA} \quad (27)$$

$$\Delta C_{BSL,LK,unplanned} = \Delta C_{TOT,LB} \quad (28)$$

Where:

$\Delta C_{BSL,unplanned}$	Net greenhouse gas emissions in the baseline from unplanned deforestation; t CO ₂ -e
$\Delta C_{BSL,PA,unplanned}$	Net CO ₂ emissions in the baseline from unplanned deforestation in the project area; t CO ₂ -e
$\Delta C_{BSL,LK,unplanned}$	Net CO ₂ emissions in the baseline from unplanned deforestation in the leakage belt; t CO ₂ -e
$GHG_{BSL,E}$	Greenhouse gas emissions as a result of deforestation activities within the project boundary in the baseline; t CO ₂ -e
$\Delta C_{TOT,PA}$	Sum of the baseline carbon stock change in all pools up to time t^* in the project area; t CO ₂ -e
$\Delta C_{TOT,LB}$	Sum of the baseline carbon stock change in all pools up to time t^* in the leakage belt; t CO ₂ -e

3.2.2 Project Emissions (VCS, 3.15)

Project emissions are calculated by applying Equation 1 as found in module M-REDD (VMD0015) of Methodology VM0007. Values for individual parameters are justified in Table 3.6 or derived in Tables 3.7, Table 3.9, and Table 3.10.

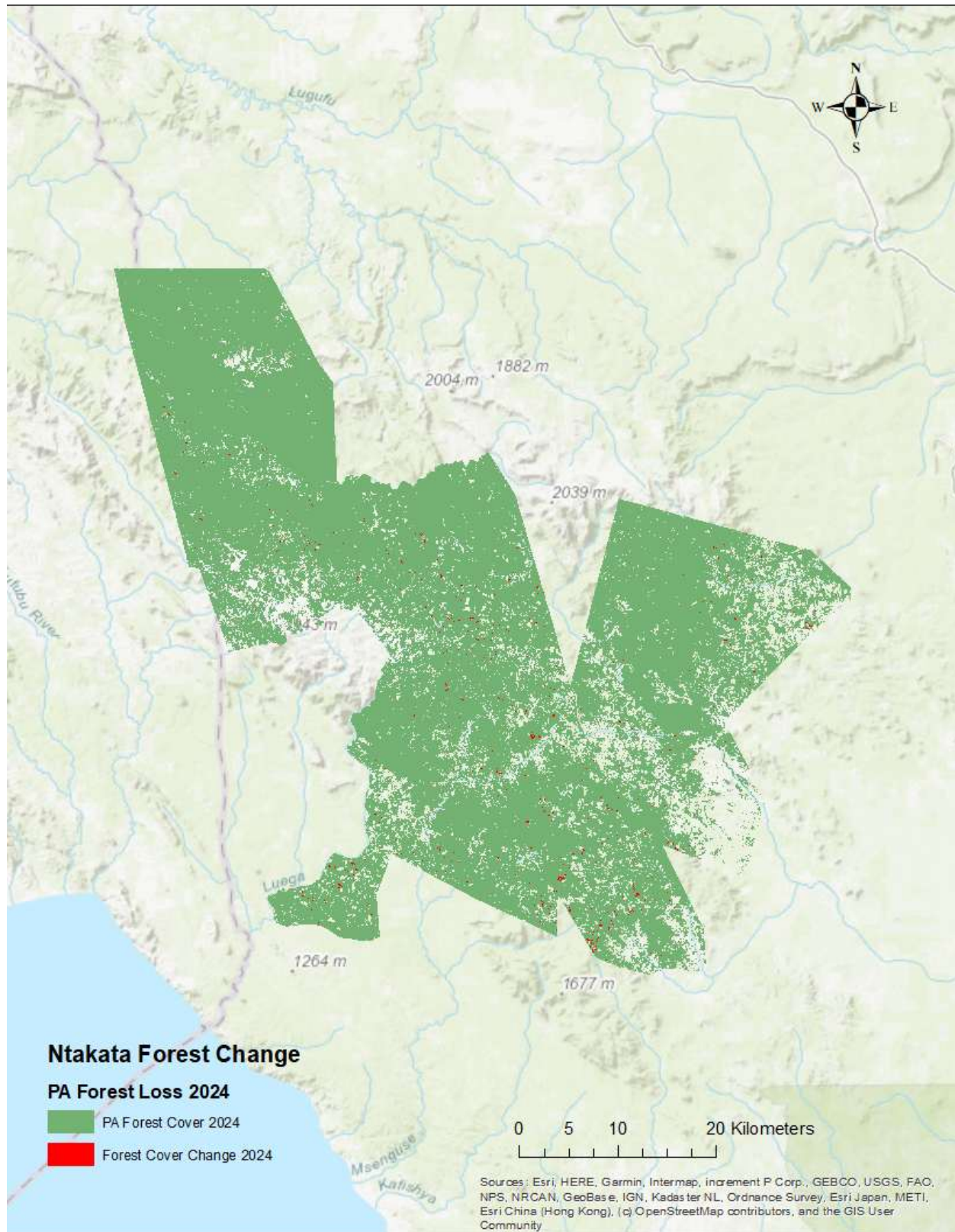


Figure 3.1. A benchmark map of the project area showing forested area at the end of the monitoring period in 2024, derived using Landsat imagery.

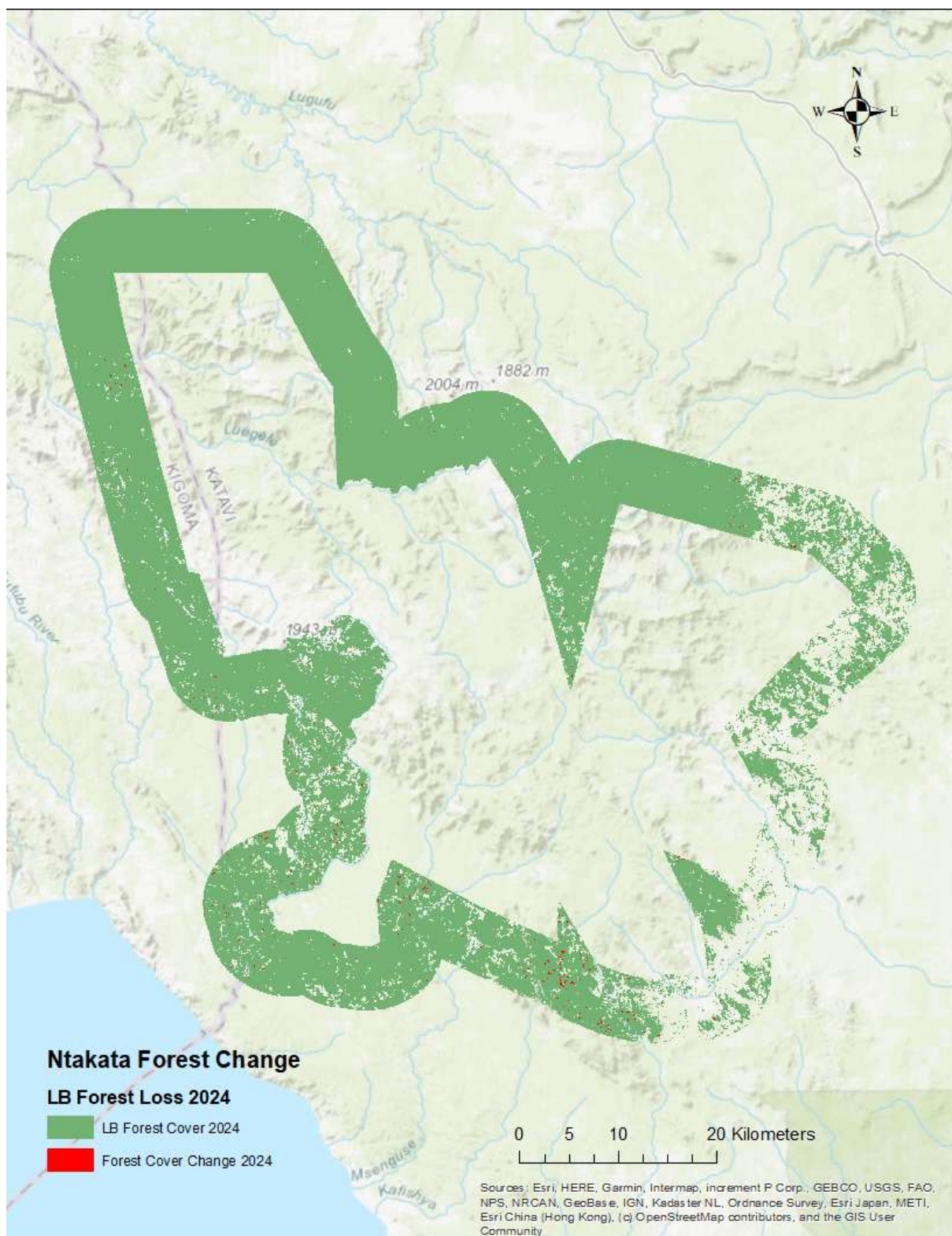


Figure 3.2. Benchmark map of the leakage belt showing forested area at the end of the monitoring period in 2024.

Table 3.6. Parameters and Values used to Calculate Annual Project Emissions.

Parameter	Description	Value	Justification
ΔC_P	Net greenhouse gas emissions within the project area under the project scenario; t CO ₂ e	See table below for calculations.	
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t; t CO ₂ e	See table below for calculations.	
$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum i at time t; t CO ₂ e	$\Delta C_{P,Deg,i,t} = 0$	No emissions from degradation occurred due to the prevalence of available fuelwood outside the project area. Forest patrols will further deter degradation activities. Additionally, a PRA, conducted in 2023, showed that 3.3% of survey respondents considered degradation/illegal logging to be a problem within the project area, well below the 10% threshold that would trigger further investigation (see “Ntakata Continued Participatory Rural Appraisal Log Sheet (2023).pdf”). Therefore, degradation is set to 0 for the monitoring period.

			Emissions resulting from degradation due to selective logging of FSC certified areas (parameter $\Delta C_{P, SelLog, i, t}$) equates to zero as no selective FSC logging occurs in neither the baseline or with-project case.
$\Delta C_{P, DistPA, i, t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t; t CO ₂ e	$\Delta C_{P, DistPA, i, t} = 0$	No disturbances occurred during the monitoring period that caused tree death and CO ₂ emissions.
$GHG_{P-E, i, t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum i in year t; t CO ₂ e	See table below for calculations.	
$\Delta C_{P, Enh, i, t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t; t CO ₂ e	$\Delta C_{P, Enh, i, t} = 0$	Conservative to exclude.

Table 3.7. Data used to Calculate ΔC_P .

Year	$\Delta C_{P, DefPA, i, t}$ (t CO ₂ -e)	$\Delta C_{P, Deg, i, t}$ (t CO ₂ -e)	$\Delta C_{P, DistPA, i, t}$ (t CO ₂ -e)	$GHG_{P-E, i, t}$ (t CO ₂ -e)	$\Delta C_{P, Enh, i, t}$ (t CO ₂ -e)	ΔC_P (t CO ₂ -e)
2023	80,778.6	0	0	5,341.4	0	86,120.0

Deforestation in the With-Project Case

Table 3.8. Parameters and Values used to Calculate Annual Ex Post Deforestation Emissions.

Parameter	Description	Value	Justification
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t; t CO ₂ e	See table below for calculations.	See table below for calculations.
$A_{DefPA,u,i,t}$	Area of recorded deforestation in the project area stratum i converted to land use u at time t; ha	See table below for calculations.	See table below for calculations.
$\Delta C_{pools,Def,u,i,t}$	Net carbon stock changes in all pools in the project case in land use u in stratum i at time t; t CO ₂ e ha ⁻¹	$\Delta C_{pools,Def,u,i,t} = 114.7$	See the forest inventory report for more information on the derivation of this value.

Table 3.9. Data Used to Calculate $\Delta C_{P,DefPA,i,t}$.

Year	$A_{DefPA,u,i,t}$ (ha)	$\Delta C_{pools,Def,u,i,t}$ (t CO ₂ -e/ha)	$\Delta C_{P,DefPA,i,t}$ (t CO ₂ -e)
2023	704.1	114.7	80,778.6

GHG Emissions

Greenhouse gas emissions as a result of deforestation activities within the project area ($GHG_{P,E,i,t}$) are calculated in Table 3.11 using Equation 30. Parameters are found in Table 3.10.

Table 3.10. Parameters and Values Used to Calculate Annual GHG Emissions.

Parameter	Description	Value	Justification
$GHG_{P,E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project area in the project case in stratum i in year t; t CO ₂ e	See table below for calculations.	
$E_{BiomassBurn,i,t}$	Non-CO ₂ emissions due to biomass burning in stratum i in year t; t CO ₂ e	See table below for calculations.	Biomass burning is expected to occur in the with project case.

Table 3.11. Calculation of $E_{BiomassBurn,i,t}$ for the project area.

Year	aDefPA,u,i,t (ha)	COMF	E-N ₂ O Biomass Burning (tCO ₂ e)	E-CH ₄ Biomass Burning (tCO ₂ e)	E-Biomass Burning (tCO ₂ e)	GHGP-E,i,t (t CO ₂ -e)
2023	704.1	0.45	1,163.1	4,178.4	5,341.4	5,341.4

3.2.3 Leakage Emissions (VCS, 2.5, 3.2, 3.6, 3.15, 4.3)

Leakage emissions from displacement of unplanned deforestation are estimated in conformance with the VCS modular REDD methodology VM0007, specifically the LK-ASU module. This module provides for accounting for activity shifting leakage resulting from both local and immigrant deforestation agents.

Leakage due to market effects is restricted to market responses due to project activity impacts on market supply of commercial timber and fuelwood. Agents of deforestation in the project area are mainly pastoralists, not loggers, who would not have the capacity to haul and commercialize any timber recovered in the process of land clearing activities. Instead, timber and fuelwood are used locally for subsistence use. Additionally, timber markets in Tanzania exist predominantly in coastal regions due to easier access to markets through ports and roads. Therefore, this project did not produce market effects leakage related to timber production. Fuelwood in the project region was predominately collected for subsistence purposes, and not commercially harvested, thus reductions in fuelwood produced no market effects (beyond activity displacement, treated above).

Estimation of Baseline Carbon Stock Changes and Greenhouse Gas Emissions in the Leakage Belt

Activity shifting leakage due to displacement of unplanned deforestation was assessed using a baseline specific to the leakage belt developed following procedures detailed in the Module BL-UP. Details of the baseline are provided in the Project Document section “1.1.3 Leakage” for the leakage belt, against which with-project deforestation in the leakage belt is measured. Calculations of baseline carbon stocks and emissions in the leakage belt are found in Table 3.12.

Table 3.12. Estimation of Baseline Carbon Stock Changes and Greenhouse Gas Emissions in the Leakage Belt.

Year	ΔCTOT (t CO ₂ -e)
2023	307,914.3

Leakage in the leakage belt was calculated based on total area deforested in the leakage over the monitoring period. Greenhouse gas emissions as a result of deforestation activities within the leakage belt (GHGP,E,i,t) are calculated in Table 3.13 using Equation 30. Leakage is then calculated as the difference between project and baseline carbon stock changes and greenhouse gas emissions in the leakage belt, as outlined in Equation 1 in LK-ASU VMD0010. The parameters for monitoring leakage in the project case are listed in Table 3.14. Net CO₂ emissions due to unplanned deforestation displaced from the project area to the leakage belt are calculated for each year in the baseline period in Table 3.15.

Table 3.13. Calculation of eBiomassBurn,i,t. for the leakage belt.

Year	aDefLB,u,i,t (ha)	COMF	E-N ₂ O Biomass Burning (tCO ₂ e)	E-CH ₄ Biomass Burning (tCO ₂ e)	E-Biomass Burning LB (tCO ₂ e)
2023	475.3	0.45	785.1	2,820.5	3,605.6

Table 3.14. Parameters and Values used to Calculate Annual GHG Emissions in the Leakage Belt.

Parameter	Description	Value	Justification
$\Delta C_{LK-ASU-LB}$	Net CO ₂ emissions due to unplanned deforestation displaced from the project area to the leakage belt; t CO ₂ e	See Table 3.15.	Calculated.
$\Delta C_{BSL,LK,unplanned}$	Net CO ₂ emissions in the baseline from unplanned deforestation in the leakage belt; t CO ₂ e	See Table 3.13.	Derived in Section 3.1.
$\Delta C_{P,LB}$	Net greenhouse gas emissions within the leakage belt in the project case t CO ₂ e	See Table 3.15.	Ex-post estimates of emissions within the leakage belt are calculated by multiplying the area deforested in the leakage belt by carbon stocks in the leakages belt by strata.

Table 3.15. Estimates of the Net CO₂ Emissions due to Unplanned Deforestation Displaced from the Project Area to the Leakage Belt.

Year	$\Delta\text{CBSL, LB, un}$ planned (t CO ₂ -e)	ADefLB, u, i t (ha)	$\Delta\text{CP, DefLB, i}$ t (t CO ₂ -e)	E-Biomass Burning LB (tCO ₂ e)	$\Delta\text{CBSL, LK,}$ unplanned (t CO ₂ -e)	$\Delta\text{CP, LB}^1$ (t CO ₂ -e)	$\Delta\text{CLK-ASU-LB}$ (t CO ₂ -e)
2023	659,244.3	475.3	54,528.2	3,605.6	307,914.3	58,133.8	0.0

Estimation of Unplanned Deforestation Displaced from the Project Area to Outside the Leakage Belt

We first estimated parameter PROPIMM, the proportion of area deforested by population that has migrated into the area in the last 5 years, applying the approach described in section 3.1.3.

The area-weighted average live aboveground tree carbon stock for Tanzanian forests (COLB) was calculated using data from NAFORMA³⁰ as found in Table 3.17. COLB = 54.7 t CO₂-e ha⁻¹.

Table 3.17. Live Aboveground Biomass Carbon Stocks in Tanzanian Forests.

Vegetation Type	AGB ¹ t CO ₂ /ha
Forest	111.8
Woodland	55.1
Bushland	21.8
Area-weighted average	54.7

The net leakage outside the leakage belt ($\Delta\text{CLK-ASU, OLB}$) was calculated ex-post using Equation 11 in module LK-ASU VMD0010. The values for the parameters used in this equation can be found in Table 3.19. Annual values for $\Delta\text{CLK-ASU, OLB}$ were calculated in Table 3.20.

Table 3.19. Parameters and Values used to Calculate the Net CO₂ Emissions due to Unplanned Deforestation Displaced Outside the Leakage Belt.

Parameter	Description	Value	Justification/Source
$\Delta\text{CLK-ASU, OLB}$	Net CO ₂ emissions due to unplanned deforestation displaced outside the leakage belt; t CO ₂ e	Calculated in Table 3.20, below.	

³⁰ Values transformed from NAFORMA data. p48 NAFORMA, Ministry of Natural Resources and Tourism, Tanzania Forest Services Agency, Government of Finland, AND FAO. 2015. NAFORMA - National Forest Resources Monitoring and Assessment of Tanzania Mainland - Main Results.

PROP _{IMM}	Proportion of area deforested by immigrant agents in the leakage belt and project area (proportion)	0.290	Calculated above
PROP _{RES}	Proportion of area deforested by the population that has been resident in and around the leakage belt and project area for ≥ 5 years (proportion)	0.290	Calculated above
A _{DefPA,i,t}	Area of recorded deforestation in the project area in the project case in stratum i in year t (ha)	See Table 3.20.	Calculated above
A _{DefLB,i,t}	Area of recorded deforestation in the leakage belt in the project case in stratum i in year t (ha)	See Table 3.20	Calculated above
A _{LK-OLB,t}	Area deforested by immigrants outside the Leakage Belt and project area under the project scenario in year t (ha)	See Table 3.20	Calculated above
A _{LK-IMM,t}	Total area deforested by immigrant agents in the baseline and project scenario in year t (ha)	See Table 3.20	Calculated above
A _{LK-ACT-IMM,t}	Area deforested by immigrants in the project area and Leakage Belt under the project scenario in year t (ha)	See Table 3.20	Calculated above

COLB	Area-weighted average aboveground tree carbon stock for forests available for unplanned deforestation outside the Leakage Belt (t CO ₂ -e ha ⁻¹)	54.7 t CO ₂ /ha	NAFORMA Report
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Table 3.20. Calculation of Net CO₂ Emissions due to Unplanned Deforestation Displaced Outside the Leakage Belt.

Year	PROIMM	ALK-IMM,t	ALK-ACT-IMM,t	ALK-OLB,t	ΔCLK-ASU,OLB (t CO ₂ -e)
2023	0.290	1,443.6	342.4	1,101.1	60,190.5

Emissions from Leakage Prevention Activities

Leakage prevention measures do not include the use of fertilizers, nor the burning of biomass, nor the flooding of agricultural lands to increase production, nor the intensification of livestock production through use of feedlots. As such, greenhouse gas emissions as a result of leakage of avoided deforestation activities (GHGLK,E) are assumed to be zero.

Estimation of Total Leakage due to the Displacement of Unplanned Deforestation

The total leakage due to the displacement of unplanned deforestation is estimated in Table 3.21 using Equation 16 in module LK-ASU VMD0010. GHG emissions are not included in the project boundary.

Table 3.21. Parameters and Values used to Estimate Total Leakage due to the Displacement of Unplanned Deforestation.

Parameter	Description	Value	Justification
ΔCLK-AS,unplanned	Net greenhouse gas emissions due to activity shifting leakage for projects preventing unplanned deforestation Net CO ₂ emissions; t CO ₂ e	See Table 3.22	Calculated

$\Delta\text{CLK-ASU-OLB}$	Net CO ₂ emissions due to unplanned deforestation displaced outside the leakage belt; t CO ₂ e	See Table 3.20.	Calculated
$\Delta\text{CLK-ASU-LB}$	Net CO ₂ emissions due to unplanned deforestation displaced from the project area to the leakage belt; t CO ₂ e	See Table 3.22.	Calculated

Table 3.22. Estimation of Total Leakage Due to the Displacement of Unplanned Deforestation.

Year	$\Delta\text{CLK-ASU-OLB}$ (t CO ₂ -e)	$\Delta\text{CLK-ASU-LB}$ (t CO ₂ -e)	GHGLK,E (t CO ₂ -e)	$\Delta\text{CLK-AS,unplanned}$ (t CO ₂ -e)	$\Delta\text{CLK-ME}$ (t CO ₂ -e)	$\Delta\text{CLK-REDD}$ (t CO ₂ -e)
2023	60,190.5	0.0	0.0	60,190.5	0.0	60,190.5

3.2.4 GHG Emission Reductions and Carbon Dioxide Removals (VCS, 3.15, 4.1)

Net GHG emissions reductions and removals are presented in Table 3.24 and 3.25 below.

Uncertainty is assessed applying module X-UNC.

Uncertainty in the baseline rate, parameter $\text{Uncertainty}_{\text{BSL,RATE}}$, is equal to zero. Per the X-UNC module, “It is here assumed that there is zero uncertainty in baseline rate of deforestation or degradation where numbers are equal to a long-term average (BL-UP)” as they are for this project.

Total uncertainty in carbon stocks in forest (parameter $\text{Uncertainty}_{\text{BSL,SS}}$) is equal to uncertainty of the total forest carbon stock estimate. Parameter $\text{Uncertainty}_{\text{BSL,SS}}$ is calculated to be 25.1% at the 95% confidence level (calculations detailed in Forest Biomass Carbon Inventory Report) for the initial forest inventory.

$\text{Uncertainty}_{\text{WRC_BSL,t}}$ is zero as this is not a WRC project. Further, $\text{Uncertainty}_{\text{REDD_WPS}}$ is zero as no ex post estimates of carbon pools or sources will be made. NERREDD+ERROR,t^* is therefore limited to $\text{Uncertainty}_{\text{BSL,SS}}$. The results of overall uncertainty calculations are presented below in Table 3.23.

Table 3.23. Summary of uncertainty calculations.

X-UNC Equation Number	5	Part 1, Step 1	6	10
Parameter	$Uncertainty_{BSL,SS}$	$Uncertainty_{BSL,RATE}$	$Uncertainty_{BSL,t*}$	$NER_{REDD+ERROR,t*}$
Value	25.1%	0.0%	25.1%	25.1%

Estimates of GHG credits eligible for issuance as VCUs were calculated in Table 3.22, below; where

Estimated GHG emission reduction credits =

Baseline emissions, fixed for 10 years at validation minus

Project emissions minus

Leakage minus

Non-permanence Risk Buffer withholding (calculated as a percent of net change in carbon stocks prior to deduction of leakage, see the risk report submitted on the Verra Hub and the Ntakata_Risk_Report.pdf")

Note that an uncertainty deduction was applied to the baseline minus project emissions.

Table 3.24. Estimated Net Emission Reduction Credits.

Years	Date	Estimated baseline emissions or removals (tCO ₂ e)	Estimated with-project emissions or removals (tCO ₂ e)	Estimated with-project emission reductions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Risk buffer (%)	Deductions for AFOLU pooled buffer account (tCO ₂ e)	NER REDD	Adjusted NER REDD	GHG credits eligible for issuance as VCUs (tCO ₂ e)
2023	19 May 2023–18 May 2024	659,244	86,120	573,124	60,190	27%	154,744	512,934	461,289	306,545

Table 3.25. VCU and buffer credits broken out into calendar years.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCUs (tCO ₂ e)	Removals VCUs (tCO ₂ e)
19 May 2023– 31 December 2023	408,876	53,413	37,331	95,975	190,125	-

1 January 2024 - 18 May 2024	250,369	32,707	22,859	58,769	116,420	-
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Organization, Responsibilities, and Monitoring Frequency

For all aspects of project monitoring, project staff will ensure that data collection, processing, analysis, management and archiving are conducted in accordance with the monitoring plan.

Table 3.26. Type of Monitoring and Party Responsible for Monitoring.

Variables to be monitored	Responsible	Frequency
Monitoring deforestation and natural disturbance	Carbon Tanzania	Prior to each verification
Monitoring illegal degradation	Carbon Tanzania	Every two years
Monitoring project emissions	Carbon Tanzania	Prior to each verification
Activity shifting immigrant leakage assessment	Carbon Tanzania	Prior to each verification event and at least every 5 years.
Updating forest carbon stocks estimates	Carbon Tanzania	At least every 10 years.
Revision of the baseline	Carbon Tanzania	At least every 10 years.

State the non-permanence risk rating (%)	27
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes ☐ No
For ARR and IFM projects with harvesting, state, in tCO ₂ e, the Long-term Average (LTA).	N/A
Has the LTA been updated based on monitored data, if applicable?	☐ Yes ☐ No If no, provide justification.
State, in tCO ₂ e, the expected total GHG benefit to date.	4,805,729
If a loss occurred (including a loss event or reversal), state the amount of tCO ₂ e lost:	No loss occurred during the reporting period.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCUs (tCO ₂ e)	Removals VCUs (tCO ₂ e)
19-May-2017 to 31-Dec-2017	620,821	114,110	84,335	65,872	313,976	-
01-Jan-2018 to 18-May-2018	377,415	69,371	51,270	40,046	190,876	-
19-May-2018 to 31-Dec-2018	805,672	114,110	51,345	89,903	485,853	-
01-Jan-2019 to 18-May-2019	489,792	69,371	31,214	54,655	295,365	-
19-May-2019 to 31-Dec-2019	773,603	90,340	37,978	83,887	496,427	-

01-Jan-2020 to 18-May-2020	473,704	55,318	23,255	51,367	303,980	-
19-May-2020 to 31-Dec-2020	698,634	90,340	29,054	75,301	445,618	-
01-Jan-2021 to 18-May-2021	424,720	54,920	17,663	45,778	270,904	-
19-May-2021 to 31-Dec-2021	487,034	179,780	11,754	38,415	227,333	-
01-Jan-2022 to 18-May-2022	296,083	109,293	7,146	23,354	138,202	-
19-May-2022 to 31-Dec-2022	530,473	44,497	64,278	131,213	248,026	-
01-Jan-2023 to 18-May-2023	322,490	27,051	39,076	79,769	150,782	-
19-May-2023 to 31-Dec-2023	408,876	53,413	37,331	95,975	190,125	-
01-Jan-2024 to 18-May-2024	250,369	32,707	22,859	58,769	116,420	-
19-May-2024 to 31-Dec-2024	412,663	-	-	-	-	-
01-Jan-2025 to 18-May-2025	250,870	-	-	-	-	-
19-May-2025 to 31-Dec-2025	418,255	-	-	-	-	-
01-Jan-2026 to 18-May-2026	254,270	-	-	-	-	-
19-May-2026 to 31-Dec-2026	411,395	-	-	-	-	-
01-Jan-2027 to 18-May-2027	250,099	-	-	-	-	-
Total	8,957,237	1,104,223	508,391	933,934	3,871,700	-

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
19-May-2017 to 18-May-2018	600,754	679,151	12%	Project performance exceeded expectations, and forest loss was lower than expected.
19-May-2018 to 18-May-2019	788,716	1,029,424	23%	Project performance exceeded expectations, and forest loss was lower than expected.
19-May-2019 to 18-May-2020	769,128	1,037,573	26%	Project performance exceeded expectations, and forest loss was lower than expected.
19-May-2020 to 18-May-2021	707,122	931,377	24%	Project performance exceeded expectations, and forest loss was lower than expected.
19-May-2021 to 18-May-2022	511,398	475,144	-8%	Project performance was less than expectations, and forest loss was higher than expected.
19-May-2022 to 18-May-2023	559,028	678,061	18%	Project performance exceeded expectations, and forest loss was lower than expected.
19-May-2023 to 18-May-2024	448,462	512,934	13%	Less deforestation occurred during the reporting period than had been anticipated during this reporting year in the ex-ante estimates.

				Therefore, the ex-post credits exceeded the ex-ante estimates.
Total	4,384,608	5,343,662	18%	

3.3 Optional Criterion: Climate Change Adaptation Benefits

The project activity, through development and implementation of the Village Land Use Plans, improves the resiliency of the local communities to climate change. Targeted land-use planning resulted in improved water access at the end of dry season, as well as, generally, soil conservation and moderated local climate through retention of forest cover.

3.3.1 Activities and/or processes implemented for Adaptation (CCB, GL1.3)

The land tenure and planning that the project is based around and was implemented during this period provide one of the most basic and useful adaptations to climate change. Land-use plans ensure that enough land is set aside to ensure livelihoods even given the variability of future climate scenarios. These land use plans also include projections of future needs that compensate for such future scenarios.

During this monitoring period efforts on community health interventions also helped educate and protect the communities against future health issues compounded by a more variable, wetter and hotter climate. Plans to increase training of health officers from ICHIF headquarters were made during the monitoring period.

Investment and training in good governance and institutions was ongoing during this period, supporting communities to adapt and cope with a changing climate, and helping communities to better implement future strategies and adaptations through strengthened capacity. During this period over 2,220 individuals participated in an environmental education program focused on climate and forests provided by Carbon Champions, and now have an improved framework and understanding of climate change in their own communities. The employment of VGS and their regular patrols have served to protect the natural resource base in the communities, which is also critical in the landscapes ability to be resilient amongst a changing climate reality, both for people and wildlife. The monitoring around these activities and processes implemented to assist communities and biodiversity to adapt to the probable impacts of climate change during this period can be found in the community monitoring plan section 4.3.1.

The various measures during this period, individually and holistically, have worked in a matter that has reduced effects on the community and pressure on the biodiverse habitat that they live in and depend on and will continue to do so in the future.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CCB, CM2.1)

Community group	Villages (all 8 project villages)
Impact	1. Improved livelihoods (e.g. income, employment, production) 2. Improved access to healthcare and reproductive health 3. Increased access to education 4. Reduced conflict over land and resources Increased resilience
Type of benefit/cost/risk	1. Improved livelihoods (e.g. income, employment, production) Aspects of improved livelihoods are benefits for villagers in the project area. Employment as VGS is an actual direct benefit. More generalized livelihood improvements such as improved quality of life is a predicted indirect benefit, based on training and resources provided capacity building efforts where villagers are expected to adopt new practices and utilize new skills to increase farm production. 2. Improved access to health care Better access to health care is a direct predicted benefit. Provision of health insurance to all community members and construction of infrastructure like health clinics provide a direct benefit to all community members. Reproductive rights directly benefit from the insurance program and clinics. There are no anticipated risks associated with improved access to health care. 3. Increased access to and quality of education The Village Government has built new classrooms that have been outfitted with new equipment like desks. In one village, they are paying private teachers to augment the government supplied ones in their local schools. Therefore, this is an actual indirect benefit. 4. Reduced conflict over land and resources With an augmented budget and technical support provided by the project, the Village Government has increased resources

	and skills to deal with land conflict in the villages. This is an actual indirect benefit for the community. 5. Increased resilience Village governance structures and villagers themselves benefit from increased resilience to environmental problems. This is a predicted indirect benefit based on the belief that training, capacity development, and better-resourced government services will increase the ability to respond and adapt to crises such as drought, fires, landslides, etc.
Change in well-being	1. During this monitoring period, large direct and indirect benefits in the form of Improved livelihoods were achieved (e.g. income, employment, production). 2. During this monitoring period a large direct benefit in the form of increased access to health care and, as a result, reproductive rights, was achieved. 3. During this monitoring period a large indirect benefit in the form of increased access to education was achieved. 4. During this monitoring period a large indirect benefit in the form of reduced conflict over land and resources was achieved. During this monitoring period a large indirect benefit in the form of increased resilience was achieved.

Community group	Women and Women's groups
Impact	Improved livelihoods Greater control over reproductive health
Type of benefit/cost/risk	1. Improved livelihoods Community conservation banks target women to enable individuals to access finance. Carbon Tanzania aims to increase the capital in these banks to enable greater economic opportunities for women. This is an actual direct benefit. 2. Chicken farming Specific revenue generating activities in villages include chicken farming as a household revenue generating activity. This activity is often conducted by women. This is a predicted indirect benefit. 3. Improved access to health care and reproductive health

	The health insurance program and construction of new clinics is creating an actual direct benefit to women's reproductive health as they are better able to access treatment and medicine for all aspects of their health. There are no anticipated risks associated with better reproductive health services.
Change in well-being	1. During this monitoring period a large direct benefit in the form of improved livelihoods was achieved. 2. During this monitoring period a large indirect benefit in the form of chicken farming was achieved. 3. During this monitoring period a large direct benefit in the form of improved access to health care, resulting in better reproductive health.

Community group	Village Game Scouts (VGS)
Impact	1. Improved livelihoods (e.g. income, employment, production) Improved capacities (enforcement, negotiation, coordination).
Type of benefit/cost/risk	1. Improved livelihoods (e.g. income, employment, production) VGS are employed by the village to conduct on-the-ground forest protection activities, including patrolling. They benefit from regular income that contributes to improving their livelihoods. For example, they are able to purchase food in times of scarcity, contributing to increased food security. They are paid fairly depending on the time and effort they contribute. Increased income and employment are actual direct benefits leading to generally improved livelihoods, which are indirect actual benefits. 2. Improved capacities (enforcement, negotiation, coordination). VGS are increasing their capacity through training programs, giving them marketable skills such as knowledge of forestry and wildlife laws, capabilities in enforcement, negotiation techniques, and project coordination. These skills will contribute to human resources development. This is a direct actual and predicted impact.
Change in well-being	1. During this monitoring period large direct and indirect benefits in the form of improved livelihoods were achieved (e.g. income, employment, production). 2. During this monitoring period large direct benefits in the form of improved capacities were achieved.

4.1.2 Negative Community Impact Mitigation (VCS, 3.19; CCB, CM2.2)

Over time the availability of new agricultural land for expansion is decreasing. While agricultural land is currently sufficient for existing families, restrictions on encroachment of remaining forest areas could be negatively perceived by some village families that do not have enough land to divide among all of their children. Mitigation efforts that took place during this reporting period include microfinancing and entrepreneurship through COCOBAs. No new climate smart agriculture interventions were added during this period, but some actions from previous reporting periods continue to be implemented. Furthermore, a more vibrant local economy and training courses/ has created opportunities for alternative livelihoods for young people such as small businesses like produce and meat markets, restaurants, mini-shops, tailors, grain sellers, and pharmacies. Some villagers are also employed as VGS.

There are no negative impacts anticipated on HCV related to community well-being.

4.1.3 Net Positive Community Well-Being (VCS 3.19; CCB, CM2.3, GL1.4)

The current net well-being impacts of the project are positive and will continue to be positive for all community groups in the eight project villages. The activities benefit all 57,189 people living in the villages, including 28,594 women, according to the 2022 Tanzania Census. The positive impacts of the project include improved livelihoods through improved agriculture, employment, and income, increased access to and quality of education, improved access to health care including reproductive health services, reduced land conflict, and increased resilience in response to environmental shocks. It will be possible for all community groups to experience most of these benefits, including women and marginalized groups. These positive impacts will far outweigh any perceived negative impacts. One potential unwelcome impact could be lack of access to new agricultural land. New migrants are not considered as project stakeholders and will be discouraged from moving to the project area. Negative impacts on descendants of villagers will be alleviated by more purposeful and improved agriculture. An improved local economy will also open up more opportunities for alternative livelihoods, such as small businesses, thus reducing pressure on remaining forests.

The project activity, through development and implementation of the Village Land Use Plans, improves the resiliency of the local communities to climate change. Targeted land-use planning is expected to result in improved water storage at the end of dry season, as well as, generally, soil conservation and moderated micro-climates through retention of forest cover.

Climate change scenarios developed specifically for Tanzania identify clear trends relating to increasing temperatures throughout (+0.8-1.8C by 2040). Rainfall will be less predictable, likely with drier dry seasons and wetter wet seasons, measured by less rain days per year. Rainfall overall may increase but could also be paired with generally increased aridity due to increased temperatures and longer periods between heavy rains.³¹³²

Due to the communities' main economic activities (agriculture and pastoralism) being directly connected to reliability of rains, this change will have a major effect on land use, especially in terms of areas designated as agricultural, pastoral and reserve. Changes in rainfall reliability, whether increase or decrease can cause crop failure which can be further exacerbated by other stresses such as temperature changes, loss of fertility and lack of land tenure. Crop failure leads to hunger, conflict, poverty and land use change and even migration.³³ Similarly, for livestock keepers, drought can lead to large-scale stock collapse. Increased rainfall could lead to direct human health issues, primarily increases in cholera and malaria both of which are seen at rates positively correlated with rainfall. In these ways community well-being and livelihoods will be directly negatively affected.

Land tenure and planning provide one of the most basic and useful adaptations to climate change. Land-use plans can ensure that enough land is set aside to ensure livelihoods even given the variability of future climate scenarios. Land use plans also include projections of future needs that compensate for such future scenarios. Diverse livelihoods also provide protection against a changing climate, especially livelihoods attained through education, which are not reliant on exploiting the local natural resource base. Investment in health facilities and interventions also protect the communities against future health issues compounded by a more variable, wetter and hotter climate. Climate-smart and adaptive agriculture and grazing regimes also serve as an adaptation mechanism that can increase resilience among communities.

Already-undertaken investments and training in good governance and institutions allow communities to adapt and cope with any climate related situations in the future and will furthermore allow communities to better implement all the other strategies and adaptations already identified. The project activities address all these various measures, individually and holistically, in a manner that will reduce both effects on the community and protect the natural resource base that they depend on.

³¹ FCFA (2017b) Summary: Future climate projections for Tanzania. Cape Town: Future Climate for Africa. www.futureclimateafrica.org/resource/future-climate-projections-for-tanzania

³² Girvetz, E. H., Gray, E., Tear, T. H., & Brown, M. A. (2014). Bridging climate science to adaptation action in data sparse Tanzania. *Environmental Conservation*, 41(2), 229–238.

³³ Hepworth, N. (2010). *Climate Change Vulnerability and Adaptation Preparedness in Tanzania*. [online] Tzdpdg.or.tz. Available at: http://www.tzdpdg.or.tz/fileadmin/_migrated/content_uploads/TZ_CC_Adaptation_Preparedness_HBS_2010_02.pdf

4.1.4 Protection of High Conservation Values (CCB, CM2.4)

The HCVs related to community well-being were not negatively affected by the project; furthermore, on the contrary, only positive impacts have been seen and are expected for water sources, spiritual sites, and beekeeping areas. All of these HCVs are related to the maintenance of forest areas that have been better protected under the project and to which community rights have been guaranteed through the land use planning process. The indicators associated with these HCVs include the tracking of illegal activity in the forest area (42 incidents, See section 4.3.1. Community Monitoring Plan). Better protection of water sources and spiritual sites is enhanced by the fact that they are recognized in the land use plans.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.2)

Other stakeholders identified include the Tanganyika district government and Mpanda district government. There are no anticipated negative impacts on other stakeholders so therefore no mitigation measures are needed, but negative impacts will be assessed in ongoing consultations with stakeholders.

4.2.2 Net Impacts on Other Stakeholders (VCS, 3.18, 3.19; CCB, CM3.3)

The benefits for other stakeholders, particularly these district authorities, include additional financial resources for district development as well as training and capacity building opportunities for government officers. As a result, these districts have the potential to become models for conservation and sustainable development. As there were no observed negative impacts and only positive impacts on the well-being of other stakeholders, the net impact of the project is positive.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan (CCB, CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)

A separate Community Monitoring Plan (CMP) has been developed to guide the monitoring activities of the Ntakata REDD project. This CMP includes background information on the project, an explanation of how the Plan adheres to the CCB monitoring requirements, a description of the project stakeholders, a description of the key monitoring principles adopted by the project, the roles and responsibilities for monitoring, a description of data management and reporting, and finally, the Community monitoring framework. The Community Monitoring Plan and underlying data sources are available, and the results are summarized in the table below and will be shared with communities prior to each verification event. The following table represents results from the current monitoring period.

Three HCVs are found in the project area and include village water sources, “Matambiko” spiritual sites, and beekeeping / honey hunting areas. Village water sources are in or depend directly on the forest for function, the connection between forests and hydrology and water security is well documented. The spiritual sites are located within the forests and the site itself is usually a tree. Honey hunting involves finding wild honey within trees in the forest and thus is directly dependent on the forest/trees. Therefore, all data from forest monitoring, including deforestation analysis, forest by-law enforcement, patrol data, and reporting of illegal activity serve as direct indicators on the effectiveness of the improved forest management measures are having on maintaining or enhancing community well-being HCVs. The climate section analysis shows the enhanced effectiveness of the forest measures against the baseline, and the continued patrolling would at a granular level show any failure to maintain spiritual sites or beekeeping areas, this has not been the case at all.

Objective	Activities	Term	Indicator/Output	Unit/Measure	Data Collection Method/Tool	Results
1. Project stakeholders have the human capacity needed for effective forest management.	1.1 Village governments receive training on good governance for project management.	March 2020 through present	# of Village Government members participating in governance training	# of Village Government members	- attendance lists from training and meetings* - training reports	1,161 people participating in governance training
	1.2 Village Game Scouts receive training on forest law enforcement and are on active duty.	2017 through present	# of VGS trained at the Pasiansi Institute # of VGS employed with project funds # of VGS participating in training courses (e.g. SMART, forest inventory)	# of VGS	- training certificates - attendance lists*	36 VGS that have been trained at Pasiansi Institute 103 VGS currently employed with project funds 103 participated in other training courses
	1.3 Training and employment of Carbon Champions	2018 and as needed	# of people educated on REDD project activities: climate change, project plan, land use plan and revenue distribution	# of people	-attendance lists	2,220 people educated on REDD project activities

Objective	Activities	Term	Indicator/Output	Unit/Measure	Data Collection Method/Tool	Results
	1.4 Forests are effectively patrolled and monitored to prevent illegal activity	November 2018 through present	# of patrols conducted # incidents reported	# of patrols conducted #incidents reported	- VGS patrol reports	273 Patrols 1 Poaching Incident 2 Wires and Snares Removed 14 agricultural land clearing incidents 25 illegal timber harvesting incidents
2. Livelihoods of villagers is improved	2.1 Carbon revenues are channeled to support village development plans	January 2020 through present	- amount of money transferred to Village Governments to support village development # Amount of money spent on education with project support # Amount of money spent on health with project support	-amount of money transferred	- proof of transfer to Village Governments - expenditure within each village on health and education	5,746,117 USD transferred to Village Governments 1,377,712 USD spent on education 383,201 USD spent on health
	2.4 Provide training and matching grants to Community Conservation Banks (COCOBA) in each village to enable micro-finance for enterprise development	2020 through present	# of grants provided through project support	# members in the COCOBA # registered COCOBA	Member lists	343 COCOBA Members (183 F) 13 Registered COCOBAs 6 grants provided through project support
	2.5 Provide training on entrepreneurship to women's groups and young mothers	2020 through present	# of new women-owned businesses formed with project support	# members in the COCOBA # registered COCOBA	Member lists	343 COCOBA Members (292 F) 13 Registered COCOBAs 27 women owned

Objective	Activities	Term	Indicator/Output	Unit/Measure	Data Collection Method/Tool	Results
						business started through COCOBAs now supported by project
3. Improved health services lead to healthier families.	3.1 Provide health insurances	2021 through present	# of households/people covered by health insurance	# households/people	report	4400 households were covered by health insurance policies (26,400 individuals)
4. Village population is effectively tracked	4.1 Track and keep accurate records on the number of births, deaths, immigration and outmigration to the villages.	2018 through present	District updates to village population statistics continue	updates	updates log	Updates continuing, maintained by District Government

4.3.2 Monitoring Plan Dissemination (CCB, CM4.3)

A summary of the monitoring plan has been translated to Swahili and disseminated to the community groups and other stakeholders prior to verification. Monitoring results are communicated through meetings with the Village Governments in each of the eight villages on a bi-annual basis. A copy of the monitoring results will also be shared with the Tanganyika and Mpanda districts. All of these meetings (with Village Governments and districts) provide an opportunity to analyze and discuss the project strategy and activities to assess effectiveness and consider adjustments.

Along with the monitoring report a local language summary was uploaded to the registry before the verification. A notice letter was sent informing stakeholders of such and its surrounding procedures. The district, the overseeing authority of all governance and representative processes in the area confirmed during site visit their knowledge and use of the registry. The summary was also sent to the district directly. The summary was also sent to the project manager who shared it and informed community members and leaders. Any community leaders who are digitally available also received the digital copy.

Carbon Champions also received copies and shared it and discussions in their regular interactions with community members, it was noted during site visit that even when Carbon Champions are not on an explicit deployment the community view and come to them as a source of project information.

Though some community members were unable to recall specific monitoring results or documentation community members were largely knowledgeable and confirmatory on positive climate, community, and biodiversity benefits achieved during this monitoring period. In the case of the community results the majority were generated directly by the communities themselves and collated through the official and representative governance structures the project works with. It should be noted that Katavi region has one of the lowest literacy rates in a country in one of the lowest literacy regions of the world and this informs the project in its practical commitment to ensuring multi-directional information flow and results sharing with the participating community.

4.4 Optional Criterion: Exceptional Community Benefits

The project fulfils both criteria for applying exceptional community benefits.

The project area is designated village land recognized under the approved village land use plans (VLUPs). These VLUPs give villagers the management rights to the land and therefore the rights to claim that their activities will generate the project's benefits. Furthermore, the project zone is in a low human development country. The human development index (HDI) in Tanzania was reported at 0.532 in 2022, with a rank of 167 out of 193 countries³⁴, placing Tanzania in the low human development category. During this period all employment opportunities generated by this project such as project manager, Carbon Champions (16 total, 9 are women) and Village Game Scouts (103 total, 18 are women) come from these villages. During this verification period the project achieved exceptional community benefits in the long term and short term, creating positive net impacts on the community and specifically women. Likewise, the project benefit sharing mechanism remains intact and functioning. Many of the specific quantified benefits can be found in the results column of the Community Monitoring Plan Table 4.3.1. More detail on community benefits is provided in the following sections 4.4.1.-4.4.6.

4.4.1 Short-term and Long-term Community Benefits (CCB, GL2.2)

In both the short-term and long-term, the project generates benefits to well-being.

During this verification period in the short-term, the project has provided capacity development and increased knowledge through training and education on REDD+, project governance (1,161 people), forest management (103 VGS) as well as health insurance (851 households). The project also provided employment for 115 villagers as project managers, Village Game Scouts and Carbon Champions thus providing immediate income to them and their families. The 237 patrols during the reporting period also served to protect the natural resource base, which the community relies on daily.

³⁴ United Nations Development Programme. Human Development Indicators; Tanzania.
<http://hdr.undp.org/en/countries/profiles/TZA>

Many of the trainings that increased capacity and knowledge and in the short term will create long term benefits through the application of said capacity and knowledge. Improved governance at the village level allows all decision making and implementation both project and non-project related to be conducted more efficiently and transparently and given the village government is the main development vehicle for the community, this provides great long-term benefit. Trained VGS will better protect forest resources in the long-term, protecting the resources the communities depend on such as natural medicine.

Health insurance has been provided to 851 households in the project area improving long-term health outcomes for the communities. Community members can enroll in the health insurance plan by visiting the District or Village Office of the Enrolment Officer or an authorized agent. The enrollment process utilizes modern mobile phone technology. During the enrollment process, each member of the household will have their photograph taken for free and receive an ID card. If a member reaches the limit of their membership, it can be renewed using the same mobile phone technology.

The health insurance plan, known as ICHIF (Integrated Community Health Insurance Fund), provides access to various services. Members with ICHIF membership can avail themselves of dispensary services, health center services, district hospital services, and regional hospital services. These services include doctor's consultations, laboratory tests, X-ray and ultrasound measurements, medications, various types of surgeries (such as inpatient and outpatient, normal, small, and large surgeries), as well as referral services available at all provincial levels.

To ensure effective dissemination of information about ICHIF, a coordinated effort is undertaken. Trained ICHIF coordinators, system personnel, and experts conduct comprehensive trainings on the ICHIF system. These trainings aim to equip enrollment officers who form a task force team responsible for implementing awareness campaigns within the communities.

The ICHIF coordinator organizes and facilitates meetings at the village general assembly, where they collaborate with local leaders and enrollment officers to promote and educate the community about the benefits and usage of ICHIF. They explain how the registered cards are utilized from the dispensary level to regional health centers, and provide information about the types of services available at each level. This approach ensures that community members are well-informed about the coverage, the enrolment process, and how to effectively utilize the health insurance plan.

Critically, the project activities implemented during this period underpin the project's ability to generate future revenue through the sale of verified emissions reductions. These revenues will provide critical funds used for the continued development of the communities, specifically in areas like children's education outputs, general health, and women's entrepreneurship. This is all made possible by activities implemented during this period. As per the monitoring for this period the project is track in achieving and to further achieve short-term and long-term community benefits.

4.4.2 Marginalized and/or Vulnerable Community Groups (CCB, GL2.4)

Community Group	Poor households
Net positive impacts	Poorer households in the community will experience net positive impacts from the project as a result of several activities. These include improved livelihoods resulting from projects supported by the Village Government using project carbon revenues. Though these projects are not yet clearly defined, they are likely to include projects related to primary and secondary education, water and electricity, and agricultural improvements which will have wide benefits, also for poor households. The Village Government have specific strategies to alleviate poverty in their villages, and thus village development activities under the project will align to these strategies. Poorer households often may rely on legal use of natural resources like wild medicine or honey and project activities during this period such as patrols, protect those resources for the benefit of these poorer community members.
Benefit access	The members of poorer households' risk being excluded due to illiteracy and lack of time to attend meetings. The project addresses this issue by relying on verbal communication and door-to-door meetings through the carbon champions who share information and seek input from all households in the villages. The Village Government already have a mechanism for identifying poor households in the community in order to target additional assistance.
Negative impacts	While no negative impacts are anticipated, the Village Government regularly monitor project impacts. The Village Government has a role to facilitate feedback from the most vulnerable members of the community. This process of regular interaction prevents negative impacts on community members.

Community Group	Women in the villages
Net positive impacts	Women positively benefit from the project activities. Health insurance is now available to all household and will provide coverage for women's reproductive health. They will benefit the livelihood activities, and access to protected natural resource base. Women have also been included in employment for project positions like carbon champions and make up a significant portion of village governments.

Benefit access	Women risk being excluded due to illiteracy and lack of time to attend meetings. The project addresses this issue by relying on verbal communication and door-to-door meetings through the carbon champions. Women were included in the application process for Carbon Champion roles and secured half of the available positions. In addition, women make up a substantial component of village government positions so involved in decision making.
Negative impacts	While no negative impacts have been seen or are anticipated, the Village Government regularly monitors project impacts. The Village Government has a role to facilitate feedback from the most vulnerable members of the community, including women. This process of regular interaction actively prevents negative impacts on women.

4.4.3 Net Impacts on Women (CCB, GL2.5)

The project villages are traditionally patriarchal, and while discrimination is often not overt or even recognized, women do not hold the same status or decision-making power as men in the village. They are also considered to be more vulnerable from a livelihood standpoint. The project has a positive influence on the status of women in the project area with current and future benefits including improved livelihoods, improved access to health care and reproductive health, and influence in decision-making. Carbon Tanzania encourages greater participation of women as VGS by urging committees to attain gender balance in their selection.

During this verification period women continued to be employed as carbon champions. Aside from being a direct opportunity for these women, they also serve as an example as they travel throughout their community, being presented in a leadership position in the project even in remote areas of the villages. Furthermore, the door-to-door visits by the carbon champions increase the interaction with women on project matters, as some women may be hard to reach outside the home. During this monitoring period, many members of the village governments were women, many of whom occupy powerful, decision-making positions. This includes village where women are either the Chairperson or the Village Executive Officer, the two most powerful positions in the village. The COCOBA's now have 343 members with 6 grants provided through the project. Women also stand to benefit from the positive impacts that affect the communities, such as a better protected natural resource base. Given the many positive impacts and limited risk for negative impacts, the projects net impact on women are positive.

4.4.4 Benefit Sharing Mechanisms (CCB, GL2.6)

CT's philosophy in benefit sharing is to maximize benefits to the community in order to change behavior. Therefore, CT minimizes the project operating costs in order to maximize the payments to communities. The company does this by relying on existing governance structures, building partnerships with development and conservation organizations, and hiring within the community whenever possible.

The benefit sharing mechanism of the project is based on existing democratic governance structures and procedures. It incorporates checks and balances and allows for participation of the wider community through the elected village committee representatives. Payments from carbon sales flow directly to the village committees on a bi-annual basis (every six months). Together all eight villages receive 51% of the net revenues from sales with 49% remaining with CT to cover its operating costs and invest in new projects. Revenues are announced, administered and reported on through the project steering committee, which is comprised of the village executive officer and village chairman from each project village. The steering committee was formed and convened in 2019, while carbon sale revenues started in 2020 and continued through the current period. Ongoing consultation with the steering committee occurs during each reporting period and the benefit sharing mechanism continues to be shared with the communities prior to each verification event.

The payments to communities are based on three criteria: participation, size of the forest area managed, and performance. See Section 2.5.6 for more details on the Benefit Sharing Mechanism, including a breakdown of funds distributed to villages during the monitoring period and their various uses.

The above ensures community involvement and decision making to empower the communities. The committees applied payments received to priorities already established in the existing village development plans. The precise division of funds varied depending on the community needs and priorities; however, all adjustments and transfers were made based on discussion and decision-making among the village committee members. To increase transparency in the process, CT publicly posts the amount of the bi-annual payment in an accessible and visible way so that the wider community is aware of the amount received. Whenever possible, CT also attended and made a short presentation to the general assembly to update the wider community on the project activities and revenues.

During this verification period the main mechanism implemented towards awareness of benefit sharing was the occurrence of steering committee meetings. The minutes of these meetings are provided to all village governments and are used to analyze community understanding and as evidence of the functioning mechanism. Carbon Champion activities during this period ensure that at a grassroots level and throughout the landscape community members were educated about the project, its potential benefits, and the steering committee mechanism. Furthermore, during this period Carbon Tanzania attended general community assemblies, highlighting the forthcoming carbon revenue, and discussing the mechanisms for it to be used fairly by the community. During this period monitoring was conducted, to ensure fair and equitable use and benefit sharing. Villages provided spending reports based on the revenues they received, and along with Carbon Tanzania the district government ensured that spending was legitimate and geared towards community benefits and project outcomes.

4.4.5 Governance and Implementation Structures (CCB, GL2.8)

The project governance structure is led by Carbon Tanzania. Carbon Tanzania, as the project proponent, holds overall responsibility for the project in ensuring that its objectives are attained. Carbon Tanzania manages the day-to-day higher-level project operations including planning, monitoring, reporting, credit marketing, financial management and external relations. The local government is also a key actor in project governance and implementation, particularly in ensuring that the forest protection and village development activities are implemented. The project relies on the existing governance structure represented by Tanganyika District, Mwese and Katuma Wards, and the village committees and sub-village representatives of the eight project villages. This democratic structure (with elected representatives) has checks and balances embedded.

4.4.6 Smallholders/Community Members Capacity Development (CCB, GL2.9)

Carbon Tanzania has a long-term approach to developing the capacity of community members and local government institutions. A number of trainings have already been conducted and future trainings are also planned.

During this MP, Carbon Tanzania conducted training on financial and procurement procedures. The communities capacitated to manage finances effectively ensuring that the procurement process runs smoothly, efficiently, and within budget.

During this monitoring period, Carbon Tanzania also facilitated training on the use of the mobile app Cluey for patrol data and community data collection. The future plan is to replace SMART/Cybertracker with the Sensing Clues platforms to simplify data management and monitoring as well as reporting and verification.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (VCS, 3.19; CCB, B2.1)

Change in Biodiversity	Forest Cover and HCVs						
Monitored Change	Forest cover in the project area was maintained above the predicted forest cover in the without-project scenario during the monitoring period. See the table below. Forest cover is tied to the well-being of HCV species. The relatively low level of forest cover loss during the reporting period indicates that habitat for HCV species within the project area is not being threatened and the project is effectively protecting populations of those species.						
	<table><tr><th>Year</th><th>Without-Project Forest Cover Loss (ha)</th><th>With-Project Forest Cover Loss (ha)</th></tr><tr><td>2023</td><td>4,972.1</td><td>704.1</td></tr></table>	Year	Without-Project Forest Cover Loss (ha)	With-Project Forest Cover Loss (ha)	2023	4,972.1	704.1
	Year	Without-Project Forest Cover Loss (ha)	With-Project Forest Cover Loss (ha)				
2023	4,972.1	704.1					
Justification of Change	The analysis of forest cover change in the project area during the monitoring period, detailed in Section 2.1, indicates that less forest loss occurred in the with-project scenario than would have without the project activity. Additionally, the forest loss in the with-project scenario represents a change of 0.4%, which is less than the uncertainty in the land cover classification model.						

Change in Biodiversity	Offsite forest cover
Monitored Change	Forest cover in offsite forest was maintained above the predicted forest cover in the without-project scenario during the monitoring period. In the without-project scenario 2,609.1 ha of forest cover was expected to be lost outside of the project area in the leakage belt during the current monitoring period. Actual forest cover loss in the with-project scenario was 475.0 ha. Additionally, the amount of forest loss in the with-project scenario represents a change of 0.3% in the leakage belt, which is less than the uncertainty in the land cover classification

Change in Biodiversity	Native tree diversity		
Monitored Change	Native tree (woody plants > 5 cm dbh) diversity was maintained during the monitoring period and reflects the diversity measured in the forest inventory. Under native forest conditions in the project area, native tree diversity exceeds conditions in the without project scenario where 4,972 ha of forest was expected to be converted to non-forest use (minus 704 ha in the with-project scenario = an impact of 4,268 more hectares of forest where native tree diversity is maintained). 117 species of tree were documented in the 2017 inventory and presented along with the relative basal areas in the table below to illustrate species richness in the project area. According to Banda et al 2006³⁵, species richness in areas with heavy timber and NTFP extraction compared to protected national park in Miombo woodland can be similar. However, composition between protected and unprotected forest areas is quite different, and it can be expected that important timber species, like Julbernadia spp and Brachystegia spp, will be removed from the forest in areas of heavy human deforestation, impacting forest composition. Species richness is also well known to be a function of area³⁶, and it can be expected that the without-project scenario, with less forest area conserved, has fewer tree species than the with-project case. Therefore, we assume a reduction in relative basal area of important timber species in the without-project scenario relative to the with-project scenario. <table border="1"> <thead> <tr> <th>Species</th><th>Relative Basal Area</th></tr> </thead> <tbody> <!-- Empty body as per image --> </tbody> </table>	Species	Relative Basal Area
Species	Relative Basal Area		

³⁶ MacArthur, R.H. and Wilson, E.O., 2001. *The theory of island biogeography* (Vol. 1). Princeton university press.

	Albizia versicolor	15.899%
	brachystegia bussei	14.369%
	Brachystegia boehmii	6.694%
	Brachystegia spiciformis	6.506%
	Pericopsis angolensis	6.230%
	Julbernadia globiflora	4.991%
	Brachystegia glaucescens	3.639%
	Pterocarpus rotundifolius	3.226%
	Diplorhynchus condylocarpon	2.800%
	Annona senegalensis	2.357%
	Euclea divinorum	2.227%
	Lannea discolor	2.044%
	Terminalia stenostachya	1.949%
	Pterocarpus angolensis	1.923%
	Diospyros mespilitormis	1.550%
	Brachystegia microphylla	1.455%
	Combretum zeyheri	1.357%
	Combretum schumannii	1.294%
	Erythrophleum africanum	1.085%
	Albizia antunesiana	1.082%
	Terminalia sericea	1.074%
	Vitex doniana	1.003%
	Combretum molle	0.931%
	Cussonia kirkii	0.908%
	Pseudolachnastylis maprouneifolia	0.797%
	Terminalia mollis	0.680%
	Parinari curatellifolia	0.675%
	Pandanus livingstonianus	0.620%
	Protea gagueedi	0.607%
	Acacia galpinii	0.518%
	Syzygium guineense	0.482%
	Dombeya kirkii	0.410%
	Brachystegia floribunda	0.386%
	Piliostigma thonningii	0.371%
	Albizia harveyi	0.367%

	Strychnos innocua	0.329%
	Combretum hereroense	0.319%
	Markhamia platcalyx	0.310%
	Julbernadia paniculata	0.380%
	Cassipourea gummiflua	0.302%
	Vangueriopsis lanciflora	0.275%
	Protea nitida	0.261%
	Lonchocarpus capassa	0.249%
	Acacia siberiana	0.244%
	Uapaca kirkiana	0.231%
	Erythrina abyssinica	0.224%
	Euclea linearis	0.209%
	Jubernadia paniculata	0.165%
	Ozoroa insignis	0.159%
	Burkea africana	0.153%
	Maytenus heterophylla	0.153%
	Lonchocarpus bussei	0.145%
	Kigelia africana	0.145%
	Iannea rivae	0.134%
	Xeroderris stuhlmannii	0.132%
	Acacia spp	0.130%
	Faurea speciosa	0.128%
	Tarchonanthus camphoratus	0.127%
	Heteropyxis natalensis	0.125%
	Cassine matabelica	0.122%
	Combretum quainzii	0.121%
	Vernonia bellinghamii	0.117%
	Clerodendrum myricoides	0.116%
	Dalbergia nitundula	0.116%
	Acacia caffra	0.114%
	ficus sycomorus	0.106%
	Syzygium cardatum	0.104%
	Azanza garckeana	0.099%
	Isobertinia globiflora	0.087%
	Lonchocarpus eriocalyx	0.086%

	Cassia abbreviata	0.074%
	Gardenia ternifolia	0.074%
	Acacia hockii	0.072%
	Strychnos cocculoides	0.072%
	Faidherbia albida	0.066%
	Rhus chirindensis	0.056%
	Vernonia colorata	0.052%
	Acacia gerrardii	0.052%
	Grewia bicolor	0.050%
	Grewia inaequilatera	0.048%
	Securida longipedunculata	0.047%
	Acacia reficiens	0.046%
	Boscia mosambicensis	0.046%
	Lannea humilis	0.045%
	Markhamia obtusifolia	0.045%
	Strychnos potatorum	0.039%
	Mimusops zeyheri	0.037%
	Acacia hereroensis	0.033%
	Allophylus melliodorus	0.031%
	Grewia pachycalyx	0.029%
	Albizia schimperana	0.028%
	Syzygium owariense	0.025%
	Combretum zyheri	0.025%
	Manilkara mochisia	0.024%
	Albizia tanganyicensis	0.024%
	Tarenna pavettoides	0.023%
	Allophylus africanus	0.021%
	Laurophyllus capensis	0.018%
	Annona senegalensis	0.017%
	Steganotaenia araliacea	0.015%
	Nuxia oppositifolia	0.011%
	Heteromorpha arborescens	0.010%
	Bridelia cathartica	0.009%
	Ficus natalensis	0.009%
	Strychnos innocua	0.008%

	Maytenus mossambicensis	0.007%
	Cassipourea congoensis	0.007%
	Albizia amara	0.007%
	Protea obtusifolia	0.006%
	Dovyalis macrocalyx	0.005%
	Friesodielsia obovata	0.005%
	Commiphora africana	0.005%
	Pleurostylie africana	0.005%
	Antidesma venosum	0.005%
	Pavetta zeyheri	0.005%
	Swartzia madagascariensis	0.005%
	Xeromphis obovata	0.004%
Justification of Change	The analysis of forest cover change during the monitoring period, detailed in Section 3.1, indicates that less forest loss occurred in the with-project scenario than would have without the project activity, and therefore native tree diversity and composition was likely maintained at a higher level than it would have been without implementation of the project activity.	

Change in Biodiversity	Eastern Chimpanzee (<i>Pan troglodytes</i>) habitat suitability
Monitored Change	The chimpanzee habitat suitability index, based on the chimpanzee habitat suitability model, the average habitat suitability index at the end of the monitoring period was 0.436 compared to 0.371 in the baseline.
Justification of Change	See Appendix 1 and “Chimpanzee Suitability_Method.docx” for detailed methods and analysis of habitat suitability change data.

5.1.2 Mitigation Actions (VCS, 3.19; CCB, B2.3)

The main threats to megafauna in this landscape stem from habitat fragmentation and loss of landscape connectivity. Addressing these threats forms the fundamental design of this project. The design of this project enables the Village Governments to take the necessary actions to maintain the protection of biodiversity within the project area. The governance, management and implementation of VLUPs by the Village Governments is supported by Carbon Tanzania, and The District Government.

Based on project design, implementation and structure of the VLUPs, the precautionary principle in environmental science follows: to take preventive action in the face of uncertainty; shifting the burden of proof to the proponents of an activity; exploring a wide range of alternatives to possibly harmful actions; and increasing public participation in decision making. As evidenced by monitoring of the indicator species above, implementation of the VLUPs is having the desired effect to slow and prevent habitat fragmentation and degradation of biodiversity in the Ntakata Mountains Project Area.

5.1.3 Net Positive Biodiversity Impacts (CCB, B2.2, GL1.4)

Net impacts on biodiversity resulting from the project activity are positive through the current monitoring period as compared to the baseline scenario, outlined in the validated project document.

Net positive biodiversity benefits are demonstrated through remotely sensed data on deforestation as compared to the baseline scenario, as detailed in Section 3.1, and through monitoring of chimpanzee habitat using the habitat suitability model described in Section 5.3.1 below. In the without-project case, 4,972 ha of forest was projected to be lost during the current monitoring period. Results from the forest cover classification demonstrate that 704 ha of forest was lost in the project area during the monitoring period, meaning that more than 4,000 ha of forest loss was prevented during this period, which is a net positive impact of the project activity. Forest cover is a direct predictor of habitat suitability for many important plant and animal species living in and around the project area, including the chimpanzees.

According to the habitat suitability model, habitat quality as indicated by the average habitat suitability index, was maintained during the monitoring period as compared to the baseline. The suitability index at the end of the monitoring period was 0.436 compared to 0.371 in the baseline. Maintenance of tree diversity was not required to be monitored in this reporting period and will be monitored in future reporting periods.

Climate change is expected to cause the region to become drier with more variability in rainfall patterns, increasing the risk of fire on the landscape that could reduce habitat for forest dwelling species³⁷. The project activity involves active monitoring to prevent fire risk. Additionally, reducing deforestation in the project area will protect the resiliency of the ecosystem by reducing degradation and loss of waterways and soil health, and reducing risk of floods and landslides during the predicted higher intensity storms.

5.1.4 High Conservation Values Protected (CCB, B2.4)

³⁷ Shemsanga, Ceven, Anne Omambia, Yangsheng Gu. 2010. The Cost of Climate Change in Tanzania: Impacts and Adaptations. *Journal of American Science* 6(3).

Biodiversity conservation is a priority objective of the project, and HCVs related to biodiversity were not negatively affected by the project activity. Eastern Chimpanzees (*Pan troglodytes*) are monitored as an indicator of HCV well-being in the project area as the species is highly sensitive to disturbance. Based on model analysis described in Section 5.3.1, high quality chimpanzee habitat was maintained during the reporting period where the average habitat suitability index at the end of the monitoring period was 0.436 compared to 0.371 in the baseline.

Absence of negative impacts is demonstrated through periodic monitoring and reporting of biodiversity indicators like the chimpanzee habitat suitability model, detailed above.

5.1.5 Species Used (VCS, 3.19; CCB, B2.5, 2.6)

No species are grown or introduced as part of project forest conservation activities. Maize, bananas, beans, cassava, sweet potatoes, Irish potatoes, sesame, coffee, sunflower, millet, and sorghum have been used in ongoing agricultural activities.

5.1.6 Invasive Species (VCS, 3.19; CCB, B2.5)

No species are grown or introduced as part of project forest conservation activities.

The project is a REDD activity and does not involve any introduction of new biological material. Agricultural crops and livestock in areas designated in the VLUPs for agriculture and grazing represent species and stock already existing in the project region and not known to invade native ecosystems and displace native species. No known invasive species are introduced by the project, and in fact, the project activity is expected to reduce vectors of invasives by reducing the development of new access routes in forest protection areas.

5.1.7 GMO Exclusion (CCB, B2.7)

The project uses no GMOs to generate GHG emissions reductions or removals. GMOs are illegal in Tanzania.

5.1.8 Inputs Justification (VCS, 3.19; CCB, B2.8)

In village agricultural areas (makazi) the following fertilizers are legally³⁸ used by farmers. This is only within the designated farming areas following the village land use plans (VLUPs). Some inputs are used when needed by farmers but are not part of the projects monitoring activities. These fertilizers, chemical pesticides, and herbicides are not used by the project or in project activities in any way. They are included only as examples of some of the inputs that are potentially used by community members in agricultural communities and for agricultural livelihood in Tanzania. The project or any project activities in no way use any of these fertilizers, chemical pesticides, and herbicides nor encourages or supports their use. Knowledge of the impacts of agricultural run-off is limited and there is no monitoring system within Lake Tanganyika or within the drainage basin around the project area³⁹. The following pesticides, and herbicides are used when needed in agricultural activities:

Name	Calcium Ammonium Nitrate
Justification of Use	Fertilizer
Adverse Effect	Runoff from fertilizer may cause degradation of water quality in the region. ⁴⁰ However data from western Tanzania is limited and no adverse effects are reported in the literature.

Name	DAP (Diammonium Phosphate)
Justification of Use	Adds phosphorus and ammonium to soils with limited fertility
Adverse Effect	Runoff from fertilizer may cause degradation of water quality in the region however there is no local or regional evidence of runoff affecting local water sources.

Name	Urea
Justification of Use	Fertilizer
Adverse Effect	Runoff from fertilizer may cause degradation of water quality in the region however there is no local or regional evidence of runoff affecting local water sources.

³⁸<https://www.tpri.go.tz/storage/app/media/uploadedfiles/Registered%20Pesticides%20for%20use%20in%20the%20United%20Republic%20of%20Tanzania%202020.pdf>

³⁹ <https://www.sciencedirect.com/science/article/pii/S0380133018300911>

⁴⁰ <https://link.springer.com/article/10.1007/s13201-015-0269-z>

Name	Phosphate
Justification of Use	Fertilizer
Adverse Effect	Runoff from fertilizer may cause degradation of water quality in the region however there is no local or regional evidence of runoff affecting local water sources.

Name	Roundup
Justification of Use	Herbicide
Adverse Effect	Roundup may be potentially harmful to human and animal health. There are no reported cases of negative impacts of roundup use in Katavi Region.

Name	Selecron (organophosphate)
Justification of Use	Insecticide
Adverse Effect	Insecticides may be potentially harmful to human and animal health. There is no reported cases of negative impacts of Selecron use in Katavi Region

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impacts (CCB, B3.1) and Mitigation Actions (CCB, B3.2)

Negative Offsite Impact	Mitigation Measure(s)
Deforestation due to leakage outside of the project area	Village Land Use Plans contain efforts to mitigate the effects of deforestation due to leakage by designating areas of agricultural activity. The success of the carbon project has led to many villages requesting to partake, and CT always states that an independent participatory land use plan is a prerequisite. This has encouraged land-use planning in the nearby areas, outside of the project zone. One example is Bugwe village neighboring Mpembe to the north, which passed a Land Use Plan in 2020 and will potentially be incorporated in future carbon projects.

5.2.2 Net Offsite Biodiversity Benefits (VCS, 3.19; CCB, B3.3)

Biodiversity indicators, all directly related to forest cover, were tracked both within the Ntakata REDD project area and leakage belt as part of climate impact monitoring activities, and net impacts on biodiversity indicators are quantified and reported in Section 5.1.1. Forest cover loss outside of the project area during the project monitoring period was significantly lower than the predicted forest loss expected in the without-project scenario. Because all biodiversity indicators are in some way tied to conservation of forest cover around the project area as well, it is clear that the outcome of the project activities has been a net benefit to offsite biodiversity.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan (CCB, B4.1, B4.2, GL1.4, GL3.4)

Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
Maintenance of forest cover	Change in areal coverage of forest	Carbon project area, 204,807 ha	Assessment of forest cover change via time series of classified satellite imagery Detailed protocol in PD Section 3.3, Monitoring Plan	Initial forest cover assessment 2017, subsequently every five years or less	Carbon Tanzania	See Section 5.1.1 Monitored from May 19, 2023 to May 18, 2024
Potential negative offsite impacts due to displacement of deforestation	Change in areal coverage of forest due to displaced deforestation	Activity shifting leakage belt as defined in PD	Assessment of forest cover change via time series of classified satellite imagery Detailed protocol in PD Section 3.3, Monitoring Plan	Initial forest cover assessment 2017, subsequently every five years or less	Carbon Tanzania	See Section 5.1.1 Monitored from May 19, 2023 to May 18, 2024
Maintenance of native tree diversity	Tree (woody plants > 5 cm dbh) species richness and composition, relative basal area (percent of total tree basal area represented) of each species	Carbon project area, 204,807 ha	Forest inventory Detailed protocols provided in "Mahale Forest Inventory Feb2018"	Initial inventory in 2017 Re-inventory every ≤ 10 years	Carbon Tanzania	See Section 5.1.1 Tree diversity is assumed to remain constant where forest cover is maintained until the next re-measurement event.

Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
Maintenance of habitat suitability for eastern Chimpanzees (<i>Pan troglodytes schweinfurthii</i>)	Average remote sensing-derived habitat suitability index value (0-1), difference between actual and baseline scenarios	Carbon project area, 204,807 ha	Monitoring will apply the habitat suitability model developed by Jantz et al 2016⁴¹, incorporating any future refinements made to the model. Note that the Jantz et al 2016 model had the highest predictive capability ($r^2 = 0.89$) in the Ntakata REDD Project region (for the eastern Chimpanzee sub-species). For each monitoring event, the model will incorporate predictor variables derived from the most recent Landsat data. The average habitat suitability index for the baseline scenario will be derived applying the same model and Landsat data, clipped to the projected area of forest remaining in the baseline for the corresponding year (previously derived in the PD Section 3.2), with predicted non-forest areas assigned a habitat suitability value of 0. The model will be re-validated periodically as ground-truth field observation data becomes available.	Conducted every ≤ 5 years	Carbon Tanzania GMERC	The average habitat suitability index at the end of the reporting period was 0.436 compared to the average habitat suitability index in the baseline scenario of 0.371. The initial habitat suitability index in 2017 was 0.451. See “ChimpanzeeSuitability_Method.docx” for further detail. Monitored from May 19, 2023 to May 18, 2024

5.3.2 Biodiversity Monitoring Plan Dissemination (CCB, B4.3)

⁴¹ Jantz, S.M., Pintea, L., Nackoney, J. and Hansen, M.C., 2016. Landsat ETM+ and SRTM data provide near real-time monitoring of chimpanzee (*Pan troglodytes*) habitats in Africa. *Remote Sensing*, 8(5), p.427.

A summary of the monitoring plan was translated to Swahili and disseminated to the community groups and other stakeholders prior to validation. Monitoring results are being communicated through meetings with the Village Governments in each of the eight villages on an annual basis. A copy of the monitoring results is also being presented to the Tanganyika and Mpanda districts. All of these meetings (with Village Governments and districts) create an opportunity to analyze and discuss the project strategy and activities to assess effectiveness and possibly adjust.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

5.4.1 Trigger Species Population Trends (CCB, GL3.2, GL3.3)

Trigger Species	Eastern Chimpanzee (<i>Pan troglodytes schweinfurthii</i>)
With-project Scenario	Through implementation of the VLUPs during this monitoring period in the with-project case, forest loss has been reduced. Reduced deforestation in the with-project scenario as compared to the without-project baseline, demonstrates that the species population has likely been maintained at a higher level during the monitoring period due to implementation of the project activity. In 2017, analysis indicated that there were 1,168 km² of suitable chimpanzee habitat in the project area with an average habitat suitability index of 0.451, and 6,984 km² in the Greater Mahale Ecosystem (GME). The chimpanzee habitat suitability model indicated an average habitat suitability index of 0.436 at the end of the reporting period, compared to 0.371 in the baseline scenario.
Trigger Species	Leopard (<i>Panthera pardus</i>)
With-project Scenario	Impacts on identified trigger species are inferred by tracking change in forest cover over time; per CCBA v3.1 GL3. Through implementation of the VLUPs during this monitoring period in the with-project case, forest loss has largely been reduced. Reduced deforestation in the with-project scenario as compared to the without-project baseline, demonstrates that the species population has likely been maintained at a higher level during the monitoring period due to implementation of the project activity. The current population status is maintained.

Trigger Species	Temminck's Ground Pangolin (<i>Smutsia temminckii</i>)
With-project Scenario	Impacts on identified trigger species are inferred by tracking change in forest cover over time; per CCBA v3.1 GL3. Through implementation of the VLUPs during this monitoring period in the with-project case, forest loss has largely been reduced. Reduced deforestation in the with-project scenario as compared to the without-project baseline, demonstrates that the species population has likely been maintained at a higher level during the monitoring period due to implementation of the project activity. The current population status is maintained.
Trigger Species	Martial Eagle (<i>Polemaetus bellicosus</i>)
With-project Scenario	Impacts on identified trigger species are inferred by tracking change in forest cover over time; per CCBA v3.1 GL3. Through implementation of the VLUPs during this monitoring period in the with-project case, forest loss has largely been reduced. Reduced deforestation in the with-project scenario as compared to the without-project baseline, demonstrates that the species population has likely been maintained at a higher level during the monitoring period due to implementation of the project activity. The current population trend is maintained.

APPENDIX 1: CHIMPANZEE SUITABILITY MODEL

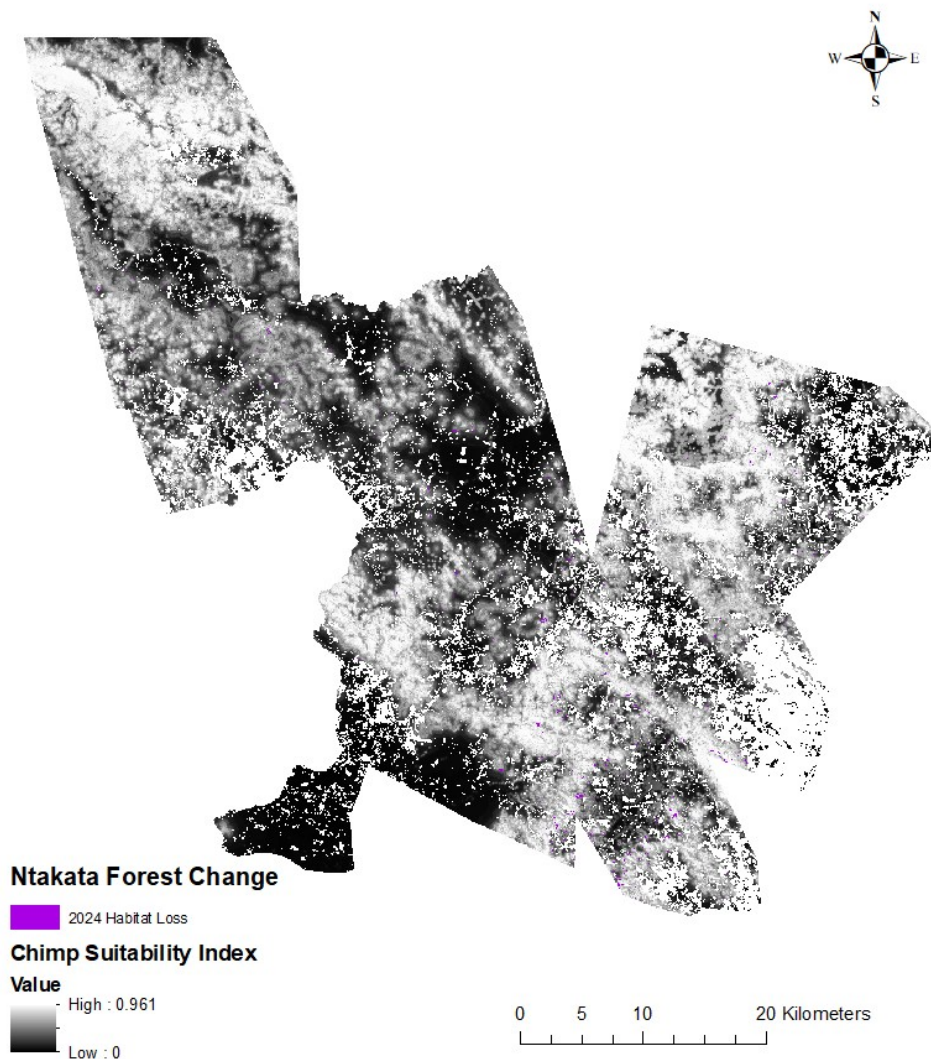


Figure 5.1. Habitat suitability model showing a range of habitat suitability values for Chimpanzees in the Ntakata Mountains REDD Project area in 2024. New non-forest in suitable habitat within the project area is displayed in purple. Note that the values shown are transformed to a 0-1 in the index.

Chimpanzee Habitat

The chimpanzee habitat suitability model outputs a habitat suitability index value for each pixel in the project area based on biophysical input parameters (see “ChimpanzeeSuitability_Method.docx”). The index value is continuous and an indicator of chimpanzee habitat quality. Higher values indicate higher quality habitat and a greater likelihood that a chimpanzee will be found in that location. Habitat suitability in the project area was derived at the project start in 2017.

The updated Chimp Habitability Index (CHI) was calculated for both the with-project and baseline scenarios for the current Monitoring Report. Both Indices were derived from the originally predicted CHI raster. During each Monitoring Period any areas of deforestation have the Index set to 0 and the average value for the Project Area is recalculated for the Report. It should be noted that the Project Area used for this calculation is the original Project Area that was set during Validation. Typically, lower quality chimp habitat is deforested before high quality habitat. If the updated CHI were calculated on the remaining forested areas (as opposed to the beginning forest area), the CHI increases with deforestation rather than decreases as lower quality habitat is deforested.

The with-project (WP) scenario was calculated by setting the new non-forested areas identified during the Monitoring Period to a CHI of 0 and the baseline scenario was determined utilizing the allocated baseline risk model. The Index is then rescaled to 0-1 (from 0-1,000) to align with previous reporting. The mean chimpanzee index for 2024 is 0.436. The mean chimpanzee index without the project was calculated as 0.371.

APPENDIX 2: ACCURACY ASSESSMENT OF 2024 LANDSAT IMAGERY CLASSIFICATION

Data

To produce the 2024 forest/non-forest cover map, Landsat 8 and 9 imagery was obtained for July 2024 (07/20-07/29/2024), with a median composite created for all images with less than 10% cloud cover. Sentinel-2 data was obtained in a similar fashion, also utilizing a median composite for July 2024 of all images with less than 10% cloud cover (07/01-07/31/2024). Sentinel-1 VV and VH band data was obtained from ASF Vertex data browser, also for July 2024 (07/29/2024). Sentinel-1 and Sentinel-2 data

were resampled to 30m resolution to match the Landsat data. Several spectral indices were calculated for both the Landsat and Sentinel data, including Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI) and Modified Soil Adjusted Vegetation Index (MSAVI). Unless otherwise mentioned, imagery was obtained in R using the packages `rstac` and `gdalcubes` from Microsoft Planetary Computer, with all transformations (resampling, calculations) performed in R using the `terra` package.

Classification

Training data was delineated using Planet imagery obtained through the NICFI program for July 2023 and 2024 and, where available, high-resolution images through Google Earth. A false color composite (NIR, R, G), true color composite (R, G, B), and SAVI index was created from the Planet 2023 and 2024 data. Training samples were identified in 6 classes - Agriculture (NF), Soil (NF), Burned Forest (F), Low-density Forest (F), Dense Forest (F), Forest Loss (NF), which were collapsed into the final Forest/Non-Forest classes as labeled.

The classification was conducted in R using the `caret`, and `randomForest` packages. Non-Forest from prior 2023 was masked out of the final output of the classification. After combining the classes to binary F/NF additional manual verification and editing was performed in QGIS using the Semi-Automatic Classification Plugin (SCP). Edits were based on the 2024 Planet imagery.

Accuracy Assessment

After classification, 230 points were randomly selected for accuracy assessment purposes, resulting in 115 Forest and 115 Non-Forest points (see figure 3). Using the Planet imagery from July 2023 and 2024, classification results were compared to the high-resolution imagery to assess the accuracy of the classification. The assessment was conducted on a Forest/Non-Forest basis at the 0.5 ha scale, centered around the point. In cases where the 0.5 ha area covered an edge of both Forest/Non-Forest, the point was used to determine the class. There was overall map accuracy of 96.96%. The accuracy assessment results are summarized in the table below.

Reference	Classification	Total	Accuracy (%)

Land-use class as determined from ground-truth points				Producer's accuracy (# correct / row total)
	Non-forest	Forest		
Non-forest	112	3	115	97.391%
Forest	4	111	115	96.522%
Total	116	114	200	Overall Accuracy
User Accuracy (%) (# correct / column total)	96.552%	97.368%		96.96%

Table 1. Accuracy assessment confusion matrix

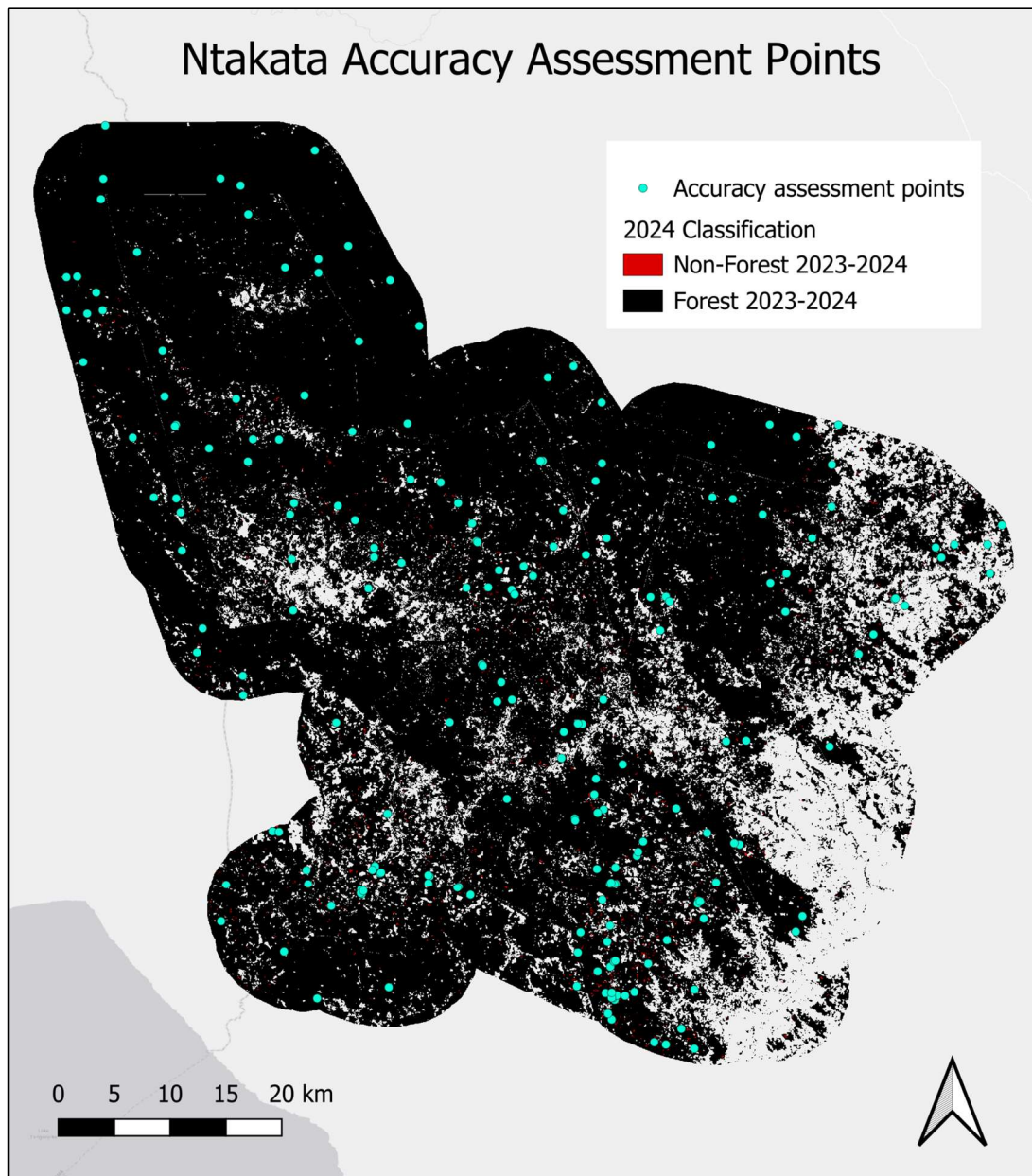


Figure 1. Forest / Non-forest in 2024 and accuracy assessment point

APPENDIX 3: PROJECT RISKS TABLE

	Identified risk(s)	Potential impact of risk on stakeholders, ecosystem health, and biodiversity	Mitigation or preventative measure(s) taken
Natural and human induced risks to stakeholders' wellbeing	Human conflict, wildlife encounters	Displacement, loss of livelihoods, injury, or death	Improved governance capacity to respond to hazards supported community awareness towards project risks, improved resource availability
Risks to stakeholder participation	Exclusion of marginalized groups, lack of communication, misinformation, unequal distribution of benefits, discrimination of women	Reduced community engagement, project delays, lack of local support	Established inclusive communication channels including door-to-door visits by carbon champions, conducted regular stakeholder meetings, and implemented feedback mechanisms across all project areas. Multiple grievance and feedback pathways were established and tracking of project spending to prevent unequal distribution. Comprehensive HR and safeguarding policies to prevent discrimination.
Working conditions	Non-compliance with labor laws, inadequate safety measures, exploitation	Occupational diseases, penalties, fines, legal disputes, cancellation of company registration	Ensured compliance with local and international labor laws, provided training, and distributed materials when relevant.

Safety of women and girls	Gender-based violence, harassment, discrimination	Physical and psychological harm, legal liability, loss of trust within the community	Developed and enforced gender-sensitive safeguarding education and policies, provided training, ensured safe reporting mechanisms.
Safety of minority and marginalized groups, including children	Discrimination, exploitation, lack of access to services	Marginalization, social unrest, reputational damage	Established and communicated anti-discrimination policies, provided equal access to resources, provided safeguarding trainings, engaged with project partners.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	Increased village economic activities could lead to generation of waste	Increased waste could have negative impacts on ecosystems and human and biodiversity health	Carbon Tanzania maintains internal policies around waste and pollutants and ensures partner projects are subject to Tanzanian regulation and compliance. Carbon Tanzania also encourages utilization of eco-friendly alternatives where applicable.
Discrimination	Inequality in hiring, promotion, and treatment of employees	Legal disputes, loss of skilled workers, damage to organizational reputation	Adhered to non-discrimination policies, conducted training on such, and reviewed hiring practices regularly.
Sexual harassment	Inappropriate behavior or abuse in the workplace	Legal liability, loss of staff morale, and reputational damage	Established a zero-tolerance policy, provided ongoing training and awareness programs, and ensured confidential reporting channels are in place.
Equal pay for equal work	Pay disparities based on gender, ethnicity, or other discriminatory factors	Legal action, employee dissatisfaction, and turnover	Conducted regular pay audits, ensured transparent pay policies, and aligned with both local and international labor laws.

Gender equity in labor and work	Gender discrimination in employment opportunities and workplace practices	Underrepresentation of women in leadership, gender-based wage gaps, legal challenges	Promoted gender equity in recruitment, provided leadership opportunities for women, maintained gender equity policies, and supported women in conservation roles within the projects.
Forced labor⁴²	Coercion or exploitation of workers	Legal repercussions, reputational harm, harm to employees	Provided clear contracts in languages understood by workers, implemented regular staff monitoring, and recognized labor rights.
Child labor	Employment of underage workers	Legal action, reputational damage, and ethical concerns	Adhered to safeguarding policies prohibiting child labor, and provided training to stakeholders on child labor laws, maintained company whistleblowing policy.
Human trafficking	Involvement in or facilitation of trafficking activities	Harm to individuals, severe legal consequences, reputational damage	Maintained anti-trafficking policies, trained staff on policy and reporting.
Recognition of, respect of, and promotion of the rights to IPs, LCs and customary rights holders	Ignoring or infringing on the rights of Indigenous Peoples (IPs) and Local Communities (LCs)	Conflict with local communities, legal challenges, project failure	Engaged in meaningful consultations, obtained Free, Prior, and Informed Consent (FPIC), and respected customary laws and rights across all conservation and development projects.
Preserving and protecting cultural heritage	Destruction or neglect of cultural sites or practices	Loss of cultural heritage, community conflict, legal penalties	Collaborated with local communities to identify and protect cultural sites, integrated

⁴² The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

			cultural heritage considerations into project planning and implementation.
Protecting and preserving property rights, customary rights, or protecting legal or customary tenure/access rights to territories, property, and resources, including collective and/or conflicting rights	Violation of rights by project or adjacent stakeholders	Loss of land or resource access, loss of access to cultural sites, failure of project	Project design is based on protection of property rights and customary rights. Project activity is to sustain protection of tenure and access rights.
Impacts on biodiversity and ecosystems	No risk identified		The project has net positive benefits for biodiversity and ecosystems by preventing forest loss and does not pose a risk.
Soil degradation and soil erosion	No risk identified		The project activities prevent forest loss and thus prevent soil degradation and soil erosion.
Water consumption and stress	No risk identified		Prevention of forest loss will maintain and improve water retention in the project area.
Habitats (and areas needed for habitat connectivity) for rare, threatened, and endangered species	No risk identified		Prevention of forest loss maintains and improves chimpanzee habitat in the project area, as evidenced by habitat suitability assessment in Appendix 1.
Areas needed for habitat connectivity	No risk identified		Prevention of forest loss maintains and improves existing habitat connectivity,

			especially for species relying on forested habitat.
Invasive species	No risk identified		No invasive species are introduced by project activities
Ecosystem conversion	No risk identified		The prevention of forest loss directly mitigates ecosystem conversion.

