

PROJECT IMPLEMENTATION REPORT



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Protecting forests for communities, wildlife, and climate



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MakameSavannah
Protecting forests for pastoralists, wildlife and climate

Project title	Makame Savannah REDD
Project ID	1900
Crediting period	27 April 2016 - 26 April 2046; 30-year lifetime
Monitoring period	27 April 2023 – 26 April 2024; 1 year
(CCB) GHG accounting period	27 April 2016 - 26 April 2046; 30-year lifetime
Original date of issue	August 31, 2024
Most recent date of issue	29 March 2026
Version	3.0
VCS Standard version	4.7
CCB Standards version	3.1
Project location	Makame Wildlife Management Area Kiteto District, Arusha Region, Tanzania
Project proponent(s)	CT Limited, t/a Carbon Tanzania, Marc Baker Email: marc@carbontanzania.com ; Phone: +255 (0) 784 448761
Validation/verification body	VVB ID: 016 Contact: Aster Global Environmental Solutions, Inc. Location: 3800 Claremont St NW North Lawrence, OH 44666 Website: www.asterglobal.com
History of CCB Status	Validated - 23 June 2020 Initial Verification – 9 November 2020 Second Verification – August 2021

	Third verification – October 2022 Fourth verification – October 2023 Fifth verification – October 2024
Gold Level criteria	Community: Masai community owned land and resources through wildlife management area (WMA) designation. Biodiversity: Protection of key habitat for 13 IUCN Red List species, 2 endemic birds and providing ecosystem connectivity for migratory mammal populations Climate: Regional level climate analysis and community-based identification of climate threats and adaptation. Development of resource planning and adaptation in response to identified climate change impacts.
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CONTENTS

Update the page numbers of the table of contents below upon completion of the project description.

1	SUMMARY OF PROJECT BENEFITS	4
1.1	Unique Project Benefits	4
1.2	Standardized Benefit Metrics	7
2	PROJECT DETAILS	10
2.1	Summary Description of the Implementation Status of the Project	10
2.2	Project Implementation Status	19
2.3	Stakeholder Engagement & Safeguards	31
2.4	Management Capacity	42
2.4.3	Project Management Partnerships/Team Development.....	45
2.5	Legal Status and Property Rights.....	46
3	CLIMATE	56
3.1	Monitoring GHG Emission Reductions and Removals	56
3.2	Quantification of GHG Emission Reductions and Removals	101
3.3	Optional Criterion: Climate Change Adaptation Benefits	127
4	COMMUNITY	128
4.1	Net Positive Community Impacts	128
4.2	Other Stakeholder Impacts.....	138
4.3	Community Impact Monitoring	140
4.4	Optional Criterion: Exceptional Community Benefits	148
5	BIODIVERSITY	160
5.1	Net Positive Biodiversity Impacts	160
5.2	Offsite Biodiversity Impacts.....	167
5.3	Biodiversity Impact Monitoring	168
5.4	Optional Criterion: Exceptional Biodiversity Benefits	174
	APPENDIX 1: PROJECT THEORY OF CHANGE	177
	APPENDIX 2: PROJECT RISKS	179
	APPENDIX 3: REMOTE SENSING AND ACCURACY ASSESSMENT	184

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) Strengthened land-rights	The continued implementation of the Resource Zone Management Plan means the five WMA village communities are enjoying increased capacity and rights to enforce their existing land-use plans that were designed to protect habitat, which supports the traditional pastoralists' livelihoods. However, the Resource Zone Management Plan will be changed to the General Management Plan (GMP), which is going to be implemented across all of the WMA as per the requirements of MNRT through the Wildlife Management Regulation of 2018. This requires the WMA to shift from RZMP to GMP after five years of practice, and GMP will last for ten years in implementation.	4.3	Recognition, maintenance, and renewal of community land and resource rights.
2) Improved and secure access to grazing areas for domestic animals	The implemented Resource Zone Management Plan strengthened the status of areas reserved specifically for seasonal grazing of pastoralist herds that form the value-basis of the Masai communities' traditional lifestyle. Those	4.3	Improved and secured access to community grazing area backed by a strong community rights and protection regime.

	areas are still protected for the designated uses by Village Game Scouts.		
3) Access to increased revenue from wildlife-based tourism	The project has improved the communities' ability to attract wildlife-based tourism, both consumptive and non-consumptive, as the areas that support wildlife populations are better protected through the project activities. During this period, Makame WMA has managed to sign contracts with two tourist hunting investors, and they are active in the WMA.	4.3	WMA remains actively engaged with wildlife-based tourism investors who compliment the increased WMA project revenues.
4) Ecosystem connectivity for the southern part of the Tarangire-Manyara Ecosystem	Remote sensing analysis results show forest cover was maintained supporting pastoralist livelihoods, migratory corridors and habitat for threatened species.	5.1	Remote sensing analysis results show ecosystem has been maintained supporting pastoralist livelihoods, migratory corridors and habitat for threatened species.
5) Strengthened land-rights	The continued implementation of the Resource Zone Management Plan means the five WMA village communities are enjoying increased capacity and rights to enforce their existing land-use plans that were designed to protect habitat, which supports the traditional pastoralists' livelihoods. However, the Resource Zone Management Plan will be changed to the General Management Plan (GMP), which is going to be implemented across all of the WMA as per the requirements of MNRT through the Wildlife Management Regulation of 2018. This requires the WMA	4.1	Recognition, maintenance, and renewal of community land and resource rights.

	to shift from RZMP to GMP after five years of practice, and GMP will last for ten years in implementation.		
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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	354,072 t CO ₂ e	3.2.4	1,621,818 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	8,216 ha	3.2.2	38,863 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	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*)

	project's activities, measured against the without-project scenario			
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	1,112	4.3.1	3,545
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities	474	4.3.1	1,456
Employment	Total number of people employed in of project activities, ⁵ expressed as number of full-time employees ⁶	32	4.3.1	32
	Number of women employed in project activities, expressed as number of full-time employees	9	4.3.1	9
Livelihoods	Total number of people with improved livelihoods ⁷ or income generated as a result of project activities	>26,395	4.1.3	>26,395
	Number of women with improved livelihoods or income generated as a result of project activities	>13,552	4.1.3	>13,552
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	0	4.3.1	0
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	0	4.3.1	0

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.

Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	243	4.3.1	1,099
	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	106	4.3.1	586
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	26,395	4.3.1	26,395
	Number of women whose well-being was improved as a result of project activities	13,552	4.3.1	13,552
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation, ⁹ measured against the without-project scenario	>100,000Ha	5.1.1	>100,000Ha

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.

	Number of globally Critically Endangered or Endangered species ¹⁰ benefiting from reduced threats as a result of project activities, ¹¹ measured against the without-project scenario	5	5.1.1	5
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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. Forest cover is being monitored using remotely sensed satellite and aerial imagery, as detailed in Section 3.1 below and following the methodology outlined in M-MON VMD-0015. 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 leakage belt 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 1-year monitoring period the project area resulted in 383,283 tons t CO₂e emission reductions with a buffer pool contribution of 92,091 t CO₂e and a total emission reduction of 354,072 t CO₂e after accounting for leakage (55,245 t CO₂e) and uncertainty.

The project also accomplished community and biodiversity objectives during the reporting period including improving the well-being and livelihoods of 26,395 community members and protecting 4 endangered or critically endangered species.

2.1.2 Audit History (VCS, 4.1)

Audit Type	Period	Program	VVB Name	Number of years
Validation/ Verification	26 April 2017 – 25 April 2019	VCS-CCB	Epic	Two years
Verification	26 April 2019 – 25 April 2021	VCS-CCB	Aster Global	Two years
Verification	26 April 2021 – 25 April 2022	VCS-CCB	Aster Global	One year

¹⁰ Per IUCN's Red List of Threatened Species

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

Verification	26 April 2022 – 25 April 2023	VCS-CCB	Aster Global	One year
Verification	26 April 2023 – 25 April 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	CT Limited t/a Carbon Tanzania
Contact person	Mr. Marc Baker
Title	CEO, Carbon Tanzania
Address	PO Box 425, Arusha
Telephone	+255 (0) 784 448761
Email	marc@carbontanzania.com

2.1.5 Other Entities Involved in the Project

Organization name	Makame Wildlife Management Area Authorized Association (Makame WMA – AA)
Role in the project	Legal body managing the WMA and the natural resources within it. Responsible for implementing the resource plan and ensuring areas set aside for conservation are conserved. Manages finances to ensure that people and villages receive revenue from the project.
Contact person	Supuk Olekao
Title	Makame WMA Manager
Address	Makame, Kiteto
Telephone	+255 784 594 379
Email	manager@makame.co.tz

Organization name	Village Councils of Makame, Ngabolo, Ndedo, Katikati and Irikishoibor villages, in Kiteto District
Role in the project	Villages participating in the WMA mechanism are obliged to uphold and enforce the provisions of the Resource Management Plan (RMP) that defines the different management regimes for each designated areas within the WMA. They are also tasked with managing village game scouts (VGS) who are responsible for patrolling, monitoring and by-law enforcement according to the RMP.
Contact person	Meleyaki Njuldu
Title	WMA Community Officer
Address	Ngabolo Village (Makame WMA)
Telephone	+255 68 9708 472
Email	melayekikibo@gmail.com

Organization name	TerraCarbon, LLC
Role in the project	Co-leads project kickoff. Designs and manages forest carbon inventory. Leads baseline development task. Develops Project Description and Monitoring Reports and advises Carbon Tanzania on various aspects of project development.
Contact person	David Shoch
Title	Director Forestry & Technical Services
Address	1822 W. Willow Wood Dr. Peoria, IL 61614
Telephone	001-309-693-9303
Email	david.shoch@terraarbon.com

2.1.6 Project Start Date (VCS, 3.8)

Project start date	27-04-2016
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Justification	The memorandum of understanding (MOU) dated 27th April 2016 between Carbon Tanzania and partners, signed with Kiteto District government (who is responsible for all investments in WMA under the Wildlife Act), is the project start date for the Makame Savannah REDD project since it (i) allocates roles and responsibilities between Carbon Tanzania and the Kiteto District government with respect to development of the carbon project, and (ii) marks the start of the educational program and carbon baseline that led up to the contract being signed by the WMA and Carbon Tanzania on 27th May 2017 and to future carbon funding for activities to implement the WMA.
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2.1.7 Benefits Assessment and Project Crediting Period (VCS, 3.9; CCB, G1.9)

Crediting Period	The project crediting period is between April 27 th , 2016 and April 26, 2046. The convention throughout this document is that each carbon accounting year refers to the period from April 27th of the previous year to April 26th of the designated year. For example, the year 2017 refers to April 27th, 2016 to April 26, 2017.
Start Date of First or Fixed Crediting Period	27-April-2016 to 26 April 2046
Total Number of Years of Crediting Period	30 years
CCB Benefits Assessment Period	30 Years

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

The project is located in the northern part of the Makame Wildlife Management Area (WMA), Kiteto District, northern Tanzania. This project area covers 104,065 hectares of Acacia-Commiphora scrub and Woodland, and is located 120 km due south of Arusha, Tanzania. The whole WMA is a 364,300 hectares area buffered by 102,700 hectares of community land also managed by the same communities.

The coordinates for a central area of the project are: (- 4.665142°, 36.654932°)

☒ KML file has been provided

2.1.9 Title and Reference of Methodology (VCS, 3.1)

Type (methodology, tool, module)	Reference ID (if applicable)	Title	Version
Methodology	VM0007	REDDMF: VM0007 REDD+ Methodology Framework	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
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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

2.1.10.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

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

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

2.1.12 Sustainable Development Contributions (VCS, 3.17)

This project does not aim to specifically contribute to achieving any nationally stated sustainable development priorities, however, it was developed to be in line with national policies such as The Wildlife Policy (1998)¹² and The National Land Policy (1995)¹³. This project does not have any provisions for reporting and monitoring on national policies.

¹² <http://www.tzonline.org/pdf/wildlifepolicy.pdf>

¹³ <http://extwprlegs1.fao.org/docs/pdf/tan169570.pdf>

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 for the Maasai living in communities surrounding the ~350,000 ha WMA
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 Maasai communities surrounding the ~350,000 ha WMA.
3)	8.3	8.3.1 Direct and sustainable employment	Implemented activities to increase	During this reporting period, the project employed 32 people	Over the project lifetime, the project has employed 32 people.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By conserving ~350,000 ha of acacia commiphora forest, the project has prevented the release of ~383,286 tonnes of carbon into the atmosphere during the monitoring period	Prevented the release of ~1,245,506 tonnes of carbon into the atmosphere

4)	15.1	15.1.1 Protection of forest resources resulting in reduced deforestation	Implemented activities to decrease	During the reporting period deforestation decreased by ~8,216 ha.	During the project lifetime deforestation has been reduced by ~38,863 ha.
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2.2 Project Implementation Status

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

Date	Milestone(s) in the project's development and implementation	CCB Activities/Indicators
November 22, 2012	Free prior and informed consent is given by participating communities to create Makame Wildlife Management Area and registered in Kiteto District	
April 27, 2016	Project start date MoU signed between Carbon Tanzania and Kiteto District	
August 2016	Consultative meetings with communities – introduction of project aims and requirements	
September 2016	Climate change adaptation workshop and presentation of climate change analysis.	
May 2017	Contract signed between Carbon Tanzania and Makame WMA	
January 2018	Implementation of biodiversity monitoring plan	
March 1, 2018	Complete PD	
March 2018	Resource Zone Management Plan completed and signed	
April 1, 2018	Registration of the project	
June, 2019 – June 2020	Validation and Verification of project activities.	
July 2020	First request for issuance of VCUs from project	
August 2021	Second verification begins.	
October 2022	Third verification begins.	
10th April 2021	Makame WMA appointed delegates for councils for the 2021 to 2023	
12nd – 13rd May 2021	Makame WMA conducted Governance Strengthening Framework for Makame WMA.	

18th – 20th May 2021	Makame WMA conducted Site-Level Assessment of Governance and Equity (SAGE) Workshop at Kibaya Kiteto District.	
September 2021	Makame WMA conducted carbon champions programme and presented holistic documentary showcasing the progress of activities implemented in Makame WMA to the communities.	
3rd November 2021	Makame WMA conducted Biannual meeting.	
November 2021	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of Degradation and Illegal logging in the Ntakata Mountains REDD Project. Surveys were conducted in Makame, Ndedo, Irkiushuobor and Katikati.	
14th – 16th December 2021	Makame WMA conducted VGS training at Ilchekuti.	
14th March 2022	Makame WMA conducted Biannual meeting.	
13th April 2022	Makame WMA conducted Women Forum at Ngabolo Village.	Community – Women's empowerment
7th May 2022	Makame WMA conducted Women Forum at Irkiushiobor Village.	Community – Women's empowerment
9th May 2022	Makame WMA conducted Women Forum at Katikati Village.	Community – Women's empowerment
17th May 2022	Makame WMA conducted Women Forum at Makame Village.	Community – Women's empowerment
18th May 2022	Makame WMA conducted Women Forum at Ndedo Village.	Community – Women's empowerment
18th May 2022	Makame WMA conducted Technical Training Workshop at Makame WMA office.	Community - Governance
May 2019 – May 2022	Makame WMA conducted surveys on the increased human wildlife interactions, attacks on livestock and crop damage and reported incidents: 41 caused by	Biodiversity – Negative impact monitoring

	human/wildlife interactions, 55 Livestock predation incidents and 35 crop damaged by wildlife.	
May 2021 – May 2022	Makame WMA implemented addition of solar electricity, radio communications and internet access to WMA infrastructure.	Community – Governance management
22nd – 26th September 2022	Makame WMA conducted a carbon champion programme in Irkiushiobor village.	Community - Education
22nd September - 1st October 2022	Makame WMA conducted a carbon champion programme in Makame village.	Community - Education
29th September – 3rd October 2022	Makame WMA conducted a carbon champion programme in Katikati village.	Community - Education
20th September – 4th November 2022	Makame WMA conducted a carbon champion programme in Ndedo village.	Community - Education
26th September – 4th December 2022	Makame WMA conducted a carbon champion programme in Ngabolo village.	Community - Education
31st October 2022	Makame WMA conducted training for Makame WMA servants.	Community – Governance management
1st - 2nd November 2022	Makame WMA conducted training on good governance for the board of AA and Makame WMA management.	Community – Governance management
3rd – 4th November 2022	Makame WMA conducted training on good governance and leadership.	Community – Governance management
7th November 2022	Makame WMA conducted Biannual meeting.	Community – Community relations
21st – 23rd November 2022	Ground counts were implemented in Makame WMA.	Biodiversity – Occupancy modeling
November 2022	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of	Biodiversity – Negative impact monitoring

	Degradation and Illegal logging in the Makame WMA. Surveys were conducted in Ndedo, Irkiushuio bor and Katikati.	
6th January 2023	Makame WMA conducted paramilitary training in wildlife crime for the Village Game Scouts (VGS).	Community - Education
20th January 2023	Makame WMA conducted Women Forum at Ndedo Village.	Community – Women's empowerment
25th January 2023	Makame WMA conducted paramilitary training in wildlife crime for the Village Game Scouts (VGS).	Community – Women's empowerment
27th January 2023	Makame WMA conducted Women Forum at Katikati Village.	Community – Women's empowerment
12nd February 2023	Makame WMA conducted Women Forum at Irkiushiobor Village.	Community – Women's empowerment
20th February 2023	Makame WMA appointed 13 women into leadership.	Community – Women's empowerment
27th February 2023	Makame WMA conducted Women Forum at Makame Village.	Community – Women's empowerment
3rd March 2023	Makame WMA conducted Women Forum at Ngabolo Village.	Community – Women's empowerment
6th March – 10th March 2023	Occupancy modelling was implemented in Makame WMA.	Biodiversity – Occupancy modeling
24th March 2023	Makame WMA conducted Biannual meeting.	Community – Community relations
June 2022 – March 2023	Makame WMA conducted surveys on the increased human wildlife interactions, attacks on livestock and crop damage and reported incidents: 4 caused by human/wildlife interactions, 33 Livestock predation incidents and 0 crop damaged by wildlife.	Biodiversity – Negative impact monitoring
27th April 2022 – 26th April 2023	Allocated 117,721.06 USD for education, 588,354 USD for management activities and 218,781.60 USD for villages.	Community - Governance
May 2023	Forest Loss analysis	Climate – Remote sensing

May – Aug 2023	Reduced emissions accounting	Climate – Carbon accounting
July 2023	Carbon Tanzania Protocols for Continued Participatory Rural Appraisal of Degradation and Illegal logging in the Makame WMA. Surveys were conducted in Makame, Katikati and Ngabolo.	Biodiversity – Negative impact monitoring
3rd September 2023	Makame WMA conducted Women Forum at Ndedo Village.	Community – Women's empowerment
5th September 2023	Makame WMA conducted Women Forum at Makame Village.	Community – Women's empowerment
7th September 2023	Makame WMA conducted Women Forum at Katikati Village.	Community – Women's empowerment
7th – 10th September 2023	Ground counts were implemented in Makame WMA.	Biodiversity – Occupancy modeling
8th September 2023	Makame WMA conducted Women Forum at Irkiushiobor Village.	Community – Women's empowerment
11th September 2023	Makame WMA conducted Women Forum at Ngabolo Village.	Community – Women's empowerment
13th - 20th September 2024	Makame WMA conducted a carbon champion programme in Irkiushiobor village.	Community - Education
14th – 16th September 2023	Makame WMA conducted a carbon champion programme in Irkiushiobor village.	Community - Education
15th – 16th September 2023	Makame WMA conducted a carbon champion programme in Katikati village.	Community - Education
18th – 21st September 2023	Makame WMA conducted a carbon champion programme in Ndedo village.	Community - Education
13rd September – 4th October 2023	Makame WMA conducted a carbon champion programme in Makame and Ngabolo village.	Community - Education

11st - 12nd December 2023	Training on the constitution and good governance in Makame WMA	Community – Governance management
1st January 2024	Makame WMA appointed 13 women into leadership.	Community – Women's empowerment
4th – 9th March 2024	Occupancy modelling was implemented in Makame WMA.	Biodiversity – Occupancy modeling
10th March – 8th April 2024	Makame WMA conducted a carbon champion programme in Katikati village.	Community - Education
14th – 18th March 2024	Makame WMA conducted a carbon champion programme in Ndedo village.	Community - Education
18th March – 4th April 2024	Makame WMA conducted a carbon champion programme in Ngabolo village.	Community - Education
28th March – 2nd April 2024	Makame WMA conducted a carbon champion programme in Makame village.	Community - Education
24th April 2024	Biannual meeting conducted in Kibaya Kiteto District	Community – Community relations
April 2023 – March 2024	Makame WMA conducted surveys on the increased human wildlife interactions, attacks on livestock and crop damage and reported incidents: 3 caused by human/wildlife interactions, 81 Livestock predation incidents and 191 crop damaged by wildlife.	Biodiversity – Negative impact monitoring
27th April 2023 – 26th April 2024	Allocated 175,143.24 USD for education, 529,789.50 USD for management activities and 234,950.29 USD for villages.	Community - Governance
27th April 2023 – 26th April 2024	Makame WMA sponsored 58 students for higher learning studies from Carbon finance.	Community - Education
October 2023	Fourth verification initiated	
April 26, 2026	End date of the first REDD baseline period.	
April 27, 2026	Start of second baseline period. The baseline must be renewed every 10 years from the project start date.	
April 26, 2036	End date of the second REDD baseline period.	

April 27, 2036	Start of third baseline period. The baseline must be renewed every 10 years from the project start date.	
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No new project activities commenced during this reporting period. All project activities that began in April 2016 continued through the end of the monitoring period. Leakage is monitored with remote sensing analysis of deforestation in the leakage belt, as described in Monitoring Plan in Section 3.1.3 and non-permanence risk was reassessed for this monitoring period (see “VCS- Risk-Report_Makame_.docx”).

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 in the development of this monitoring report:

1. The parameter COLB (equation 4 module LK-ASU) 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 GHG emission reductions or removals because, though the data to demonstrate suitability is unavailable, we assume that areas of vegetation included in estimation of COLB could be used for agriculture or livestock because ungulates are found to graze in almost all areas with vegetation. It is thus likely still an accurate estimate of this parameter. This deviation relates only to procedures and criteria for monitoring or measurement and does not relate to any other part of 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 has no impact on the quantification of GHG emission reductions or removals. This deviation relates only to procedures and criteria for monitoring or measurement and does not relate to any other part of the methodology, and thus does not affect project conservativeness.
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 affect the conservativeness of the quantification of GHG emission reductions or removals because the method parallels the method laid out in the methodology and achieves a similar result. Additionally, this deviation relates only to procedures

and criteria for monitoring or measurement and does not relate to any other part of the methodology.

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. Additionally, this deviation relates only to procedures and criteria for monitoring or measurement and does not relate to any other part of the methodology.
5. Parameter UP,SS,ipool 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 affect the conservativeness of the quantification of GHG emission reductions and removals because stock estimates do not change at year 5, and thus uncertainty would not change in this year either. This deviation does not affect the conservativeness of the quantification of GHG emission reductions and removals because stock estimates do not change at year 5, and thus uncertainty would not change in this year either. Additionally, this deviation relates only to procedures and criteria for monitoring or measurement and does not relate to any other part of the methodology.

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

Parameters were added to the Community Monitoring Plan to account for potential risks and costs to community members including, human/wildlife interactions, increased attacks on livestock from wildlife, increased crop damage from wildlife, and reduced land availability for agriculture. These parameters were listed as potential risks to the project, but were not directly monitored, though there have been no reports or complaints to the district government or to the WMA detailing any human/wildlife interactions, attacks on livestock, crop damage from wildlife, or reduced land availability for agriculture.

The Resource Management Zone Plan (RMZP) as described in Appendix 5 of the PD is considered to operate for a period of 5 years, from 2017 to 2022. However, during the monitoring period, the RMZP remained recognized by the Kiteto District Council as the legitimate management document of the Makame WMA during the interim period while the new General Management Plan (GMP) undergoes finalization and approval. Supporting documents are provided to demonstrate the continued recognition and use of the RMZP in the interim period.

In the community monitoring plan, hectares of crop fields damaged have not been recorded. Instead, the number of incidents of wildlife encounters has been tracked as this is more representative of the impact of increased wildlife presence in the project area.

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

1. The PDD contains a methodology deviation requesting that the parameter, COLB, is calculated as the average aboveground tree carbon stock and not the area-weighted average aboveground tree carbon stock. This deviation was not actually applied in the accounting of COLB in the validated PDD, the 1st reporting period, and the 2nd reporting period. Therefore, the methodology deviation listed in section 3.1.6 of the PDD relating to calculation of COLB should be ignored. The calculations follow the original formula in the methodology.
2. The CAB_tree value for stratum MAS is reported incorrectly in the validated PDD on page 67 as 43.5 tCO₂e. The correct value is 42.5 tCO₂e and is the value used in the validated calculation workbook.
3. The PROPIb formula is reported incorrectly in the PDD on page 77 but is applied correctly in the validated calculation workbook and in the monitoring report, dividing the total leakage belt area by AVFOR.
4. The Cpost parameter has been updated in the baseline to reflect a more conservative assumption about post-deforestation biomass stocks in the project area. Though it is evident on the project site that above-ground biomass stocks on land converted from forest to cropland is exceedingly small, in the absence of a locally-based study, the project has chosen to apply a highly conservative default value for this parameter, originally set to 0. The value is derived from the IPCC 2006 AFOLU report Chapter 5, Table 5.9, with a value of 1.8 tCh⁻¹ for biomass carbon stocks present on land Converted to Cropland. The value was multiplied by 3.664 to convert to tCO₂/ha to get 6.6 tCO₂/ha. The downstream calculations for baseline parameters have been updated to reflect this update.
5. 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.

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

This is not a grouped project.

2.2.7 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
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Poaching	Decrease biodiversity through poaching of target wildlife species.	VGS is continuing to implement a patrol management plan (PMP) that guides the number of patrols to be implemented in a year. Through this, VGS conducted patrols across all the project areas according to the work plan. Adaptive management plan dictates that additional resources will be purchased when necessary, including vehicles and/or motorbikes. During the current monitoring period, four motorbikes were purchased for VGS patrols. Carbon champions conducted outreach to the community members to disseminate the importance of conservation and strengthen land rights. The project continues the plan to roll out carbon champions training biannually to reach more community members to obtain education about conservation, resource planning, and strengthening land rights. See Section 5.3.1.
Weak leadership / governance / limited allocation of income	Inability to implement project activities could negatively impact the climate, community and biodiversity; ultimately leading to a failed project and no income generation from carbon credits	Governance and leadership training were continuing to be provided to both WMA staff and village local leaders, as well as biannual meetings to increase capacity and transparency in implementing the projects. Significant resources were allocated to all key implementation vectors.
Climate change / drought	Decrease availability of pasture and water for livestock and wildlife. Resulting in livestock deaths causing poverty to pastoralists and their families. Lack of appropriate habitat for wildlife resulting in reduced biodiversity and opportunities for tourism.	Community members were still custodians and stewards in ensuring ecosystems are maintained through reducing deforestation, as evidenced in the report. A significant increase in forest finance contributed to

		the development and implementation of a variety of activities, including community loans, as an alternative source of income. Furthermore, finances were used to support students in the school, which was used as a source of income, which reduces pressure on livestock only. Increased and improved pastures for the livestock and habitat for the wildlife contribute to livelihoods and increase tourism potential as well.
Disregard or misunderstanding of resource plan / environmental destruction	Negative impacts on Climate, Community and Biodiversity are possible as the resource plan is designed to provide climate, community and biodiversity benefits. Poor resource management will affect all citizens and their livestock, create conflict in the community, cause damage to wildlife habitat and create unwanted carbon emissions potentially reducing or removing PES.	Ensuring a participatory development of the resource plan, enforcing management zones, and creating a conservation awareness campaign educating community members about the values underlying the resource plan and climate change.
Invasion of WMA land by outsiders	Conversion of land from forest to agriculture will release carbon emissions exacerbating global warming and decreasing available habitat for wildlife or pasture for livestock. Illegal use of Makame WMA resources will create conflicts amongst communities, potentially leading to violence.	Regular patrols, purchasing of more vehicles to conduct patrols, increasing awareness of community members about conservation and the rules of the resource plan, strengthening and authenticating land rights.

2.2.8 Benefit Permanence (CCB, G1.11)

Carbon Tanzania and its partners have conducted capacity building and training within the communities and WMA entities to ensure project benefits will remain beyond the project lifetime. During this MP, this included education provided to community members by carbon champions. Additionally, the following were undertaken in the project during the monitoring period:

1. Training on the constitution and good governance in Makame WMA
2. Consultation on creating a team to develop and prepare the General Management Plan (GMP)
3. Carbon Champion training to disseminate education on the importance of forest conservation and its impacts on climate change
4. Governance training for the WMA staff and local leaders.

2.3 Stakeholder Engagement & Safeguards

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

No stakeholders were identified during the reporting period.

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

All project documentation, including local language versions, of the PD and all MRs were provided by Carbon Tanzania to the WMA management team and stored with the Makame WMA office situated in Makame Village. All project documentation, including local language versions are also provided by Carbon Tanzania to all five Village governments, the elected representatives of the communities. Copies of the RMP and accompanying map were translated into Swahili and were sent to every village by the WMA management team to support awareness of the WMA. This map contains local Maa names for areas and the REDD project boundaries. Carbon Tanzania provided copies of all project documentation including a local language version of this PD and all MRs with the District Government and partner NGOs. Informational meetings with stakeholders were publicized through invitations sent to the village offices.

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

Summary documentation describing the proposed project activities and its requirements have been translated into Swahili and shared with all community groups at all levels of administration through consultative workshops and specific training sessions. Carbon Tanzania has set in place a Carbon Champions program, training young men and women from each of the five villages in climate change and project development. These carbon champions have travelled to all villages and sub-villages to inform people in Maa about this REDD project.

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

During project development and early-stage implementation various informational meetings were held with stakeholders at the local and district level. All these meetings were aimed at increasing stakeholder understanding of the project, including identifying informational gaps to be addressed by later meetings and trainings. Some meetings and trainings were conducted in both Kiswahili, the

national language, and Maa, the tribal language, to allow as many stakeholders as possible full access to information. A formal informational meeting with stakeholders was held on:

- April 2024: Bi-annual meeting with WMA management team.

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

See Project Risks Table in Appendix 2.

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

Information about Community Costs, Risks, and Benefits was exchanged and discussed during several points in project development. Specifically, during sessions in August 2016 focused on how the proposed project would affect the communities and during consultative meetings and contract negotiations in 2017. The Carbon Champions continued project briefings to many community members more spread out throughout the landscape who would not have attended such sessions. Carbon Tanzania and the WMA also produced a financial guidelines document which again outlines potential risks. The Bi-annual meetings and Makame Authorised Association (AA) meetings also provide forums for Carbon Tanzania to convey any new risks and potential benefits and for the community to identify any new risks they feel have arisen.

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.

Our commitment is reflected in several key policies and practices related to safety of women and girls. All project staff are required to sign statements of integrity, committing to adhere to our strict code of conduct. This code explicitly prohibits any form of harassment, abuse, or threats towards women and girls. Any violation of this policy is taken seriously and is subject to immediate disciplinary action, including termination and legal consequences. The Carbon Tanzania policies are designed to foster a safe and respectful environment for all community members. These guidelines include zero tolerance for gender-based violence and strict enforcement of ethical behavior standards. The Makame Savannah REDD project fundamentally imposes governance structures that reinforce and support existing community mechanisms aimed at protecting women and girls. By working within these established frameworks, we promote gender protection, security, and the rule of law. This includes collaborating with local authorities and community leaders to ensure that our project activities align with and bolster local efforts to safeguard vulnerable populations. Given our strong governance structures and commitment to integrity, we have assessed that the risk of harm to women and girls due to our specific project activities is minimal. We continuously monitor our operations to ensure compliance with our policies and maintain open lines of communication with community stakeholders to address any concerns promptly. By embedding these principles into our project framework, we ensure that the safety and dignity of women and girls are protected and prioritized in all aspects of our work. Our approach not only mitigates risks but also supports and enhances the local governance structures dedicated to upholding gender protections and security.

The Makame Savannah REDD project is dedicated to ensuring the safety and well-being of all community members, particularly children and minority and marginalized groups. We take our responsibility seriously and have established the following measures. All project staff are required to sign statements of integrity, committing to uphold our code of conduct, which explicitly prohibits any form of harm or discrimination against children and minority and marginalized groups. Violations of this code are met with immediate disciplinary actions, including termination and potential legal consequences. Our policies are designed to protect vulnerable groups, with a zero-tolerance stance on any behavior that could harm or marginalize children and minority groups. These policies ensure that our project activities are conducted in a safe and respectful manner. The Makame Savannah REDD project supports and enhances local governance structures aimed at protecting children and marginalized groups. By collaborating with local authorities and community leaders, we ensure our activities align with and reinforce existing protections and legal frameworks. We have conducted thorough assessments and determined that the risk of harm to children and minority groups due to our specific project activities is minimal. Our governance structures and commitment to ethical practices provide robust safeguards. Continuous monitoring and open communication channels with the community enable us to promptly address any concerns or issues that may arise. We engage with community members and representatives of all groups, to understand their needs and concerns. This engagement ensures that their perspectives are integrated into our project planning and execution. We collaborate with local organizations to provide necessary support services, including education, healthcare, and assistance, to children and marginalized groups. This ensures that they have access to the resources needed to thrive and remain safe. By embedding these principles into our project framework, we ensure that the safety and dignity of children and minority and marginalized groups are protected and prioritized in all aspects of our work. Our approach not only mitigates risks but also supports and enhances the local governance structures dedicated to safeguarding these vulnerable populations.

VGS patrols carry firearms in the WMA, mainly for protection against wildlife. The WMA maintains SOPs for VGS patrols who carry firearms that are strictly applied to ensure the safety of WMA staff and community members. See “PDF_GO_MAKAME SOP.pdf”

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

During the bi-annual meetings, the communities discussed all project activities that have taken place during the last six months and what can be expected over the next six months. During the most recent meeting, the communities were informed of the upcoming verification. Furthermore, carbon champions have been spreading information at a more grassroots level (see monitoring results), specifically informing community members of the community monitoring plan and how it relates to verification. Our partners also provided key resources that verify their engagement in the project. Two months before and then again, a month before verification the leadership will be

informally (often best direct communication form) informed through mobile messages of the upcoming verification.

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

As stated above, both communities and stakeholders have been aware of the verification process, including a timeline, from early development stages of the project. The community and stakeholders have continuously been presented with updated details both about the process and the timeline, specifically in bi-annual meetings, Carbon Champion conversations, and various communications with the WMA entity. Carbon Tanzania also submits a formal letter to the community and relevant stakeholders around one month before the verification site visit with a summary of the upcoming audit, public comment period, monitoring results, and to confirm the date of the site visit. In addition to this formal letter, village leadership is informally informed about upcoming verification dates through mobile messages around two months ahead of time. Carbon champions are also deployed to distribute this information at a grassroots levels.

Carbon Tanzania will ensure direct and independent communication between the validation/verification body and communities/stakeholders. This will be achieved by allowing unlimited and open access between the two parties in a process that is open and not unnecessarily facilitated by the project developer, this will include that both parties have direct mobile contact information for one another.

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

Ongoing consultation	The review and amendment of the RMP were the key interventions of the community in terms of the design of the project. During the reporting period the taskforce to create GMP was formulated. The taskforce created the first draft of the GMP, which was presented to stakeholders.
Date(s) of stakeholder consultation	November 2023 GMP Draft Presentation April 2024 Bi-annual Meeting
Communication of monitored results	Results were presented at the biannual meeting. There were also disseminated by posting them at the WMA office, and through carbon champions.

Consultation records	Meeting minutes were collected at the biannual meetings to record stakeholder input. Meeting minutes from the presentation of the draft GMP were also collected.
Stakeholder input	Meeting minutes were collected during the biannual meetings and stakeholder input was documented in the minutes and incorporated into project management. See project supporting documents. Stakeholder feedback was collected during the presentation of the draft GMP and incorporated into the GMP planning process. See project supporting documents.

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

Carbon Tanzania, along with our partners such as Honeyguide and UCRT, informed continued review, and advised adjustment of the project activities to better deliver the intended outcomes. The regular presence of Carbon Tanzania and partner organizations in the village council and WMA bi-annual meetings ensured that Carbon Tanzania received information and feedback about potential issues with project implementation as they arose. In addition, during the monitoring period, project partner Honeyguide carried out consultative meetings with both the WMA and Carbon Tanzania such as the development of the new GMP for the WMA and continued updating the business plan for ten years for the WMA and the development of the new GMP for the WMA. The bi-annual meetings also serve as an opportunity for both the WMA and CT to share project updates and outlook, towards working together in consultation and adaptation.

Summary of comments received	Actions taken
WMA insisted on proper formalities to visits to WMA project areas.	CT will follow proper formalities when scheduling and coordinating visits to WMA project areas.
Comments on the draft GMP are summarized in the supporting documents. They included suggestions to expand the area for settlement in the land-use map after consulting villagers' opinions, clarify hunting block maps, etc.	Feedback was taken into account for the drafting of the GMP.

2.3.11 Stakeholder Consultation Channels (CCB, G3.5)

Channels of consultation are multi-leveled. Channels were open between Carbon Tanzania and individual community members, as well as with the community and the leadership of the WMA entity. With-in these levels exist both informal (phone calls, face to face conversations) and formal (bi-annual meetings, appeals committee) mechanisms. The WMA is a legitimate entity based on participation and buy-in from the communities it encompasses, and is made up of community members, this legitimizes the consultations and participatory process that Carbon Tanzania engages with. Our partners Honeyguide and UCRT also provide a separate and independent consultation channel available to the community at all levels and are experts in community engagement including around cultural and gender issues. Carbon Tanzania is satisfied with the level of information sharing that has occurred to date and the awareness assessment conducted supports this belief. The carbon champions now have a lot of experience and are informed enough to ensure sufficient understanding and awareness within the community.

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

The WMA structure was designed specifically to be a participatory entity that encompasses all the stakeholders in the area under WMA supervision. This purpose was outlined and cemented by the RMP. The project developer deals directly with the WMA entity and ensured stakeholder participation in the decision-making and implementation of the project. Our partner UCRT acts as a secondary insurance method to guarantee true stakeholder participation in decision-making, and implementation took place during this monitoring period. Their presence in village council, women's forums, and WMA meetings allowed us to effectively monitor the functionality of the decision-making process, especially in regard to sensitive cultural and gender aspects that were involved.

There are significant activities and processes implemented to enable the effective participation of all communities with sensitivity to culture and gender. The RMP which the project works to implement and renew periodically, confers rights to all the community over land and resource. Grazing is the primary livelihood concern of the community group Masai Pastoralists and its subsets, Masai Women and girls, Masai Children, Masai Warriors, Masai Male Elders. Rather than establishing new governance mechanisms, the project's initiative seamlessly integrates with existing community structures and local authorities, ensuring that local traditions, cultures, and sensitivities are always respected. Recognizing the inherent challenges presented by the patriarchal nuances in the Masai community, the project takes proactive measures to emphasize gender issues, pushing for women's empowerment and leadership. This is done through targeted education and by creating leadership opportunities for women, all while delicately navigating the cultural gender sensitivities. Additionally, a functioning grievance mechanism exists to protect the communities and project relationship,

providing a transparent channel for feedback and concerns. The project's approach is designed to be proactive in promoting gender equality, yet deeply respectful of the Masai's cultural intricacies, making it both effective and harmonious with the community's ethos. The project does not impose anything; the project aims to strengthen and help communities fight the tide of destruction and degradation of their land and culture.

Masai small-scale Agriculturists participate in the benefit through the rights for areas of agriculture laid out in the RMP. Non-Masai who may not be farmers or agriculturists benefit from Non timber rights to things like honey and wild medicines. All of this is critical to these groups' livelihoods but also to their cultural identities. The RMP and the process that lead to its creation and renewal has been demonstrated as participatory. Members from all groups including women and excluding children are part of the implementation and project governance, including in management positions in the WMA, position in the WMA Board and AA, and positions as VGS. In these positions they lead many of the monitoring and evaluations aspects of project processes. The Carbon Champions program with its grassroots house to house approach ensures that project information, discussion and engagement reaches more remote areas of the community and people who may be less likely to be found in village centers or governance institutions, this can be true especially for women, elders, and children. Governance training for WMA and Village leadership includes a focus on broad encouraging participation from community groups and includes members from various community groups. The project engages women through the women's leadership forums and tracks women's leadership in the project and WMA, having seen positive results against the local baseline. Increased education budgets have also increased participation of women and youth.

The WMA structure is democratic and representative as are the village governments. The board process is democratic, transparent and widely displayed as witnessed during the site visit. These WMA structures and leadership have been evidenced to undertake project implementation, management training and generate monitoring and evaluation reports, even having received certificates of actions from district and regional authorities. The WMA's constitution also has a statement of no discrimination on any grounds, which serves to protect various project communities.

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

The Makame Savannah REDD project is dedicated to upholding the highest standards of integrity and safety, particularly concerning the well-being of women and girls in the local community. Our commitment is reflected in several key policies and practices. All project staff are required to sign statements of integrity, committing to adhere to our strict code of conduct. This code explicitly prohibits any form of harassment, abuse, or threats towards women and girls. Any violation of this

policy is taken seriously and is subject to immediate disciplinary action, including termination and legal consequences. Our company policies are designed to foster a safe and respectful environment for all community members. These guidelines include zero tolerance for gender-based violence and strict enforcement of ethical behavior standards.

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 organisations 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 WMA office. The policy defines a grievance and its scope and outlines both an informal and formal procedure for managing grievances. As this is the process for all communities' issues with the WMA it aligns with the traditional governance and grievance procedure. The attempt to resolve the grievance on an informal traditional basis, taking advice, if necessary, from other local parties. The director and affected person will 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. Additional details, including the contact numbers of the directors, are included in the grievance policy, available in both English and Swahili. The bi-annual finance and grievance meetings also serve as an intentional and recurring opportunity for the WMA leadership to raise any grievance they may have or have received, and during this meeting they are specifically prompted on grievances.

No grievances, either formal or informal, have been logged during this reporting period.

Grievances received	Resolution and outcome
N/A	N.A

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

Makame WMA RMP was designed to promote sustainable community development and to consistently improve the quality of conservation. Makame WMA is committed to involving the community in its program of work, and to contributing toward sustainable local development. There is a preference for hiring local people. Candidates from the local community who meet a position's requirements are given preference in hiring decisions. It is important to note that there is a lack of individuals with advanced technical or professional studies in the local area and therefore this type of service has to be contracted from outside the communities.

All Makame WMA personnel receive orientation training through the administration and operations program (See RMP) when they are hired, including content related to professional ethics and conduct as part of the institutional culture. Staff evaluations and staff training are part of the RMP (See section 6.1.4. of the RMP). New employees are informed through briefing about their legal rights, anti-discrimination laws and policies and methods of resolving problems and formalizing complaints within the organization. With regards to adherence to host country laws regarding workers' rights, the project proponent, to the best of its knowledge, complies with all relevant national laws, including labor laws. During this period all of these policies which are enshrined in the RMP, and host country laws were followed, this is a WMA responsibility as any deviation would be illegal.

All WMA staff including management and VGS are from the local community, so the knowledge and skills transferred during VGS and governance trainings. and through employment are geographically anchored to the WMA and community setting. Carbon Champions have participated in thousands of knowledge transfers to community members and gained leadership and teaching skills in the process. Education and governance infrastructure built like classrooms and offices offer permanent capacity increases to those sectors of community life. Solar and communication technology provided through the project also provides long term capacity increase for the WMA. Furthermore, the women's leadership forums permanently increase the capacity of women to engage in the leadership and governance structures in the WMA and the community, something that will undoubtedly have long lasting impacts. All educational, informative, or training material is backed-up digitally and the WMA keeps a file for all carbon related activities to ensure institutional knowledge and documentation is maintained.

Demonstration of ongoing Carbon Champion training, Village Game Scout training, and governance training is provided in project supporting documents.

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

Sourcing employees from the community is crucial to Carbon Tanzania as creating local employment is one of our main company goals. All community members regardless of age, sex, gender etc. are given equal opportunity to fill all work positions including management. Positions are not open to non-community members unless it is determined that the capacity does not exist locally and cannot be built immediately. The only barrier is based on job requirements and even here Carbon Tanzania is committed to doing whatever necessary to source all project employees directly from the community, including helping to build capacity of community members to fulfill job requirements that they may not have met at project outset. The community-run WMA is tasked with most of the selection of workers however Carbon Tanzania has input, especially on behalf of ensuring women, youth, and any marginalized people are given a fair chance to fill positions for which they are well suited or can be subsequently trained. All employees of the WMA during this period such as the WMA manager and Village Game Scouts were employed from within the five villages that make up the WMA. 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.

Since the inception of the project and during this monitoring period (as reported in Section 1.2), women have been employed in various roles, including direct hires of Carbon Tanzania, Village Game Scouts, Carbon Champions, and Makame WMA employees. While women are able to apply for project positions, the limited number of females directly 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 WMA to fill positions. 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. The women noted as employed in part of the directly employed leadership team of the WMA represent the inroads made against the pre-project baseline, whereas in Masai society traditional leadership and governance are exclusively patriarchal. Furthermore, though not formally employed, there are women filling positions in the leadership structure of the WMA and thus the project during the monitoring period. Women's leadership forums also continue to meet in all 5 villages (as per MR Section 4.3.1). All of this works to ensure the effective and sustainable appropriate participation of women in project implementation, monitoring, and evaluation.

Job positions are mainly advertised in a variety of websites highlighting the list of eligibilities and requirements needed and deemed fit for the work.

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

Work within Carbon Tanzania and Makame WMA includes low-level risks typically associated with activities conducted in sites with little infrastructure and irregular conditions. The level of risk varies depending on the type of employment in Makame WMA and the associated activities, although none of the work requires undue exposure to risks. Work in the WMA does not require the operation of heavy machinery or vehicles larger than the rangers' pickup trucks. All Carbon Tanzania field staff have first aid training, and all vehicles carry first aid kits. Carbon Tanzania, through WMA structures, provides assistance to injured project participants. Carbon Tanzania policy instructs participants to avoid, to the best of their ability, situations which pose unnecessary risk to personal safety. As participants live with-in and often traverse the landscape risks like exposure to dangerous animals, snake bites, etc. are unaffected by employment in the WMA. Carbon Tanzania discourages the use of weapons in any project related activities. No occupational safety incidences were reported this monitoring period.

Two potential risks to WMA worker safety are from interactions with poachers/encroachers and environmental safety risks. Neither of these “have arisen due to project implementation” as communities live in and normally traverse for their livelihood a “potentially dangerous” environment and the WMA (though under resourced) was engaging in anti-poaching and anti-encroachment activity prior to the project. The increased capacity of the WMA due the project may have potentially increased these risks and therefore an assessment was still conducted by consulting with the WMA, and others who work similarly in the landscape.

All WMA workers are briefed on occupational hazard when joining the team though as they come from the community are often already acutely aware. All CT staff are briefed when on boarded and again before any first field visit. The WMA has first aid capacity, as do all the member villages. Close project communication with district and regional staff also provide safety as they maintain the local security apparatus.

No occupational safety incidences were reported in this monitoring period.

2.4 Management Capacity

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

Project participants

Key Function	Organization involved	Type of group / organization	Brief description of activities
Project administration	Carbon Tanzania	Project developer	- Administrative - Reinvestment - Financial planning - Engagement with government of Tanzania - Market research - Project prospecting - Administer funds
Project technical operations	Carbon Tanzania	Project coordinator	- Ensure project implementation in accordance with contract and PD - Enter into sales contracts for VCUs - Review field data, track project developments - Serve as key actor in dispute resolution - Develop and monitor project cycle to ensure that it is in accordance with approved methodologies - Manage and support technical demands of project - Increase local capacity where possible
Community engagement/participation	Ujamaa Community Resource Team (UCRT)	Community partner	- Provide legal counsel to communities for the purpose of securing land tenure, governance, and contractual development - Provide knowledge of local context to ensure CT is able to carry out the necessary field operations - Organize meetings with ward and district officials

			- Serve as key actor in dispute resolution
Forest management/monitoring	WMA	Communities recognized by central government as holding land tenure rights in project area	- Develop and implement RMP - Serve as community guards and patrol, monitor and report on natural resource use in violation of the land use plan - Take action against violators in accordance with Wildlife Act, village by-laws and Village Land Act
WMA capacitation	HoneyGuide Foundation (HGF)	Technical partner	- Capacity training and support to WMAs, including training for Village Game Scouts, anti-poaching, data collection, Carbon Champion training and education, facilitation of bi-annual finance and grievance meetings
Socio-ecological assessment	Dr. Peader Brehony	Technical consultant	Socio-ecological systems analysis
Biodiversity assessment	Osupuko Keri Keri Ltd	Technical consultant	Biodiversity analysis and assessment of project impacts

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

Marc Baker - CEO

Marc Baker is a director and shareholder of CT Ltd. based in Arusha, Tanzania. He has worked in various capacities in conservation and ecotourism since 1998, including consulting for UNDP-GEF cross border biodiversity project from 1998 to 2000 where he worked in forest management in Tanzania and Kenya. Marc has also worked as a consultant for DANIDA, Care International, and the Wildlife Division of Tanzania on biodiversity assessments, wildlife management, and tourism development. Marc founded Carbon Tanzania in 2008 with the specific aim of driving in-country value-added carbon offsets directly to communities, to ensure both biodiversity protection and a community-based understanding of climate change mitigation and adaptation.

Jo Anderson - CFO

Jo Anderson is a director and shareholder of CT Ltd. based in Arusha, Tanzania. His work has ranged from wildlife surveys in remote areas to assessments of tourism resources in potential development sites. He has worked in the forestry, environment, and tourism industries for 16 years in Tanzania, and has built a network of professional contacts, both in the government and non-governmental sectors. He works in policy development with the relevant Ministries and non-governmental organizations, writing briefing papers and editing technical documents.

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

Partnerships

Ujamaa Community Resource Team (UCRT) works to empower marginalised people in the rangelands of northern Tanzania, to secure rights to their natural resources and land in order to improve their livelihoods and ability to conserve their resources. UCRT assists the community facilitation for Carbon Tanzania in Makame WMA.

HoneyGuide Foundation (HGF) provides capacity training and support to WMAs. This includes training for Village Game Scouts, specifically on anti-poaching and data collection using SMART. During the monitoring period, HGF implemented trainings and built skills on the constitution and good governance in Makame WMA.

Maliasili Initiatives is a non-profit organization that supports the growth, development and performance of leading civil society organizations and social enterprises working to advance sustainable natural resource management practices in Africa. Maliasili Initiatives provides Carbon Tanzania with advice and support around its organizational and business development.

The Nature Conservancy (TNC) is a global conservation organization working to protect ecologically important lands and waters for nature and people. To date, the Conservancy and its more than one million members have been responsible for the protection of more than 15 million acres in the United States and have helped preserve more than 102 million acres in Latin America, the Caribbean, Asia, the Pacific and Africa. TNC provides technical support to Carbon Tanzania.

Team Development

Carbon Tanzania conducts annual strategic planning exercises with consultants to ensure roles and accountabilities are under regular revision. This strategic perspectives approach is suitable for small medium enterprises like CT who are constantly dealing with multiple accountabilities.

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

Carbon Tanzania had received donor funds through USAID as part of the EENT project (2016-2018) to assist with the costs to develop and certify the carbon project under the VCS-CCB standard.

Carbon Tanzania has experience marketing REDD credits on the global market and has used this applied experience to form conservative estimates for expected annual credit sales for the Makame Savannah REDD Project. Additionally, the Project Proponent's combined REDD project development experience have contributed to a detailed financial model for the development and management of the Project. Predicted credit sales and an accurate estimated annual budget demonstrate sufficient cash flow from predicted contracted sales to sustain the project through the end of the crediting period. Documents supporting these investments can be produced to the project auditor for inspection. Carbon Tanzania has equity investors and a concise business plan and financial modal that are available on request. The project partners are all well-funded, sufficiently capitalized organizations, and include a major international NGO (The Nature Conservancy), local Tanzanian NGOs with impressive histories of financial sustainability (UCRT, Honeyguide).

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

CT is continuing to ensure zero tolerance for any act of bribery or corruption. All forms of bribery and corruption are prohibited. Carbon Tanzania will not tolerate any act of bribery or corruption. Any breach of Carbon Tanzania company policy on corruption and unethical behavior or local law could result in disciplinary action being taken. A bribe does not actually have to take place - just promising to give a bribe or agreeing to receive one is prohibited. 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 contained within this monitoring report document.

Supporting documents which include commercially sensitive information that will not be made publicly available include: the MOU; Contracts with Buyers and Service Providers; and documents related to project financials.

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)

National Sector Policies and WMAs

In the late 1990's, Tanzania went through a complete reform of its natural resource policies to deal with critical management issues facing natural resources. These reforms placed greater emphasis on Community Based Management of Natural Resources (CBNRM). Changes included revisions of the Wildlife Policy (1998), the Environment Policy (1997)¹⁴, the Forest Policy (1999)¹⁵, the Tourism Policy (1999)¹⁶, and Beekeeping Policy (1998)¹⁷. Note that the common thread in all of these revisions is: (a) to utilize natural resources efficiently and sustainably, (b), to include local communities in the process, and (c) to increase benefits accruing to local communities. All this adds up to a much stronger people orientation in natural resource management policies and sets the stage for the creation of Wildlife Management Areas (WMAs) and the basis for developing a Resource Management Plan (otherwise known as Resource Management Plan - RMP). Besides the national policy context, the RMP is embedded in the framework of the national development vision, which amongst other things, aspires to graduate Tanzania from a least developed country to a middle-income country by 2025. This development vision aims to promote 'high quality livelihoods, through sustainable and shared growth, free from poverty and gender inequalities, political stability, with leaders and public servants held accountable through good governance, and a strong competitive economy.' The economic benefits to communities from managing WMAs as a means of generating revenue for local development is supported by this vision.

In order to implement the Wildlife Policy (1998), the Tanzanian Government developed and approved several strategies including development and approval of the Wildlife Conservation (Wildlife Management Areas) Regulations in 2012. The WMA Act (2012) aims to guarantee sustainable conservation of wildlife resources in local community lands and safeguard the interests of traditional communities, the Wildlife Conservation (Wildlife Management Areas) Regulations 2012¹⁸ calls for the development of a Resource Management Plan (RMP) of a WMA. The RMP, updated in 2017 for this REDD project is a result of the workshops organised by the AA and review workshops to accord the RMP with Wildlife Conservation Act no. 5 of 2009¹⁹. The RMP is a document that sets the basic management and development philosophy of MWMA, provides the current image of reality, defines the desired future of the MWMA and provides for the means of changing the negative situation and achieving the desired future over a period of 5 years (2017-2022). New regulations were added to national law to regulate carbon trading in Tanzania in October 2022.

¹⁴ <http://faolex.fao.org/docs/pdf/tan175140.pdf>

¹⁵ <http://faolex.fao.org/docs/pdf/sol18884.pdf>

¹⁶ https://www.tnrf.org/files/E-URT_POLICIES_National_Tourism_Policy_1999_0.pdf

¹⁷ <http://faolex.fao.org/docs/pdf/sol18884.pdf>

¹⁸ <https://tnrf.org/files/WMA%20regulations%202012.pdf>

¹⁹ https://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/pdfpreview/wildlife_conservation_act_2009_tanzania_0.pdf

Local Government Policy

The Local Government Act of 1982²⁰, empowers District Councils to implement economic activities and ensure economic growth and development in a District. Responsibility is delegated to the Village Government, as the grassroots organ. People must be involved in planning, decision making, implementation and M&E, on all matters pertaining to development. WMAs conform well to this policy, and MWMA is charged with local development responsibility on behalf of the members.

Benefit Sharing

Once User Rights are obtained, the RMP assumes that the AA will enter into agreements for the specified commercial operations of the WMA, subject to approval by the Director of Wildlife.

Anticipated is that the Director shall collect normal fees for such operations as pertains to Hunting Block Fees, Permit Fees, Conservation Fees, Trophy Fees, Trophy Handling Fees, photographic tourism, etc. (as in the Tourist Hunting Regulations, 2010). The 1995 Management Plan for Tourism Hunting suggested a scheme whereby 50% of revenues go back to the community for development projects.

MWMA Benefit Sharing Guidelines

In line with the MWMA Constitution of 2017 the following guidelines shall prevail: The benefit sharing from a WMA shall comply with mechanisms of equitable distribution of costs and benefits, distributed equally for the benefit of Village Members irrespective of size of land or population. Targeted shall be economic development and poverty reduction.

2023 Tanzania Carbon Trading Regulation

During the monitoring period, new Tanzania federal regulation on carbon trading came into effect, as of October 6, 2023. These new regulations have a range of requirements for projects, including requiring social and environmental impact assessments, registration with the National Carbon Registry, alignment with national policies, and benefit sharing requirements. During this monitoring period, Carbon Tanzania began transitioning the project to comply with the new requirements and expects to be in full compliance by 2025. See supporting documents for more details on the new regulations.

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

²⁰ <https://www.policyforum-tz.org/sites/default/files/LocalGovtDistrictAuthoritiesAct71982.pdf>

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.

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, the Labor Institutions Act constitute the governmental instruments charged with

administering the laws. 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. Carbon Tanzania is organizationally committed through internal policy to following these laws. All employees receive a briefing on laws and worker's rights in Tanzania and receive a copy of the Carbon Tanzania company policy documents.

Carbon Tanzania is required by Tanzanian law to:

1. Contribute to employees' pensions
2. Pay into a workers' compensation fund in case of injury
3. File annual returns for non-citizen employees

By complying with Tanzanian labor and business laws, Carbon Tanzania can receive tax clearance and renewed business licenses. Evidence of compliance is provided in the form of a receipt for payment to the national pension, a receipt from the workers compensation fund, signed employee pay slips showing these deductions, and the labor registration for non-citizen employees. The tax clearance certificate and business license have also been reported from this reporting period as evidence of compliance with national laws and regulations. The WMA has a history of being in compliance through previous reports of payments and by maintaining legal status as a WMA. Information on workers rights in Tanzania are available to community members at any time through the WMA office and will be communicated to communities prior to each verification event.

2.5.3 Human Rights (VCS, 3.19)

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.

Carbon Tanzania conforms to international human rights law, the UN Declaration on the Rights of Indigenous Peoples, and ILO Convention 169 on Indigenous and Tribal Peoples. Carbon Tanzania respects the human rights of all people, including Indigenous Peoples, local community members, and customary right holders of their project areas. We ensure these groups enjoy the full measure of human rights and fundamental freedoms without hindrance or discrimination. The provisions of the convention shall be applied without discrimination male or female members of these people regardless of race, sex, nationality, ethnicity, language, religion, or any other status.

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 over rights to territories and resources took place during the monitoring period.
Respect for property rights	A Wildlife Management Area (WMA) is, by law, a mechanism to decentralise natural resource management to participating communities within a given area. In order to do so, the participating communities must create the WMA and its guiding documentation (See Section 2.5.4. of PD). The Resource Management Plan, which during the monitoring period was in the process of being updated and converted to a General Management Plan, was designed by representatives of the community to ensure customary rights to resources are maintained, in the context of Makame, this was mainly focused on maintaining annual grazing resources. There is currently no law or policy that specifically mentions the ownership of carbon rights within Tanzania. The new draft forest policy, yet to be enacted, does mention non-wood forest products (NWFP) and their potential; "Payments for ecosystem services through carbon or watershed

protection (PES) will be promoted to strengthen private sector and community investments” (draft National Forest Policy, 2011). The current Forest Act (2002), which is the act governing forest utilization in Tanzania, clearly states that “village or community forest reserves confer all ownership and user rights to the village or designated community”. Additionally, guidelines and regulations for carbon projects are being finalized by the Tanzanian government and Carbon Tanzania is closely monitoring these developments.

The Tanzanian government, with technical and financial assistance from the Royal Government of Norway, has developed a National Framework and Strategy for REDD. This process incorporates a National Climate Change Steering Committee (NCCSC), a National Climate Change Technical Group and a National REDD Taskforce to ‘guide the implementation of climate change activities’. A number of Non-Governmental Organizations (NGOs), including Carbon Tanzania, are currently engaged with the government on issues related to carbon rights and how REDD might be implemented in Tanzania.

Land tenure in Tanzania is governed by the Land Act No. 4 of 1999, and the Village Land Act No. 5 of 1999. These laws classify all land within the boundaries of registered villages as ‘village land,’ which is held by the resident communities under customary rights of occupancy held in perpetuity. The Village Land Act designates the village councils and village assemblies as the statutory management authorities over these village lands. This land tenure framework, in combination with Tanzania’s local government structures, provides for the rights and responsibilities of the village councils and village assemblies and provides a strong foundation for participatory management of communal land and resources such as forests.

2.5.6 Benefit Sharing Mechanism (VCS, 3.18, 3.19)

Summary of the benefit sharing plan

The structure of a WMA is fundamentally set up to be fully participatory on every level and allow decision-making powers to ultimately be held by the community members. It is a system designed to give equal voice and concern to all members of the community through a classic representative governing structure. More on the structure of governance in the WMA which ensures it is representative and held accountable by the community can be found in the Governance section. Makame WMA was set up as a mechanism for the five member villages to gain rights over their natural resources and subsequently fairly and equitably share benefits from them. All financial benefits conferred from the project to the communities go directly to the WMA structure and thus we can be confident in the benefit sharing mechanism.

Per the WMA resource management plan, financial benefit sharing shall conform with laid down procedures from the Wildlife Division and Treasury for annual gross revenues as follows (WMA Regulation 2012):

1. Capital Fund: Not less than 15% shall be capital, re-invested for WMA resource development.
2. Trust Fund: Not less than 50% shall be directed to member village projects (to be split, 30% for community projects and 20% placed on fixed deposit to earn interest as a buffer for contingency, emergency, etc.).
3. Operations Fund: Not less than 25% shall be used to strengthen the AA (i.e. operations, Secretariat support, MWMA meetings, training, etc.).

Carbon Tanzania has full confidence in the WMA benefit sharing structure and AA, and all benefits are conveyed through the WMA official bank accounts they operate. WMA finances are posted and available to the community for accountability. Carbon Tanzania at its bi-annual meetings does a financial disclosure of project activities for transparency. The WMA also employs a full time and qualified accountant to oversee financial activities. Carbon Tanzania monitors WMA benefit sharing through financial statements to ensure the mechanism is working and make recommendations and changes if anything is found to be inadequate. Information about the benefit sharing mechanism will be shared with communities prior to each verification event.

The benefit sharing mechanisms are now enshrined in the national carbon regulations established in 2022 in Tanzania.

Benefit sharing during the monitoring period

During this monitoring period the detailed financial benefit sharing mechanism remained in place and functioning, and no changes were made. This structure followed as it is now providing direct finance to the community and WMA. Many of the benefits detailed in 4.3.1. were shared amongst the community. Primarily through the approval of the RMP, which guarantees all community members access to the grazing areas and non-timber forests products which are vital to their livelihoods. Furthermore, natural resource management education through the carbon champions program was available to all the community, at a grassroots level, and door to door. Women specific outputs including empowerment and leadership training ensured that women were also included in the project and its benefits. During this verification period no issues were flagged about benefit-sharing, either by the communities, the WMA, or partner organizations.

2.5.7 Free, Prior, and Informed Consent (VCS, 3.18, 3.19; CCB, G5.2)

Consent

Prior to validation, Carbon Tanzania representatives were invited to a board meeting of the Makame WMA AA and a Kiteto District Council meeting where they introduced the concept of the REDD project. Later, consultative meetings were held with both members of the Makame WMA committee and representatives of the five participating villages to explain the respective responsibilities of each stakeholder in the proposed REDD project. As a part of the project design and implementation stakeholders consented to consultation through meetings with the full Makame WMA board (including village representatives) and executives were held to negotiate the terms of contract, which was thereafter signed by both parties. The contract forms the basis of the REDD project activities. Multiple grassroots-led training sessions were conducted which included representatives of both Makame WMA AA and village communities. These training sessions were conducted in the local language (Maa) to sensitise general community members to the aims and requirements of the REDD project.

The project followed and reinforced the RMP, which is the community generated document that outlines the communities' own desires for natural resource management within the WMA. During the monitoring period, the WMA began the process of updating the RMP to the GMP. Biannual meetings and ongoing community consultations with carbon champions provide ongoing opportunities to inform community members about project activity implementation, and allow community members to provide feedback to the project prior to each verification event.

During the monitoring period, a representative from Carbon Tanzania held a meeting with the Makame WMA AA and the Kiteto District Council, where he elaborated on the new regulation to monitor carbon trading in Tanzania and the new requirement to operate carbon

	trading in Tanzania to the stakeholders. The process to sign a new contract with WMA to conform to a new requirement is still ongoing.
Outcome of FPIC	The project was undertaken with full consent of the communities, WMA, local and district government. The project did not involve any property or land held privately.

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

This project is based on the Makame WMA RMP, a document developed in a participatory manner to ensure that the rights and resources within the project area are protected. This project follows this RMP and therefore aims to protect the rights of the communities within Makame WMA. Property rights are guaranteed under the Village Land Act (See Section 2.5.1) and were not impacted by the creation of a WMA and zonation of land use. The development of a WMA and the RMP was a participatory process, no community members were relocated or denied resource rights during the development of the WMA, the RMP, or this REDD project.

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

The RMP was based on laws governing natural resource protection and use in Tanzania, WMA Act 2012 and thus illegal activity can be defined as the use of natural resources contrary to the RMP. Illegal activities likely to affect the project are poaching of wildlife and the illegal conversion of land in the project area contrary to the RMP. Poaching and illegal land conversion were significantly reduced by implementation of the WMA and RMP during this monitoring period.

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.

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

There were no known ongoing disputes or conflicts within the project area.

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	tCO ₂ e					
Description	Net CO2 emissions in the baseline from unplanned deforestation in the project area					
Source of data	Derived in Section 3.2 of PD					
Value applied	<table><tr><td>Years</td><td>$\Delta C_{BSL-REDD}$ (tCO₂e)</td></tr><tr><td>2024</td><td>440,788.5</td></tr></table>		Years	$\Delta C_{BSL-REDD}$ (tCO ₂ e)	2024	440,788.5
Years	$\Delta C_{BSL-REDD}$ (tCO ₂ e)					
2024	440,788.5					
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	$\Delta C_{BSL,LK,unplanned}$	
Data unit	tCO _{2e}	
Description	Net CO2 emissions in the baseline from unplanned deforestation in the leakage belt	
Source of data	Derived in Section 3.2 of PD	
Value applied	Year	$\Delta C_{BSL,LB,unplanned}$ (tCO2-e)
	2024	586,947.2

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	Aunplanned,i,t, MAS (ha)	AAunplanned,i,t, MWF (ha)
	2024	6158.7	2095.8
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	68.3
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
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	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	GCH ₄ = 6.8 GN ₂ O = 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	CH ₄ = 28 N ₂ O = 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	CF
Data unit	tCt ⁻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	C _{OLB}
Data unit	tCO _{2e} 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

Justification of choice of data or description of measurement methods and procedures applied	Derived above in Section 3.2 of the PD
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	R
Data unit	t root d.m. t ⁻¹ shoot d.m.
Description	Root to shoot ratio appropriate to species or forest type / biome
Source of data	Data resulting from the forest inventory.
Value applied	0.28
Justification of choice of data or description of measurement methods and procedures applied	Root biomass density was calculated using an IPCC root to shoot ratio of 0.28 for dry tropical forest, as found in the VM-0007 module CP-AB, "Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools".
Purpose of data	Calculation of baseline emissions Calculation of project emissions
Comments	Value documented in VMD0001

3.1.2 Data and Parameters Monitored (VCS, 3.16)

Complete the table below for all data and parameters monitored during the project crediting period (copy the table as necessary for each data unit/parameter). The values provided are used to quantify the reductions and removals for the project crediting period in Section 0 below.

Data / Parameter	$\Delta C_{P,Def,i,t}$
Data unit	tCO _{2e}
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	<table><tr><td>Year</td><td>ΔCP,DefPA,i,t (t CO2-e)</td></tr><tr><td>2024</td><td>2,129.8</td></tr></table>		Year	ΔCP,DefPA,i,t (t CO2-e)	2024	2,129.8
Year	ΔCP,DefPA,i,t (t CO2-e)					
2024	2,129.8					
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	Calculate project emissions					
Calculation method	Equation 3, VMD0015					
Comments	None					

Data / Parameter	$\Delta C_{P,DefLB,i,t}$					
Data unit	tCO ₂ 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	<table><tr><td>Year</td><td>$\Delta C_{P,DefLB,i,t}$ (t CO₂-e)</td></tr><tr><td>2024</td><td>24,445.1</td></tr></table>		Year	$\Delta C_{P,DefLB,i,t}$ (t CO ₂ -e)	2024	24,445.1
Year	$\Delta C_{P,DefLB,i,t}$ (t CO ₂ -e)					
2024	24,445.1					

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	Calculate leakage
Calculation method	Equation 4, VMD0015
Comments	None

Data / Parameter	$\Delta C_{P,DistPA,i,t}$					
Data unit	tCO 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><tr><td>Year</td><td>$\Delta C_{P,DistPA,i,t}$ (t CO₂-e)</td></tr><tr><td>2023</td><td>0</td></tr></table>		Year	$\Delta C_{P,DistPA,i,t}$ (t CO ₂ -e)	2023	0
Year	$\Delta C_{P,DistPA,i,t}$ (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	A _{DefPA,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	<table><tr><td>Year</td><td>A_{DefPA,u,i,t} (ha) MAS</td><td>A_{DefPA,u,i,t} (ha) MFW</td></tr><tr><td>2024</td><td>33.6</td><td>4.9</td></tr></table>	Year	A _{DefPA,u,i,t} (ha) MAS	A _{DefPA,u,i,t} (ha) MFW	2024	33.6	4.9		
Year	A _{DefPA,u,i,t} (ha) MAS	A _{DefPA,u,i,t} (ha) MFW							
2024	33.6	4.9							
Monitoring equipment	GIS software								
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	A _{DefLB,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 are provided under monitoring plan description. Monitoring responsibilities are listed in section 3.3.								
Frequency of monitoring/recording	Every ≤ 5 years								
Value monitored	<table><tr><th>Year</th><th>ADefLB,u,i,t (ha) MAS</th><th>ADefLB,u,i,t (ha) MFW</th></tr><tr><td>2024</td><td>254.0</td><td>125.4</td></tr></table>	Year	ADefLB,u,i,t (ha) MAS	ADefLB,u,i,t (ha) MFW	2024	254.0	125.4		
Year	ADefLB,u,i,t (ha) MAS	ADefLB,u,i,t (ha) MFW							
2024	254.0	125.4							
Monitoring equipment	GIS software								
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	A _{DistPA,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 are provided under monitoring plan description. Monitoring responsibilities are listed in section 3.3.					
Frequency of monitoring/recording	Every ≤ 5 years					
Value monitored	<table><tr><td></td><td>A_{DistPA,q,i,t}</td></tr><tr><td>2024</td><td>0</td></tr></table>			A _{DistPA,q,i,t}	2024	0
	A _{DistPA,q,i,t}					
2024	0					
Monitoring equipment	GIS software					

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	C _{BSL,i}							
Data unit	tCO 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 are provided under monitoring plan description. Monitoring responsibilities are listed in section 3.3.							
Frequency of monitoring/recording	Every ≤ 10 years							
Value monitored	<table><tr><td>Strata</td><td>CBSL,i (t CO2-e ha-1)</td></tr><tr><td>MAS</td><td>54.6</td></tr><tr><td>MWF</td><td>99.0</td></tr></table>		Strata	CBSL,i (t CO2-e ha-1)	MAS	54.6	MWF	99.0
Strata	CBSL,i (t CO2-e ha-1)							
MAS	54.6							
MWF	99.0							
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 3.2 of the PD.							
Comments	None							

Data / Parameter	$\Delta C_{\text{pools,Def,u,i,t}}$
Data unit	tCO ₂ e ha ⁻¹
Description	Carbon stock in all pools in post-deforestation land use u in stratum i
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	4.9
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	Equation 5, VMD0015
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	0.909
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	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 "Makame Forest Inventory 2017.04.19.doc"	
Frequency of monitoring/recording	At least every 10 years, when forest inventory data is collected	
Value monitored	MAS	MWF
	42.5	76.3
Monitoring equipment	N/A	
QA/QC procedures to be applied	Provided in validated inventory SOPs "Makame Forest Inventory 2017.04.19.doc"	
Purpose of the data	Calculation of baseline and project emissions	
Calculation method	See validated inventory SOPs "Makame Forest Inventory 2017.04.19.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 “Makame Inventory Calcs 2017.08.17-2.xls”				
Frequency of monitoring/recording	At least every 10 years, when inventory data is collected				
Value monitored	<table border="1"> <tr> <td>MAS</td><td>MWF</td></tr> <tr> <td>0.2</td><td>1.4</td></tr> </table>	MAS	MWF	0.2	1.4
MAS	MWF				
0.2	1.4				
Monitoring equipment	N/A				
QA/QC procedures to be applied	See forest inventory calculations “Makame Inventory Calcs 2017.08.17-2.xls”				
Purpose of the data	Calculation of baseline and project emissions				
Calculation method	See forest inventory calculations “Makame Inventory Calcs 2017.08.17-2.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	N/A
QA/QC procedures to be applied	Accuracy assessment (see Appendix 3)
Purpose of the data	Calculation of project emissions
Calculation method	N/A
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	N/A

QA/QC procedures to be applied	Accuracy assessment (see Appendix 3)
Purpose of the data	Calculation of project emissions
Calculation method	N/A
Comments	

Data / Parameter	$E_{\text{biomassburn},i,t}$
Data unit	t CO ₂ e
Description	Non-CO ₂ emissions due to biomass burning in stratum i in year t
Source of data	Calculated
Description of measurement methods and procedures to be applied	See Section 3.2.2
Frequency of monitoring/recording	At least every 5 years or at verification
Value monitored	130.5
Monitoring equipment	None
QA/QC procedures to be applied	Detailed procedures provided under the monitoring plan description
Purpose of the data	Calculation of leakage emissions
Calculation method	N/A
Comments	

Data / Parameter	$A_{\text{DegW},i,t}$
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 indicated no degradation

Data / Parameter	$C_{DegW,i,t}$
Data unit	tCO ₂ -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 indicated no degradation

Data / Parameter	AP_i
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	0
Monitoring equipment	GIS software
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	$\Delta C_{P,DegW,i,t}$
Data unit	tCO ₂ -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 indicated no degradation

Data / Parameter	PROP _{IMM}
Data unit	Proportion
Description	Estimated proportion of baseline deforestation caused by immigrating population
Source of data	Calculated based on results of survey of communities in the area around the project.
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 3.2.
Frequency of monitoring/recording	Every ≤ 5 years or before each verification event.
Value monitored	0.129
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	$A_{RRL,forest,t}$	
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 3.2.	
Frequency of monitoring/recording	See deviation 2 in Section 2.2.2	
Value monitored	ARRL,Forest2005	3,126,053
	ARRL,Forest2015	2,747,978
Monitoring equipment	GIS Software	
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 nonforested areas.	
Comments	None	

Data / Parameter	$A_{burn,q,i,t}$
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
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	dbasal
Data unit	cm
Description	Basal diameter
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	Dbh may be used as a conservative estimate of dbasal

Data / Parameter	U _{P,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	tCO ₂ 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	Strata	Live aboveground tree biomass	Belowground biomass	Standing dead wood
	MAS	3,062,053	857,375	11,415
	MWF	2,446,006	684,882	44,024
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	$U_{BSL,SS,i,pool\#}$
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	Strata	Live aboveground tree biomass	Belowground biomass	Standing dead wood
	MAS	35.5%	35.5%	82.3%
	MWF	45.0%	45.0%	115.4%
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	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	tCO ₂ -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	Strata	EBSL,SS,t,i (tCO ₂ e)	
	MAS	3,930,843	
	MWF	3,174,912	
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	$U_{BSL,SS,i}$	
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	Strata	Uncertainty $_{BSL,SS,i}$ (%)
	MAS	28.7%
	MWF	36.1%
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	$B_{i,t}$
-------------------------	-----------

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	Bi,t (tonnes d.m./ha) Ex-ante Project Area	31.0
	Bi,t (tonnes d.m./ha) Ex-ante Leakage Belt	31.0
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	Plot level values can be found in the Forest Inventory Report
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	Measuring tape
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 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 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
Data unit	tCO 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	Year	CP,Dist,q,i (t CO ₂ -e)	
	2024	0	
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	CP,Dist,q,i		
Data unit	tCO 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	Year	CP,Dist,q,i (t CO ₂ -e)	
	2024	0	
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	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
Comments	

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	0.004
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
Comments	

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	0.8
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	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	0.103
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
Comments	

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.

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 baseline or with project case, the degradation due to harvest of timber will not be monitored, thus parameter $\Delta CP, SelLog, i, t$ is 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 3.6. 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 can only 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 ($\Delta CP, Def, i, t$ and $\Delta CP, DistPA, i, t$ for deforestation and natural disturbance, respectively) are estimated by the 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
$\Delta CP, Def, i, t$	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
$\Delta CP, DistPA, i, t$	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 ₂ e	Calculated
$ADefPA, u, i, t$	Area of recorded deforestation in the project area stratum i converted to land use u at time t	Ha	Monitored for each verification event
$ADistPA, q, i, t$	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i, at time t	Ha	Monitored for each verification event
$CBSL, i$	Carbon stock in all pools in the baseline case in stratum i	t CO ₂ e ha ⁻¹	Estimated from the forest carbon inventory
$ARRL, forest, t$	Remaining area of forest in RRL at time t	Ha	Updated every 10 years, see Methodology Deviations.

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. When multiple images are used, a clustering algorithm is used to distinguish clusters of forest, non-forest, clouds, shadow and water. The forest and non-forest classes are used to fill any gaps from other images. 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. Locations surveyed include:

Families residing in the WMA directly adjacent to the project area; and

Nearby villages and rural lands, outside of the WMA approaching the project area.

The surveys produce information on wood consumers (fuel wood, wood for construction, and charcoal production) in the surroundings areas, as well as a general indication of the areas where wood is sourced and maximum depth of penetration of harvest activities from access points.

The most recent surveys, conducted as part of community meetings with local villages in interviews with community members, indicate that illegal logging is below the threshold to warrant further investigation of degradation from illegal logging in the project area (see, “Makame Continued

Participatory Rural Appraisal Log Sheet (2023).pdf”). Therefore $ADegW_{i,t}$ is set to 0 in this monitoring period. The parameters for monitoring illegal degradation are listed in Table 3.2 below.

Table 3.2. Data and Parameters for Monitoring Illegal Degradation.

Parameter	Description	Units	Source/ Justification of Choice of Data or Description of Measurement Methods
$ADegW_{i,t}$	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
$CDegW_{i,t}$	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 $ADegW_{i,t}$
$\Delta CP_{DegW,i,t}$	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 emissions from fossil fuel combustion ($EFC_{i,t}$) + non-CO₂ emissions due to biomass burning ($EBiomassBurn_{i,t}$) + direct N₂O emissions as a result of nitrogen application ($N2O_{direct-N,i,t}$). 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 $EBiomassBurn$ 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 is conservatively assumed that the total area burnt during the deforestation process is equal to the area deforested, ADefPA,u,i,t. Thus, the area used when calculating E-BB is equal to Aburn,i,t. (area burnt) = Aburn,q,i,t. (area burnt in natural disturbance) + ADefPA,u,i,t (area burnt via deforestation in project ex-post).

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
EBiomassBurn,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
Aburn,i,t	Area burnt for stratum i at time t	Ha	Monitored for each verification event
Bi,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 (CBSL,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.

Gg,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 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 (Δ CLK-ASU-LB) is then calculated as the with-project emissions in the leakage belt (Δ CP, LB) minus the baseline emissions in the leakage belt (Δ CBSL,LK,unplanned).

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
Δ 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
Δ CP, Def,i,t	Net carbon stock change as a result of deforestation in the project case in the	t CO ₂ e	Calculated

	project area in stratum i at time t		
--	--	--	--

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 $\Delta\text{CBSL,LK,unplanned}$; AVFOR ; TOTFOR ; PROTFOR ; MANFOR ; PROPLB ; LBFOR ; COLB ; CLB ; PROPCS ; and $\text{ABSL,PA,unplanned,t}$) or gathered in the course of monitoring activity shifting leakage within the leakage belt and deforestation in the project area (including ADefPA ; ADefLB,i,t ; and $\Delta\text{CP,LB}$).

The monitoring parameters MANFOR , PROTFOR , TOTFOR are sourced from the NAFORMA Report²¹ and will be reevaluated after 5 years. Demonstration that managed and protected forests are protected against deforestation is demonstrated in the monitoring report, above, as stipulated in the LK-ASU module. Leakage caused by immigration is estimated using the parameters listed in Table 3.5.

Monitoring immigrant leakage, based on M-MON, is based on the 2022 Tanzanian Census data. According to the census, the population in Manyara region grew by 2.8% between 2012 and 2022, which comes out to a compounded increase of 12.9% over 5 years.

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

²¹ NAFORMA, Ministry of Natural Resources and Tourism, Tanzania Forest Services Agency, Government of Finland, AND FAO. 202015. NAFORMA - National Forest Resources Monitoring and Assessment of Tanzania Mainland - Main Results.

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

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 2026. Carbon stocks and baseline greenhouse gas emissions are based on estimates from the initial inventory conducted in 2016 and detailed in the Makame 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 (See Appendix 3). 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 is 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 Verra 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.

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 3.6. Type of Monitoring and Party Responsible for Monitoring.

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

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

Carbon Tanzania has shared a summary of the monitoring plan and results with the communities through the WMA. These documents also will be made publicly available on the internet for the communities, other stakeholders, and all those concerned. Summaries are kept at the WMA office where communities can access them. In addition, Carbon Tanzania shared monitoring results with our partners in the landscape through the bi-annual and grievance meetings to explain the

monitoring plan and any results and further explain how they may affect their roles and responsibilities vis-a-vis the project.

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 Section 3.2.1 Quantification of GHG Emission Reductions and Removals section of the Makame Project Document titled, “Makame_PD_validated_UpdatedFeb2025_CLEAN.docx”. The calculations for baseline emissions are included in “Makame REDD Project_Monitoring2023_Calcs_*.xlsx”.

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 reference region for rate of deforestation (RRD) has a total area of 5,011,230 ha hectares and was delineated as shown in Figure 3.1. It excludes the project area and leakage belt, and all non-forested areas at the start of the historical reference period in the year 2005. Further, the reference region was 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), to facilitate any eventual alignment with an anticipated Government of Tanzania jurisdictional REDD framework. 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 was 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.

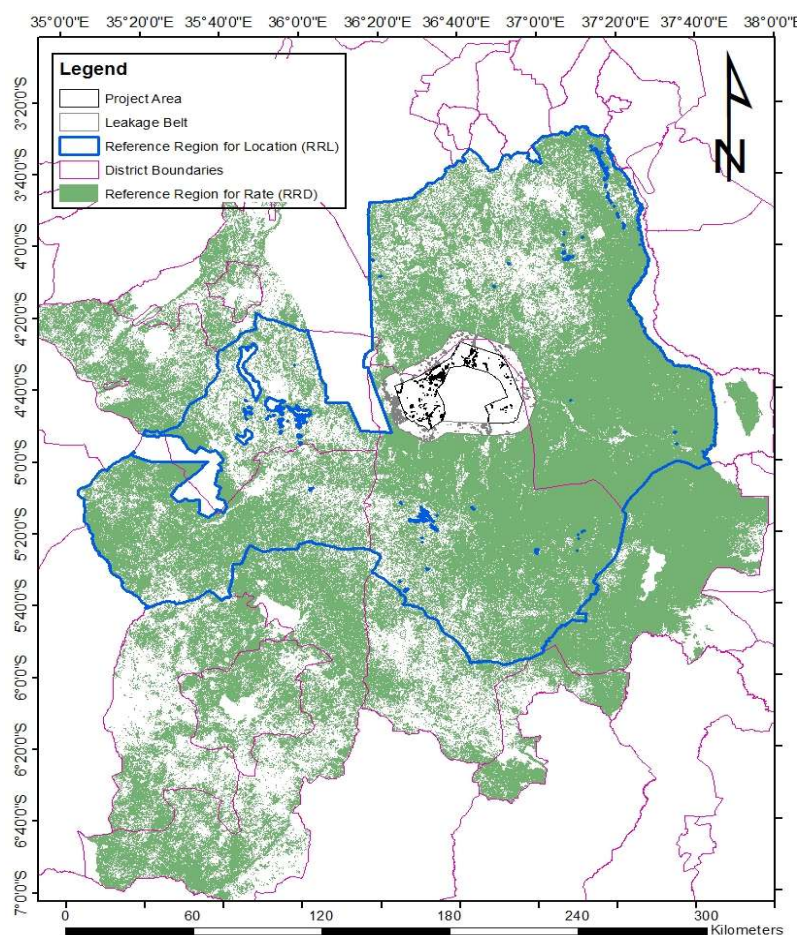
Incorporation of these landscape factors had little effect on delineating the RRD as almost all land in the RRD is suitable for conversion to agricultural land.

Land tenure was also used to help delineate the RRD. Specifically, national parks, forest reserves, and game reserve were excluded from the RRD as these areas differ from the privately-owned project area.

The reference region for projecting location of deforestation (RRL) was delineated as shown in Figure 3.1. The entire RRL is located within the outer perimeter of the RRD and has an area of 4,199,540 hectares. In agreement with the methodology, it is a single parcel, contiguous with and including the

project area and the leakage belt. Further, it was 26% non-forest and 74% 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 totals 4,199,540 ha which is within the $\pm 25\%$ of the size of the RRD. As the primary driver of deforestation is subsistence and small-scale farming, access to and availability of land were the most important factors when determining if land was suitable for conversion. Neither soil suitability, precipitation, elevation, or access to markets played a significant role in the deforestation agent's decision on where to settle and convert land. Conservation lands where the protected status is enforced were removed from the RRL. Further, lands with elevation greater than 1800 m or less than 800 m were removed from the RRL to ensure the RRL was similar to the project area. Finally, wards where the population density is greater than 0-5 persons/ha were removed as urban and semi-urban areas were not reflective of the project area.

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



The rate of deforestation was derived from an analysis of deforestation occurring within the RRD during the historical reference period, 2005-2015.

Annual estimates of deforestation within the RRD were derived by calculating the amount of all deforestation within the boundary of the RRD from 2005-2015 (which already has all the deforestation prior to 2005 removed, see Figure 3.1). The result was the amount of deforestation within the RRD in the historical reference period. This was then summarized by year yielding the results found in Table 3.7.

Table 3.7. Annual Amount of Deforestation in the RRD.

Year	Area of deforestation in RRD (ha/yr)
2005-2010	162,738
2010-2015	199,332
Average	181,035

There were only 2 data points for the amount of deforestation in the RRD, so the mean area deforested across the historical reference period ($ABSL,RRD,unplanned,t$), located above in Table 3.7, is used for each year in the baseline period.

$ABSL,RRD,unplanned,t = 181,035$ ha

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

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

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
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ABSL,RR,unplanned,t	Projected area of unplanned baseline deforestation in the reference region for location (RRL) in year t; ha	112,931	
ABSL,RRD,unplanned,t	Projected area of unplanned baseline deforestation in RRD in year t; ha	181,035	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	0.624	RRL2005Forest = 3,126,053 ha RRD = 5,011,230 ha

ABSL,RR,unplanned,t = 112,931 ha per year

Using the risk mapping procedure described in the PD Section 3.2.1, multiple risk maps and the corresponding prediction maps were created for the year 2010. Each prediction map was compared to an actual map from 2010 to assess the model's performance. The measure of performance used as mandated by the methodology is the "Figure of Merit" (FOM) that confirms the model prediction in statistical manner (Pontius et al. 2008²²; Pontius et al. 2007²³). 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 (see Equation 15 in the BL-UP Module). 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.

²² 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.

²³ 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.)

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

Equation 15

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.

$$FOM \text{ } 141,255 \text{ ha} / (141,255 \text{ ha} + 283,906 \text{ ha} + 283,906) = 0.199$$

$$\%FOM = 19.9\%$$

From the model, a future deforestation risk map was created to assign a likelihood of deforestation to each pixel. Using a rank operation, all forested pixels of the RRL were ranked in descending order, so that the pixel with the highest likelihood of deforestation was assigned a value of 1. Future deforestation was assumed to happen first at the pixel locations with the highest deforestation risk value, so each pixel was allocated to deforestation in rank order for each year according to the annual projections from 2017- 2026 (ABSL,RR,unplanned,t). This operation resulted in a single map showing the predicted deforestation over the baseline period (Figure 3.2) in the project area and surrounding reference region. Further, the area of baseline deforestation for the project area and leakage belt was summed by strata for each year in the baseline period (Table 3.9 and Table 3.10).

Figure 3.2. Map of the Predicted Deforestation in the Baseline Period, 2017-2026.

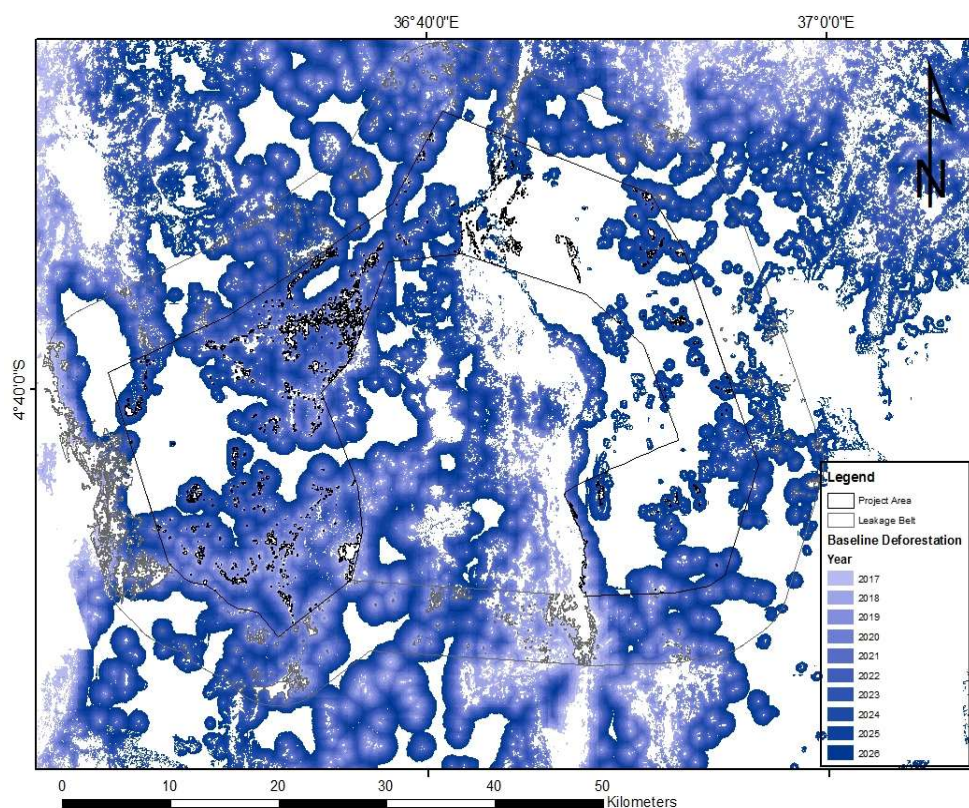


Table 3.9. Amount of Baseline Deforestation (ha) in the Project Area.

Year	Aunplanned,i,t, MAS (ha)	AAunplanned,i,t, MWF (ha)
2017	151.2	21.3
2018	1411.8	67.0
2019	3519.0	256.8
2020	5426.3	547.0
2021	5090.8	655.5
2022	6354.3	1140.3
2023	5698.2	1473.8
2024	6158.7	2095.8
2025	6742.0	2763.0
2026	5641.4	2795.6
Total	46193.8	11816.1

Table 3.10. Amount of Baseline Deforestation (ha) in the Leakage Belt.

Year	Aunplanned,i,t, MAS (ha)	AAunplanned,i,t, MWF (ha)
2017	1874.6	212.7
2018	2682.4	487.2
2019	3581.4	688.2
2020	4918.1	1373.9
2021	5136.9	1713.0
2022	7081.5	2790.7
2023	6609.4	2936.8
2024	6622.5	3570.3
2025	6809.5	3666.7
2026	5509.4	3534.8
Total	50825.9	20974.5

The project area was stratified, according to module X-STR, using a land cover map developed as part of the Northern Tanzania Rangeland Initiative²⁴. The forest types present in the Project area include Acacia dominated shrubland (MAS) and Acacia-Commiphora woodland (MWF).

Table 3.11. Areas of Strata within the Project Area.

Stratum	Stratum Description	Area (hectares)
MAS	Acacia dominated shrubland	71,990
MWF	Acacia-commiphora woodland	32,075

Table 3.12. Areas of Strata within the Leakage Belt.

Stratum	Stratum Description	Area (hectares)
MAS	Acacia dominated shrubland	71,940
MWF	Acacia-commiphora woodland	32,075

Forest carbon stocks were directly measured in a forest inventory of the project area in 2016-2017.

Results are detailed in the “Forest biomass carbon inventory for the Makame Project, Kiteto District,

²⁴ Land-cover map developed by Dan Kelly, The Nature Conservancy in Arusha, Tanzania.

Tanzania” 2017 which can be found in the project database. Stocks were used to estimate carbon stock change using equations 16-22 in the BL-UP module.

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

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

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

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

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

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

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

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

GHG emissions in the baseline within the project boundary were estimated using equation 25.

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

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

Net GHG emissions in the baseline were calculated using equations 26, 27, and 28 from the BL-UP module.

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

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

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

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)

Estimated project emissions are calculated ex-post and apply Equation 1 as found in module M-MON (VMD0015) of Methodology VM0007. Values for individual parameters are justified in Table 3.7 or derived in Tables 3.8, Table 3.10, and Table 3.11. Benchmark maps of the project area and the leakage belt show forest cover conditions at the end of the monitoring period in 2023, derived using the methods described above, see Figure 3.1 and Figure 3.2. No wildfires are known to have occurred during this monitoring period after review of aerial imagery and based on VGS patrols. Conservatively, all forest cover loss detected is attributed to anthropogenic deforestation. During the reporting period, forest loss was reduced by 8,216 ha compared to the baseline.

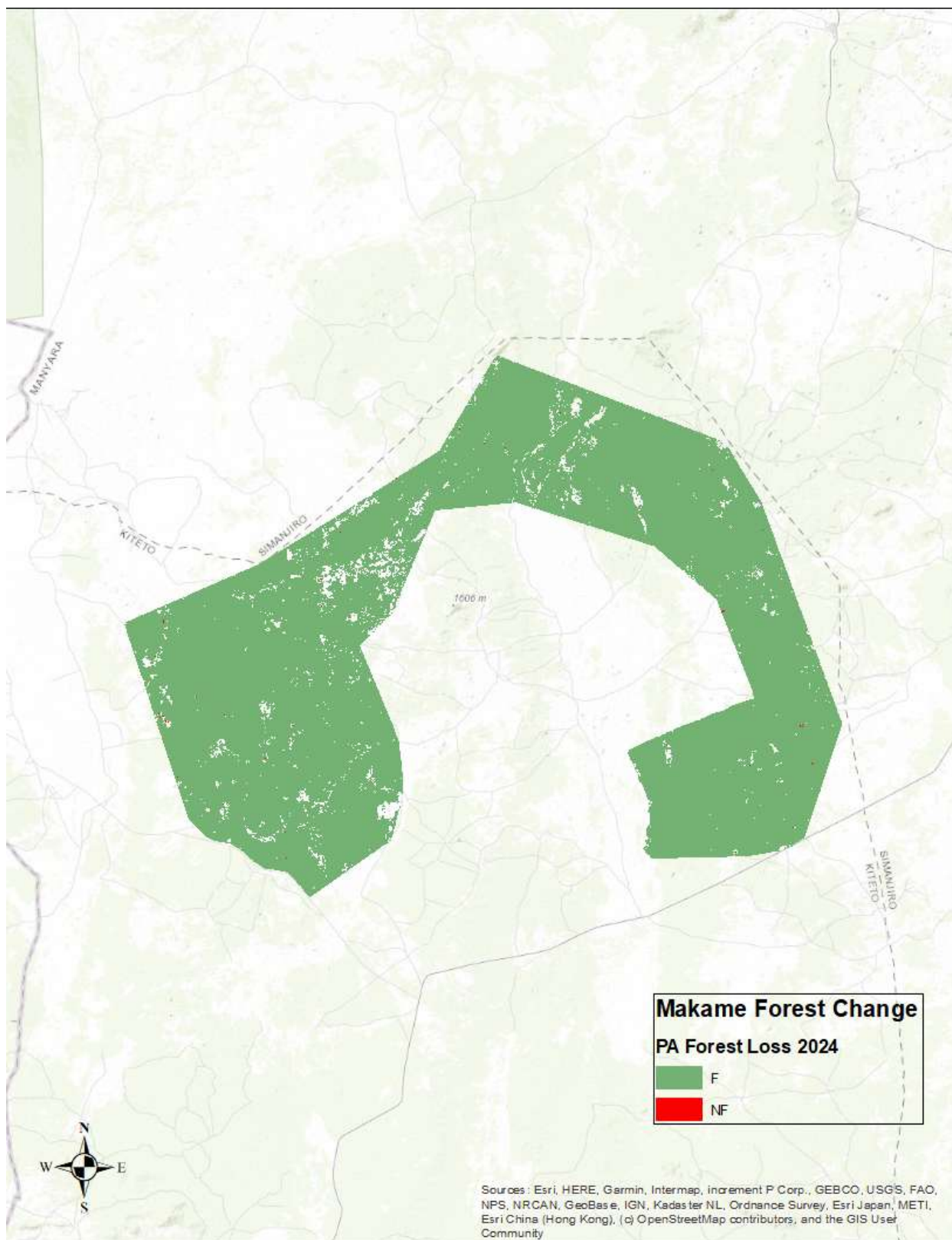


Figure 3.3. A benchmark map of the project area showing forested area at the end of the monitoring period in 2024, derived using Landsat, Sentinel-2 optical, and Sentinel-1 SAR satellite imagery.

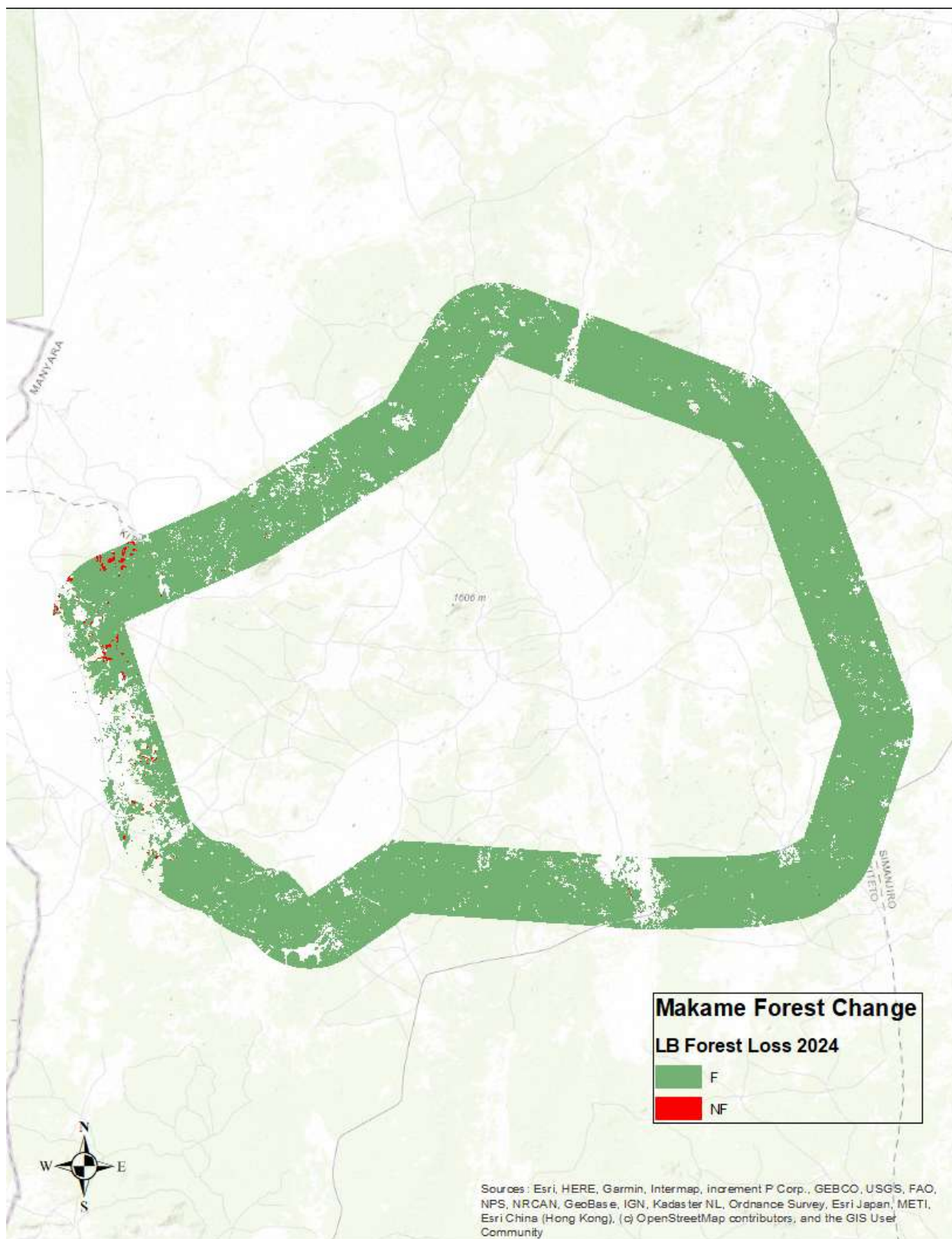


Figure 3.4. Benchmark map of the leakage belt showing forested area at the end of the monitoring period in 2024, derived using Landsat, Sentinel-2 and Sentinel-1 SAR satellite imagery.

Table 3.13. Parameters and Values used to Calculate Annual Ex Post Project Emissions.

Parameter	Description	Value	Justification
ΔCP	Net greenhouse gas emissions within the project area under the project scenario; t CO ₂ e	See table below for calculations.	
$\Delta CP, DefPA, i, t$	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.	
$\Delta CP, Deg, i, t$	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	$\Delta CP, Deg, i, t = 0$	No evidence of degradation was detected. Ample fuelwood resources remain outside the project area and ongoing forest patrols have deterred degradation activities. Emissions resulting from degradation due to selective logging of FSC certified areas (parameter $\Delta CP, SelLog, i, t$) equates to zero as no selective FSC logging occurs in either the baseline or with-project case.
$\Delta CP, DistPA, i, t$	Net carbon stock change as a result of natural disturbance in	$\Delta CP, DistPA, i, t = 0$	No significant natural disturbances resulting in emissions from

	the project area in the project case in stratum i at time t; t CO ₂ e		included pools have been detected during the period.
GHGP-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.	
ΔCP,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	ΔCP,Enh,i,t = 0	Conservative to exclude.

Table 3.14. Data used to Calculate ΔCP.

Year	ΔCP,DefPA,i,t (t CO ₂ -e)	ΔCP,Deg,i,t (t CO ₂ -e)	ΔCP,DistPA,i,t (t CO ₂ -e)	GHGP-E,i,t (t CO ₂ -e)	ΔCP,Enh,i,t (t CO ₂ -e)	ΔCP (t CO ₂ -e)
2024	2,129.8	0.0	0.0	130.6	0.0	2,260.5

Deforestation in the With-Project Case

Table 3.15. Parameters and Values used to Calculate Annual Ex Post Deforestation Emissions.

Parameter	Description	Value	Justification
ΔCP,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.

ADefPA,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	$\Delta C_{pools,Def,u,i,t} = 68.3$	This value is the strata area weighted mean. See the forest inventory report for more information on the derivation of this value.

Table 3.16. Data Used to Calculate $\Delta C_{P,DefPA,i,t}$.

Year	ADefPA,u,i,t (ha) MAS	ADefPA,u,i,t (ha) MFW	$\Delta C_{pools,Def,u,i,t}$ (t CO ₂ -e/ha) MAS	$\Delta C_{pools,Def,u,i,t}$ (t CO ₂ -e/ha) MFW	$\Delta C_{P,DefPA,i,t}$ (t CO ₂ -e)
2024	33.6	4.9	49.7	94.1	2,129.8

GHG Emissions

Greenhouse gas emissions as a result of deforestation activities within the project area (GHGP,E,i,t) are calculated in Table 3.12 using Equation 30. Parameters are found in Table 3.10.

Equation 30. Equation for Calculating GHG Emissions as a Result of Deforestation Activities within the Project Area in the Project Case.

$$GHGP-E,i,t = EBiomassBurn,i,t = Aburn,i,t * Bi,t * COMF_I * Gg,I * 10^{-3} * GWPg$$

Table 3.17. Parameters and Values Used to Calculate Annual Ex-Ante GHG Emissions.

Parameter	Description	Value	Justification
GHGP,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.	
EBiomassBurn,i,t	Non-CO ₂ emissions due to biomass burning	See table below for calculations.	Biomass burning is expected to occur in the with-project case.

	in stratum i in year t; t CO ₂ e		
--	--	--	--

Table 3.18. Calculation of EBiomassBurn_{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)
2024	38.5	0.45	28.4	102.2	130.6	130.6

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 results from 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, commercial timber markets in Tanzania exist predominantly in coastal regions due to easier access to markets through ports and roads. Therefore, this project does not produce market effects leakage related to timber production. Fuelwood in the project region is predominately collected for subsistence purposes, and not commercially harvested, thus any reductions in fuelwood produce no market effects (beyond activity displacement, treated below).

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 and documented in the PD. Table 3.13 below details the baseline estimates for the leakage belt, against which with-project deforestation in the leakage belt will be measured.

Table 3.19. Estimation of Baseline Carbon Stock Changes and Greenhouse Gas Emissions in the Leakage Belt.

Year	ΔCTOT (t CO ₂ -e)
2024	586,947.2

Leakage in the leakage belt is calculated based on total area deforested in the leakage belt over the monitoring period. 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 3.20. 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 3.21.

Table 3.20. Calculation of $E_{\text{BiomassBurn},i,t}$ for the leakage belt.

Year	$A_{\text{DefLB},u,i,t}$ (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)
2024	379.5	0.45	280.8	1,008.7	1,289.5

Table 3.21. Estimates of the Net CO₂ Emissions due to Unplanned Deforestation Displaced from the Project Area to the Leakage Belt.

Year	$A_{\text{DefLB},u,i,t}$ (ha) MAS	$A_{\text{DefLB},u,i,t}$ (ha) MFW	$\Delta\text{CP,DefLB},i,t$ (t CO ₂ -e)	E-Biomass Burning LB (tCO ₂ e)	$\Delta\text{CP,LB}$ (t CO ₂ -e)	$\Delta\text{CBSL,LK,unplanned}$ (t CO ₂ -e)	$\Delta\text{CLK-ASU-LB}$ (t CO ₂ -e)
2024	254.0	125.4	24,445.1	1,289.5	25,734.6	586,947.2	0.0

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

The live aboveground tree carbon stock (COLB) was determined to be the average stock for Tanzanian forest using data from NAFORMA²⁵ as found in Table 3.17. COLB = 54.7 t CO₂-e ha⁻¹.

²⁵ 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.

Table 3.22. Live Aboveground Biomass Carbon Stocks in Tanzanian Forests.

Vegetation Type	area ha	AGB ¹ t CO ₂ /ha
Forest	3,364,457	111.8
Woodland	44,726,246	55.1
Bushland	6,445,471	21.8
	wtd avg (COLB)	54.7

The 2015 NAFORMA - National Forest Resources Monitoring and Assessment of Tanzania Mainland was the source of information for the area of AVFOR, the forest strata, and the stocks of aboveground biomass carbon present in each stratum.

The proportional leakage for areas with immigrating populations was calculated using Equations 7-11 in module LK-ASU VMD0010. The values for the parameters used in this equation can be found in Table 3.23.

Table 3.23. Parameters and Values used to Calculate the Proportional Leakage for Areas with Immigrating Populations.

Parameter	Description	Value	Justification/Source
PROPIMM	Estimated proportion of baseline deforestation caused by immigrating population; proportion	0.129	Estimated from surveys

PROPRES = the proportion of area deforested by the population that has been resident in and around the leakage belt and project area for ≥ 5 years = 0.909; and

PROPIMM = the proportion of area deforested by population that has migrated into the area in the last 5 years = 0.129.

The net leakage outside the leakage belt (Δ CLK-ASU,OLB) is 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 3.23. Annual values for Δ CLK-ASU,OLB were calculated in Table 3.24.

Table 3.24. Parameters and Values used to Calculate the Net CO₂ Emissions due to Unplanned Deforestation Displaced Outside the Leakage Belt.

Parameter	Description	Value	Justification/Source
$\Delta C_{LK-ASU,OLB}$	Net CO ₂ emissions due to unplanned deforestation displaced outside the leakage belt; t CO ₂ e	Calculated in Table 3.20, below.	
$PROP_{IMM}$	Proportion of area deforested by immigrant agents in the leakage belt and project area (proportion)	0.129	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	See Table 3.20	Calculated above

	project area and Leakage Belt under the project scenario in year t (ha)		
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

Table 3.25. Calculation of Net CO₂ Emissions due to Unplanned Deforestation Displaced Outside the Leakage Belt.

Year	PROPIMM	ALK-IMM,t	ALK-ACT-IMM,t	ALK-OLB,t	ΔCLK-ASU,OLB (t CO ₂ -e)
2024	0.129	1,064.6	53.9	1,010.7	55,245.2

Emissions from Leakage Prevention Activities

Leakage prevention measures do not include the use of fertilizers or the burning of biomass. 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 3.27 using Equation 16 in module LK-ASU VMD0010. GHG emissions are not included in the project boundary.

Table 3.26. 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	See Table 3.37	Calculated

	for projects preventing unplanned deforestation Net CO ₂ emissions; t CO ₂ e		
$\Delta\text{CLK-ASU-OLB}$	Net CO ₂ emissions due to unplanned deforestation displaced outside the leakage belt; t CO ₂ e	See Table 3.35.	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 3.30.	Calculated.

Table 3.27. Calculation of the 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)	$\Delta\text{CLK-ME}$ (t CO ₂ -e)	$\Delta\text{CLK-AS,unplanned}$ (t CO ₂ -e)
2024	55,245.2	0.0	0.0	0.0	55,245.2

Uncertainty was assessed applying module X-UNC.

Uncertainty in the baseline rate, parameter $\text{UncertaintyBSL,RATE}$, 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 UncertaintyBSL,SS) is equal to combined uncertainty of forest carbon pool stock estimates, calculated using propagation of errors (equation 4 of VM0007 module X-UNC). Parameter UncertaintyBSL,SS is thus calculated to be 22.6% at the 95% confidence level (calculations detailed in “Makame Inventory Calcs 2017.08.17-2.xlsx”) for the initial forest inventory.

$\text{UncertaintyWRC_BSL,t}$ is zero as this is not a WRC project. Further, $\text{UncertaintyREDD_WPS}$ is zero as the same estimates of carbon pools or sources are used for the with-project scenario as for the

baseline. $NER_{REDDERROR,t*}$ is therefore limited to $Uncertainty_{BSL,SS}$. The results of overall uncertainty calculations are presented below in Table 3.28.

Table 3.28. Summary of uncertainty calculations.

X-UNC Equation Number	5	Part 1, Step 1	6	10
Parameter	$Uncertainty_{BSL,SS}$	$Uncertainty_{BSL,RATE}$	$Uncertainty_{BSL,t*}$	$NER_{REDDERROR,t*}$
Value	22.6%	0.0%	22.6%	22.6%

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

Estimates of GHG credits eligible for issuance as VCU were calculated in Table 3.26, and broken into calendar year vintage in Table 3.27 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 risk report).

Uncertainty deduction (applied to produce Adjusted NER REDD).

State the non-permanence risk rating (%)	21
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 N/A.
State, in tCO ₂ e, the expected total GHG benefit to date.	1,601,279
If a loss occurred (including a loss event or reversal), state the amount of tCO ₂ e lost:	N/A

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCU (tCO ₂ e)	Removals VCU (tCO ₂ e)
27 April 2016– December 31 2016	5,186.3	4,284.6	-	259.6	1,002.6	-
January 1 2017 - 26 April 2017	2,416.1	1,996.0	-	120.9	467.1	-
27 April 2017– December 31 2017	41,879.1	4,284.6	3,709.8	7,902.3	27,091.8	-
January 1 2018 - 26 April 2018	19,510.0	1,996.0	1,728.3	3,681.4	12,621.1	-
27 April 2018– December 31 2018	109,898.2	4,284.6	11,496.8	22,022.2	74,430.0	-
January 1 2019 - 26 April 2019	51,197.6	1,996.0	5,356.0	10,259.3	34,674.2	-
27 April 2019– December 31 2019	178,962.5	11,673.8	12,362.0	34,274.1	124,036.1	-
January 1 2020 - 26 April 2020	84,090.8	5,485.3	5,808.6	16,104.7	58,282.0	-
27 April 2020– December 31 2020	180,744.7	11,705.8	11,626.4	34,745.6	125,742.5	-
January 1 2021 - 26 April 2021	84,202.3	5,453.3	5,416.3	16,186.7	58,578.9	-
27 April 2021– December 31 2021	244,496.9	8,806.7	3,063.8	46,525.3	168,372.4	-
January 1 2022 - 26 April 2022	113,902.2	4,102.7	1,427.3	21,674.4	78,438.6	-

27 April 2022– December 31 2022	250,106.2	2,659.8	33,103.7	51,963.7	146,043.7	-
January 1 2023 - 26 April 2023	116,515.3	1,239.1	15,421.8	24,208.0	68,036.4	-
27 April 2023– December 31 2023	299,880.7	1,537.9	37,584.8	62,652.0	178,233.3	-
January 1 2024 - 26 April 2024	140,907.8	722.6	17,660.3	29,438.9	83,748.2	-
27 April 2024– December 31 2024	358,194.9	-	-	-	-	-
January 1 2025 - 26 April 2025	166,869.9	-	-	-	-	-
27 April 2025– December 31 2025	339,117.9	-	-	-	-	-
January 1 2026 - 26 April 2026	157,982.7	-	-	-	-	-
Total	2,946,062.2	72,228.7	165,766.0	382,019.2	1,239,798.8	-

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
27-Apr-2016 to 31-Dec-2016	2,077	1,003	-52%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2017 to 26-Apr-2017	7,587	467	-94%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2017 to 31-Dec-2017	16,287	27,092	66%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually

				due to factors like model error and environmental conditions.
01-Jan-2018 to 26-Apr-2018	20,185	12,621	-37%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2018 to 31-Dec-2018	43,329	74,430	72%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2019 to 26-Apr-2019	33,464	34,674	4%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2019 to 31-Dec-2019	71,636	124,036	73%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2020 to 26-Apr-2020	34,614	58,282	68%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2020 to 31-Dec-2020	73,867	125,743	70%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2021 to 26-Apr-2021	47,279	58,579	24%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.

27-Apr-2021 to 31-Dec-2021	101,487	168,372	66%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2022 to 26-Apr-2022	49,659	78,439	58%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2022 to 31-Dec-2022	130,230	146,044	12%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
01-Jan-2023 to 26-Apr-2023	60,670	68,036	12%	Ex-ante estimates were made using a constant prediction of reductions, while actual reductions can vary annually due to factors like model error and environmental conditions.
27-Apr-2023 to 31-Dec-2023	156,543	178,233	14%	During this monitoring period, the achieved emission reductions exceeded the ex-ante emission reduction estimations because there was less deforestation in the project than was expected during this time due to successful implementation of project activities.
01-Jan-2024 to 26-Apr-2024	73,556	83,748	14%	During this monitoring period, the achieved emission reductions exceeded the ex-ante emission reduction estimations because there was less deforestation in the project than was expected during this time due to successful implementation of project activities.

Total	922,471	1,239,799	34%	
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3.3 Optional Criterion: Climate Change Adaptation Benefits

Carbon Tanzania, in partnership with The Nature Conservancy, conducted a detailed analysis of climate change scenarios and impacts within the northern Tanzania region as well as specifically to Makame WMA. This research allowed us to predict a range of climatic change scenarios, helping us to inform communities and improve resilience, which in this context means adapting and reorganizing specific threats to pastoralist communities and ensuring these communities are better prepared for future climate change impacts. Increasing climate resilience involves improving governance, land and natural resource management, livelihoods practices and critically for the pastoralist Masai and wildlife, mobility across the landscape. In this context, mobility for both grazing and access to water for cattle and wildlife during the dry season. A community analysis of climate change impacts aims at increased awareness of district staff, village governments, community members and Non-Governmental Organization (NGO) staff - on projected climate change impacts in Northern Tanzania. The analysis identified immediate threats and aimed to identify and rank observed threats based on climate change information so realistic adaptation strategies could be implemented.

The results of these climate change models were presented to the communities at the community climate change workshop in September 2016 (see G1.8 in the Project Document). During this workshop, climate change was identified as a threat to the landscape's ability to provide integrated pastoralist grazing lands and seasonal habitat for wildlife. A strategy to combat the effects of climate change was identified around the development and effective utilization of land management plans. As a result, the RMP was implemented during this monitoring period, a document that specifically mentions the REDD project and climate change mitigation. Monitoring results around the implementation of the RMP, can be found in section 4.3.1. Community Monitoring Plan. This includes community rights, allocation, and maintenance over the high biodiversity community grazing area as well as non-timber forest products, both of which are crucial to their climate adaptive and resilient livelihoods²⁶. In addition, protecting indigenous habitat and rangeland is recognised as a strategic objective in the National Climate Change Strategy.

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

²⁶ <https://profiles.uonbi.ac.ke/gouma/publications/assessing-climate-change-adaptation-strategies-among-rural-masai-pastoralist-ken>

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. The natural resource protection provided by the project serves to safeguard the availability and health of grazing resources, vital to the pastoralist livelihoods of the communities. Land-use plans (including the WMA Resource Zone Management Plans and follow-on General Management Plan) 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 protected the communities against future health issues compounded by a more variable, wetter and hotter climate. Investment and training in good governance and institutions during this period supported communities to adapt and cope with a changing climate, and will allow communities to better implement future strategies and adaptations through strengthened capacity. During this period over 1,112 individuals participated in an environmental education and training program, and now have an improved framework and understanding of climate change in their own communities. 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.

In addition, protection of Indigenous habitat and rangeland is recognised as a strategic objective in the National Climate Change Strategy.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CCB, CM2.1)

Community group	ALL GROUPS
Impact	Increased transparency of community income and expenditure
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved confidence in leadership and the dissemination of community funds; empowerment of community members over community finances; increased efficiency in community development projects and improved service provision leading to improved quality of life and well-being, greater community cohesion, resilience and stability. Revenue and resource

	allocation were reported with communities (see community monitoring plan, section 4.3.1).
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Community group	ALL GROUPS
Impact	Strengthened governance, resource management plan and land rights
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Overall better management of society and resource/land use leading to improved service provision; greater trust and confidence in the government; security in land rights; successful implementation of the land use plan leading to improved livelihoods. Implementation of the resource management plan and trainings to improve governance have taken place (see community monitoring plan, section 4.3.1).

Community group	ALL GROUPS
Impact	Increased resilience of the landscape/resource
Type of benefit/cost/risk	Predicted, direct benefit
Change in well-being	Enhanced security and resilience of livelihoods in the face of climate change will be realized as the project activities continue to be implemented.

Community group	ALL GROUPS
Impact	Improvements to community infrastructure including roads, water sources, education facilities and health care centres
Type of benefit/cost/risk	Actual, direct benefit
Change in well-being	Increased ease of access to crucial services; decreased time spent fetching water or traveling to places; improved well-being; heightened level of education throughout the community. Addition of solar electricity, radio communications and internet access have been implemented (see community monitoring plan, section 4.3.1).

Community group	ALL GROUPS
Impact	Increased awareness of conservation and the environment
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Better productivity and condition of the forest resource and ecosystem services it provides (medicinal plants, reduced dust levels, reduced erosion, prevention of siltation of water holes and dams, sustainability of resources creates security in livelihoods. Successful training of people through the Carbon Champions Program has brought awareness to communities of conservation and environmental benefits of the project (see community monitoring plan, section 4.3.1).

Community group	ALL GROUPS
Impact	Development of tourism industry
Type of benefit/cost/risk	Predicted, direct/indirect benefit
Change in well-being	Increased employment/business opportunities; diversification of income sources; increased community resilience; source of revenue for community development enhancing well-being; improved provision of ecosystem services. As the project is implemented, tourism opportunities will improve.

Community group	ALL GROUPS
Impact	Sustainability of natural resource
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Enhanced security of, and confidence in, the future of their society and livelihoods. Implementation of project activities are already improving sustainability of natural resources through management training and resource allocation (see community monitoring plan, section 4.3.1).

Community group	ALL GROUPS
Impact	Increased frequency of human-wildlife conflicts
Type of benefit/cost/risk	Predicted, direct risk
Change in well-being	Increased negative attitudes toward wildlife; increased insecurity of people in the landscape. Human-wildlife conflict was reported during this monitoring period, see community monitoring plan results in section 4.3.1).

Community group	Women
Impact	Improvements to village water sources
Type of benefit/cost/risk	Predicted, direct benefit
Change in well-being	Availability of more time in the day when they are walking less distance to fetch water; less physical strain when they are carrying the water home themselves. The creation of resource zone management plans is intended to improve access to water though water availability has not been directly measured.

Community group	Women
Impact	Improved access to and quality of education services
Type of benefit/cost/risk	Actual, direct benefit
Change in well-being	Receiving quality education can empower young women to have more choice about their future, rather than accepting their traditional role in society; increased opportunity to be employed, to continue studies at a higher level or to create their own business opportunities. During this period funding was allocated for education (see community monitoring plan, section 4.3.1).

Community group	Women
Impact	Improved pasture for livestock

Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved quality and quantity of produce from livestock; improved food security; more opportunities for income by selling milk or meat; greater potential to own more cows. The resource zone management plan allocates community grazing areas (see community monitoring plan, section 4.3.1).

Community group	Women
Impact	Incorporation of women into leadership positions
Type of benefit/cost/risk	Actual, direct/indirect benefit
Change in well-being	Consideration of female views into decision making; empowerment of women and increased gender equality throughout the community. Women occupy leadership positions in the community (see community monitoring plan, section 4.3.1).

Community group	Children / Youth
Impact	Improved access to and quality of education services
Type of benefit/cost/risk	Actual, direct benefit
Change in well-being	Empowerment of children and youth to have more choice about their future, rather than accepting their traditional role in society; increased opportunities to be employed, to continue studies at a higher level or to create their own business opportunities. Funding for education services was allocated using project revenue (see community monitoring plan, section 4.3.1).

Community group	Children / Youth
Impact	Improved pasture for livestock
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved quality and quantity of produce from livestock, ensuring greater food security and income for themselves and

	their families; easier access to pasture and reduced tension/conflict when herding livestock; greater potential to own more cows. The resource management plan is improving allocation of resources for grazing and management of resources (see community monitoring plan, section 4.3.1).
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Community group	Children / Youth
Impact	Improved pasture for livestock
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved quality and quantity of produce from livestock, ensuring greater food security; easier access to pasture and reduced tension/conflict when herding livestock; greater potential to own more cows. The resource management plan allocates areas for grazing (see community monitoring plan, section 4.3.1).

Community group	Male Elders
Impact	Improved pasture for livestock
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved quality and quantity of produce from livestock, ensuring greater food security and income for themselves and their families; easier access to pasture and reduced tension/conflict when herding livestock; greater potential to own more cows. The resource management plan allocates grazing areas for livestock (see community monitoring plan, section 4.3.1).

Community group	Warriors (Young Men)
Impact	Increased wildlife
Type of benefit/cost/risk	Predicted, direct cost/risk
Change in well-being	As it is the warriors' responsibility to defend against wildlife attacks, it is this sub-group that takes on the risk of facing potentially fatal interactions with wild animals; increased

	negative attitudes toward wildlife. Interactions with wildlife were reported during this period, but actions taken by this group were sufficient to mitigate the risk to the community.
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Community group	Pastoralists
Impact	Increased sustainability and resilience of pastoralism
Type of benefit/cost/risk	Predicted, direct benefit
Change in well-being	Increased security in livelihood; increased food security; improved well-being. The resource management plan allocates resources and education and training will continue to improve sustainability and resilience for this community.

Community group	Pastoralists
Impact	Increased attacks on livestock from wildlife
Type of benefit/cost/risk	Predicted, indirect cost/risk
Change in well-being	Loss of livestock results in decreased produce and assets, costing the pastoralist financially; additional emotional costs as Masai can hold particular cows to be extremely important, treating them like pets who are part of the family; food insecurity; increased negative attitudes toward wildlife. Wildlife attacks on livestock were reported during this monitoring period (see community monitoring plan results in section 4.3.1), and the risk remains as wildlife populations continue to repopulate the project area.

Community group	Pastoralists
Impact	Improved water quality for livestock
Type of benefit/cost/risk	Predicted, indirect benefit
Change in well-being	Healthier livestock ensure enhanced psychological well-being; increased food security; increased security in livelihood. The resource management plan allocates water resources and improves access though water quality has not been directly measured.

Community group	Pastoralists
Impact	Improved pasture for livestock
Type of benefit/cost/risk	Actual, indirect benefit
Change in well-being	Improved quality and quantity of produce from livestock, ensuring greater food security and income for themselves and their families; easier access to pasture and reduced tension/conflict when herding livestock; greater potential to own more cows. The resource management plan allocates grazing areas for livestock and improves access to pasture (see community monitoring plan, section 4.3.1).

Community group	Agriculturalists (Non-Masai)
Impact	Increased crop damage from wildlife
Type of benefit/cost/risk	Predicted, indirect cost
Change in well-being	Financial losses; food insecurity; decreased resilience; reduced confidence in livelihoods; increased negative attitudes toward wildlife. Interactions with wildlife were reported during this period, however measures taken by the community have sufficiently mitigated the risk.

Community group	Agriculturalists (Non-Masai)
Impact	Reduced land availability for agriculture
Type of benefit/cost/risk	Predicted, indirect cost
Change in well-being	Reduced possibility to expand agriculture. Though land availability for agriculturalists has not been tracked, it remains a likely risk.

Affected groups have participated in the evaluation of impacts in various ways during this monitoring period. All groups participate in traditional legal governance systems – which are democratic, participatory, and geographically representative. These have been documented to be heavily engaged and supported by the project. Therefore, most local government and WMA meetings cover the updates on the project and community discussions around impacts. The WMA structure which is

built on and legitimized by several of those other systems was in fact the main source and first compiler of much of the impact data. The project is built on the implementation of the RMP, which itself was developed in a participatory manner and aimed to develop these same positive impacts to the community on behalf of the community. The Carbon Champions program and discussions on monitoring results at a household level also allowed impact evaluation at the most grassroots level, including youth, and women, and elders, who may be less likely to be found than the males, warriors, and non-pastoralists who are often more engaged in the village centers. The functioning women's forums also provided another official space for impact evaluation for women.

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

One of the primary risks identified pertains to crop damage due to wildlife encroachment. To combat this, the project employs the resource management plan, which is designed to distinctly separate wildlife habitats from agricultural zones. This deliberate demarcation substantially reduces potential crop damages for the agriculturalists of Makame WMA.

Reduced land availability for agriculture, due to conservation measures, was another concern. To counteract this, the renewed resource management plan ensures ample land is demarcated within the Human-Settlement/Agriculture Zone (Makazi) for agricultural activities. This systematic land-use planning is pivotal in preventing potential disputes over land-use changes, land grabbing, or conflicts that might arise during the project's duration. Simultaneously, the plan underscores the significance of preserving High Conservation Value grazing land, which is vital for the traditional Masai pastoralist lifestyle and crucial for sustaining diverse wildlife populations.

The potential increase in human-wildlife conflicts, given the proximity of wildlife habitats to human settlements, is also a significant risk. To address this, the project has bolstered the governance of the WMA structure, enhancing its capacity to engage in daily operations and respond proactively to such conflicts. A critical facet of this empowerment is the financial stability afforded to the WMA, which enables it to conduct regular patrols, ensuring early detection and intervention in potential conflict scenarios. This proactive approach ensures swift response to any reports of human-wildlife conflicts, offering immediate mitigation of risks and ensuring the overall safety and well-being of the community.

All HWC incidents are logged by the WMA, and mitigation is affected through assistance from VGS, employed by the WMA. Makame WMA purchased 4 additional motorbikes in the MR period to assist with HWC incidents (receipt available). Generally, there is a net positive impact on the communities, as they understand that if the wildlife population increases they will gain additional income from

tourists and hunting leases. The community recognizes that increased wildlife populations are indicators of the success of conservation efforts that lead to all of the other project benefits.

The collaboration between Honeyguide and Carbon Tanzania has continued during the reporting period and Honeyguide maintains full time staff in the WMA and continuing activities and capacity-building. Paired with the project's governance work and resource availability, the WMA has been able to significantly mitigate this risk by being able to react to any reports of human wildlife conflict and directly intercede, mitigating the immediate risk while maintaining safety for the community.

In summary, the combined strategies of a well-structured resource management plan, robust governance mechanisms, and the financial empowerment of the WMA have been instrumental in mitigating potential negative impacts, ensuring a harmonious balance between conservation objectives and the local community's well-being.

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

The main goal of this project is to assist the community in the implementation of the resource management plan that the community themselves developed. The RMP serves as the formalization of their traditional land management techniques and has been designed to generate social and economic benefits for the whole community, including marginalised and vulnerable groups. For example, the project's protection and conservation of natural resources maintains the health of the ecosystem which contributes to landscape connectivity, health, resilience, and adaptive capacity. As this resource is fundamental to pastoralism, it is essential to maintain so that it, and likewise community livelihoods, may withstand future pressures such as climate variability. Many of the benefits achieved during this period are reported in the Community Monitoring Plan section 4.3.1. Based on the limited risks and the solid negative impact mitigation structure in contrast to the numerous benefits to all community groups outlined in this monitoring report, it is confidently stated that the project provided net positive well-being impacts for all identified community groups (Section 4.1.1.) during this period. These community groups are comprised of >26,395 people (13,552 women) according to the 2022 Tanzanian Census data.

During this monitoring period, previous actions by the community led to the creation of Verified Emission Reductions (VERs) and have contributed and will continue to contribute to community development and other positive community well-being outputs through the use of the revenues generated from the sale of these VERs. For specific net impact on groups, all community groups had net positive impact from the project. There are a significant number of positive impacts to the category "All Groups" and the single noted risk has been mitigated, so impact is net positive for "All

Groups”. Women also have additional positive impacts with no risks so net impact to women remains positive. Youth also have additional positive impacts with no risks so net impact to women remains positive. Warriors have additional group specific positive impacts while group specific risks were shown to be mitigated so net impact is positive. Male elders have additional group specific positive impacts while group specific risks were shown to be mitigated so net impact is positive. Pastoralists have additional group specific positive impacts while group specific risks were shown to be mitigated so net impact is positive. Non-pastoralists specific risks were shown to be mitigated and are outweighed by positive impacts non-pastoralists received as part of “All “Groups” and therefore net impact is also positive for non-pastoralists.

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

The main goal of this project is to assist the community in the implementation of the resource management plan which formalises their traditional land management techniques and customs. Therefore, the project has not, during this period, had any negative impact on any of the project area’s High Conservation Values. The project is designed to protect and conserve these areas from misuse, enhance community understanding of their value, and to improve overall community well-being through the development and implementation of the RMP. Specifically, during this monitoring period, the implementation of the RMP led to increased community control of resources, specifically the allocation of the community grazing area, an HCV, and non-timber products (carbon, medicine, honey), also an HCV. The increased WMA capacity through governance trainings, employment of community game scouts, and environmental awareness campaigns during this period also contribute to the protection and maintenance of HCV in the project (see Community Monitoring Plan Section 4.3.1. for results of monitoring). Water sources for livestock and people were not negatively affected by the project in any way, on the contrary, forest protection and its associated water benefits and the presence of VGS enforcement ensured positive impact on livestock water sources, increased governance and function at a village level also generated net positive impacts on the HCV water sources of people. The HCV of churches has not been negatively affected by the project in any way, nor is there any mechanism for the project to negatively affect them, in fact due to the project and RMP the land the churches sit on is now more strongly held by the local communities, as the communities that makeup the church have increased governance capacity and resource availability, which could also have potential benefit for church function and community well-being. Therefore, during this reporting period, the project and community were successful in the stated goal of protection of High Conservation Values.

4.2 Other Stakeholder Impacts

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

The project did not have any negative impacts on other stakeholders this period, so direct mitigation was not necessary. The project was designed with input from all stakeholders including district government, and has been implemented in the same way, including use of the precautionary principle, proactively aiming to prevent negative impacts on other stakeholders that could result from the project. The risks, costs, and benefits of the project are evaluated at each biannual meeting and prior to each verification event.

The establishment and management of WMAs in Tanzania are primarily governed by the Wildlife Conservation Act of 2009 and overseen by the Ministry of Natural Resources and Tourism. The process of RMP creation is integral to ensuring community-based conservation efforts and is anchored in the following structured approach:

Initial Consultations: The Village Council, as the grassroots governance structure in Tanzania, plays a pivotal role. At this stage, the Wildlife Division of the Ministry introduces the concept of WMAs and garners preliminary input, ensuring community buy-in from the outset.

Participatory Rural Appraisal (PRA): Rooted in Tanzania's commitment to decentralized governance, PRA techniques are essential. The PRA ensures that local communities actively participate in delineating zones within the WMA, identifying resources, and indicating areas of potential conflict or convergence.

Drafting of the RMP: Utilizing the information from the PRA and initial consultations, a preliminary RMP is drafted. This draft is in line with guidelines provided by the Wildlife Conservation (WMAs) Regulations of 2012, which stipulate the creation of zones like core wildlife conservation zones, buffer zones, and human settlement zones.

Stakeholder Workshops: Before the RMP is finalized, the Wildlife Division, in collaboration with the Authorized Association (a local body given authority to manage a WMA), hosts workshops to scrutinize the draft. Local communities, representatives from the Tanzania Wildlife Authority (TAWA), NGOs, and even district officials are invited to provide feedback.

Final Approval and Implementation: The finalized RMP is then submitted to the Director of Wildlife for approval. Once endorsed, the RMP is communicated back to the communities, and the Authorized Association takes the lead in its implementation, in accordance with the Wildlife Conservation (WMAs) Regulations.

Feedback Mechanisms: The 2012 WMA regulations also emphasize the importance of monitoring and regular reviews of the RMP. Therefore, channels are established to gather continuous feedback, ensuring the plan remains dynamic and adjusts to changing realities on the ground.

In conclusion, the formation of the RMP for WMAs in Tanzania is a legally mandated, collaborative effort, ensuring that conservation aligns with community interests and national conservation goals. The process is anchored in Tanzanian laws and regulations, with each step designed to foster transparency, inclusivity, and sustainability.

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

During this period, the project achieved positive impacts on other stakeholders. Among these achievements is the increased capacity of local government and the WMA structure in relation to conflict resolution and management, resulting from project governance work. This has given other stakeholders, like district government, and external actors like potential photographic and hunting tourism businesses, and regionally active development organizations like Tanzania People and Wildlife or Oikos Institute, the ability to engage with the WMA more easily. Increased work with participatory forest, wildlife and resource conservation in the WMA also benefits other stakeholders who benefit from the stability of the resource base. Increased community awareness on issues ranging from land tenure, governance, and the environment mean that the community has already been primed to participate in potential future interventions and activities with other stakeholders and external actors. Positive governance impacts experienced by all other stakeholders and external actors and the lack of any negative impacts caused a net positive impact on the well-being of these additional other stakeholders and external actors.

As it is stated in Section 4.2.1, there were no perceived or actual negative impacts on other stakeholders during this period.

4.3 Community Impact Monitoring

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

Area	Objective	Activities	Term	Indicator/ Output	Data Collection Method/Tool	Frequency of Monitoring	Responsible to Monitor	Stakeholder group impacted
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Education	Increase community understanding of natural resource management and the project	Carbon Champions Program	2017-2023	# People reached # People tested for knowledge	Records of meetings/ interactions Testing results	Bi-annual	Carbon Tanzania	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -Masai children -Masai male elders -Non-cattle owning Masai/Masai small-scale agriculturists -Non-Masai agriculturists
	Results: 1051 people from all member village 532 People tested for knowledge as carbon champions in Katikati							
	Increased education opportunities in the WMA	Increased education budget	2020 - 2023	Funds available for education	Financial details	Annually	WMA	-Masai women and girls -Masai warriors -Masai children -Non-cattle owning Masai/Masai small-scale agriculturists -Non-Masai agriculturists -Kiteto District Government
Results: USD 175,143 available to WMA								
Governance Management	Improved management of WMA	Train WMA leaders in good governance	2016 - 2023	# trainings # people trained	Meeting records	Annually	Carbon Tanzania	-Masai pastoralists -Masai male elders -Non-cattle owning Masai

								-Non-Masai agriculturists -Kiteto District Government -External stakeholders (investors/NGOs)
		Results: 1 Training 12 Leaders Trained						
		Train local government leaders in good governance	2016-2023	# trainings # people trained	Meeting records	Annually	Carbon Tanzania	-Masai pastoralists -Masai male elders -Non-cattle owning Masai -Non-Masai agriculturists -Kiteto District Government -External stakeholders (investors/NGOs)
		Results: 1 Trainings 49 Leaders Trained						
		Implementation and awareness training for resource zone management plan and business plan	2018-2023	Did training happen? # trained	Training records	Every 5 years	Carbon Tanzania	-Masai pastoralists -Masai warriors (young men) -Masai male elders -Non-cattle owning Masai -Non-Masai agriculturists -Kiteto District Government
		Results: Updates to RMP began during monitoring period						

		Increased budget for management activities	2020 - 2023	Funds available for management	Financial details	Annually	WMA	-Masai pastoralists -Masai warriors (young men) -Non-cattle owning Masai -Non-Masai agriculturists -Kiteto District Government
		Results: USD 529,789 allocated						
	Creation/Renewal of management frameworks Increased/ Maintained natural resource management infrastructure	Creation/Renewal of WMA resource zone management plan	2017 - 2023	Existence of WMA resource zone management plan	WMA resource zone management plan	Every 5 years	WMA	-Masai pastoralists -Masai warriors (young men) -Non-cattle owning Masai -Non-Masai agriculturists -External stakeholders (investors/NGOs)
		Results: The RMP remained effective during this period, and is currently being updated to become the GMP						
		Creation/Renewal of WMA business plan	2018 - 2023	Existence of WMA business plan	WMA business plan	Every 5 years	Carbon Tanzania & WMA	-Masai pastoralists -Masai warriors (young men) -Kiteto district council -External stakeholders
		Results: Exists, no updates this period						
		Addition of solar electricity, radio communications and internet	2018 - 2023	Implemented or not	Proof of implementation	Every 5 years	Carbon Tanzania	-Masai pastoralists -Masai warriors (young men)

		access to WMA infrastructure						-Kiteto district council -External stakeholders
		Results: Implemented						
Employment/ Income/ Livelihood	Increased control of resources	Allocate and maintain community grazing area (HCV)	2017 2022	Resource zone management plan	Resource zone management plan	Every 5 years	WMA	-Masai warriors (young men) -Non-cattle owning Masai -Non-Masai agriculturists
		Results: Allocated, no changes this period						
		Non-timber (including carbon, medicine, honey) rights (HCV)	2017 2022	Resource zone management plan	Resource zone management plan	Every 5 years	WMA	-Masai warriors (young men) -Non-cattle owning Masai -Non-Masai agriculturists
		Results: Allocated, no changes this period						
	Improved community livelihoods	Employment of village game scouts	2019 - 2023	# people registered as village game scouts # people employed as village game scouts	Registry/payment sheets	Annually	WMA	-Masai pastoralists -Masai warriors (young men) -Non-cattle owning Masai -Non-Masai agriculturists -Kiteto District Government -External stakeholders (investors/NGOs)
								Results: 32 registered as village game scouts 32 employed as village game scouts

		Increased village budgets for development	2020 - 2023	Funds available for villages	Financial details	Annually	WMA	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -Masai children -Non-cattle owning Masai -Non-Masai agriculturists -Kiteto District Government -External stakeholders (investors/NGOs)
			Results: USD 234,950 sent to project villages					
Women's Empowerment	Formal women's empowerment	Formation of regularly meeting women's forums in WMA member villages	2017 - 2023	# of forums # of forum members	Meeting records	Annually	Ujamaa Community Resource Team	-Masai women and girls
			Results: 5 Forums 100 Women members of forum					
	Female representation in WMA leadership	Women in leadership positions in WMA	2017 - 2023	# of women in leadership positions	WMA leadership records	Annually	WMA	-Masai women and girls
			Results: 13 women in leadership positions					
Carbon Tanzania - Community Relations	Formal relations structure	Appeals and complaints committee	2017-2023	# of appeals and complaints logged	Appeals and complaints log	Annually	Carbon Tanzania & WMA	-Masai pastoralists -Masai women and girls -Masai warriors (young men)

								-Masai children -Masai male elders -Non-cattle owning Masai/Masai small-scale agriculturists -Non-Masai agriculturists
		Results: 0 appeals and complaints logged						
	Informal relations structure	Bi-annual feedback meetings with WMA	2018-2023	# of meetings held # of attendees	Meeting Records	Bi-annually	Carbon Tanzania	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -Masai children -Masai male elders -Non-cattle owning Masai/Masai small-scale agriculturists -Non-Masai agriculturists
		Results: 1 meeting 13 attendees						
Community Risks	Increased human/wildlife interactions		2021-2023	# of people injured by wildlife	Reports to community leaders	Annually	WMA	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -Masai children -Masai male elders

								-Non-cattle owning Masai/Masai small-scale agriculturists -Non-Masai agriculturists
		Results: 3 direct conflict incidents						
	Increased attacks on livestock		2021-2023	# of livestock attacked by wildlife	Reports to community leaders	Annually	WMA	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -small-scale agriculturists -Non-Masai agriculturists
		Results: 81 livestock attack incidents						
	Increased crop damage from wildlife		2021-2023	Number of incidents of crops damaged by wildlife	Reports to community leaders	Annually	WMA	-Masai pastoralists -Masai women and girls -Masai warriors (young men) -small-scale agriculturists -Non-Masai agriculturists
		Results: 191 wildlife damage incidents						
	Reduced land availability for agriculture		2021	Area of farmland needed	Reports to community leaders	Annually	WMA	-Masai pastoralists -Masai women and girls

								-Masai warriors (young men) -small-scale agriculturists -Non-Masai agriculturists
			Results: No new farmland required during this period per the RMP					

4.3.2 Monitoring Plan Dissemination (CCB, CM4.3)

Carbon Tanzania has shared the full translated community monitoring plan with the communities through the WMA, and are available prior to and after each verification event. These documents are available on the internet for the communities, other stakeholders, and all those concerned, the WMA office will have hard copy and has internet access as well. Carbon Tanzania also prepares project report that are based on compiled data and are available to the communities. In addition, Carbon Tanzania holds bi-annual meetings to share project information and data with community members. These meeting minutes are then available to the community with originals kept at the WMA office and copies available upon request from Carbon Tanzania.

4.4 Optional Criterion: Exceptional Community Benefits

The project is predominantly implemented by the Authorised Association of the Makame WMA (with assistance from Carbon Tanzania and project partners). Table 4.3.1. outlines the exceptional community benefit being the development, renewal, and implementation of the RMP and its allocation of community grazing rights and rights over non-timber resources. The resource management plan (RMP) which continued to be implemented during this monitoring period ensures that the communities have ownership and management rights of the project area, which are being reinforced through the project. During the monitoring period, the WMA began the process of updating the RMP. Project lifetime exceptional community benefits (Gold Criteria) are outlined in table 4.4.1. below and in this period included improved pasture for livestock and thus increased food security, employment opportunities, and women's empowerment. These community activities (through the implementation of the resource management plan) have generated the CCB benefits described in

Section 4.4.1. of the PD. According to the Human Development Index²⁷, the project is occurring in a low human development country. During this verification period the project achieved exceptional community benefits in the long term and short term (see Section 4.4.1), creating positive net impacts on the community and specifically women (see Section 4.4.3).

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

The project theory of change, available as Appendix 1, explains the projects path to generating short-term and long-term net positive well-being benefits for smallholders/community members and includes the activities the project will undertake and the associated expected outputs, outcomes and impacts, both human and natural resource related. The Community Monitoring plan is directly related to the project theory of change, and through community monitoring, the project validates the assumptions of the theory of change and adjusts when necessary.

During this verification period the project has achieved all its desired targets as shown in section 4.3.1. Community Impact Monitoring. In this period, short term benefits to community members included; increased understanding of natural resource management, improved management capacity by the WMA and local leaders through training, implementation of the RMP, solar electricity and radio facilities maintained at the WMA office, protection of rights of non-timber forest products, employment of VGS and continued functioning of the Women's Forums.

Long term benefits generated during this period include that increased community understanding of natural resource management couples with improved governance at the local and WMA level improve the sustainability of the natural resource base which the community depends on in the long term. Likewise, the approval of the RMP has granted the community with rights to the crucial grazing area as well as non-timber products. Furthermore, women's leadership at the WMA level serves as a long-term example to women in the community of the ability to achieve leadership status in the WMA and the project. Lastly, project activities undertaken during this period set the stage for future carbon revenue, which will continue to increase the availability of development and education funds in the long term.

Table 4.4.1. Short and long-term benefits achieved during this monitoring period.

²⁷ UNDP. (2016). Human Development Report 2016: Human Development for Everyone. Retrieved from: <http://report.hdr.undp.org/>

ACTIVITIES	OUTPUTS	OUTCOMES	IMPACTS	EXCEPTIONAL (Gold) level community impact
TARGET 1				
Enable the WMA to conduct anti-poaching and control illegal grazing as specified in the RMP	Increased enforcement of the WMA and associated laws protecting biodiversity	Increased security of land and resources and reduction in poaching and illegal grazing	Protection and conservation of natural resources within the project area, including: Improved	
	Increased patrol hours and coverage by the VGS	Decreased poaching resulting in net positive biodiversity outcomes and illegal grazing	protection of both resident and migratory biodiversity. Protection and management of	Improved pasture for livestock, a major benefit for Masai culture
	No deforestation in project area	Carbon stocks are maintained in forest, community receives carbon revenue	grazing stocks for the benefit of communities. Projection of carbon stocks	Increase in income generated by the WMA
Conservation awareness campaign to ensure RMP is known by all community members	Zero deforestation in the project area	Carbon stocks are maintained in project area, community receives carbon revenue	with the designated REDD project area creating increased income to the WMA (Positive impact) Improved resilience to climate change through maintenance of dry season grazing resources and	Food security is improved, increased revenue to WMA and community

			mobility (Positive impact)	
TARGET 2				
Conduct climate change analysis and climate change adaptation workshop	Regional level climate change analysis and community level understanding of impacts and adaptation to climate change	Climate change is recognised by WMA, District Government and communities as a priority. Communities identify threats to their lifestyle from climate change and have a better understanding of the REDD project and it's benefits	Climate change adaptation is incorporated into implementation of the RMP that leads to greater adaptive responses to climate change through the protection of grazing areas and improvements to availability of dry season water resources by creating new dams (Positive impact)	Improved grazing, seasonal management of resources and water availability for livestock and wildlife. Dialogue is established that climate change affects daily life and natural resource management is recognised as both a mitigation and adaptation strategy
Develop a business plan for Makame WMA	Provides WMA with planning tool for management and recognition of potential for tourism Better decision making within the AA of the WMA	Better managed tourism potential and better management of the WMA to conserve carbon stocks	Promotion of tourism in Makame WMA and natural resource conservation resulting in improved protection of biodiversity, grazing areas and carbon stocks (Positive impact)	Better planning of revenue results in Increased community engagement in the WMA and resilience due to improved management of natural resources
Increased hunting tourism	Increase number of hunting tourists	Increased tourism revenue for WMA		Increased employment opportunities,

				especially favouring youth
		Creation of employment opportunities within communities		Improved provision of ecosystem services (medicinal plants, reduced dust levels, reduced erosion, prevention of siltation of water holes and dams)
		Increased protection of biodiversity through anti poaching		Revenue source for community development
TARGET 4				
Review resource management plan	Create more relevant resource management plan that reflects community needs	Resource ownership	Secure land rights for WMA and natural resource conservation resulting in better management of natural resources, the protection of biodiversity and carbon stocks (Positive impact)	Eliminate poverty through resource ownership creates strong links between addressing climate change and improved economic opportunities
Stakeholder agreement on resource management plan	Maintain community resource ownership			
Authenticate resource management plan with government	Ensure stakeholder understanding of the plan			
Share new resource management plan accordingly				

TARGET 5				
Support traditional grazing zones and by-laws through implementation of the RMP	Decreased unlawful grazing and land use	Better availability of grazing resources throughout the whole year	Protect and maintain the culture and tradition and natural resource conservation. Better protection of grazing land for target megafauna and greater resilience of communities to climate change impacts (Positive impact)	Security and sustainability of livelihoods
		Improved rangeland health		Food security increase
		Healthy cows		Wealth increase
		Increased connectivity for cattle and wildlife across the landscape		Formalization of grazing rights
		Resilience and sustainability of pastoralism		
TARGET 6				
Governance training for WMA leadership	Improved capacity to manage natural resources	Better implementation of the resource management plan	Strengthen governance, improve livelihoods and natural resource conservation through the RMP (Positive impact)	More trust and confidence in leadership and the WMA structure
Governance training for village leaders & comm. members	Improved capacity to manage natural resources	Improved management of the WMA		Improved service provision
Governance training for women's leadership groups	Improved capacity to manage natural resources	Consideration of women in community decisions		Improved livelihoods
Ensure female representation in leadership	Better integration of women into decision making			Empowerment of women in leadership

		Empowerment of women		Increased gender equality in leadership
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Table 4.4.2 Short-term and long-term net positive impacts for ongoing project activities.

Key:

Positive Project Impact in MR	Aligned Exceptional (Gold) Level community impacts identified in section “Short-term and Long-term Community Benefits” of the Validated PD.	Progress made during this period towards desired impact
Increased understanding of natural resource management	1,2,3,4,5,6,8,11,13,15,16,17,18,22	1051 people from all member village trained on the natural resource management through carbon champions
Improved management capacity by the WMA and local leaders through training	1,2,3,4,5,6,8,11,12,13,14,16,17,18,20,21,22	12 Leaders Trained
Implementation of the RMP	1,2,3,4,5,8,11,13,14,16,17,18,19,20,21,22	Implemented
Solar electricity and radio facilities maintained at the WMA office	14,21	Solar and radio maintained
Protection of rights of non-timber forest products,	1,3,4,5,8,11,13,16,17,19,21,22	Rights granted through RMP
Employment of VGS	7,11,14,15,16,18,21	32 employed as village game scouts

Continued functioning of the Women's Forums	11,12,14,16,20,21,23,24	100 Women members of forum 13 women in leadership positions
Increased community understanding of natural resource management coupled with improved governance at the local and WMA level improve the sustainability of the natural resource base which the community depends on in the long term	1,2,3,4,5,6,8,11,12,13,14,15,16,17,18,20,21,22	1051 people from all member village trained on the natural resource management through carbon champions 12 Leaders Trained
Approval of the RMP has granted the community with rights to the crucial grazing area as well as non-timber products	1,3,4,5,8,11,13,16,17,19,21,22	Rights granted/ implemented through RMP
Women's leadership at the WMA level serves as a long-term example to women in the community of the ability to	11,12,14,16,20,21,23,24	100 forum members 13 women in leadership

achieve leadership status in the WMA and the project		
Project activities undertaken during this period set the stage for future carbon revenue, which will continue to increase the availability of development and education funds in the long term	2,3,6,9,10,11,13,14,15,16,17,18,21,22	175,143 USD Available to WMA 234,950 USD sent to project villages

Table key for Table 4.4.2 (above):

Exceptional (Gold) Level community impacts identified in section “Short-term and Long-term Community Benefits” of the Validated PD.

1. Improved pasture for livestock, a major benefit for Masai culture
2. Increase in income generated by the WMA
3. Food security is improved, increased revenue to WMA and community
4. Security and sustainability of pastoralist livelihoods
5. Improved grazing, seasonal management of resources and water availability for livestock and wildlife. Dialogue is established that climate change affects daily life and natural resource management is recognised as both a mitigation and adaptation strategy
6. Better planning of revenue results in Increased community engagement in the WMA and resilience due to improved management of natural resources
7. Increased employment opportunities, especially favouring youth
8. Improved provision of ecosystem services (medicinal plants, reduced dust levels, reduced erosion, prevention of siltation of water holes and dams)
9. Revenue source for community development
10. Improved quality of life due to revenue expenditure on community-based projects
11. Enhanced well-being
12. Greater community cohesion
13. Increased community resilience
14. Greater stability of governance structures

15. Eliminate poverty through resource ownership creates strong links between addressing climate change and improved economic opportunities
16. Security and sustainability of livelihoods
17. Food security increase
18. Wealth increase
19. Formalization of grazing rights
20. More trust and confidence in leadership and the WMA structure
21. Improved service provision
22. Improved livelihoods
23. Empowerment of women in leadership
24. Increased gender equality in leadership

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

Community Group	Non-cattle owning Masai (people living in poverty)
Net positive impacts	This group is socio-economically vulnerable and often depend directly on forest products like honey and wild medicine to support them since they are without cattle, the normal currency in Masai society. Rights, ensured this period through the approved RMP, to the forest products and the continued health of the forest are a crucial benefit to these people. The group benefited as the general community gained increased ability and understanding with regard to natural resource management. Non-cattle owning Masai depend directly on forest products and thus benefited directly as natural resource management understanding increased in the general community.
Benefit access	Non-cattle owning Masai may leave the village areas for long periods of time so benefits conferred by village development may not reach them, however when out of the village they are spending most of the time in the forest and often living from resources within it, therefore the forest health and access benefits are available always. The implementation of the RMP during this period guaranteed non-cattle owning Masai members of the community access to forest products like honey and wild medicine that support them since they are without cattle.
Negative impacts	Non-cattle owning Masai have not seen negative impacts from the project this period nor are they expected to in the future.

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

In addition to the positive impacts derived by the whole community through the implementation of this project, there were several benefits focused on women. These included incorporating women into positions of leadership within appointed roles in the WMA leadership, hence creating opportunities to influence decision making. Furthermore, the implementation of women's forums served to benefit women and advance their interests in the community. These forums were provided with technical training on land policy, law and administration. The forums mobilized women and the wider community to collectively address existing threats to their lands, demand accountable governance and participatory decision making by local elected leaders, and ensured all community members' views were considered in land management decisions. Forums also addressed gender inequality through women's economic empowerment. Forums were given both material help and training in how to develop themselves economically. The additional impacts of the project on women, concurrent to those affecting the entire community, are outlined in section 4.1.1.

During this verification period women benefited from community wide project activities including the natural resource management education program, and the governance management trainings. The implementation of the RMP during this period and all the benefits in confers were a direct benefit to the women in the community. Please see 4.3.1. for quantification of the results of community-based project activities during this period. During this period the desired objectives of formal women's empowerment and increased women's leadership were both monitored and considered adequate, including women that met in regular forums and female members of WMA leadership. In this period there were no negative impacts on women associated with the project, therefore balanced with the multitude of benefits, the project had net positive impacts on women during this verification period.

4.4.4 Benefit Sharing Mechanisms (CCB, GL2.6)

Benefit sharing is already described in Section 2.5.6 above.

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

The project is primarily governed and implemented by the Makame Wildlife Management Area administration in participation with Carbon Tanzania. The governance of the WMA is distributed between the Village Council and the Authorised Association (AA), in collaboration with the District Government. It is these authorities that enforce the renewed WMA resource management plan which forms the foundation of the project, through which the enactment of traditional land management creates much of the CCB benefits. The responsibilities of these authorities and the regulations of the WMA can be found in the WMA Regulations 2012.

Per the WMA Regulations 2012, an AA is “a community-based organisation, whose primary objective is to conserve wildlife resources for the benefit of local community members ordinarily residing in that particular area”. In Makame it is a collection of representatives elected from all the involved villages, who make the decisions for the WMA and this project, on behalf of the greater community. It is their responsibility to prepare the resource management plan. It is composed of the Board and Executive Committee, both of which are elected and are required to contain approximately 30% women. These are supported by the Village Game Scouts, a Revenue Committee and a Security Committee, as well as additional representatives from each member village, to complete the AA. The AA works in conjunction with the Village Councillors, who are elected within each village. The Village Game Scouts are appointed to protect the natural resources within the WMA and help to enforce the resource management plan. They work closely with the Officer for Community and Patrolling. Within the villages there are also Women’s Forums. These contain 24 members each, elected from each of the sub-villages, that receive trainings regarding rights and leadership from UCRT, including on how to rise to positions of leadership and how to demand and support better governance from existing leadership. Village governance is composed of the elected Chairman, the Village Executive Officer, Village Secretary and the Village Council; who undertake the requests of the entire Village Assembly (everyone above 18 years).

The District Government is responsible to support the WMA by establishing a District Natural Resources Advisory Body. This Body is comprised of the following members:

- District Commissioner
- District Executive Director
- District Legal Officer
- District Land Officer
- District Forestry Officer
- District Bee-Keeping Officer
- District Community Development Officer
- Three representatives of the AA

In addition, project governance and implementation are supported by UCRT and Carbon Tanzania. This support is aimed at improving governance structures within the WMA enabled through capacity building and training provision. Training topics include good governance, book-keeping, financial management, conflict resolution, and current government laws and policies. These organisations have experience working with a collection of specialised organisations, predominantly local NGOs, involved in the greater project area.

It is inherent in the functioning of a WMA that smallholders and community members are involved in decision making processes through their elected representatives. The concept of democracy is well

understood throughout Tanzania and carefully applied in the implementation of this project by the project developers, Carbon Tanzania and UCRT.

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

AA and the village leadership groups led the development of the Conservation Action Plan, conducted in August 2016. The village leadership groups have been involved in learning sessions with the project developer as well as with development partners in the landscape (The Nature Conservancy, Ujamaa Community Resource Team). Educational sessions in Maa and Kiswahili were conducted by a skilled educator to explain all aspects of REDD developments to leaders, administrators and youth in the participating villages. These efforts have then been assessed to ensure knowledge and capacity was gained. Village Game Scouts continue to be trained in basic patrol protocols and monitoring for the project activities. VGS have also been equipped with modern technology and a fully equipped based station. The Carbon Champions program provides employment opportunities to spread information and understanding of the project at all levels into the farthest reaches of the community. From Carbon Tanzania's perspective these trainings have already led to a measured increase in the WMA's and AA's efficiency when interacting with the project developer. Throughout the project's lifespan one of Carbon Tanzania's focuses with our partners is developing and increasing the capacity of community members and of the WMA as an entity.

Carbon Tanzania is also continuing to work with partners to conduct capacity building and trainings for WMA leadership on good governance, bookkeeping, financial management, conflict resolution, and current government laws and policies.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

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

Generally, all monitored species populations appear to be stable or increasing during this monitoring period based on monitoring indicators reported below and in Section 5.3.1.

Monitoring of large mammal populations were supported by annual ground transects and occupancy modeling using dung and spoor (track) counts in March 2024 (see "makame_occupancy_modeling_2024.docx").

Table 5.1 Net positive biodiversity impacts on the 6 target threatened species present within the project area, presented in the following tables.

Change in Biodiversity	African Elephant
Monitored Change	The population was predicted to increase during the project lifetime and increased during this monitoring period. Based on data presented below, estimated occupancy has increased since the project start through the current monitoring period (from estimated occupancy in 2019 of 0.58 to 0.94 in 2024; “makame_occupancy_modeling_2024.docx”).
Justification of Change	Though considered vulnerable due to population declines throughout its African range. Successful habitat protection as shown through protection of forest cover, and prevention of ivory poaching within Makame WMA as part of project activities offer direct and indirect benefits to the population. This is supported in the occupancy data.

Change in Biodiversity	Giraffe
Monitored Change	The population was predicted to increase during the project lifetime and continued to remain stable during this monitoring period.
Justification of Change	Giraffe continued to be present throughout the reporting period, benefitting from successful habitat protection, demonstrated by forest cover analysis, and prevention of meat poaching within Makame WMA as part of project activities.

Change in Biodiversity	African Wild Dog
Monitored Change	The population was predicted to remain stable or increase during the project lifetime and no significant trends in density were detected through the monitoring period.
Justification of Change	The detection probabilities for wild dog were low during this reporting period, However, the variability in densities is as expected when monitoring wildlife that occur at low densities over large home ranges. Indeed, looking back over the past few years, densities of African Wild Dog fluctuate over time. See “Makame_occupancy_modeling_2024.docx”. The species is

	now considered endangered due to rapid population declines throughout its African range. Importantly, however habitat protection as shown through protection of forest cover and the protection of food source (against poaching) as part of project activities within Makame WMA will help to prevent their decline.
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Change in Biodiversity	Beisa Oryx
Monitored Change	The population was predicted to remain stable or increase during the project lifetime and appeared to remain stable during this monitoring period.
Justification of Change	Monitoring of Beisa Oryx is employed through presence/absence analysis in the project area. Beisa Oryx was present in 2019 and 2021. Beisa Oryx tends to be more difficult to track and its absence in 2023 and 2024 is not necessarily an indicator that the population is declining. See “Ground count_Makame_2016-2024”. It is considered vulnerable due to population declines throughout its African range. Successful habitat protection, demonstrated by forest cover analysis, and prevention of meat poaching within Makame WMA as part of project activities lead to the estimated changes during this reporting period.

Change in Biodiversity	African Lion
Monitored Change	The population was predicted to remain stable during the project lifetime and continued to remain stable during this monitoring period.
Justification of Change	Survey-specific occupancy estimates show that African Lions are present in the project area over the reporting period. No significant changes in estimated occupancy were detected through the current reporting period. African Lions continue to be present at low densities, and appear to be stable in the project area. See “Makame_occupancy_modeling_2024.docx”. African Lions benefit from habitat protection, as shown through remote sensing of forest cover, the conservation of food sources, and protection against poaching as part of project activities within Makame WMA.

Change in Biodiversity	African Leopard
Monitored Change	The population was predicted to remain stable during the project lifetime and continued to remain stable during this monitoring period.
Justification of Change	Survey-specific occupancy estimates show that African Leopards are present in the project area over the reporting period. No significant changes in estimated occupancy were detected through the current reporting period. African Leopards continue to be present at low densities, and appear to be stable in the project area. See “Makame_occupancy_modeling_2024.docx”. African Leopards benefit from habitat protection, as shown through remote sensing of forest cover, the conservation of food sources, and protection against poaching as part of project activities within Makame WMA.

Density estimates (estimated individuals per square kilometer) from 2019 to 2024 for six large carnivore species monitored through annual ground surveys in March and April (most recently in March 2024) (summarized from “makame_occupancy_modeling_2024.docx”).

Species	Year	Density	lower 95% CI	upper 95% CI
African wild dog	2019	2.2	0.0	5.1
African wild dog	2020	0.6	0.0	1.4
African wild dog	2021	0.8	0.0	2.4
African wild dog	2022	0.0	0.0	0.0
African wild dog	2023	0.0	0.0	0.0
African wild dog	2024	0.0	0.0	0.0
Cheetah	2019	0.6	0.0	1.4
Cheetah	2020	0.0	0.0	0.0
Cheetah	2021	0.0	0.0	0.0
Cheetah	2022	0.0	0.0	0.0
Cheetah	2023	0.0	0.0	0.0
Cheetah	2024	0.0	0.0	0.0

Leopard	2019	5.0	1.8	8.1
Leopard	2020	0.5	0.0	1.1
Leopard	2021	2.7	1.1	4.4
Leopard	2022	0.6	0.0	1.4
Leopard	2023	0.2	0.0	0.5
Leopard	2024	0.6	0.0	1.4
Lion	2019	4.2	3.5	4.8
Lion	2020	2.6	1.4	3.7
Lion	2021	1.1	0.0	3.3
Lion	2022	0.2	0.0	0.5
Lion	2023	0.8	0.0	1.7
Lion	2024	2.7	0.0	6.0
Spotted hyena	2019	6.1	2.6	9.5
Spotted hyena	2020	12.0	4.9	19.1
Spotted hyena	2021	26.5	20.5	32.5
Spotted hyena	2022	29.4	23.4	35.4
Spotted hyena	2023	25.2	20.2	30.3
Spotted hyena	2024	19.0	9.0	29.0
Striped hyena	2019	0.3	0.0	0.7
Striped hyena	2020	0.2	0.0	0.5
Striped hyena	2021	0.2	0.0	0.5
Striped hyena	2022	0.0	0.0	0.0
Striped hyena	2023	0.3	0.0	0.7
Striped hyena	2024	10.1	4.9	15.2

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, mitigating these threats forms the fundamental design of this project. By successfully implementing the resource management plan, Makame WMA has enhanced habitat for resident and migratory megafauna. The design of this project and the wildlife laws of Tanzania has enabled the Authorized Association of Makame WMA to update the RMP and to take the necessary mitigating actions, where needed, to maintain the protection of biodiversity within the project area. These actions include updating the RMP, which mandates rights to the WMA, improvement of governance as described in Section 4.4.5, protection measures such as those described in Table

4.4.1. These actions lead to improved landscape protection, landscape connectivity for migratory species and anti-poaching to reduce loss of wildlife.

The employment of village game scouts during this period (see Community Monitoring Plan 4.3.1.) also directly mitigates threats to biodiversity in the landscape as their mandate is to patrol the WMA and monitor its resources and wildlife. The VGS play the important role of implementing the RMP by enforcing community rules around grazing resources which are also critical to wildlife and doing anti-poaching work to protect the WMAs biodiversity from illegal exploitation. These activities and processes all serve to mitigate threats to biodiversity and more specifically wildlife within the WMA and the project as a whole.

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

The degradation of habitat that existed prior to project initiation in 2016 includes those conditions described in section 2.1.5 of the Project Description (PD) and further the conditions are the same as the baseline scenario as described in section 3.1.4 of the PD. This REDD project was designed to implement the Makame WMA Resource Management Plan (RMP) which focuses on the protection and conservation of natural resources. The species outlined in section 5.2.1 of the PD all require large tracts of intact habitat and both resident and migratory populations exist in the project area, and adjacent habitats. In the case of resident predators (all of which are endangered) such as Leopard, Cheetah and Lion, the presence of prey species in sufficient densities is also essential for breeding success. The camera trapping exercise conducted in September to December 2017 as part of the biodiversity monitoring plan confirmed the presence of our targeted endangered species (section 1 and section 5.) and further to that, surveys and occupancy modelling conducted in March 2024 confirmed the presence of Lions and Leopards that are almost certainly ranging between Makame WMA and Tarangire National Park, along with megafauna such as elephant and giraffe. Landscape connectivity is critical for these herbivores. Though populations of monitored species fluctuate due to difficulties of tracking and the large range of habitat, these species continue to be present with evidence suggesting stable populations. By maintaining substantially more forest cover in the project than compared to the baseline forest loss, it is clear that the project is having net positive benefits to biodiversity.

As stated in the PD, the Tarangire–Manyara Ecosystem in northern Tanzania forms a patchwork of protected and unprotected areas and experience substantial human population growth²⁸. In the Tarangire – Manyara Ecosystem, pastoral Maasai areas such as areas around Makame WMA are gradually shifting away from exclusive pastoralism towards both subsistence and commercial agriculture and illegal hunting

²⁸ Msoffe, F.U., Said, M.Y., Ogutu, J.O., Kifugo, S.C., de Leeuw, J., van Gardingen, P. & Reid, R.S. (2011) Spatial correlates of land-use changes in the Maasai-Steppe of Tanzania: implications for conservation and environmental planning. *Int. J. Biodivers. Conserv.* 3, 280–290.

is rampant, particularly outside fully protected areas²⁹. This development may directly and indirectly reduce wildlife species richness³⁰ whilst reduced species richness often leads to a loss of functional species groups which in turn can be lead to trophic cascades and may affect ecosystem services³¹. Beyond such ecological consequences, a loss of species richness may directly compromise tourism, an important source for Makame WMA as well other areas within the Tarangire-Manyara ecosystem³².

As part of this REDD project, climate change and variability analysis using Climate Wizard³³ was conducted to forecast future climate change scenarios in five community wildlife management areas in the northern Tanzania rangelands (Burunge, Enduimet, Lake Natron Basin, Makame, and Randilen) and four districts (Kiteto, Monduli / Longido, and Simanjiro) in Northern Tanzania. The analysis projected climate scenario over the next 50 and 100 years. This analysis was produced using a set of 9 General Circulation Model (GCM) projections from the World Climate Research Programme's (WCRP's) Coupled Model Intercomparison Project phase 3 (CMIP3). The Climate Wizard was developed to calculate 22 “derivative climate metrics” that are calculated from projections of both temperature and rainfall³⁴. These climate change scenarios have clarified the impacts on availability of grazing for both pastoralist Masai and wildlife. This regional assessment was further supported by multiple national studies referenced in a synopsis by USAID³⁵ and articulated in the Tanzanian National Climate Change Strategy³⁶. In all cases there is recognition of supporting the planning and protection of indigenous habitat for livestock and wildlife. The project activities help to maintain vital woodland habitat that will continue to support wildlife populations as the impacts of

²⁹ Kiffner et al. (2014) From savannah to farmland: effects of land-use on mammal communities in the Tarangire-Manyara ecosystem, Tanzania. *African Journal of Ecology*. Vol 53, issue 2.

³⁰ Ogotu, J.O., Bhola, N. & Reid, R. (2005) The effect of pastoralism and protection on the density and distribution of carnivores and their prey in the Mara ecosystem of Kenya. *J. Zool.* 265, 281–293.

³¹ Flynn, D.F.B., Gogol-Prokurat, M., Nogeire, T., Molinari, N., Richers, B., Lin, B.B., Simpson, N., Mayfield, M.M. & Declerck, F. (2009) Loss of functional diversity under land-use intensification across multiple taxa. *Ecol. Lett.* 12, 22–33.

³² Nelson, F., Nshala, R. & Rodgers, W.A. (2010) The evolution and reform of Tanzanian wildlife management. *Conserv. Soc.* 5, 232–261.

³³ Girvetz, E. H., Zganjar, C., Raber, G. T., Maurer, E. P., Kareiva, P., & Lawler, J. J. (2009). Applied climate change analysis: The climate Wizard tool. *PLoS ONE*, 4(12)

³⁴ NTRI EENT Climate Change Report Final.

³⁵ www.climatelinks.org/sites/default/files/asset/document/tanzania_adaptation_fact_sheet_jan2012.pdf

³⁶

<http://tanzania.um.dk/en/~media/Tanzania/Documents/Environment/TANZANIA%20CLIMATE%20CHANGE%20STRATEGY/TANZANIA%20CLIMATE%20CHANGE%20STRATEGY.pdf>

climate change cause changes to the landscape by supporting the habitat availability. High conservation value areas, like watering holes, will be maintained by preventing forest loss in the Makame WMA.

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

There were no cases, documented or recorded where increased protection and implementation of the RMP through this REDD project have created any negative impacts to biodiversity or other HCVs either within Makame WMA or in adjacent areas (attestation from the manager of the Makame WMA, through March 2024, provided in "HCV_impact_letter.pdf").

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

No known species were introduced to any area affected by the project.

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

No known invasive species were introduced to any area affected by the project.

5.1.7 GMO Exclusion (CCB, B2.7)

No genetically modified organisms were used within the project area. GMO are currently illegal in Tanzania for non-academic uses.

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

No fertilizers, chemical pesticides, or biological control agents have been used as a part of project activities.

5.2 Offsite Biodiversity Impacts

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

No negative offsite biodiversity impacts occurred during this monitoring period.

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

This project provided considerable offsite biodiversity benefits as the project area in Makame WMA represents the southern limit of the Tarangire-Manyara ecosystem (see PD section 5.1.1.), an area of 35,000,000 ha supporting the second largest mammal concentration within Tanzania. The ecosystem contains two national parks, Manyara and Tarangire that protect the core refuge for large mammals during the dry season (July – November). Once the rains begin in December, many of the large mammals disperse, migrating out of the national parks where they are protected, into a variety of areas where they have either no formal protection or into areas like Makame WMA where the

communities have the rights to protect the wildlife. The Tarangire-Manyara ecosystem has a rich diversity of wildlife, with over 500 species of birds and over 100 species of mammals and thus Makame, which forms a large part of that represents a critical habitat for enigmatic megafauna and endemics species of birds.

5.3 Biodiversity Impact Monitoring

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

Table 1.3.1. Outline of biodiversity monitoring plan, for more detail see PD section 5.4. and the Biodiversity Monitoring Plan for Makame Savannah REDD project.

Objective	Activity	Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
Protection of Acacia-commiphora woodland	Implementation of the Makame RMP (ongoing)	Maintenance of ecosystem diversity, habitat connectivity	Reduction of deforestation within the project area, see Section 2.	Carbon project area, 104,065 ha	Assessment of forest cover change via time series of classified satellite imagery	Every verification period	Carbon Tanzania	During the monitoring period from April 27, 2023 to April 26, 2024, approximately 8,000 ha of Acacia-dominated shrubland and Acacia-Commiphora woodland were conserved (8,255 ha predicted to be deforested in the baseline – 39 ha actual deforestation)

Objective	Activity	Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
Annual monitoring of mammal populations in project area	Ground count surveys (March 2024)	Index of abundance for all mammal species	Species presence and absence	S14: 33.3KM S15: 24.2km S17:8.1km S18:24.2km Total 91.7km	Ground count survey methodology	Annual count	Carbon Tanzania	The following large mammal (including monitored HCV) species were observed (and present) during ground counts conducted during March 2024 and via informal observations during the current monitoring period: Leopard, Lion, Spotted Hyena, Striped Hyena and Elephant, Giraffe. (Cheetah, African Wild Dog and Beisa Oryx were not observed during the

Objective	Activity	Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
								monitoring period.) (further results provided in section 5.1.1)
Monitoring of total mammal species in project area	Camera trapping	Presence and relative abundance of mammal species	Relative abundance index (RAI) of indicator species	Selected site within project area	Camera trap survey	September – December 2017 (once at project start)	Wildlife Conservation Society	Completed at project start (not monitored)
Monitoring of total mammal species in project area	Wet season occupancy survey (March 2024)	Presence and occupancy of HCV mammal species	Dung for Elephant and spoor for large carnivores and sightings for all mammal species	S14: 33.3KM S18:24.2km Total 57.5km	Occupancy modelling	(Annual) 2019 - 2046	Carbon Tanzania & School for field studies – centre for wildlife management studies. ³⁷	Ground counts were conducted during March 2024. Estimated carnivore densities (individuals/km ²) are

³⁷ fieldstudies.org

Objective	Activity	Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
								reported in section 5.1.1. Monitoring of the reported carnivore species shows no significant change in population densities or occupancy estimates (accounting for imperfect detection probability) from 2019 to 2024 (due in part to wide confidence intervals around estimates). Estimated occupancy of elephants increased

Objective	Activity	Anticipated impact	Indicator	Area monitored	Sampling method	Frequency of monitoring	Responsible to monitor	Results
								significantly over the period from 2019-2024. All results are further detailed in "makame_occupancy_modeling_2024.docx"

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

The biodiversity monitoring plan (BMP) has been translated and disseminated to the WMA, the same is the case for any results of monitoring undertaken in accordance with the monitoring plan. Data from biodiversity monitoring was added to databases for birds in the country, including the Tanzania Bird Atlas³⁸. The mammal database does not currently exist, but when and if it becomes available again, the data will be reported. The camera trap report can be accessed online³⁹. Copies of all reports have been provided to the WMA.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

This project provided exceptional biodiversity benefits as the project area in Makame WMA represents the southern limit of the Tarangire-Manyara ecosystem (see PD map section 5.1.1.), an area of 35,000,000 Ha supporting the second largest mammal concentration within Tanzania. The ecosystem contains two national parks, Manyara and Tarangire that protect the core refuge for large mammals during the dry season (July – November). Once the rains begin in December, many of the large mammals disperse, migrating out of the national parks where they are protected, into a variety of areas where they have either no formal protection or into areas like Makame WMA where the communities have the rights to protect the wildlife.

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

Trigger species population trends and justification. All six are threatened species present within the project area. Data for these wildlife populations is tracked through annual surveys and occupancy counts.

Trigger Species	Giraffe
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching due to increased activity of the village game scouts within Makame WMA. The population remained stable throughout the monitoring period. See section 5.1.1.

³⁸ http://tanzaniabirdatlas.net/TBA_square_pdf/3604D_Makame_fn.pdf

³⁹ <https://www.facebook.com/wcstanzania/posts/surveying-mammals-in-makame-wmawcss-tarangire-elephant-project-in-collaboration-/1104258096403418/>

Trigger Species	African Elephant
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching due to increased activity of the village game scouts within Makame WMA. The population remained stable or increased throughout the monitoring period. See Section 5.1.1.

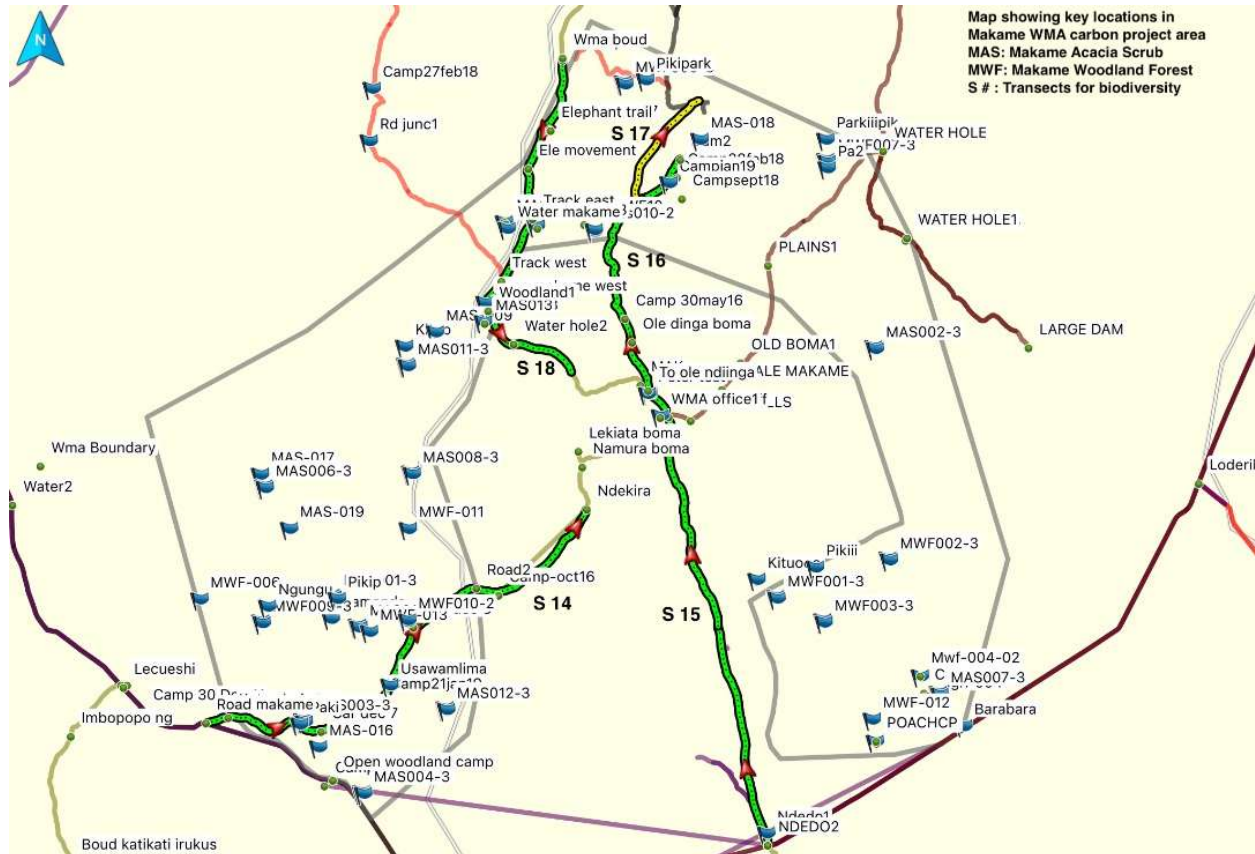
Trigger Species	African Wild Dog
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching due to increased activity of the village game scouts within Makame WMA. The population was undetected in the monitoring period.

Trigger Species	Beisa Oryx
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching due to increased activity of the village game scouts within Makame WMA. The population was undetected in the monitoring period.

Trigger Species	African Lion
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching due to increased activity of the village game scouts within Makame WMA. The population remained stable throughout the monitoring period. See Section 5.1.1.

Trigger Species	African Leopard
With-project Scenario	Protected habitat through updating and implementation of the WMA resource management plan. Prevention of meat poaching

due to increased activity of the village game scouts within Makame WMA. The population remained stable throughout the monitoring period.



APPENDIX 1: PROJECT THEORY OF CHANGE

Support traditional grazing zones and by-laws through implementation of the RMP	Decreased unlawful grazing and land use	Better availability of grazing resources throughout the whole year	Protect and maintain the culture and tradition and natural resource conservation. Better protection of grazing land for target megafauna and greater resilience of communities to climate change impacts	Security and sustainability of livelihoods
		Improved rangeland health		Food security increase
		Healthy cows		Wealth increase
		Increased connectivity for cattle and wildlife across the landscape		Formalization of grazing rights
		Resilience and sustainability of pastoralism		
TARGET 6				
Governance training for WMA leadership	Improved capacity to manage natural resources	Better implementation of the resource management plan	Strengthen governance, improve livelihoods and natural resource conservation through the RMP	More trust and confidence in leadership and the WMA structure
Governance training for village leaders & comm. members	Improved capacity to manage natural resources	Improved management of the WMA		Improved service provision
Governance training for women's leadership groups	Improved capacity to manage natural resources			Improved livelihoods
Ensure female representation in leadership	Better integration of women into decision making	Consideration of women in community decisions		Empowerment of women in leadership

		Empowerment of women		Increased gender equality in leadership
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APPENDIX 2: PROJECT RISKS

	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 livelihood, 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 against women	Reduced community engagement, project delays, lack of local support	Established inclusive communication channels, conducted regular stakeholder meetings, and implemented feedback mechanisms across all project areas. Multiple feedback and grievance pathways available at community and project level. Tracking of project spending. HR and safeguarding policies that prohibit discrimination and promote equal opportunities.
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 gear when relevant.
Safety of women and girls	Gender-based violence, harassment, discrimination	Physical and psychological harm, legal liability, loss of trust within the community	Enacted gender-sensitive safeguarding education and policies, provided training, ensured safe reporting mechanisms.
Safety of minority and marginalized	Discrimination, exploitation, lack of access to services	Marginalization, social unrest, reputational damage	Enforced anti-discrimination policies, provided equal access to resources, provided trainings, engaged with community leaders,

groups, including children			and included marginalized groups in decision-making processes.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	Environmental pollution from project activities	Health risks to the community, degradation of biodiversity, legal penalties	Maintained strict compliance with environmental regulations, and by policy utilized 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	Enforced 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, enforced gender equity policies, and supported women in conservation roles within the projects.
Forced labor	Coercion or exploitation of workers	Legal repercussions, reputational harm, employee unrest	Provided clear contracts in languages understood by workers, implemented regular staff monitoring, and ensured strict enforcement of labor rights.
Child labor	Employment of underage workers	Legal action, reputational damage, and ethical concerns	Adhered to safeguarding policies prohibiting child labor, conducted annual check, and provided training to stakeholders on child labor laws, supported by the company's whistleblowing policy.
Human trafficking	Involvement in or facilitation of trafficking activities	Severe legal consequences, harm to individuals, reputational damage	Implemented anti-trafficking policies, trained staff on and reporting, and collaborated

			when necessary with local authorities to monitor and prevent such activities.
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 delays	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 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.
Grazing	Overgrazing/resource pressure	Better quality grazing could attract others to the area and lead to increased pressure on shared resources	The RMP creates a mechanism to enforce rules for incursions by other people into the community grazing land
Finance	Corruption and theft	Increased revenue could lead to corruption and theft of funds intended for community projects	The WMA structure has an internal system of checks to ensure financial transparency for the collection and spending of project funds
Culture	Loss or damage to Masai culture	Project could threaten the ancient culture of the Masai in the area due to exposure	The RMP was designed by communities with a specific focus on protecting culture and traditional natural resource uses

Land use	Loss of access to resources or land use rights	The project could affect the way land is used in the community and restrict access	The RMP was designed by the communities specifically to protect traditional land uses
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APPENDIX 3: REMOTE SENSING AND ACCURACY ASSESSMENT

To produce the 2024 forest cover map, we first attempted to locate Landsat 8 and 9 imagery with less than 10% cloud cover. Failing that, Sentinel-2 data was obtained utilizing a median composite for June-July 2024 of all images with less than 15% cloud cover. The resulting median composite had a cloud cover within the Project Area of 10%, as the cloudiest areas were outside of the Project Area. Sentinel-1 data was obtained using Google Earth Engine, also for June-July 2024. The Sentinel-1 data was resampled to 10m to align with the Sentinel-2 optical bands. Several spectral indices were calculated for the Sentinel data, with all bands and transformations used listed in the table below. Unless otherwise mentioned, imagery was obtained in R using the packages `rstac` and `gdalraster` from the Microsoft Planetary Computer, with all transformations (resampling, calculations) performed in R using the `terra` package.

Sentinel-2	Sentinel-2 Indices	Sentinel-1
Coastal Blue	K-normalized NDVI	VV
Blue	Enhanced Vegetation Index (EVI)	VH
Green	Modified Soil Adjusted Vegetation Index (MSAVI)	VH/VV
Red Edge 1	Normalized Difference Water Index (NDWI)	
Red Edge 2	Green NDVI (GNDVI)	
NIR	Burned Soil Index (BSI)	
Water Vapor	Atmospheric Resistant Vegetation Index (ARVI)	
Red Edge 4	Green Chlorophyll Index (GCI)	

SWIR1	Structure Insensitive Pigment Index (SIPI)	
SWIR2	Normalized Burned Ratio (NBI)	
	Green Leaf Index (GLI)	
	Normalized Difference Red Edge Index (NDRE)	
	Red Edge Position Index (REIP)	

Training data was delineated using Planet imagery obtained through the NICFI program for June-July of 2023 and 2024 and, where available, high resolution images through Google Earth. Training samples were identified in 4 classes - Agriculture (NF), Soil/Grassland (NF), Light Forest (F), Dense Forest (F), which were collapsed into the final Forest/Non Forest classes as labeled.

The classification was conducted in R using the VSURF, caret, and randomForest packages. Classification variables were reduced using VSURF (Variable Selection Using Random Forest), with the final classification on the reduced dataset produced through caret and randomForest. Variables selected through VSURF are **bold** in the table above. The selected variables are known to be useful for soil and vegetation discrimination. After combining the classes to binary F/NF additional manual verification and editing was performed.

After classification, 200 points were randomly selected for accuracy assessment purposes, resulting in 100 Forest and 100 Non-Forest points. Using the Planet imagery from June-July of 2023 and 2024, classification results were compared to the high-resolution imagery to assess the accuracy of the classification. This imagery is collected from Planet Labs satellites that collect multispectral imagery at very high resolution that meets the requirements of the methodology of < 5m resolution for ground-truthing imagery. Distribution of validation points was limited to areas where high resolution imagery was available for corresponding dates to the classification imagery. As availability of high resolution imagery corresponds to areas of active deforestation and development, it follows that these scenes are a mosaic landscape with patches of forest/non forest. It is within this mosaic landscape where classification is most likely to be erroneous due to the scale at which deforestation is taking place and the resolution of Sentinel-2 which can create the challenge of mixed pixels. As such, the higher concentration of accuracy assessment points within these mosaicked landscapes is not only logical since deforestation is most prevalent here, but it is also where classification errors are more likely, thus increasing the

difficulty of attaining the requisite classification accuracy. Distribution of all points is shown in Figure A.1. below. The assessment was conducted on a Forest/Non-Forest basis at the 0.5 ha scale, centered around the point.

	Forest	Non-Forest	Producer's Accuracy (%)
Forest	99	1	99
Non-Forest	3	97	97
User's Accuracy (%)	97	99	
Overall Accuracy			98

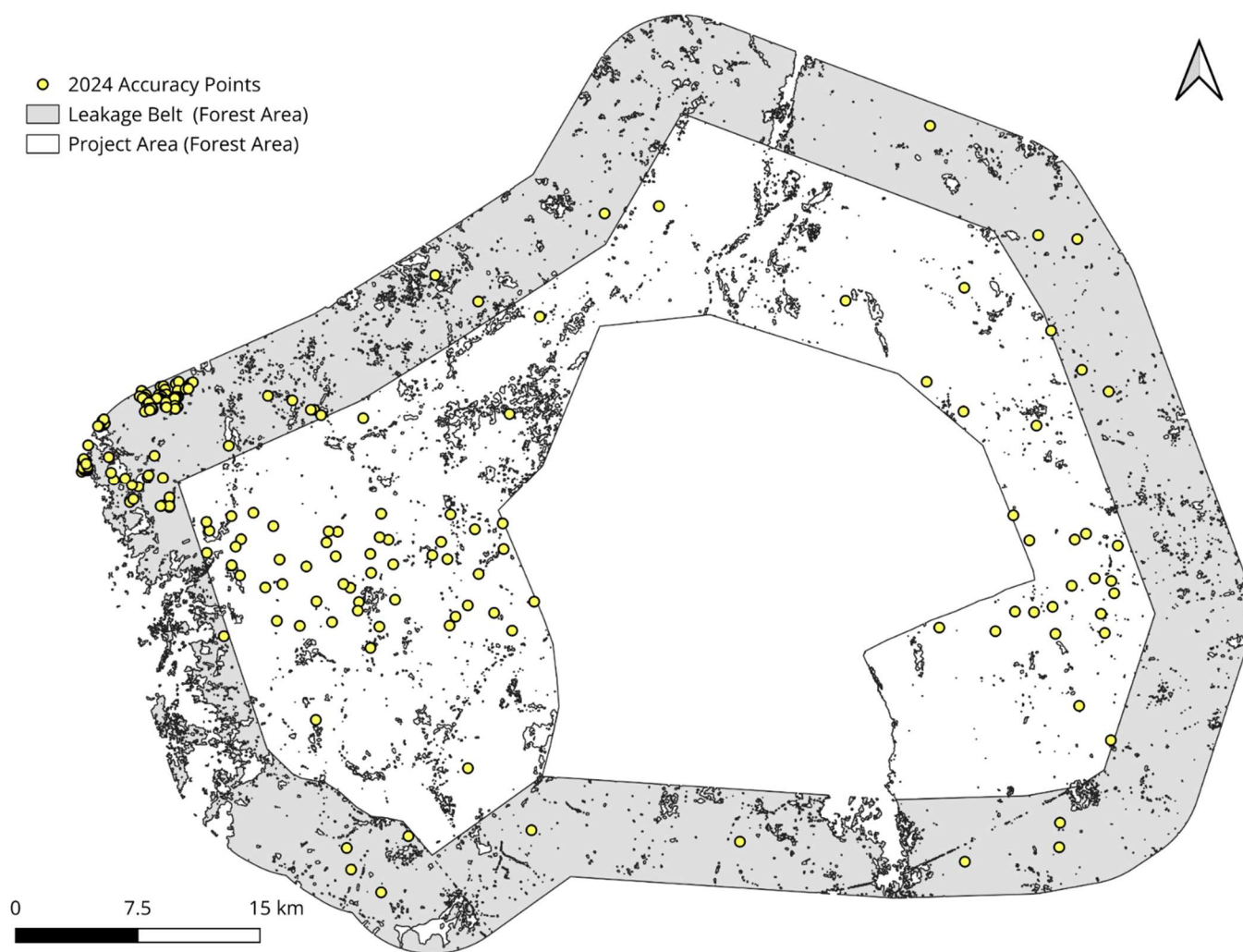


Figure A.1. Distribution of accuracy assessment points over the Makame project area and leakage belt.

Table 2. Total Area of 2024 Forest Strata within Project Area and Leakage Belt (ha)

2024 Forest Areas (ha)	Woodland/Forest	Acacia Shrub/Woodland	Total Forest Area (ha)
Project Area	31,986.2	70,871.1	102,857.3
Leakage Belt	30,524.2	67,412.3	97,936.5

Table 3. Total Loss Area of 2024 Forest Strata within Project Area and Leakage Belt (ha)

2024 Loss Area (ha)	Woodland/Forest	Acacia Shrub/Woodland	Total Loss Area (ha)
Project Area	4.9	33.6	38.5
Leakage Belt	125.4	254.0	379.5